

# BOX IT OR BAG IT MATHEMATICS



Published by The Math Learning Center



1st and 2nd Grade  
Teachers Resource Guide

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# BOX IT OR BAG IT MATHEMATICS

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## **Box It or Bag It Mathematics, Teachers Resource Guide—1st and 2nd Grade**

Box It or Bag It Mathematics consists of:

Teachers Resource Guide and Blackline Masters, Kindergarten

Teachers Resource Guide and Blackline Masters, 1st and 2nd Grade

Practice & Enrichment Boxes:

Shapes

Introduction to Measuring

Understanding Measuring

Reading, Writing & Understanding Numerals 0–10

Pattern

Arithmetic

Money

Place Value Counting

Place Value Addition & Subtraction

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## **Dedication**

With continuing thanks to the children from whom we learn, we dedicate this book to hard working teachers everywhere.

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## Foreword

It is incredibly challenging to provide a developmentally appropriate and joyful learning environment for young children. Many first and second grade teachers are provided workbooks and little else for the teaching of mathematics. We believe a good learning environment involves much more.

Dedicated teachers quickly realize young learners need hundreds of opportunities which include music, storytelling and drama as they confront geometry, patterning, estimating and counting, measuring, adding and subtracting, money, place value counting/addition and subtraction, and extended number patterns. They want children to work together making responsible choices as they grow in mathematics.

If you are one of these hard-working teachers searching for language-enriched mathematical resources, this book is for you.



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# SCOPE & SEQUENCE— 1st and 2nd Grade

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## Seasonal Mathematics

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Children will have opportunities each month to experience:

- Sorting
- Patterning
- Graphing
- Estimation and Place Value Counting
- Story Problems, Extended Number Patterns
- Measuring
- Money
- Geometry/Spatial Problem Solving

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## Organizing Information

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### Sorting

- Sorting by two or more attributes (color, size, function, material, texture, quantity, and many other properties)

### Graphing

- 2, 3, and 4 column real graphs
- 2, 3, and 4 column picture graphs
- 2, 3, and 4 column symbolic graphs

### Extended Number Patterns

- Counting by twos, threes, fours, fives, and tens to 100
- Number patterns
- Beginning multiplication and division

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## The Calendar

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- Counting by ones, fives, and tens
- Visual and number patterns
- Names of days and months
- Seasons and holidays
- Time and duration
- Number combinations
- Odd and even numbers
- Naming fractions
- Weather observations
- Graphing
- Daily schedule
- Children's growth and change
- Place value: hundreds, tens and ones



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# Concept Instruction

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## Pattern

Children will have many opportunities to:

- Copy and extend such patterns as ABAB, AABAAB, ABBABB, ABCABC, ABBCABBC.
- Sort and then pattern objects by color, size, shape, type, texture, and many other attributes.
- Create their own patterns.
- Pattern objects by position and quantity.

## Arithmetic

Children will have many opportunities to:

- Experience addition and subtraction as processes that occur in their everyday world.
- Use symbols (numerals, +, −, =) as tools to read about and record transactions.
- Act out, sketch, tell, and record story problems that involve addition and subtraction.
- Develop a sense of patterns and strategies for adding and subtracting numbers: +0, −0, +1, −1, doubles, neighbors, +10, +9.
- Learn addition and subtraction facts to 18.

## Understanding Measuring

Children will have many opportunities to:

- Measure and compare length, weight, capacity, circumference, perimeter, area, and duration in nonstandard units.

## Money

Children will have many opportunities to:

- Recognize and name coins—pennies, nickels, dimes, and quarters.
- Develop knowledge of coin worth—pennies, nickels, dimes, and quarters.
- Count sums of money to \$1.00 or more.
- Record quantities of money using proper notation.
- Read prices and calculate how to pay for items.
- Make change.

## Place Value Counting

Children will have many opportunities to:

- Count, read, write, and construct models of numbers to 999.
- Count by tens and ones.
- Count by hundreds, tens, and ones.
- Use expanded notation ( $24 = 20 + 4$ ;  $135 = 100 + 30 + 5$ ).
- Measure in centimeters.
- Search for number patterns utilizing a matrix.

## Place Value Addition and Subtraction

Children will have many opportunities to:

- Ponder reasonable sums and differences as they set up models for story problems.
- Add and subtract 2- and 3-digit numbers, with and without regrouping.
- Check work using questions such as: “Is this reasonable?” “Does my solution answer the problem?”



# INTRODUCTION

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## What is Box It or Bag It Mathematics?

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Box It or Bag It Mathematics is a set of resources for kindergarten, first grade and second grade teachers who want to develop a rich, activity-centered mathematics program. Box It or Bag It Mathematics consists of:

- **Two Teachers Resource Guides** (one for kindergarten and one for first and second grades). The guides contain monthly Seasonal Math units plus teacher-directed lessons for major mathematical concepts. A packet of blackline masters accompanies each Resource Guide.
- **Practice and Enrichment Boxes.** Nine packets of blacklines, cardstock items (in some cases) and

instructions to create Independent Practice Time activities for the following topics:

- Shapes (K)
- Reading, Writing and Understanding Numerals 0-10 (K)
- Pattern (K-2)
- Introduction to Measuring (K)
- Understanding Measuring (1-2)
- Money (K-2)
- Arithmetic (1-2)
- Place Value Counting (1-2)
- Place Value Addition and Subtraction (2)

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## What is the Philosophy of Box It or Bag It Mathematics?

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Young children learn best when they are actively involved in hands-on experiences with a variety of materials.

Understanding takes lots of time. Children need multiple opportunities and experiences in a wide variety of contexts to construct knowledge. Not all children are expected to notice the same things or come to the same levels of understanding. Individual differences are respected and celebrated.

Language is a tool for learning and thinking. Children who can tell, draw, or act out story

problems to illustrate an operation or explain to others how they solved a problem are closer to understanding a concept than children who labor alone silently over worksheets as the daily routine.

Mathematics is more than arithmetic. In fact, with the advent of computers (which can perform billions of computations in one second), geometry, patterning, sorting, graphing, estimating, measuring and problem solving might be considered the basic skills.

Mathematics is synonymous with problem solving *if* we take every opportunity to ask rather than tell, guide rather than direct.

Mathematics should be exciting to students and to teachers. It is most likely to be when it is rich,

varied and relevant. As we conduct activities in our classrooms, we need to be aware of what we're teaching and why; there are no math programs except those teachers develop and modify each year to meet the needs of the children sitting in front of them.

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## How is Box It or Bag It Organized?

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Box It or Bag It Mathematics offers four major strategies to provide rich and varied opportunities for learning:

Seasonal Mathematics (Teachers Resource Guide)

The Calendar (Teachers Resource Guide)

Concept Instruction (Teachers Resource Guide)

Independent Practice Time (Practice and Enrichment Boxes)

*Invitations to Problem Solving with Story Boxes, Kindergarten* and *Posing and Solving Problems with Story Boxes, 1st and 2nd Grade* are excellent supplements to Box It or Bag It Mathematics offering an extensive child-centered approach to problem solving.

### SEASONAL MATHEMATICS

Seasonal Mathematics activities provide exposure to key math concepts every month, all year long. Units such as Teddy Bear Math, Exploring Changes, Fall Potpourri, and Boats, Bath Toys and Water present math concepts in relation to real world problems:

*Each of us brought a teddy bear to school today. How many are brown? Which is biggest? Which is heaviest? Are there more brown bears or more white bears?*

These questions and others create a need to further investigate mathematical concepts:

*Teacher has a sealed box and we have to figure out what's inside. She'll only answer "yes" or "no" to our questions.*

Seasonal Mathematics activities provide challenges and problem-solving opportunities:

*Wow! It's a bag of conversation hearts. I wonder if there are enough for all of us to have one—or maybe more. Do you think there are more pinks or more purples? How much did they cost?*

Seasonal Mathematics activities offer review of key math concepts. Kindergartners experience sorting, graphing, patterning, counting, geometry, measuring, estimating and story problems every month. First and second graders utilize sorting, patterning, graphing, measuring, working with money, geometry, story problems and place value monthly. Children's excitement grows as they gain skills to ask and answer questions.

### THE CALENDAR

The Calendar activities provide daily introduction and reinforcement of concepts. Through daily calendar routines, students develop the concepts of place value, estimation, patterning, time, addition and subtraction, and money.

### CONCEPT INSTRUCTION

While Seasonal Mathematics activities create ongoing need for, purpose and excitement about mathematics, concept instruction provides direct whole group teaching strategies. Patterning, shapes, numerals 0-10, addition and subtraction, measuring, money, place value counting and place value addition and subtraction of two and three digit numbers are taught through carefully designed lessons featuring teacher-guided use of manipulatives.

### INDEPENDENT PRACTICE TIME

Practice and Enrichment Boxes offer multiple opportunities for small group, partner, and individual practice and enrichment. It is at this level that children begin making previously taught concepts their own. Children learn to make choices, to help one another grow and together ponder puzzles and problems that arise as activities are explored.

# How do I use Box It or Bag It Mathematics With My Children?

Chart A

	Monday	Tuesday	Wednesday	Thursday	Friday
20 minutes K 30 minutes 1-2	Concept Instruction	Concept Instruction	Seasonal Math	Seasonal Math	Concept Instruction
20 minutes K 30 minutes 1-2	Practice and Enrichment Boxes	Practice and Enrichment Boxes	Practice and Enrichment Boxes	Seasonal Math	Practice and Enrichment Boxes

Chart B

September	October	November	December	
Seasonal Mathematics units (Box It or Bag It Teachers Resource Guide, Chapters 1-9)				
Concept Instruction: Pattern	Concept Instruction: Beginning Arithmetic	(Box It or Bag It Teachers Resource Guide, Chapters 12-18)		
Discovery Materials	Pattern Boxes	Arithmetic Boxes (Facts to 10)	Practice and Enrichment Boxes	

In our own classrooms, we use Seasonal Mathematics, Concept Instruction and Practice and Enrichment Boxes simultaneously. Because our math instruction includes science, art, reading, writing and language, we allow at least one hour per day for first and second grade math and at least forty minutes per day for kindergartners. A week of math instruction might look like chart A above.

Seasonal mathematics provides on-going exposure and review of important concepts and we do a unit at our grade level each month, spreading the activities out over three or four weeks.

Concept Instruction is the way we provide a direct introduction to each major concept as the year

moves along. We like to plan two or more weeks of instruction on a given topic as we begin to phase in the new Practice and Enrichment Boxes. Once children are ready to practice and extend a particular concept, they might spend three to seven additional weeks working in the corresponding boxes. Teachers who use drill and practice sheets or workbook pages may wish to occasionally sprinkle this work throughout those weeks or to save appropriate pages until most children seem to have solid understandings of a given concept.

Our sequence of instruction is similar to most in that we provide direct instruction, practice and evaluation; it's just that we spread all the components out over longer periods of time. The sequence

may take weeks or even months rather than days. If we teach the concept of Patterning to our first graders in September, they will practice it using the Pattern Boxes in October and once the Boxes are going smoothly, we'll begin teaching beginning addition and subtraction during our group instruction time. See chart B above.

For a detailed look at how these three instructional strategies fit together at each grade level, please see Planning, Part Five.

## **"EASING IN"**

The preparation and rethinking needed to utilize all these resources is considerable. If you choose to begin this process slowly, here are some suggestions to help you "ease in" while expanding the mathematics you already teach.

### **1. Do the Seasonal Math units for your grade level.**

They're easy, fun and don't require an enormous amount of preparation. They allow you to broaden your math instruction beyond arithmetic, to include sorting, graphing, measuring, patterning, geometry, money and story problems in a painless but fairly systematic way. Spread the activities for each unit over a month, doing two or three a week; designate one day a week for them, or squeeze them all into one week. There's plenty of room to be flexible.

### **2. Try the Calendar.**

Read Part Three. Select and make items you would like to add to your current calendar or make all the components appropriate to your grade level. You

will find that you can teach and reinforce an amazing number of math skills every day through calendar lessons.

### **3. Try some of the Concept Instruction lessons outlined in this guide.**

Choose a concept or two you'd like to expand. Kindergarten teachers might choose Pattern or Shapes. First grade teachers might choose Arithmetic (addition and subtraction), and second grade teachers Place Value Counting. Read through the Concept Instruction chapter on the topic(s) you've selected and do some or all of the lessons before you ask children to do practice pages addressing those skills. (Try to rethink your instruction a little so that instead of teaching a lesson and following it with a two-page assignment each day, you concentrate your direct instruction into a longer period, maybe two or three weeks and then use selected pages as follow-up.)

### **4. Make some of the Practice and Enrichment Boxes for Independent Practice Time.**

Decide on the concepts for which you'd like more resources. Purchase the materials and make some of the Practice and Enrichment Boxes or, better yet, have classroom parents make them for you. Be sure to read the sections on Classroom Set-up, Management and Independent Practice in this chapter as well as the Discovery Time chapter. You will also want to read the appropriate Concept Instruction chapters before you begin.

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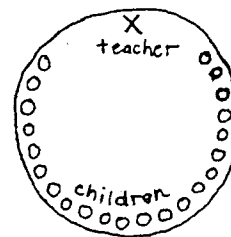
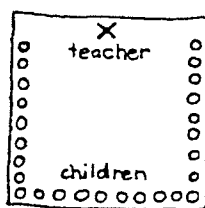
## **How Do I Set Up My Classroom?**

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There are many ways to set up a classroom; some help, some hinder our efforts to teach well. Here are some ideas that have helped teachers run an activity-centered math program effectively:

Create an open area for discussion, demonstration and instruction. Many people define such an area with a rug or by painting or taping a large circle on the floor. Children sit around the perimeter of the rug or circumference of the circle so that all can see

clearly and participate in games or activities.



If you have a very large class, some children may need to sit on chairs behind the circle or rug.

Be sure to have a chalkboard or easel nearby for the many times you'll need to record or present written information.

If you do the Calendar (Part Three, Teachers Resource Guide), post it at the front of your rug or circle area where everyone can see it clearly. If it's any great distance from where children can be seated together, you'll find it difficult to hold their attention.

Store materials in such a way that they're easily accessible. Set up the first two areas listed below if you plan to do Seasonal or Concept Instruction, all four if you're planning to use the Practice and Enrichment Boxes as well.

### 1. Classroom Tools

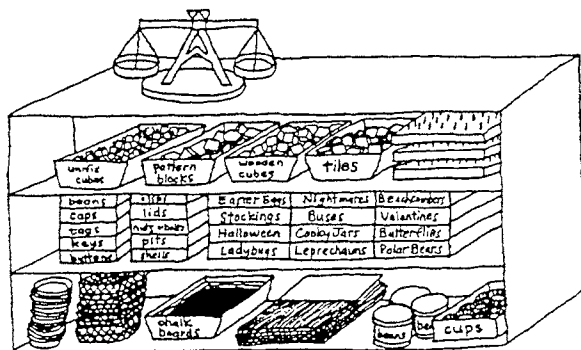
Set up easily reached, open shelves in a central location that will hold the tools children may need during math: extra pencils and crayons, colored felt markers, vis-a-vis or overhead projector pens, scissors, hole punches, paste, tape, glue, brass fasteners, paper and string.



### 2. General Math Materials

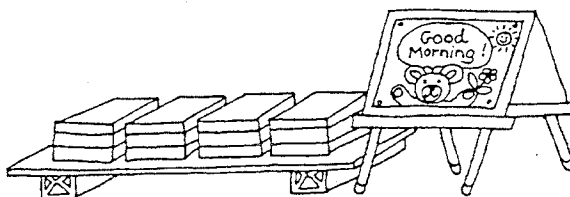
Set up low open shelving to hold the math materials you'll use over and over again all year: Unifix

cubes, pattern blocks, plain wooden cubes, geoboards and rubber bands, tiles, junk boxes, scales, individual chalkboards, small baskets or margarine tubs for distribution of materials, and, for grades 1 and 2, beans, portion cups and place value boards. (See Materials Index for ordering/ making information.)



### 3. Practice and Enrichment Boxes (set currently in use)

Store the 8-12 boxes currently in use close to your rug or circle area so you can demonstrate new ones or quickly review what's available.



### 4. Practice and Enrichment Boxes (not currently in use)

Boxes not currently in use need to be stored on teacher shelves or in closed cupboards so children are not confused about what's available or where to put things away at cleanup time.

## What Are Some Management Strategies?

Effective classroom management probably stands as the biggest challenge to teachers who want to implement activity-centered math instruction. It's

hard to offer answers that guarantee daily success but the following ideas may be helpful.

## DIRECT INSTRUCTION

Establish and review rules and procedures right away. Where do you want children to sit on the rug? How do you want them to sit? (Many people teach “safe sitting”—legs folded, hands in lap, so no one can trip over children or step on their fingers.) How do you want children to move from their tables or desks to the rug? Do you expect them to push in their chairs first? Primary children generally appreciate routines, so make sure you think through procedures carefully and establish your expectations.

Try to find ways to involve children so they aren't just watching during direct instruction. Can the group chant or read along with you? Can they mime in appropriate places? Can small groups act out the story problem? Can children take turns leading the group? Can they use individual chalkboards to write the number sentences or draw the pictures along with you?

Establish several routines for response and let children know which you expect. Having children raise their hands to respond to teachers' questions or to contribute thoughts during discussions is only one form of response and sometimes not the most effective.

Try having everyone whisper an answer to their neighbor and then say it aloud as a group at your signal. Instead of calling on a raised hand, pull a name card from a “feely box” (see Materials Index). Allow that child to formulate a solution with a friend if necessary. Since everyone's name is in the box, this keeps children's attention very well.

Have children respond by drawing or writing on individual chalkboards. If responses to a question or a problem vary, have children share and discuss the diversity.

Allow children to all respond at once. If you ask children what is special about their teddy bear and they all seem to want to answer, have them tell a child beside them.

Allow free flowing discussion. Be very careful about selectively praising responses because it almost always stops the risk taking needed for children to continue contributing different ideas.

Work with only half of your group if you have a very large class. The other half may be having In-

dependent Practice Time or doing other projects under the supervision of an aide or a parent volunteer. (Be sure, however, that you allow plenty of days to be personally involved with children as they work at the boxes or you will not understand individual progress and problems as well.)

Explain the goal of your lesson before you start and review that goal after the lesson.

Quit while you're ahead. Stop the lesson while most children are interested and actively participating.

## MATERIALS MANAGEMENT

Set up your materials beforehand. Read through any lesson you plan to do. (Even if you've done it a hundred times, think it through again.) Gather everything you'll need on a tray or in a basket and put it close to the area where you'll be conducting the lesson.

Develop several ways to get things passed out quickly:

1. Designate table monitors each week and have them get needed items for their tables.
2. Teach children to “take one and pass them on.”
3. Set up several distribution centers for supplies and have children pick them up on their way to the rug or their work areas.
4. When you want to pass out items marked with the children's names, play Upset the Fruit Basket. Distribute the materials randomly and have children deliver the items to each other when you say, “Upset the Fruit Basket.” Challenge them to do it without talking!

Make sure your children know what you expect. If you are going to have students use materials during a group lesson, show them what you will be distributing and how you expect them to use it.

Suppose the group lesson is ending and you are going to have them move to tables for an independent activity. Give them clear, specific instructions about what they're going to be doing next by modeling the activity from start to finish, including clean-up. Be sure they know what to do if they finish early. Have helpers distribute needed materials (which you've organized on trays or in baskets) to appropriate areas and then begin excusing children to the work areas a few at a time.



## PROMOTING COOPERATION AMONG CHILDREN

Remember that most of the time teaching is your goal, not testing. Children should feel comfortable making mistakes, asking each other for help and copying one another. (If no one ever copied, none of us would know how to talk!)

Teach children to teach each other. When we model something for the whole class, not everyone will be sure what to do. Many children *will* know, however, and can be encouraged to help others.

Encourage children to solve problems together. Have children work in partners and later in groups of three or four to do joint projects: create a people pattern, illustrate a story problem, find many ways to sort a junk box, invent something that will fly or float, etc. (Seasonal Mathematics offers many ideas.)

Give children one worksheet with spaces for two or more names. Pose a computational, money count-

ing or measuring problem for the class. Ask children to work together until they come up with a solution at their tables. Gather the solutions and record them on your chalkboard. Continue to work toward solutions until the class agrees that all possibilities have been explored. (Be sure to record incorrect as well as correct responses so children have to try out all ideas that are in disagreement with their own solutions. Primary children have a very hard time compromising when they don't agree. Sometimes you will need to accept more than one solution from a table.)

Have your children work together in small groups to make a page for the Big Book that you may be creating in conjunction with Seasonal Mathematics. It is often helpful to have the group brainstorm jobs that will need to be done; that is, making up the story and adding details, illustrating the story, writing the rough copy, writing the finished copy (from the teacher's corrections of the rough draft), writing the number sentences and covering them with secret doors (paper flaps).

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## Tell Me More About the Practice and Enrichment Boxes and Independent Practice Time

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If you walk into a classroom during Independent Practice Time, you will see children working by themselves or in small groups at a variety of boxed games and activities. There are eight to twelve different boxes in use, laid out one per table and several on the rug. Some of the activities are very easy, some are much more complex, but they all deal with the math topic most recently taught. This is the children's practice time and they are literally surrounded by the concept.

Most seem very absorbed and will be able to explain the task if you ask. There is motion. As children complete games or finish tasks, they clean up and move to another available box (none of the boxes accommodate more than four students). You'll see a child or two "drift" occasionally, unable to choose or settle to a task. Such children are usually redirected by the teacher or drawn in by friends. There is "working" noise. Children talk to themselves or others negotiating games, counting, comparing results, planning what to do next, talking their way through procedures, asking questions, even having a good laugh.

The teacher is in constant motion—stopping here to ask a question and there to admire work in progress. He or she nestles in with a small group for a few minutes and then moves along, questioning, observing, teaching, interacting, describing.

You're watching the heart of an activity-centered classroom. This is where children come to grips with concepts, where the teacher has a chance to see children's understandings and misconceptions at close range. This is where primary children do their most important work because there is much more going on than math. Independent Practice Time affords children the chance to make decisions about their own learning. Once the boxes have been set out (helpers set out the boxes and tuck the lids underneath so the activity is easily seen), children decide where they will go first. As they complete tasks, they clean up and move to other boxes of their choice.

The teacher serves as facilitator, observer, instructor, and friend, but he or she does not rotate children through the boxes knowing that some tasks take much longer than others; that some children

will want to persevere at one box for thirty minutes while others will complete three or four tasks; that because the boxes range from easy to difficult, not all of them are appropriate for every child. The teacher also knows that often children move from hard jobs to easy, particularly if a task has been stressful.

The teacher does *not* choose for children knowing that Independent Practice Time is a safe, structured way for children to develop decision-making power, responsibility, commitment to task, ability

to follow through and cooperation with others. These are important life skills and they're not easy to learn. Children don't always make the right decisions. If they choose a box that's too hard, they can leave, try to figure it out, or ask the teacher for help. They may choose something that's too easy; decision making can be stressful and children often take comfort in activities that are simple and familiar. Given time and trust, however, they will usually move on to more difficult tasks. Young children are powerful learners who do not cease to challenge themselves if given the opportunity.

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## How Do I Get Started With Practice and Enrichment Boxes?

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1. The activities in the Practice and Enrichment Boxes are designed to follow the concept instruction lessons. The nine packets listed on page one contain blacklines, cardstock items and instructions to create and use independent practice and enrichment activities. Review the concepts you are teaching and the topics you would like to enrich and expand. Choose the appropriate packets.

We encourage kindergarten teachers to start with Pattern and Reading, Writing and Understanding Numerals 0-10; then add Shapes, Introduction to Measuring and Money. We suggest first and second grade teachers begin with Pattern, Arithmetic and Place Value Counting; then add Place Value Addition and Subtraction, Measuring and Money.

2. Contact The Math Learning Center. The packets may be purchased individually or in recommended sets for each grade level. The MLC catalog de-

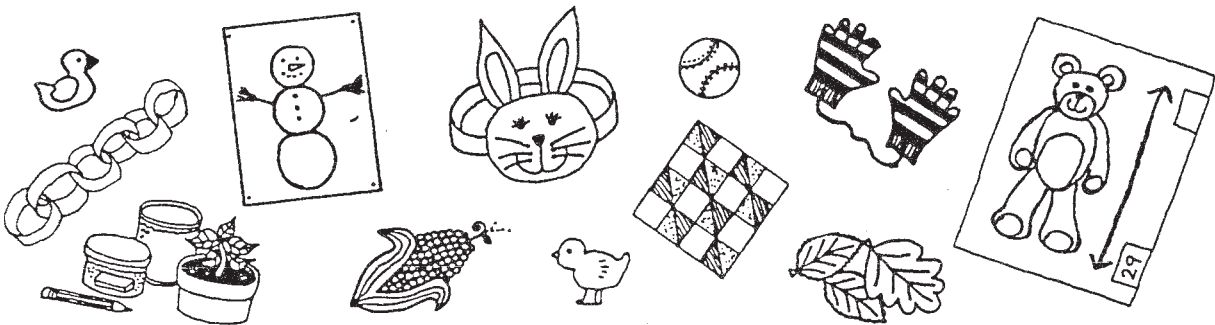
scribes the packets and others materials for creating and organizing the activities.

3. Set aside time to make your activity boxes. Make a starter set of eight to twelve boxes for each topic you've chosen.

To fully implement Box It or Bag It Mathematics requires time and dedication. We encourage teachers to work together and get volunteers to help. Parents like to be involved and can be a wonderful resource for putting together the activities.

4. Read the advice offered under Concept Instruction, Chapters 12-18, on how to make a smooth transition from Concept Instruction to Independent Practice Time. Plan to start the Independent Practice Time with the Discovery Time lessons and activities in Chapter 12. These will help children become familiar with your math materials and routines in a low stress setting.

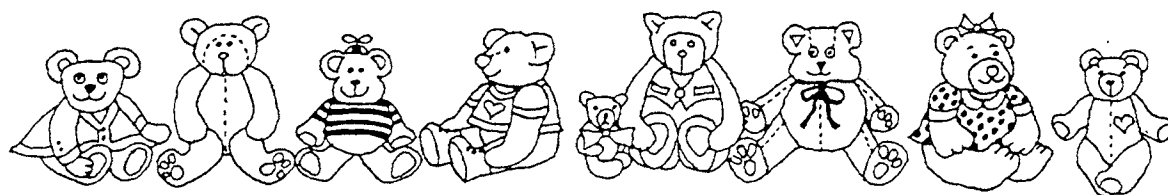
# Seasonal Mathematics





Chapter 1: September

# TEDDY BEARS



*Here is a month's worth of Seasonal Math featuring everyone's favorite—teddy bears. While some of the activities only require one or two teddy bears, others require each child to have a teddy bear. You'll probably want to invite all the bears to school once a week for three or four weeks. Be sure to have a few extra bears at school for children who don't own a bear.*

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## Sorting

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### TEDDY BEAR SORTING

**You will need→** a teddy bear for each child

Explain to the children that you are going to sort their bears into groups as they hold onto them. Let them know you will draw a large happy face on the chalkboard and that as soon as that face is drawn, no one can talk, not even the teacher.

Have each child hold his or her bear. Sort the children into two groups, not by *their* attributes but by the attributes of their bears: large bears, small bears; brown bears, other colors; dressed bears, not dressed; old bears, new bears, etc.

Motion to children one at a time to come forward and stand in front of the group to one side or the other. Help children get there—no child should feel pressured to know where to go in this sorting activity.

After you have about three youngsters and bears in each group, silently mime having the class point to where they believe the next bear and child will stand. This keeps all the students involved as they begin to think about how you are sorting the bears.



When you have sorted at least a third of your class into the two groups, erase the happy face briefly and ask a few questions to help focus the guessing. Your questions will depend upon how you are sorting but here are some examples: Am I sorting by the kinds of eyes the teddy bears have? Am I sorting by their ears? Am I sorting by color? Am I sorting by their age? Children quickly answer yes or no and then the happy face is redrawn to keep the momentum. Be sure you have asked one or two questions that will help focus your group on how you're sorting. It is so exciting for children to have a chance to figure it out before the sorting is finished.

When you have finished the sort or your group is getting too wiggly to continue, once again, erase the happy face and ask them if they can guess how you have sorted the bears. When the categories are known, have the group verbally help you label each group. "These are wearing bows—these bears aren't."

Have them sit down again in the circle and look carefully at all the bears. Ask them to suggest other ways to sort the bears and quickly follow through on several sorts, always labeling verbally how the bears have been sorted, "These are the bears that are slept with every night—these are the bears that don't get slept with every night," etc.

After you are finished sorting, try to remember and record all the ways you sorted the bears today:

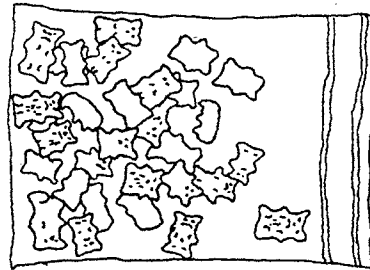
1. We sorted by color—all one color, more than one color.
2. We sorted by what they do at night—they sleep with us, they don't sleep with us.
3. We sorted by ears—large ears, small ears.
4. We sorted by age—loved a long time, loved a short time.

## MYSTERY BOX SORTING

**You will need→** small package of Gummy bears (hidden in a grocery bag or box)

blank chart paper

Follow the mystery box procedure as described in the Sorting section of Chapter 10. Once the children have determined what is in the box, continue with the activities below.




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## Estimation and Place Value Counting

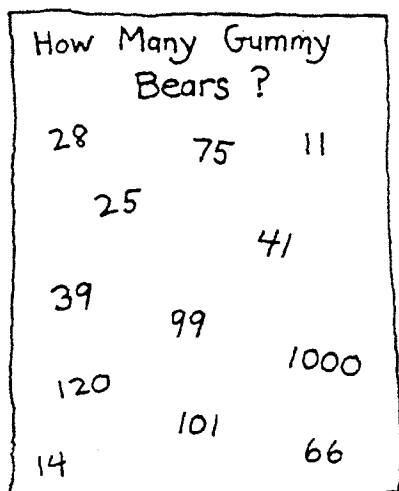
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### COUNT THE BEARS

**You will need→** Gummy bears  
portion cups (Materials Index)  
blank chart paper  
large place value board (Materials Index)

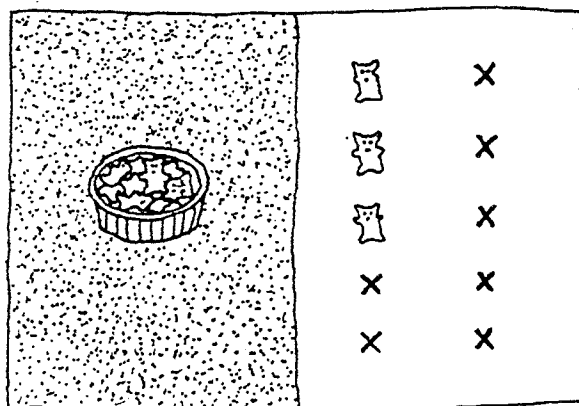
Pass the gummy bears around in their container so each child can take a quick look. Let them guess how many there are. Accept all estimates without comment; some will really be off the wall this early in the year, but it's important not to discourage good risk-taking.

Write guesses quickly on a chart.



Have the class count with you as you begin to group the bears into tens and ones. Begin counting on the white side of the place value board. Each time you get to ten bears, group the

bears into a portion cup and move them to the colored side of the board.



Practice reading the quantities in numeral form: 13, 14, 15, etc. as well as "one ten and three, one ten and four, one ten and five, etc." Even this early in the year, it is important to begin setting foundations for place value.

Once the number of bears has been determined, problem solve with your class how the bears could be shared fairly. Children have many ideas about this and it is usually wise to try out some of their suggestions. Try hard not to impose an answer of your own—usually it won't make sense to them anyway.

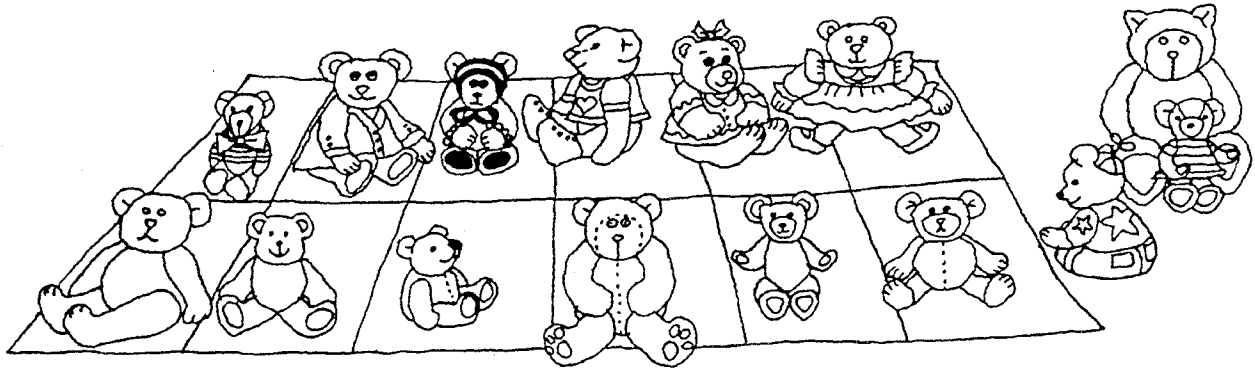
## Graphing

### DID YOU BRING A BARE BEAR OR A DRESSED BEAR?

**You will need→** graphing mat (Materials Index)  
a teddy bear for each child

Pose the question, "Did you bring a bare bear or a dressed bear?" and have children lay out their bears accordingly. After the graph has been discussed, children could make a picture of their own bear and create a picture graph

like the real graph as a permanent record to hang on the classroom wall. See Chapter 10, Graphing, for discussion questions and other graphing extensions.



Did you bring a bare bear or a dressed bear?									

## MORE TEDDY BEAR GRAPHS

Do you sleep with a bear?

etc.) Graph should only be about two or three books this time of year.

Which is your favorite bear book? (Class will have read *Ira Sleeps Over*; *The Three Bears*; *Brown Bear, Brown Bear*; *Teddy Bears' Picnic*;

Which book should be turned into a simple play?

## Patterning

### TEDDY BEAR PATTERNS

**You will need→** children's teddy bears

12 X 18 white construction paper

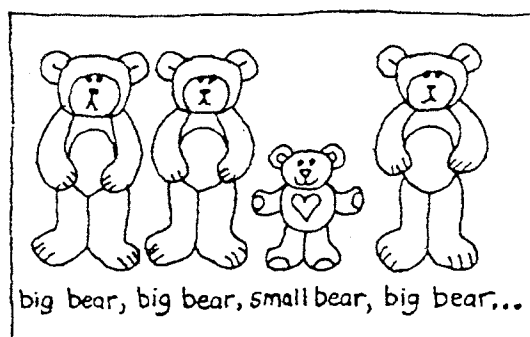
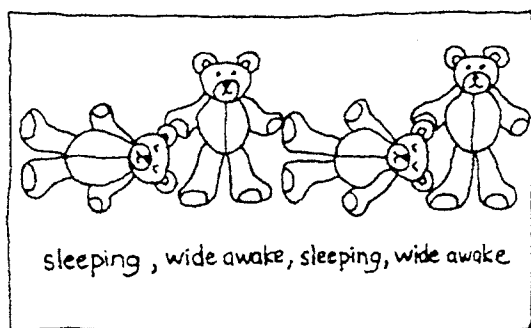
various art supplies (see below)

Have children work together to figure out ways to set up teddy bears in patterns. They will have a wide variety of ideas. Stretch their thinking by going for at least seven or eight ways. Some possibilities include:

1. Wide awake, sound asleep, wide awake, sound asleep,...
2. Jointed bear, jointed bear, not jointed,...
3. Forward, backward, backward,...

Make art reproductions of some of their favorite patterns with sponge painting or crayons; have them trace and cut bears using templates; or use magazine/catalog pictures of bears. These could be compiled into class Big Book form with words underneath. (See Materials Index for instructions on making Big Books.)





## CALENDAR TEDDY BEARS

**You will need→** Calendar Patterns record sheet (blackline supplement)  
various art supplies (see below)

On September 30, run a copy of the Calendar Patterns record sheet for each student. (Fill in September and the days of the week on a copy before you run it for first graders.) Have your youngsters make their own copy of the class September calendar before it is taken down. They could replicate the class calendar by sponge painting bears or by cutting and pasting copies of bears in appropriate colors.

SEPTEMBER						
Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.

## PICNIC WEATHER?

**You will need→** an outdoor thermometer  
1" X 12" strips of red construction paper  
12" X 18" piece white construction paper

It's fun to spend a week each month looking at the weather. Your teddy bears could have a weather report the week before the "picnic" by hanging a thermometer outside daily and checking the temperature as children return from lunch. Cut a red strip of construction paper the height of the mercury and paste it on white construction paper to begin a comparative graph of daily temperatures.

With second graders, you may want to look at both Fahrenheit and Centigrade thermometers and record the temperatures in numbers as well as with the red strips. Be sure, as the new strip is added each day, to discuss whether it's warmer or cooler than the day before, so children begin to build understandings of what "the temperature" really means.

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## Story Problems

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*Children love to act out story problems. You can provide high quality early learning experiences by telling delightful stories and asking them to help in the directing of the acting, in creating simple props and adding detail to the story. After some practice, many will be able to help generate stories for other performances. Here is a sample.*

### **TEDDY BEARS' PICNIC**

#### **You will need→**

a sample bear hat to show children

colored construction paper

staplers                      glue

*props for acting out the story:*

a bear hat for each child (made the day before from the above materials)

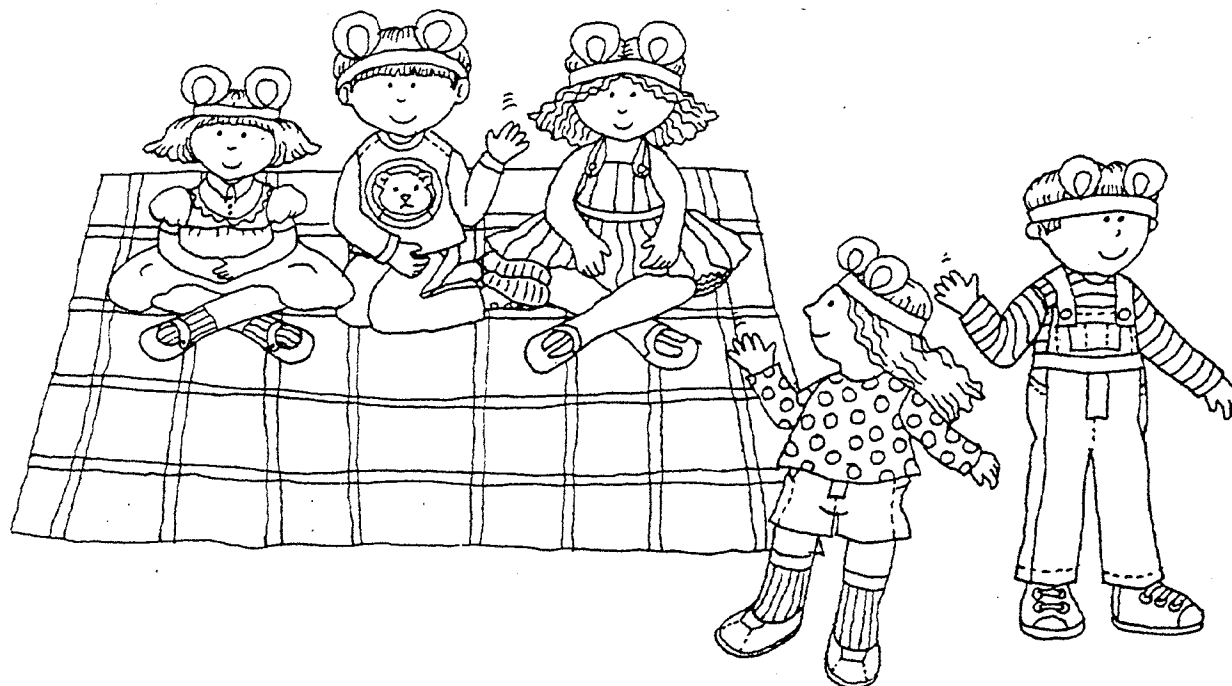
a basket                      beach towel, picnic cloth or blanket

*lesson props:*

17 precut paper bears (see Calendar blacklines for sample)

glue stick                      12 X 18 white construction paper

individual chalkboards, chalk and erasers



Begin by telling a very simple story.

**Teacher:** Five adventurous bears decided they'd like to go on a picnic. Where do you think they should go?

**Children:** There's a park right by our house. It has a pond and swings and a slide. It's got grass too!

**Teacher:** That sounds like fun! Those bears, all five of them, wondered what they should take to the picnic. What do you think they will need?

**Children:** A lunch...a blanket...something to drink...

**Teacher:** Good ideas! Let's make a list on the chalkboard so we don't forget.



**Teacher:** They packed their basket and set off for the park. How do you think they might walk?

**Children:** They should look happy...they could kind of bounce as they walk...or skip!

**Teacher:** Let's remember that when we begin to act the story out. When they arrived at the park, they spread out their blanket, got out their lunch and drinks and had such a good time eating.

**Child:** I like to go on picnics!

**Child:** Me too...

**Teacher:** Two of those bears ate a little too much honey and they decided they had better go home. They said good-bye to their bear friends and began walking home. How do you think they should look?

**Children:** They could wave good-bye. They might be sort of sad. They might walk slow and turn around and look sometimes.

**Teacher:** This is going to be a good performance if we can remember these good ideas. I think we're just about ready to act it out. You said we would need a blanket. I brought a beach towel today. Would that be OK to use as a blanket?

**Children:** Sure, that's what we take to the beach.

**Teacher:** What could we do to pretend we have a lunch?

**Children:** Let's use that basket over there.

**Teacher:** Let's get the bear hats we made yesterday so we can all get ready. (Send a few at a time to get their hats.) Does everyone have on your bear hat?

**Children:** Yes!

**Teacher:** There are so many bears from which to choose. I'll reach into my Feely Box to get some actors and actresses. How many names will I need?

**Children:** There were five bears...

Five names are pulled from the Feely Box and the performers stand together while the rest of the "bears" watch. The teacher retells the story while the "bear" audience helps to direct in any needed ways as the story is acted out.

Once this part of the story has been acted out, quickly add more detail. For instance:

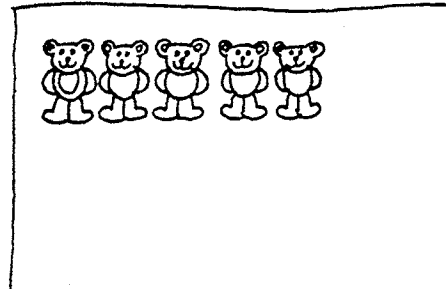
**Teacher:** Once the two bears had gone home, the bears at the picnic felt sad. They wished they had more friends at the park. Suddenly, (reach into your Feely Box) Jane, Jackie, Katie and Mario Bears came bouncing over the little hill and joined them.

**Children:** Now there are seven bears on the blanket.

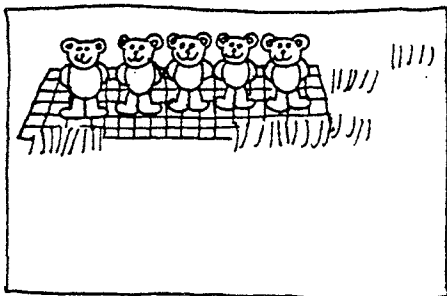
**Teacher:** Let's think about the parts of our story so far. What happened first?

**Children:** Five bears went to the park for a picnic.

**Teacher:** I have five paper bears here that I cut out last night. I'll use a glue stick to glue them close together on the big sheet of paper. What could I add with my crayons so you'd know they were at the picnic?



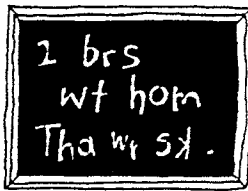
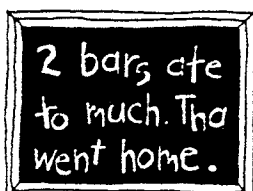
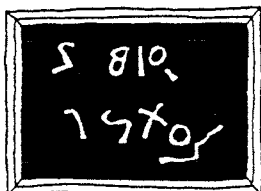
**Children:** Make the blanket...make some grass.



**Teacher:** Let's quickly distribute the chalkboards so you can help me out with the writing of this story. Would you try writing in your "best guess" spelling what happened next in our story?

(Children try writing their ideas.)

You may see everything from a fear of trying, lines and squiggles, beginning and/or ending sounds in words, to nearly correct spelling.



**Teacher:** You all have so many ideas about writing already. It is sort of like when you were toddlers learning to talk...each of you did it your own way in your own time just like you'll begin writing this year.

**Teacher:** Can someone read your story to me?

**Child:** I can. Two bears ate lots. They had to go home.

**Teacher:** That was a good way to say it. (Ask several others to read their ideas so the children know there are many ways to say this.)

**Teacher:** Let's make a page about this part of the story. Our pages will become a book when we're finished so here we go with the second page. I need five more of my bears but this time I'll need to show two

of them going home. How many will be left?

**Children:** Three!

**Teacher:** I'll write this part of the story under my picture. Besides writing it in words, I can write it the short way in a number sentence also. Let me show you on my chalkboard. (Teacher writes  $5 - 2 = 3$ .) Does anyone know what the five stands for?

**Children:** That's the five bears having lunch.

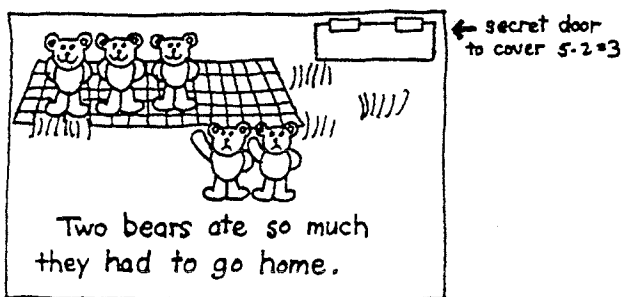
**Teacher:** How about the two?

**Children:** Those are the bears that had to go home.

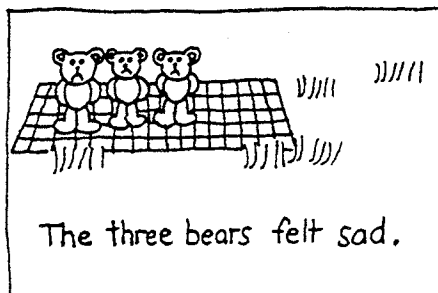
**Teacher:** Why do you suppose we have a three?

**Children:** Those bears are still at the park! Let's put the numbers on our story too.

**Teacher:** OK, I'll write it on the page and show you a special trick. (Write number sentence and then tape on a secret door to cover it.)

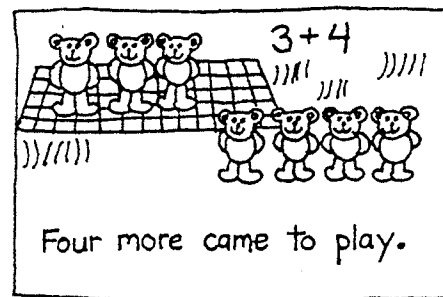


Continue in this manner acting out the next portion of the story and once again creating the parts of it on 12 X 18 paper as below. Involve the children with their chalkboards as the acting goes along, asking them to draw the number of bears that came to join the three. Encourage labeling in "best guess" spelling again and have them help you write the next two parts of the story on your paper and figure out a number sentence for the last page.



The purpose of these lessons is to surround and involve children with the rich language of

story problems, and to help them see that number sentences are a mathematical short cut to writing the full story. You will be laying foundations for the weeks and months ahead when you'll be asking them not only to act out more stories but to invent story problems for others to act out. You're also showing them ways to create permanent reading records of these wonderful times. Assemble your finished pages into a book for reading on still another day.



## Extended Number Patterns

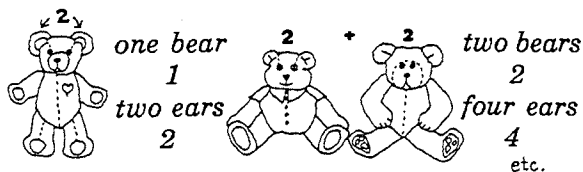
### TEDDY BEAR EARS

**You will need→** a teddy bear for each child  
individual chalkboards, chalk, erasers  
4 X 6 index cards for number cards  
large hundreds matrix (Materials Index)

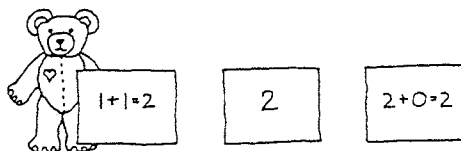
Have the children bring their teddy bears, chalkboards, chalk, and erasers to the circle.

Begin setting out teddy bears in rows as follows:

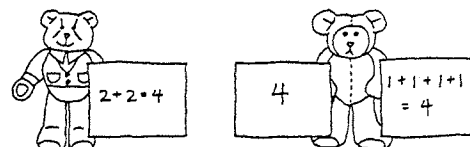
one bear	2 ears
two bears	4 ears
three bears	6 ears
four bears	8 ears
five bears	10 ears
six bears	12 ears



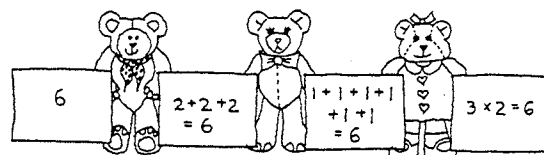
As you set out each row, ask children to write an equation about the bears' ears. Have a few share what they've written each time. Here's what they might write after the first bear has been set out:



Here's what you might see on boards for the second row:



Here's what you might see for the third:



Make number cards from the index cards to write out the number of ears for each set of bears: 2, 4, 6, etc. Use the large class hundreds matrix to circle the numbers that have been laid out to record bear ears. See if the children can project forward.

1	②	3	④	5	⑥	7	⑧	9	⑩
11	⑫	13	⑭	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

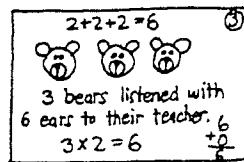
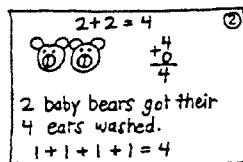
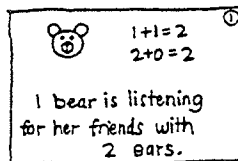
**Teacher:** What if I brought my bear over and added it to the last row? How many ears would we see then?

**Children:** Ummm...there are 14 ears now. We'd see 16 if you added your bear.

**Teacher:** What if I brought David's bear from home and added it too? Then how many ears?

**Children:** 18.

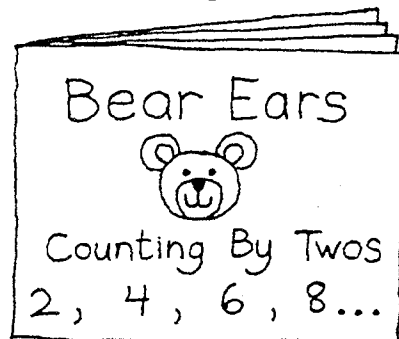
Continue to pose problems and circle the resulting numbers on the hundreds matrix. Children will see a pattern very quickly.



The next day, provide paper for children to each make tiny construction paper bear heads. As they finish, have them paste the bears onto 12 X

18 construction paper you've laid out as shown above.

When all the bears have been glued down, quickly collate the book and label each page with the children's help.



Run a copy of the hundreds matrix from the blacklines and have it glued onto a piece of construction paper for the last page of this book. When you get to it, circle the numbers that have been used to record bears' ears so far and keep going. Give the children each a copy of the hundreds matrix so they too can circle and later color in the numbers to 100 that are part of the pattern. Many will have some interesting things to tell you about the patterns they notice as they're coloring them in. See Materials Index for instructions on binding your big book.

## Measuring

*In order to have a successful Bear Measuring Extravaganza (described below), several days of preparation are necessary. Children will need to learn how to weigh and measure their bears, and figure the circumference of their bear's tummy. Many children will not have had practical measuring experiences before so here are sample lessons for large group instruction to help your class understand simple measuring strategies.*

### HEIGHT/LENGTH: Day 1—Demonstration

**You will need→**

2 or 3 teddy bears

unifix cubes

hundreds matrix

Have the children sit in a circle where all can see. Show them one of your bears and tell them you're going to measure its length today. Have a few children quickly snap together some

unifix cubes into tens. Lay those tens near your bear. Discuss whether your bear is more or less than ten cubes tall. Is he more or less than twenty cubes tall? Ask the children to guess

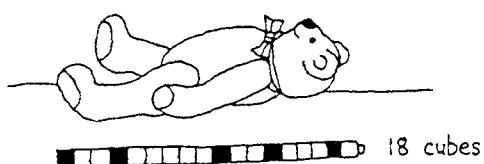
how many cubes tall he is and whisper the guess to a friend.

Snap cubes together until your teddy bear's height has been reached. Ask the children if they want to adjust their guesses now that they really see.

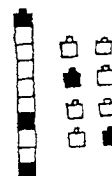
Count the cubes by ones while they are snapped together and then show the children that it is easier to know how to write it down if you break the cubes into groups of tens first. This is also a good time to show them a hundreds matrix and use it to

count to your bear's height. Then they can see right away there are tools in the room to help them when they need numbers they may not be able to write yet. First count by ones; then count by circling the tens and putting an X on each additional number as the pattern changes to counting by ones.

Have another bear or two available at this time; it is helpful to children's understanding if they can try guessing and checking again on the same type of problem with more bears.



1	2	3	4	5	6	7	8	9	10
X	X	X	X	X	X	X	X	X	X
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50



## HEIGHT/LENGTH: Day 2—Measuring Booklets

### You will need→

Measuring Booklet for each child (see blacklines)

unifix cubes

unifix cube tub

chair

sweater or coat

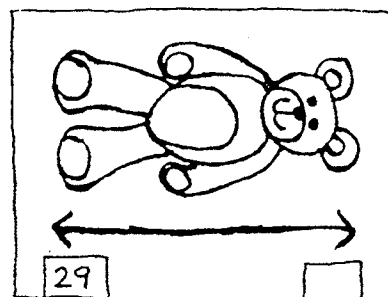
hundreds matrix

individual chalkboards, chalk, erasers

Even though they watched you measure several bears, children need an opportunity to try it themselves, but it's not practical to have them all do it at once. Demonstrate the following lesson to your entire group, but plan to have half do something else (stations; math worksheets or workbook; a simple art project) while the others are measuring.

Tell the class you're going to practice measuring length again. You'll try it together first and then some of them will have a chance to try it on their own. Have them bring a chalkboard, eraser, and chalk to the circle. (We place these items in baskets on several different tables for easy access.) When everyone's settled, hold up a new teddy bear and make a quick sketch of him on the chalkboard, with two small boxes underneath.

Have the children copy your sketch on their chalkboards and record their guesses about how long the bear is in the first small box.



Measure the bear with cubes. Count the cubes by ones, and then by tens and ones. Find the number on the hundreds matrix and have every one record it in their second small box. Have them erase their boards and repeat the whole procedure with another item, perhaps a book about teddy bears.

When you think they understand, show them the measuring booklet, one page at a time, reviewing the things they are going to measure. Send half of them back to their desks to work on something you've assigned beforehand, while half work on their booklets. (You've split your unifix cubes into four or five baskets and located them near the calendar,

and the hundreds matrix. Have the record player, unifix cube tub and a chair set out near the cubes so the children will have easy access to the things they need.) Flip flop the next day, starting with a brief review. Did the children who tried it the first day have any problems? Discuss and brainstorm possible solutions.

## CIRCUMFERENCE: Day 1—Demonstration

**You will need→**

string wrapped on tongue depressors

unifix cubes

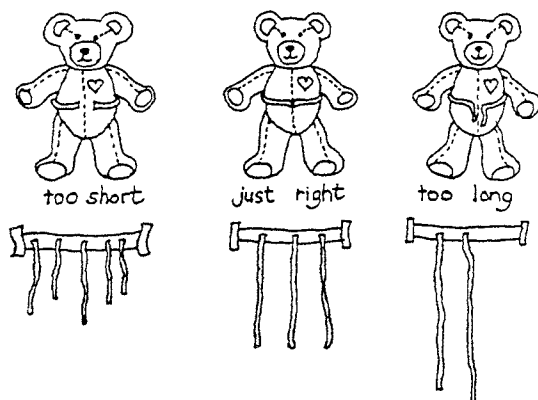
scissors

hundreds matrix

chalkboards, chalk and erasers

Try out some whole group work in estimating circumference by passing your bear around the circle so they can feel the size of his tummy.

Pass around tongue depressors already wrapped with string so each child can cut a piece of string they think will go around the bear's tummy exactly. (You may need to help with the actual cutting.) As soon as a child has cut their string, he or she tries it out on the bear's tummy and then adds it to the graph you've posted nearby.



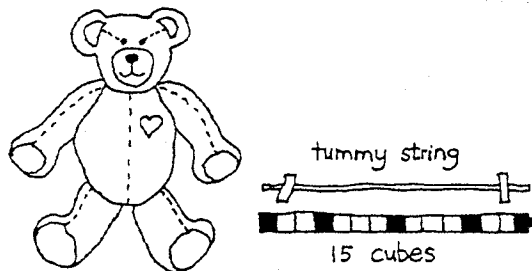
Discuss the graph and make the point that estimation is tricky and that, with lots of

practice, they will improve so much in that skill this year.

Now measure the bear's tummy and cut a piece of string exactly the size of the bear's tummy circumference and have the children whisper to a friend how many unifix cubes long that string is. It is very helpful to children when they are doing this activity if they can use a little piece of masking tape on either end of the string to anchor it to the floor or table, so model it this way as you lay it out ready to measure with unifix cubes.

Once again, have some tens ready to go and snap them together quickly until the appropriate amount is laid out. Count by ones—do the same on the matrix, then ask them how else you could count. Hopefully, by now, someone will suggest by tens and ones—if not, you suggest it and then again show this counting system on the matrix (by circling tens and marking an X on subsequent ones).

Most children really like another chance or two to try this activity to see if they can come closer. It really seems to help their "risk taking".



1	2	3	4	5	6	7	8	9	10
X	X	X	X	X	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50



## CIRCUMFERENCE: Day 2—Circumference Booklets

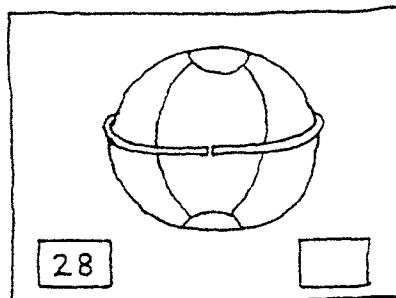
**You will need→** circumference booklets (see blacklines)  
string wrapped around tongue depressors  
individual chalkboards, chalk and erasers  
a teddy bear                      unifix cubes                      a thick book  
a class ball                      masking tape                      scissors  
hundreds matrix

*objects to measure:* a lunch box or two, a class ball or two, a coffee mug or two, several thick books

Children will need an opportunity to measure circumference themselves. Demonstrate this activity to your entire class, but plan to have half of them do something you've preassigned, while the other half work on their booklets. Have everyone come to the circle with chalkboard, eraser, and chalk. Make a quick sketch of the bear you're going to measure with two small boxes underneath. The children copy your sketch on their chalkboards and record their guesses about how many unifix cubes long this bear's tummy string will be.

Cut a piece of string the same size as the bear's tummy and anchor it on the floor with masking tape on either end. Measure with unifix cubes. Count by ones, then tens and ones, and find the number on the hundreds matrix. Everyone records it in the second small box. Have the children erase their

boards and repeat the procedure with another small round object, perhaps a classroom ball.



Then show them the circumference booklets. (You've placed several baskets of unifix cubes, several tongue depressors wrapped with string, scissors, masking tape, and the objects you intend to have them measure in a convenient location.)

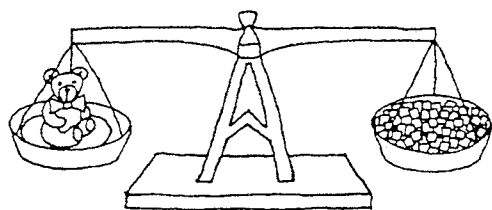
Switch groups the next day, starting with a brief review.

## WEIGHT: Day 1—Demonstration

**You will need→** 2 or 3 teddy bears  
balance scales (the bigger the pans, the better)  
individual chalkboards, chalk and erasers  
a book                      ceramic tiles                      hundreds matrix

Get out your best set of balance scales, some ceramic tiles, one of your teddy bears, and a book. Since you can't see weight it's helpful to

children to have some point of reference before they try to guess the bear's weight in tiles. Weigh the book—put it in one side of the



balance scale and dump tiles into the other until the scale balances. Dump the tiles out and count them by ones, then by tens and ones. Leave these tiles set out for later reference.

Now, put the book on one side of the scale, and the teddy bear on the other. Which is heavier? The

bear? Will it weigh more tiles than the book or fewer? Have the children guess how many tiles the bear will weigh. Put the bear on one side of the scale. Again, load the other side with tiles until the scale balances. Dump the tiles out and count them by ones, then by tens and ones. Take another look at the tiles you counted for the book. Compare the amounts. Did it take fewer or more tiles to weigh the bear than the book? Why?

Try the activity again with another bear so the children have a chance to focus another time on the strategies involved in weighing and comparing.

## WEIGHT: Day 2—Weighing Booklets

**You will need→** 3 or 4 balance scales and/or pairs of milk box scales  
(Materials Index)

weighing booklets (see blacklines)

hundreds matrix

ceramic tiles

individual chalkboards, chalk and erasers

*objects to weigh:* a large apple, a large rock, a stapler,  
a canned beverage or any canned food item

This activity will give children a chance to weigh some things independently. You will need to demonstrate first to the whole class, in a manner similar to the lessons on height and weight, once again letting children be involved by use of their chalkboards so they can learn how to record their guesses and confirmed answers.

Each day have half the children complete a weighing booklet. Make sure you have the scales, baskets of tiles, and objects you want them to weigh located on several adjacent tables or in the area where they gather for group instruction, so they have the things they need and can work without disturbing the other half of the class.

## TEDDY BEAR MEASURING EXTRAVAGANZA

**You will need→** string wrapped around tongue depressors

unifix cubes      scissors

masking tape      hundreds matrix

3 or 4 balance scales and/or pairs of milk box scales

Teddy Bear Measuring booklets (see blacklines;  
making instructions below)



You've been setting measuring foundations. It's time for the children's bears to come back to school again.

(For the Teddy Bear Measuring booklets, use blacklines to run two length pages, two weight pages, and two circumference pages. Put booklets together with one cover. Each child will receive a seven-page booklet.)

Have your room set up so that measuring can go smoothly: two tables with cubes available for measuring height; two tables with cubes, string, scissors and masking tape for measuring circumference; and two tables with pairs of scales and tiles for weighing.

Show children a copy of the Teddy Bear Measuring Extravaganza booklet and once again, quickly model how to weigh, and measure length and circumference so it is clear to the children what they

are expected to learn from these activities. Explain that they will work in partners. They will estimate the length of their teddy bear and measure it and then do the same with their partner's bear, working together, recording both in their booklets (each child has two pages for each type of measuring). They will do the same with circumference and weight. Measuring two bears instead of one each time provides some needed repetition. Let them know it would be impossible for everyone to do the booklets in order—some should begin at the back, some in the middle and some in the front of the booklets. To start smoothly, hand out the booklets and send children out two by two to the different work areas.

Lots of children have little or no ability to organize their time well, especially at the beginning of the school year. Be sure they have an idea of how long they will have for their work today and what they can do if they finish early.

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## Money

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### NEWSPAPER ADS

#### You will need→

grocery ads from newspapers

12" X 18" white construction paper

fake dollar bills (see blacklines)

real coins—quarters, dimes, nickels, pennies

catalogues

coin and dollar stamps

over 50 cents, under 50 cents; healthy food, junk food; etc.).

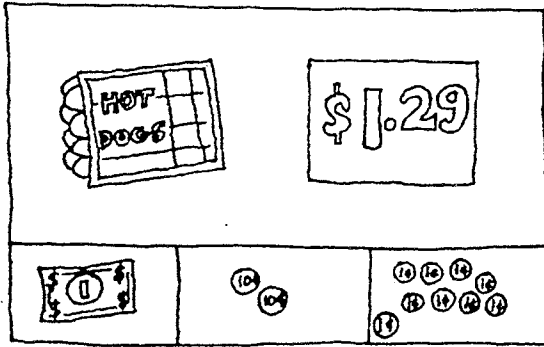
Choose several items the group agrees would be very good on a teddy bears' picnic and paste each one on a large sheet of construction paper. Make a fancy price tag so the price can be written in large numbers. Lay out appropriate coins to determine how the item could be purchased.

After the various ways of paying for the items have been explored, print the price on the page and stamp with dollar and coin stamps. Use finished



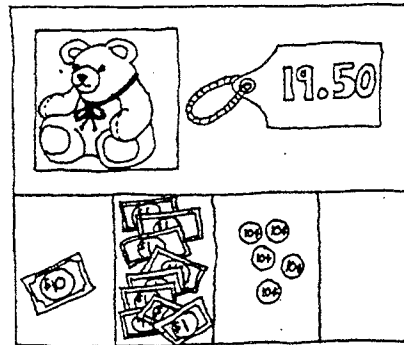
Pre-cut grocery ads, including prices, from the newspapers. Sort the ads by types of goods and again by prices (by the pound, not by the pound;

pages to create a class Big Book about money and bears.



Have children look through catalogues at home to find ads for teddy bears. Ask them to bring one of these ads (including the price) to school.

Once again, follow the steps above to lay out the price with real money and then record with dollar and coin stamps. This will make another terrific Big Book.



Chapter 2: October

# HALLOWEEN MATH

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## Patterning

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### THEATER PATTERNS

**You will need→** 9 X 9 white construction paper  
crayons or markers



Have children each draw one Halloween character—ghost, pumpkin, goblin, bat, witch, cat, etc. Sort and graph those drawings by kind. Brainstorm ways to act out each of these characters in quiet fashion. Save pictures to be used as starter cards.

Another day, choose two or three drawings from two to three different character stacks. Set up in a pocket chart or on the chalk tray to act as a pattern starter. Ask for volunteers to act out the pattern. After the pattern has been acted out a time or two, ask four or five more children to join the pattern and have the group tell them what to do. (This is the step that helps children

learn to extend patterns.) Continue, using other starter cards set up in different patterns, as long as interest level is high.



Another day, discuss the children's acting experiences with starter cards from the

previous lesson. Ask students if they could divide into groups and invent Halloween patterns without starter cards. Break into small groups and have children plan and practice their theater patterns.

When the class gets back together, each team presents its pattern. The audience watches and then tries to guess what would come next. Be sure to applaud *all* efforts even if a group hasn't been completely successful.

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## Story Problems

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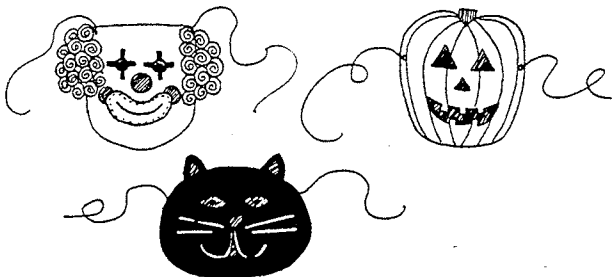
### HALLOWEEN STORIES

**You will need→** student-made masks

individual chalkboards, chalk and erasers

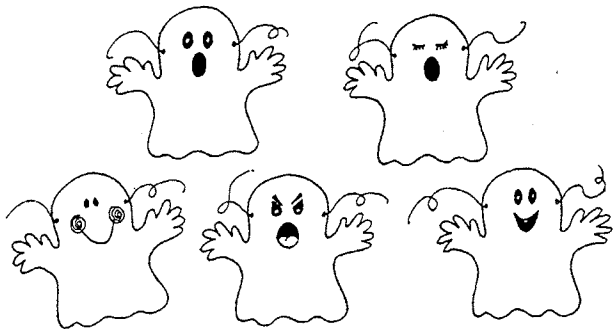
Have children paint Halloween masks or make simple construction paper masks.

Use finished masks to think of story problems. It seems especially helpful at first to just begin telling a story handing out masks to actors and actresses as needed.



### Counting

"All the ghosts gathered at the haunted house for a spooky party. (Hand out all the ghost masks.) Let's count how many ghosts came." (Children can be counted by ones, then put into groups of tens and ones if you've handed out that many masks. Try counting by twos and fives as well.)



### Addition and Subtraction

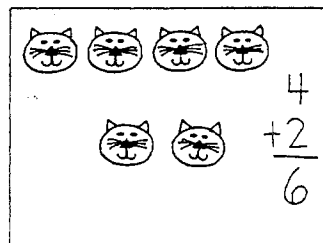
"The night was dark and damp. Strange sounds could be heard in the distance. I looked around and suddenly realized the noises were coming from four black cats." (Children quickly slip into masks and come onto the "stage".)

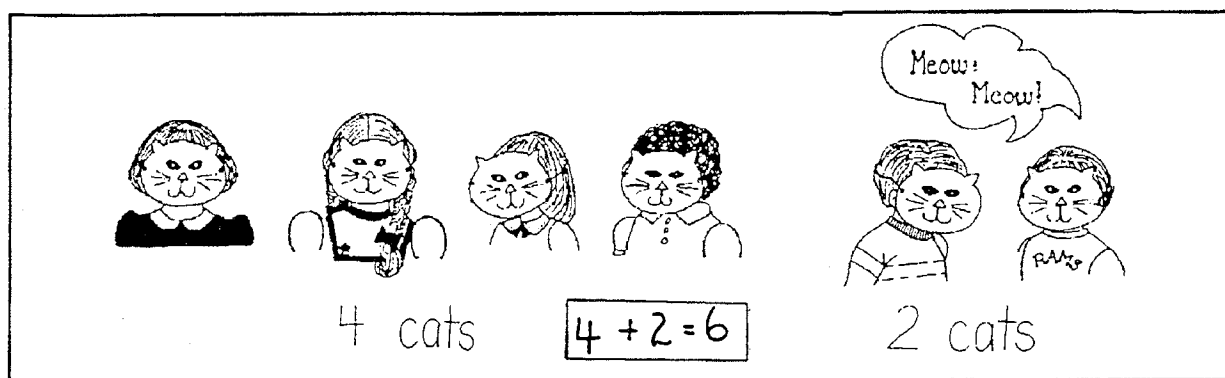
"Their eyes seemed to sparkle and their bodies quivered with excitement. I wondered what was going to happen."

"All of a sudden, I heard a loud yowling 'meow' and two more cats came into my yard. How many cats did I see that night?"

This is a good time to write a number sentence on the board to remember what happened. Do that by reenacting the events of the story problem. How many cats first appeared in the night? And then what happened? Etc.

Children love this activity and everyone wants a turn to do something. As quickly as possible, get the children to make up the stories. It is also nice to eventually make this a chalkboard activity where they record number sentences by first sketching what happened in the story.





Here, they would quickly sketch four scary cats and then two more and then write the equation  $4 + 2 = 6$ . Be sure to use vertical notation as well as horizontal in these activities.

Remember, give equal time to addition and subtraction stories from the beginning. Children eventually sort out the processes and correct notation after having enough experiences.

"Seven big round pumpkins were growing on the ground. Juan and his father arrived to pick out three for Juan's family. Juan searched carefully to find just the right three. He chose a special round one for his sister, a rather tall one for his older brother and a charming small one for his own. He and his dad carefully put them in their



car and took them home. How many pumpkins were left growing on the ground?"

## Multiplication and Division

For second graders, story problems can also help set foundations for multiplication and division. Here is an example of each to help you get started.

"Francesca, Emily and Jennifer were making decorations for a Halloween party. Each of them painted three scary white ghosts. How many ghosts did the girls get ready for their party?"



"Our class made fifteen wonderful Halloween masks. Three children in our class want to set up Haunted Houses at home using the masks. How many masks will go to each child's Haunted House?"

This is a good time to use the October theme from *Posing and Solving Problems with Story Boxes* (see Materials Index).

## FACT FAMILY CHARTS

**You will need→** student-made masks

chart paper or 12" X 18" white construction paper to make a Big Book

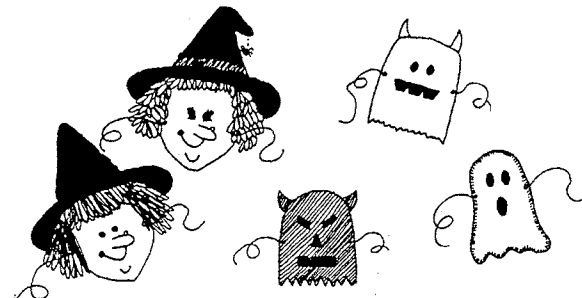
Use the children's masks again to help generate Fact Family charts. Have your class brainstorm ways to make groups of five

Halloween characters using the masks. Have each performing group sit down together after they've been gathered.

$0 + 5 = 5$  (Children might choose five pumpkins)



$2 + 2 + 1 = 5$  (Children might choose two witches, two goblins and one ghost.)



This would continue until masks and children have all been used. Then begin to generate a chart recording all the groups' number sentences on a chart or as separate pages of a class Big Book. If using a chart, leave plenty of space so children can illustrate each number sentence.

Fives

$2 + 2 + 1 = 5$

$3 + 2 = 5$

$4 + 1 = 5$

$5 + 0 = 5$

On another day, you might create a Big Book of  $+1$  and  $-1$  stories acting them out and illustrating them as before. (See Materials Index for Big Book making instructions.)

There were four pumpkins sitting on the fence.  
One got scared and rolled away down the road.  
 $4 - 1 = 3$

There were four tall ghosts and one short ghost going out to haunt. How many altogether?  
 $4 + 1 = 5$

## Estimation and Place Value

### THE POPCORN GHOST

#### You will need→



several quarts of plain popped corn in a large brown grocery bag

white glue

unifix cubes

a large bowl

a 6 X 9 counting paper for each student

2 large pieces of construction paper (light and dark)

a precut tag ghost (about 10 X 16)

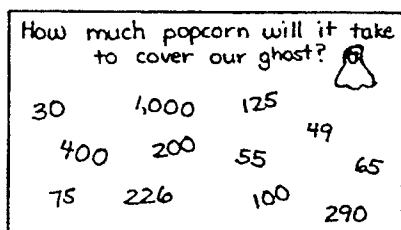
This "happening" is an opportunity for the children to experience and count very large numbers of objects.

Bring in the popcorn sealed in a brown bag so you can play Mystery Sorting (see Chapter 10.) If you are playing the Hangman version, it may take two or three days for your children to figure this one out, but many will talk it over at home and come back with new questions. (We think this is what school is supposed to be

about—lots of puzzling, gathering new information and trying again.)

Once they know it's popcorn, empty the bag into a large bowl and show them the tag ghost. Ask them how many pieces of popcorn they believe it will take to cover the ghost. Quickly, record their guesses on the chart. Try not to react to the "off the wall" guesses with shock. It takes a long time to learn to estimate large numbers with any kind of accuracy.

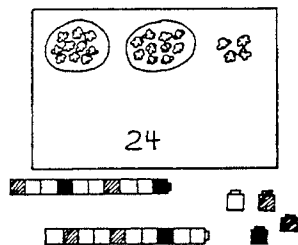




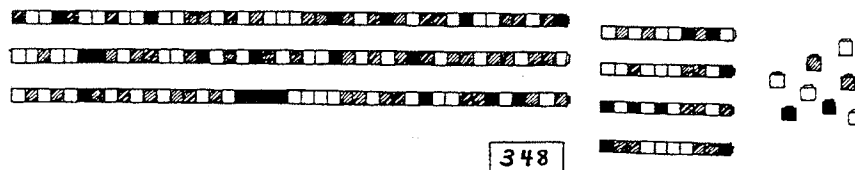
Spend a couple minutes focusing on your chart with questions, for example:

1. Which number represents five dimes and one nickel?
2. Which number has a 7 in the tens place?
3. Which number is 10 less than 300?
4. Which number would be next in this pattern? 25, 50, 75, 100?
5. If we were counting by fives, which numbers would fit our counting pattern?
6. Which number is one more than 225?

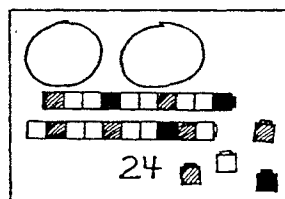
Back to the popcorn: Tell students that in a few minutes each of them will be getting a small handful of popcorn by reaching into the bowl quickly with only one hand just like you are doing. They will then carry their handful of popcorn and counting paper to their table to count their popped pieces into tens and ones. Show them how to count their kernels into groups and loop their tens on the paper. Have them help you count your handful and then label your paper.



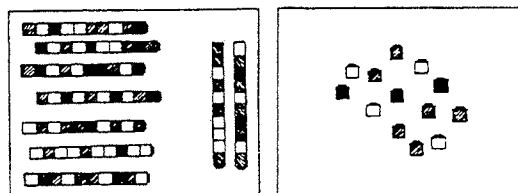
Show them that once they've finished counting, looping and labeling their popcorn, they will get an equivalent number of unifix cubes which will be snapped into tens and ones. Then they'll glue their popcorn onto the tag ghost and bring their unifix cubes to the class circle.



"Three hundreds, four tens and eight ones."



As soon as everyone is finished and back to the circle, ask them to lay all their tens on the large piece of dark construction paper. Have them place their ones on the light piece.

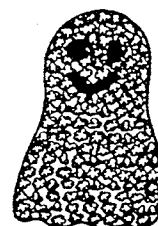


Begin with the sheet of ones to regroup into tens until no more tens can be made. Move the tens to the dark sheet of paper.

Now ask the group to help you count the tens to see if any hundreds can be made. Each time you make a hundred, have a few helpers quickly snap them into a long "train" of cubes. Continue until no more hundreds can be made (see illustration). At last you can find out how much popcorn it took to cover the ghost.

"Three hundreds, four tens, and eight ones."

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When the popcorn ghost is thoroughly dried, add black construction paper features and hang it on the wall.

*Note: If you have a classroom set of calculators, gather the children's counting papers and write the numbers on the chalkboard. Have children add all these numbers on their calculators. Is their calculator total the same as the hundreds, tens and ones they laid out?*

## HALLOWEEN JELLY BEANS

**You will need→**

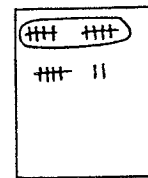
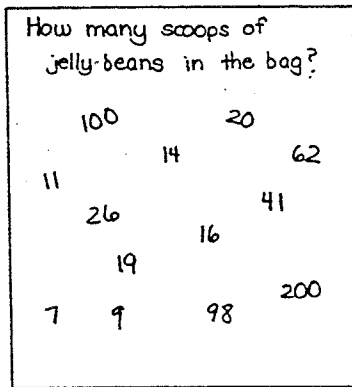
a bag of black and orange jelly beans

small ziplock bags

a small scoop

chart paper

portion cups



Bring in a bag of black and orange jelly beans. Children estimate how many scoops of jelly beans are in the bag. Record guesses on a big chart. Discuss their guesses and again ask some questions about the various numbers. Count the scoops and tally as they're counted. Count the tally marks by fives and ones and by tens and ones.

them by tens and ones using portion cups (see Counting Jars, Chapter 17).



Give small groups of children each a small ziplock bag of jelly beans. Have them estimate how many jelly beans they have and count

Have the children in each group figure out how to share the jelly beans among themselves when they finish counting.

# PUMPKIN MATH

*Have everyone bring a very small pumpkin to school. You will need to bring a few extras and/or ask children to bring in extras so there will be enough pumpkins for every child.*

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## Sorting

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### CAN YOU SORT OUR PUMPKIN COLLECTION?

**You will need→** a small pumpkin for each child

Put all the pumpkins in the middle of the circle. Ask the children to tell everything they can about the pumpkins (stems, no stems; clean, dirty; some have green markings, some

don't; different sizes, etc.) Work together to sort in various ways. Label sorting categories (see Collections Sorting, Chapter 10).

### PUMPKIN CIRCUMFERENCE SORT

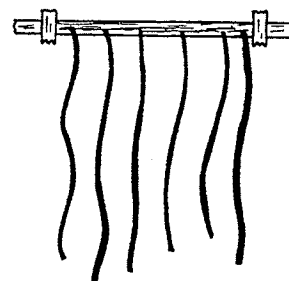
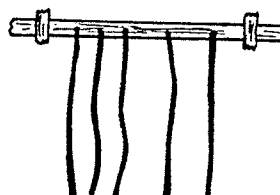
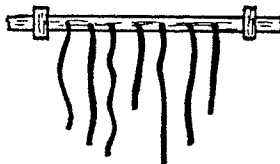
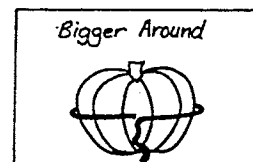
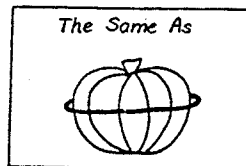
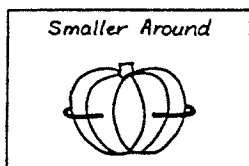
**You will need→** a small pumpkin for each child

string

masking tape

Sort by circumference, using one pumpkin as the reference point. Run a length of masking tape around the circumference of the reference pumpkin and measure it with string. Lay the string out on the floor and tape it at either end. Ask the children to guess whether their pumpkin's circumference is bigger or smaller than

the model. Have them check it by cutting a length of string to match the circumference of their pumpkin and comparing it to the string used for the model. The strings could be graphed. (Hang strings on masking tape that is set up with the sticky side out.)



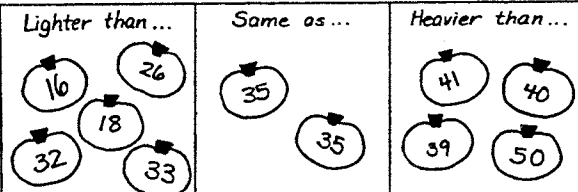
## PUMPKIN WEIGHT SORT

**You will need→** the children's pumpkins  
balance scales or milk box scales (Materials Index)  
small cut-out paper pumpkins  
prepared chart (see below)  
paste  
1" ceramic tiles

Sort by weight, using a procedure similar to the circumference sort. Weigh the reference pumpkin on a balance scale with tiles. Record the number of tiles on a cut-out paper pumpkin and paste it in the center of a chart. Have each child weigh his or her pumpkin with tiles on the balance—perhaps children could work in partners over the course of a morning. They record their pumpkin's weight on a cut-out pumpkin and paste it where it belongs on the chart.

Note: Depending upon the size of the pumpkins children bring and the size of your scales, not

all students will be able to weigh their pumpkins. You may want to select some of the smaller pumpkins from the classroom collection for everyone to work with, or even bring in a batch of miniature pumpkins for this activity.

Lighter than...	Same as...	Heavier than...
		

## PUMPKIN HEIGHT SORT

**You will need→** the children's pumpkins  
unifix cubes or 1 X 12 construction paper strips

Put the pumpkins in order by height, using unifix cubes or cut paper strips to help. If arranging the entire classload of pumpkins

seems too overwhelming, children could work in groups of 4-6 to arrange their own pumpkins.

## MYSTERY BOX SORTING

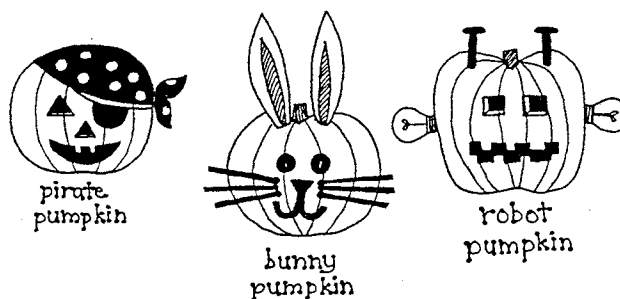
**You will need→** something sealed in a box with which to decorate the pumpkins (suggestions below)  
other decorating materials  
hot glue gun (to be used by adults only), stapler, or straight pins

Seal something in a box for decorating each child's pumpkin: chili peppers or bell peppers for ears, pipe cleaners and toothpicks for antennae and whiskers, small pieces of colored construction paper, yarn, craft pompons, colored feathers, lace, ribbon, or even pieces of fake fur (if you have an extra adult to run

around with a hot glue gun). Permanent pens could be provided for features as well.

After your class has figured out what's in the box (see Chapter 10 for lesson instructions), everyone uses that item, along with the many other materials you've provided, to put a face on

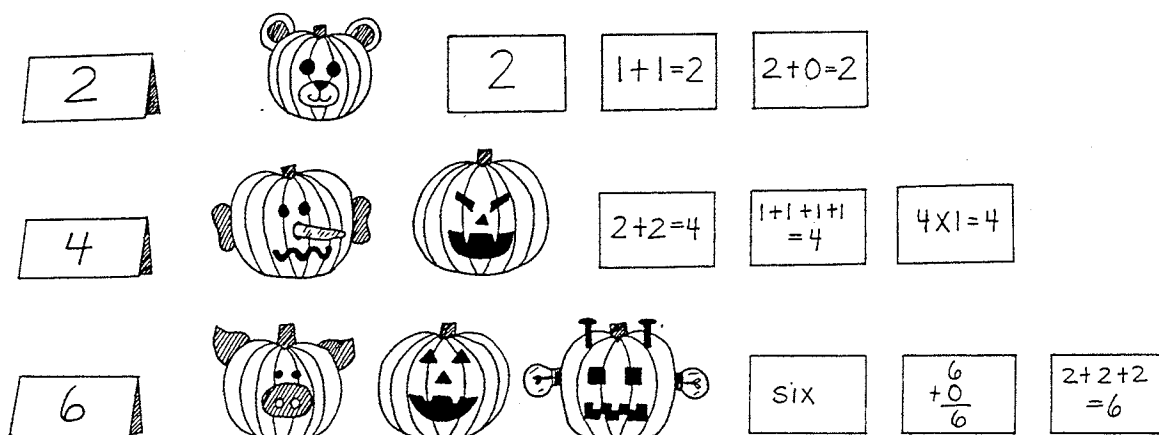
his or her pumpkin. We've seen children create pirates, Martians, bunnies, beautiful ladies, monsters, football players, and many other imaginative critters. These can then be used for Extended Number Patterns (if you stipulate that creations must each have two eyes) and then proudly taken home.



## Extended Number Patterns

### PUMPKIN EYES

**You will need→** children's decorated pumpkins  
individual chalkboards, chalk and erasers  
4 X 6 index cards, folded in half for number cards  
large hundreds matrix (Materials Index)  
5 X 5 squares of white construction paper  
12 X 18 white construction paper for Big Book pages  
dittoed copies of hundreds matrix (see blacklines)



Use the pumpkins the children have decorated. Begin setting them out in rows as below.

one pumpkin	2 eyes
two pumpkins	4 eyes
three pumpkins	6 eyes

Challenge children to each write a number sentence on their chalkboards for each new

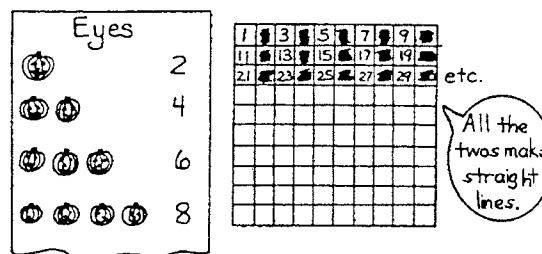
row. Let a few children read what they've written each time.

Make numbers cards to record how many eyes are in each row. Also record some of the children's number sentences as they are read. Continue until all the pumpkins have been used, or until interest flags.

Use the large class hundreds matrix to color the numbers that have been laid out to record each row of pumpkin eyes. The next day give each child a small square of white construction paper. Let them draw and color a picture of their own decorated pumpkin. Use their drawings to make a chart or pages for a Big Book. (Be sure the Big Book's final page is a matrix with the patterns colored or circled to 100.)

You can offer children copies of the matrix so they can make their own record of counting by twos as far as they can.









Some children may also enjoy making their own smaller chart or book of pumpkin eyes. (See Chapter 11 for more details.) Post the class chart and provide speech bubbles for the children to record their observations about the chart and matrix.



## Graphing

### HOW DO YOU WANT OUR PUMPKIN CARVED?

**You will need→** paper graph student-made graph markers  
a class pumpkin to carve

How do you want our pumpkin to be carved?		
Happy	Scary	Nervous
 	 	
 		

Have children propose 2 or 3 ideas for how they'd like the teacher to carve her pumpkin—happy? scary? nervous? They each draw a picture of the pumpkin face idea they like best. Graph (Chapter 10). Teacher takes her pumpkin home and carves it, saving the seeds to toast and bring back to school along with the carved pumpkin.

## Estimation and Place Value

### PUMPKIN SEEDS

**You will need→** toasted pumpkin seeds  
chart paper spoon or small scoop  
paper cups or other small containers  
portion cups (Materials Index)  
large place value board (Materials Index)

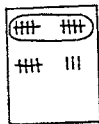
#### Spoonfuls

Bring the toasted seeds from the carved pumpkin back to school in a jar. Children

guess how many spoonfuls of pumpkin seeds came out of the teacher's pumpkin.

How many spoonfuls of seeds came out of the pumpkin?

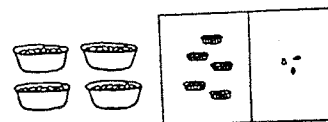
19	6	61
4		70
	12	
10		25
	250	39



pairs of children along with place value boards and counting cups. Have each pair work to count their seeds into tens and ones. Bring the seeds up to the large place value board and total. (See Counting Jars, Chapter 17, for details.)

How many seeds were in our pumpkin?

10 <sup>4</sup>	1,000	462	50
99	25	250	300
			1,000,000



453 seeds

*"Four hundreds, five tens and three ones."*

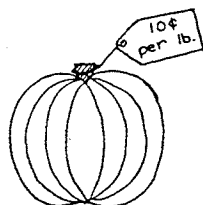
## How Many Seeds?

Children guess how many pumpkin seeds there were altogether in the teacher's pumpkin. Record guesses on a big chart. Pour the toasted seeds into small containers and distribute to

## Money

### HOW MUCH FOR THAT PUMPKIN IN THE WINDOW?

**You will need→** children's pumpkins  
lots of pennies



Tell the children what the going price per pound for pumpkins is at the local store. Work together to figure out how much some of the pumpkins in the class would cost. One procedure would

be to weigh a pumpkin, lay out the number of pennies you'd need for each pound, and add them all together. Even better, guide your *children* to figure out a procedure; it's a great problem-solving opportunity.

## Time and Duration

### WHAT HAPPENS TO AN OLD PUMPKIN?

**You will need→** the pumpkin you carved

Children estimate how many days it will take for the carved pumpkin to begin getting squishy. You can graph their guesses and then

watch the pumpkin for as long as you can stand it. Be sure to set it on a tray or flat cake pan—this can get messy!

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## More Ideas

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What can you do with pumpkins after Halloween? Brainstorm possibilities with your kids. Here are a few possibilities:

- toast the pumpkin seeds
- make a pumpkin pie
- save the seeds to plant in the late spring

- compost the pumpkin
- use it to make a Thanksgiving decoration, like a scarecrow

Try to follow up on one or more of your ideas in class.

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## Homework

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### A SWEET ASSIGNMENT

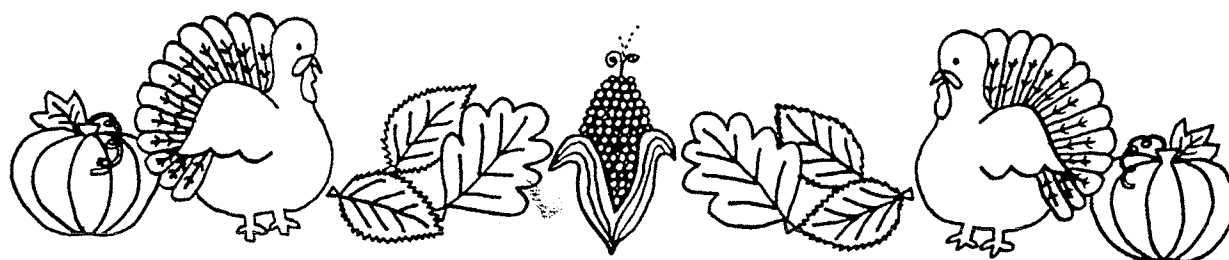
**You will need→** teacher-made assignment sheets

1. Lay out all your trick or treat candy. Sort it with your family. How many ways can you sort it? Make a record of how you sorted it in your "best guess" spelling.
2. Count your Halloween candy into tens and ones. Write down how many pieces you had.
3. Can you figure out a way to make your Halloween candy into a pattern? Draw a short record of the patterns you made.



## Chapter 3: November

# FALL POTPOURRI



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## Calendar Additions

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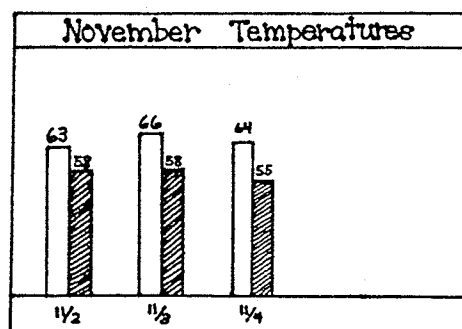
### WEATHER

**You will need→**      your outdoor thermometer      newspapers  
                                 1/2" X 12 strips of red and black construction paper  
                                 12 X 18 white construction paper

It is fun to begin gathering national weather maps from the newspaper two or three times per week as part of the focus on weather. Ask the children to check their own newspapers at home on the days you don't do this as a class. Help your children become aware of the many different weather patterns in the country at this time of year.

Make your temperature graphs from the daily newspaper records of the high and low temperatures from your own area. Read and record the previous day's high and low. Use red and black construction paper strips to show the

highs and lows on your chart. (See Picnic Weather, Chapter 1.)



## MONEY ON THE CALENDAR








**You will need→** money pocket chart (see The Calendar)

real coins—quarters, dimes, nickels, and pennies




Add the money pocket chart to your calendar activities this month (see Money Pockets, The Calendar, for making instructions). There are several terrific ways to do this activity in conjunction with the day's date.

### Trading coins

Let's say it is the 15th day of November. You begin the day with two nickels on the nickels row and four pennies. When you put in the




























	Today is <u>November 15</u>
pennies	    
nickels	 
dimes	

penny for the new day, the children discover there are once again five pennies so they have you trade for a nickel and you count the money by fives just like the month's tally chart. (You may also be trading for dimes and quarters in your pockets as appropriate.)

Today is <u>November 15</u>
  

### How many ways can we make the date?

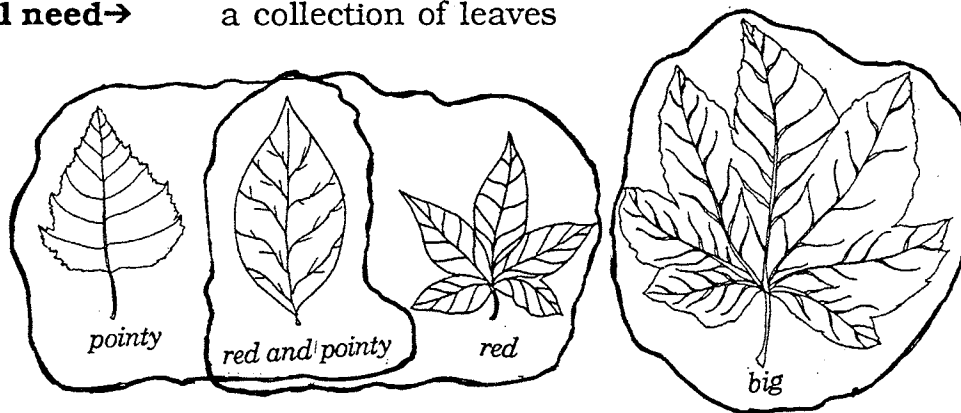
Now suppose it's November 16. What is one way we can make today's date in money? (Sixteen pennies.) Can anyone think of still another way? (One dime, one nickel and one penny.) Set up the children's ideas, right or wrong, each time and count the suggested combinations to see if they correctly match the date. Remember, children learn lots from mistakes.

Today is <u>November 16</u>
       
     
        
   

Note: Children who find this difficult rarely volunteer an idea. Try setting up a feely box (see Materials Index) with everyone's name in it. Pull out two names and have those children quickly work together to suggest a way to set up the money. Don't forget to put their names back in the can so they will stay involved.

## LEAF SORTING

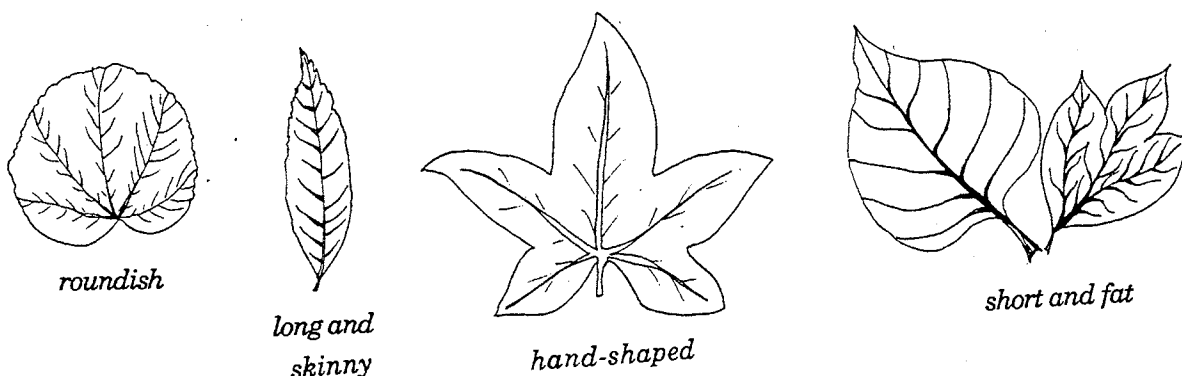
You will need → a collection of leaves



Go on a walk to gather fall leaves. Have the children put the leaves in the middle of the circle for all to see. Have the class make as many observations as they can about the leaves. Then ask them to tell you which ones they think belong together. Someone might tell you to sort by color, but you're more likely to get a pile of red leaves, a pile of big leaves, and a pile of pointy leaves. (When you've got a big red leaf or a red pointy leaf, it's interesting to see what the children do with it—frequently they decide to put it between the two groups in question.)

Put the leaves back together and ask the children to sort them a different way. If you do this several times, you're likely to see children begin to sort by opposing attributes: wet/not wet, stems/no stems, red/not red, and so on. What you're not likely to see in many first grades is

sorting by overall category where more than two attributes will be generated (e.g., sorting by shape, size, leaf types). You can guide them in this direction. Suppose a child suggests that you make a pile of long, skinny leaves. Have a child or two come up and help you do so. When that's done, hold up a leaf that's not long and skinny and ask the children to describe its shape. They may tell you it has points on it—looks kind of hand-shaped. Get help to make a pile of hand-shaped leaves. Hold up a leaf that hasn't been placed in either pile yet. Ask children to describe the shape of that one. Keep going until all the leaves have been sorted by shape. Have the children name each pile. Mention that they've done a nice job of sorting by shape. It won't take most children too long to catch on.



# Patterning

## MACARONI NECKLACES

### You will need→

a variety of macaroni such as salad macaroni, wagon wheels, rigatoni (3-4 bags for class of 30)

3-4 quart jars with tight-fitting lids

rubbing alcohol      food coloring (3-4 colors)

newspaper      white glue

thin string      white poster board or tag board



### Preparing the macaroni

Dump all the macaroni into a large container and mix. Using quart glass jars which will seal tightly, pour enough rubbing alcohol to barely cover the jar bottom and add 20-30 drops of food coloring, one color per jar.

Fill each jar 2/3 full of macaroni, seal and shake well until the macaroni is thoroughly colored. (If the macaroni isn't coloring well enough, you can always pour in a tiny bit more alcohol and a bit more food coloring, then seal and shake again.)

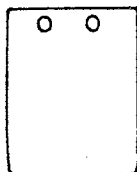
Pour colored macaroni onto several thicknesses of newspaper and let dry 10-15 minutes. (Be careful here. If you've used too much alcohol, it does soak through and strip floors.)

### Preparing the strings

Have each child measure and cut a string that, when tied, will slip over his or her head. Dip one end of each string into white glue and hang it on a "line" overnight to dry. The glue will harden and make that end of the string function like a shoelace.

### Preparing Pattern Pendants

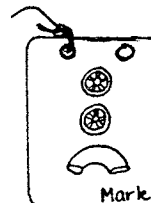
Cut 2 X 5 poster board or tag-board pieces for each child. Punch two holes at the top. For the necklaces each child



lays out colored macaroni into his or her chosen pattern. Have them extend their pattern for a few inches.



A "road" of white glue is squeezed onto the pendant piece and the basic macaroni pattern from the table is copied onto the pendant. Let the pendants dry overnight. Tie the unglued end of the string to one end of the pendant.



### Stringing the Necklaces

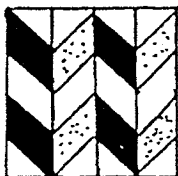
Children string macaroni necklaces to match the pattern on their pendants. To complete the necklace help them tie the other end of the string to the pendant.



## CLASS SAMPLER QUILT

### You will need→

the largest possible square you can cut from white or colored butcher paper



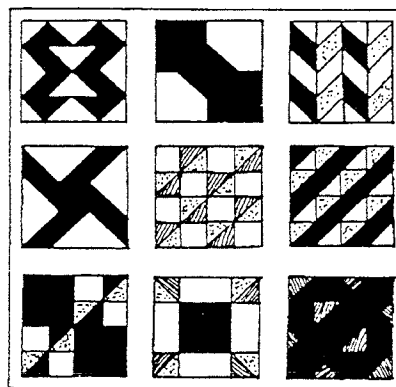
construction paper squares (Cut 2" squares from three or four complementary colors. Have your children make triangles they need by cutting the squares diagonally from corner to corner.)

copies of the Quilt Block Patterns (blackline supplement)

paste or glue sticks

Select a Quilt Block Pattern (an easy one) and model assembling a quilt block with the children. Show them the 2" construction paper squares. Brainstorm ways to cut triangles from a square. Allow the children time to experiment.

Ask your children to work with a partner sometime during the week to select a Quilt Block Pattern and to complete a quilt block from construction paper squares and/or triangles for your wall quilt. Assemble the finished blocks into a sampler quilt with the class using the large butcher paper as back ground. Hang with great pride!



## Extended Number Patterns

### HAND PRINT TURKEYS

#### You will need→

crayons

brown tempera paint

styrofoam meat trays or large sponges

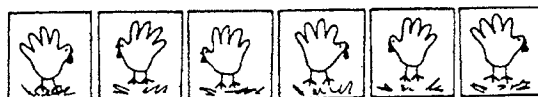
one 6" X 9" piece of yellow construction paper for each child

adding machine tape



Pour brown paint on a large sponge, or pour a thin layer of paint on a styrofoam meat tray. Child presses hand into paint, then onto 6" X 9" construction paper. When dry, add wattle, beak, eye, and legs to create turkey. If straw is available, glue a bit by turkeys' feet. Hang turkeys in your room,

side by side, with a long strip of paper underneath to record fives.



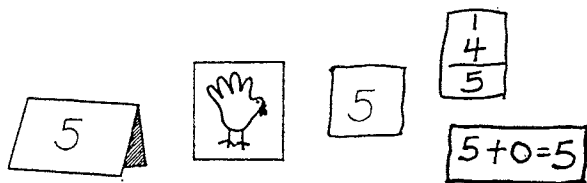
5 10 15 20 25 30

## ANOTHER FIVES CHART

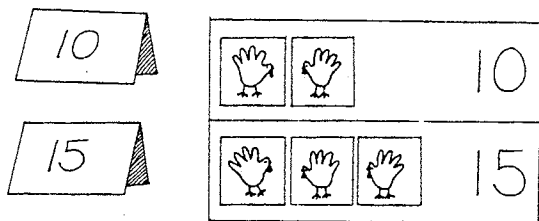
**You will need→** hand print turkeys  
individual chalkboards, chalk, erasers  
4 X 6 index cards, folded in half for number stands  
butcher paper

If you have more than 20 children in your room and don't want to run your Counting by Fives Chart over 100, you can use the extra turkeys to create a Number Pattern Chart.

Have the children get chalkboards, chalk and erasers and meet you in the class circle. Begin setting out the extra hand print turkeys in the middle of the circle as below:



Challenge children to record one number sentence on their chalkboards for each new row. Let a few children read what they've









written each time. You may want to quickly write a few of their number sentences on pieces

of construction paper and set them beside the growing pattern.

The next day, glue the turkeys in rows on a butcher paper chart. (You may need to have children make a few extra turkeys!)

With second graders, generate multiplication sentences for each row ( $1 \times 5 = 5$ ;  $2 \times 5 = 10$ ;...).

Turkeys	
	5 fingers
 	10
  	15

Don't forget the matrix extensions. Circle this pattern on the big class matrix and then encourage children to try it on their own working with a printed matrix to circle the fives pattern and a blank matrix to write the numbers in the fives patterns. (Be sure to see Chapter 11 for additional details.)

## Story Problems

### FALL STORIES

**You will need→** individual chalkboards, chalk, erasers  
12 X 18 white construction paper

November, once again lends itself to wonderful story problems depending upon your units of study. Here are some examples of November stories to act out and have children record on chalkboards:

#### Addition and Subtraction

Seven children were at the Colonial Days church meeting. Three of them were giggling and two of them were very wiggly. Of course,

they had to be scolded! How many children did *not* need to be scolded?

Grandma was getting ready for the Thanksgiving feast. She made two pumpkin pies, two apple pies, one berry pie and one mince pie. How many pies did she bake?

### **Multiplication and Division**

We went out to the garden to pick some corn for dinner. There were four of us and we each brought in two ears. How many did we bring in altogether?

Farmer Brown is crating turkeys for sale to the market. His crates each hold three turkeys. He has 15 turkeys to crate. How many crates will he need?

Once children have had opportunities to act out, tell, and record a variety of fall stories, have them write a set of arithmetic stories in their own "best guess" spelling. You can use small yellow "post-it" notes to edit their stories with adult spelling and have them read to the group. Have the class help by adding detail and asking interesting questions.

When the edited and finished stories are in their best possible form, compile them into a Big Book. Be sure to include stories from every class member and encourage bright drawings that will help readers understand the problem. (See September and October Seasonal Math for more details.)



# POPCORN MATH

## Extended Number Patterns

### TALLYING POPCORN SPOONFULS

**You will need→**

a small bag of popcorn kernels

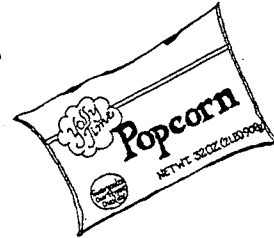
jar/funnel

spoon

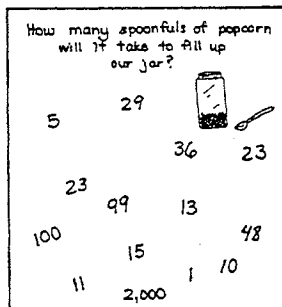
chart for estimates

toothpicks or popsicle sticks

individual chalkboards, chalk, and erasers



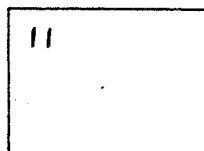
Hold up the jar and spoon to be used and ask the children to estimate how many level spoonfuls it will take to fill the jar to the top. Record their guesses on a chart.



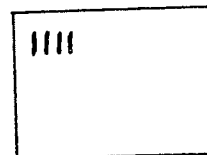
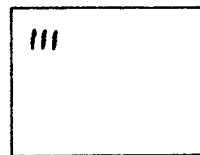
Have each child take a handful of toothpicks or popsicle sticks plus a chalkboard, chalk and eraser.

Begin filling the jar—children count aloud as each spoonful goes in:

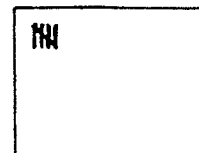
“One.” Each child sets out a toothpick on chalkboard. “Two.” Another toothpick is set



out, “Three,” and another, “Four,” and another,



“Five.” This time the toothpick is set out but after all five are counted, “One, two, three, four, five,” the last toothpick is lifted and turned to the diagonal position to more easily see this group as five.



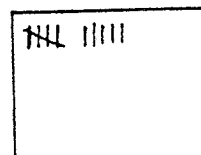
**Teacher:** What number comes next?

**Children:** Six.

**Teacher:** OK, here we go. (A spoonful is poured in.)

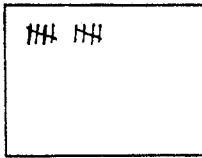
**Children:** Six. (A toothpick is set out.)

Continue to 10. At ten, the toothpicks first look like this:





The last toothpick is again picked up and turned as before. Count toothpicks together now.



**Children:** One, two, three, four, five, six, seven, eight, nine, ten.

**Teacher:** Now I want you to use your chalk to loop your ten like mine. What number comes next?

**Children:** Eleven.



Proceed to 15, dumping spoonfuls of popcorn into the jar, counting and setting toothpicks. Again lift the last toothpick and turn it to a diagonal position to more easily see the group of five.

**Teacher:** How many do we have so far?

**Children:** Fifteen.

**Teacher:** Let's count them to be sure. This time we'll count by ones.

**Children:** One, two, three, ..., fourteen, fifteen.

**Teacher:** Let's try it again, this time by fives.

**Children:** Five, ten, fifteen.

**Teacher:** Let's look at our chart. Have we passed any of our guesses yet?

Have children come up and cross out guesses that are less than 15.

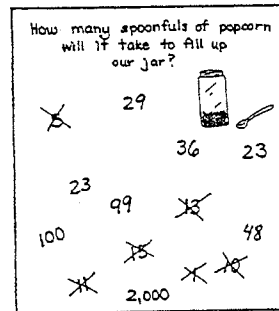
**Teacher:** Are there any other numbers we could get rid of right now?

**Children:** Fifteen!

**Teacher:** Why?

**Children:** Because you've put 15 spoonfuls in the jar and it's not full yet. It's got to be more than fifteen.

**Teacher:** OK. Come cross out the 15. Any other ideas?



**Child:** Two thousand!

**Teacher:** Why?

**Child:** It just can't be two thousand. The jar's half full, it would never hold two thousand spoonfuls.

**Teacher:** Class, do you agree?

**Children:** Yeah...

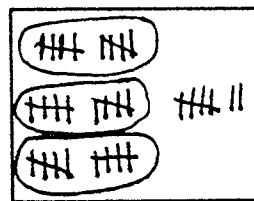
Eliminate a few more guesses and continue adding spoonfuls to the jar.

**Teacher:** What number comes next?

**Children:** Sixteen.

Proceed to 20, where the toothpick is turned, the ten is looped and counting is again done by ones, fives, and even tens. Continue until the jar is filled.

Here is an example of counting together when the jar is full:



By ones: "One, two, three, ...(continue to), thirty-six, thirty-seven."

By fives: "Five, ten, fifteen, twenty, twenty-five, thirty, thirty-five, (everyone claps)—thirty-six, thirty-seven."

By tens: "Ten, twenty, thirty, (everyone stomps), thirty-five (everyone claps)—thirty-six, thirty-seven."

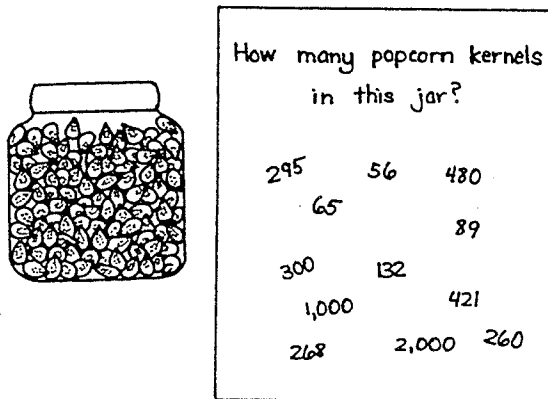
# Estimation and Place Value Counting

## HOW MANY KERNELS?

**You will need→** two or three tiny jars (make-up, pimento, etc.)  
 popcorn kernels    chart for estimates  
 portion cups    margarine tubs    place value board  
 several 3 X 5 index cards

Fill one of the jars with popcorn kernels and estimate how many kernels it took to fill the jar.

Record the guesses on a large sheet.



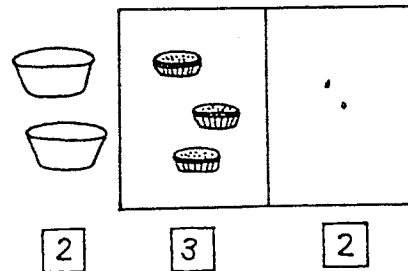
Have your children quickly help you count out the popcorn kernels into portion cups, ten kernels per cup, until no more tens can be made.

Set tens cups on the place value board; cups on the colored side, leftover kernels on the white side.

Begin counting the cups by tens. Each time you get to 100, dump the ten cups into a margarine

tub and move the tub to the left of the place value board.

Once the counting is finished, count the entire sum: 100, 200, 210, 220, 230, 231, 232...



Label with numeral cards. Point out what each number really stands for. Mix the numbers up and have children rearrange. Invent another similar number and ask children to picture it and set it up with empty cups and tubs.

**Teacher:** Let's read what we have in hundreds, tens and ones.

**Children:** Two hundreds, three tens and two ones.

**Teacher:** And how many kernels of popcorn do we have altogether?

**Children:** 232!

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## Graphing

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### PLAIN OR BUTTERED?

**You will need→**      paper graph  
graphing markers prepared  
by children or teacher

Make a picture graph to determine how children in your class like popcorn best. See Graphing in Chapter 10 for discussion questions and lesson details.

		Jessica
Mark		Manuel
Marla	Sara	Tanya
Yehudi	Jerome	
Shelby	Shane	Josh
Plain	Butter	butter + salt

*How do you like your popcorn?*

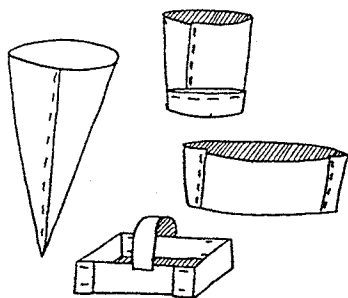
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## Geometric Problem Solving

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### POPCORN CONTAINERS

**You will need→**      one 8 1/2 X 11 piece of paper per child  
crayons                      tape, stapler, paste  
enough popped popcorn (some left plain, some buttered, and some with butter and salt) to give each child about a cup



Give each child a piece of 8 1/2 X 11 paper. Tell them they can come get the popcorn of their choice, but they'll need a container to hold it.

They can use tape, staples, crayons, or glue, but the single sheet of paper must become the container. You'll see them create baskets, boats, and envelopes. Older children may create cones. This is a challenging problem. Encourage children who are 'stuck' to ask others for help, or to walk around the room to see if they can get an idea from someone else. Let them come up to get popcorn as soon as their container is completed. When everyone has eaten, graph the containers by type. (It's interesting to see how the children decide to sort and name them.)

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# Measuring

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## THE CALIBRATED SCALE

**You will need→**      milk box scale (Materials Index)  
                                 small plastic bags  
                                 100 1" ceramic tiles  
                                 record pad (staple several sheets of 5 X 18 newsprint to  
                                 a 6 X 19 sheet of poster board)  
                                 various corn products

Bring in some additional corn products (a can of corn, an ear of Indian corn, cornstarch). Prepare a calibrated scale (see illustration).

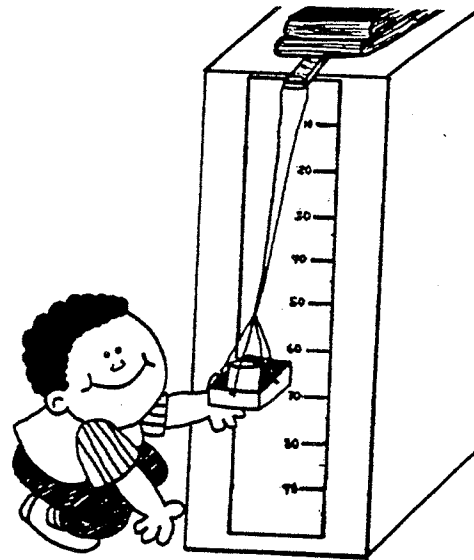
Have children help count out ten piles with ten tiles each. Seal each set into a plastic baggie.

Suspend the milk carton scale from a ruler in front of a counter or at the end of a desk so it hangs over the record pad. Have a child make a line at the base of the milk carton scale.

Put a bag of tiles into the scale and mark as above. Continue in this manner until you have stretched the rubber band as far as it will safely go. Take all the tiles out.

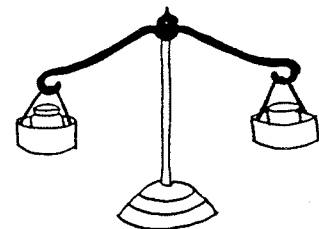
Put a corn product in the scale. Mark the bottom of the scale again on the record sheet. Write down the product name: Corn—45 tiles. Continue until all the corn products have been

weighed. Compare the weights. Arrange the products in order from the lightest to heaviest. Discuss.



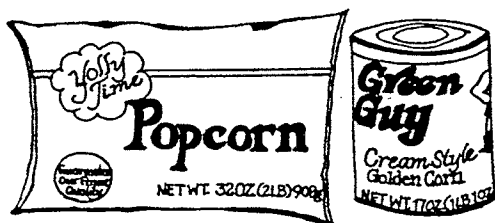
## THE BALANCE SCALE

**You will need→**      balance scales      corn products  
                                 4 X 18 strips of construction paper  
                                 1" ceramic tiles



Compare your corn products, item to item in your balance scale. Discuss language for comparing weights. (The cornstarch is lighter

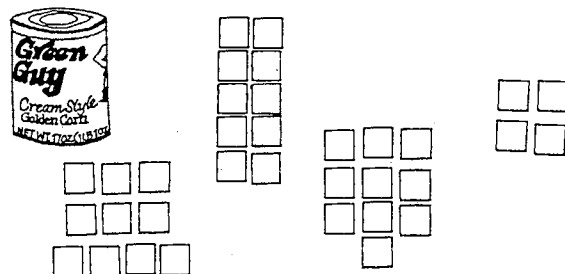
than the large can of corn.) Make record strips of these statements. Can the class use those record strips to order the items by weight?



*The bag of popcorn is heavier than the can of creamed corn.*

Estimate how many tiles one of the products will weigh. Put an item in one pan of the scale and load tiles into the other pan. Once the scale is balanced, dump out the tiles and group into tens and ones to determine how many tiles the

item weighed. Talk about how to write it down. Repeat with other items and have children practice writing in tens and ones. (See Weighing activities in September Seasonal Math for details.)




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## Homework Ideas

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**You will need→** teacher-prepared assignment sheet

1. Check your cupboards for corn products. Make a list of the corn products you have at home. Have an adult help you arrange them from least expensive to most expensive.
2. Choose one of your items. Lay out the appropriate change to pay for that item. Ask

a family member to check. Are there any other ways to lay out that same price with different combinations of coins?

3. Find grocery ads for corn products in your paper. Cut them out and bring them to school.



Chapter 4: December

# HOLIDAY MAGIC

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## Calendar Counting

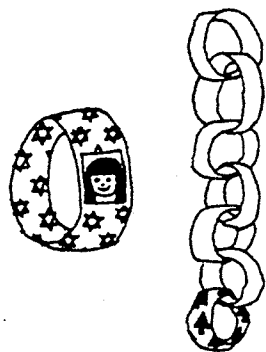
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### CHRISTMAS OR HANUKKAH COUNTDOWN CHAINS

(This project needs to be done on the first school day of December.)

*Waiting is so difficult for children when magical events are ahead. When children make paper chains to count the remaining days until the big event, it gives them another chance to experience duration.*

**You will need→** for each child:



1 X 9 red and green or blue and white strips of construction paper to equal the number of days remaining until Christmas or Hanukkah

one 1 X 9 strip of Christmas or Hanukkah giftwrap for the last link

white glue

And for a nice touch...a black and white copy of his or her xeroxed school photo (Materials Index)


Have each child complete a chain using his or her colored strips for the appropriate number of days left until the big event. Have the children use giftwrap as the last link of the chain to

signal the Special Day. Have the child glue his or her picture to the last link also. Demonstrate on your own finished chain how each evening, as the children are going to bed, they will cut

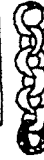
away a link for the day that has just passed. Hang a sample of each chain the class has made by your class calendar so you'll be able to keep a chain going at school. Make a record to post by the class chain. (We've cut away nine links, now there are sixteen more days until Christmas, etc.)

Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	

Vacation starts today!  
We've cut away 18 links.  
We have 7 links to go!



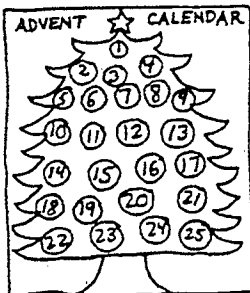
HAPPY HOLIDAYS !



## COUNTING DOWN TO CHRISTMAS OR WINTER VACATION

**You will need→**

*for each child:*



a construction paper copy of the Christmas tree (see blacklines)

a construction paper copy of the circles for Christmas ornaments (see blacklines)

or, a construction paper copy of the Snowman (see blacklines)

enough cottonballs to count the days until winter vacation

small pieces of black, brown and orange construction paper to decorate the snowman

glue

pencil

a ziplock sandwich bag or envelope to hold cotton balls or cut ornament pieces

Have your children complete the tree or snowman by cutting it out and doing needed finish work. If they are making the tree, they will need to cut out 25 circles (if you've been able to do this on December 1) and tuck them into an envelope or sandwich bag for safekeeping. If they are making the snowman, they will need to count out the appropriate number of cotton balls for the days remaining before winter vacation. Keep these in an envelope or sandwich bag.

On a large classroom version of the snowman or tree, show the children how to write in the numerals for the remaining days until the Big Event. Also demonstrate to the children how they will cover a number each day in their countdown, *beginning with the highest number they have written*. (For the Christmas tree they will use their cut circles, for the snowman the cotton balls.)

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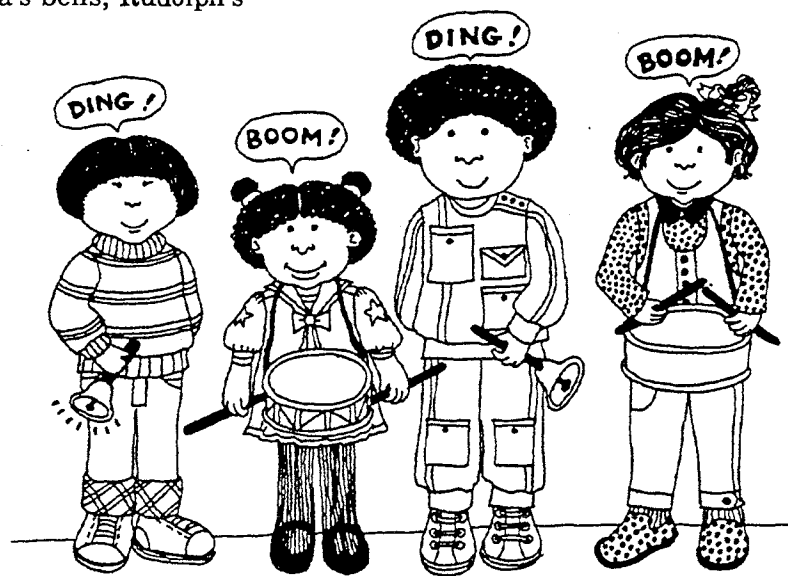
## Musical Patterns

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**You will need→** a collection of rhythm instruments

It's fun to invent musical patterns with the children. Explore the unique sounds of each of the instruments and invent some holiday music sounds to perform in repetitive patterns. (Santa's bells, Santa's bells, Rudolph's clicking hooves...)

Your children may also enjoy adding rhythm instrument patterns to favorite songs such as Jingle Bells. Let them figure out what sounds should go with each line.



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## Graphing

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### HOLIDAY ORNAMENTS

**You will need→** an ornament or decoration for each child (Have them bring one of their favorites from home.)

Have children bring their favorite holiday decoration. Brainstorm ways they can be

sorted and use children's ideas to sort several times. Graph their favorite way of sorting.



# Money

## THE DREIDEL GAME

### You will need→

bags of ten pennies or nickels per team

a chart of the dreidel symbols

*for a large class dreidel:*

a gallon milk carton

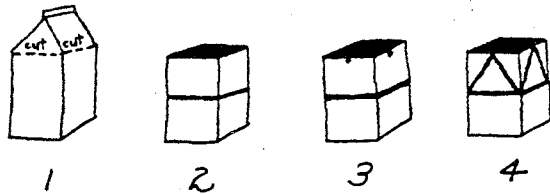
adult scissors

a permanent marking pen

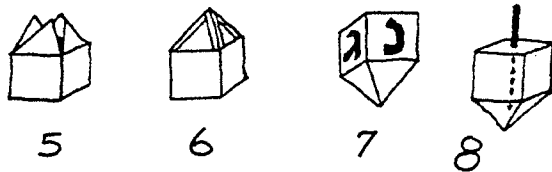
a ruler

a piece of doweling 1/4" X 10"

To make the dreidel, cut off the top portion of your milk carton (the part that folds in to seal the box). Now measure half way up the milk carton (4") and mark a line all around the carton. At the very top open edge, make a dot at the mid-point of each side (1 7/8"). Draw triangles as shown. Cut away the portion not needed for the triangles.



Use strapping tape to tape the sides of the triangles together to form the dreidel. You may wish to cover it with contact paper to make it more attractive. Write the symbols on the sides as shown. Sharpen your doweling in the pencil sharpener and then run it through the center of the bottom point. (It should be sharp enough to poke through the top of your dreidel.)



Make the dreidel chart to show the children the directions for which each symbol stands.

gimmel	nun	hay	shin
take all	do nothing	take half	put one in

To play each team will need a bag of ten pennies (or nickels). Divide your class into four teams. Give each team their bag of coins and ask them to count the money. Decide which team will get the first turn. Each team puts one coin in the "pot". The team with the first turn spins the dreidel and follows the direction of the symbol spun. Play continues in turn until the group either tires of the game or time runs out. The team with the most cash wins or a preset amount (the team to first get 10 cents) could determine the winner.

This game becomes a wonderful second grade challenge by handing out bags of mixed coins to each team. There is a lot of calculating of sums, deciding which coin to put in the pot, figuring out how to take half, and even trading coins from the pot to make change.

(This can later become a small group game for extra time if you wish to keep it available.)

## THE CHRISTMAS ART STORE

### You will need→

12 X 12 squares of gift wrap  
gold glitter stems and/or pipe cleaners  
6 X 12 pieces of construction paper  
ribbon, lace                      doilies                      glitter

(Provide enough of the above materials for each child to have at least one.)

7 small margarine tubs to set beside the above containers of art supplies (For second grade: each tub needs to contain 20 pennies for making change.)

price tags to put on each of the margarine tubs  
tape, glue, scissors, hole punches, staplers, etc.

a "bank" with enough coins for six to eight children to work with at one time (Be sure to have a variety of coins appropriate to the amount the children need to count out.)

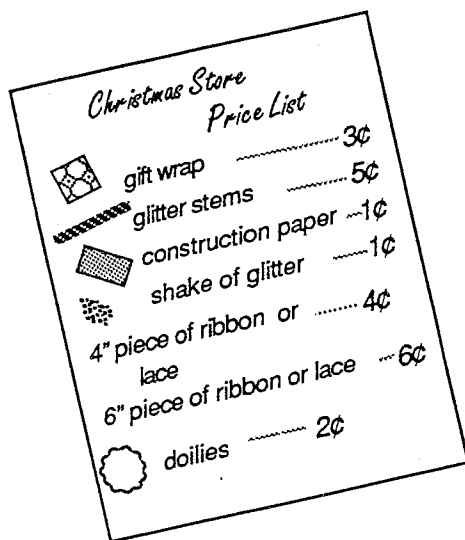
first grade: begin with twenty pennies

second grade: begin with a dime, a nickel and five pennies

two measuring cards, one 4", the other 6", against which children can measure and cut lace and ribbon

a price list for your store

brown paper lunch sacks



Show your class the art supplies and money bowls lined up on your counter. Explain that over the next few days each child will have a chance to visit the art store with 20¢, which you'll give them, to purchase supplies to make an angel. (If this seems inappropriate to your community, you could have children make a Santa, Christmas stocking, teddy bear, or other decoration. Adjust your art store supplies accordingly.)

Don't provide them with a model of an angel. Explain instead that they'll be using their best problem-solving skills to figure out how to make an angel with the available supplies and also stay within their budget of 20¢. Let them know that they don't have to spend all their money, but they can't go over 20¢. This will take some planning. After they've had a good

look at the actual supplies, post the price list. Ask them to write a list of supplies they plan to purchase and draw a picture of how they're going to make their angel. This isn't easy. The planning process is very important even though there may be a huge gap between what they plan and their finished product. Some children may overrun their budget as they plan. (It might help to have some pennies available.)

Over the next few days, let your children visit the art store, one or two at a time, plans in hand, to shop for their supplies. They get 20¢ from the bank to begin, pay for their supplies by putting the correct change in the appropriate bowls, and put their supplies in a sack labeled with their name. When everyone has gone through the store, take a class period for angel

construction. Have each child make a price tag for his or her angel showing the cost of the materials involved.

Here are some follow-up activities:

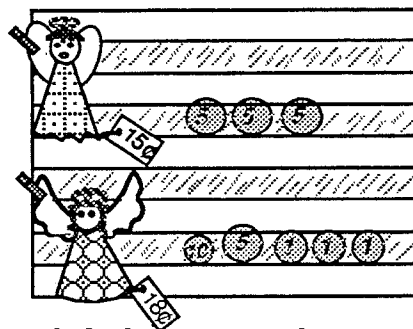
How could our angels be sorted? Brainstorm a chart. Possibilities include price, size, type of angel (two-dimensional, three-dimensional), halos/no halos.

Could we create a pattern with our angels?

Could we arrange them from least expensive to most expensive?

Using a pocket chart, large paper coins, and clothespins to attach the angels to the chart, the following types of story problems could be pursued:

How many different ways could we arrange coins to pay for this angel?



How much do these two angels cost together?

How much do the boy angels cost altogether? What if we sold one?

If I gave you \$1.00 to buy this angel, how much change would you get back? Could we write this in story form?

Children might work by themselves or with partners to write art store angel story problems for a class Big Book.

## Counting and Problem Solving

### HOW MANY CANDLES?

**You will need→**

a real or paper menorah

real or paper Hanukkah candles

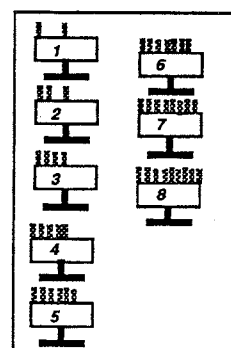
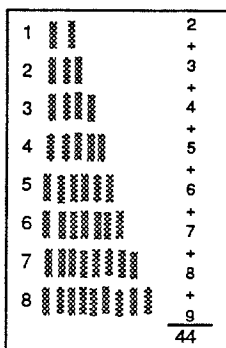
paper

unifix cubes or other counters

You'll probably want to begin this lesson by reading or telling the story of Hanukkah and explaining the significance of the menorah. Show the children your menorah and explain that each night the *shamesh*, or leader candle, is lit, and then, on each succeeding night, an increasing number of candles is lit—one the first night, two the second, three the third, until on the eighth night, the *shamesh* and eight candles are lit. The candles aren't blown out, but are always allowed to burn down; so the first night two candles are used, the second night three candles are used, the third night four candles are used and so on. Ask the children to work in partners, or by themselves if they prefer, to figure out how many candles would be needed for all eight days.

This is a challenging problem. Before you send them off, you'll want to brainstorm ways

to go about it. Some ideas children may explore include drawing lines to represent the candles for each night and counting; drawing a menorah with each night's candles to count; or using unifix cubes, crayons or other counters to represent each night's candles.



We put out crayons and counted them. There were 44.

Some children are very unsure of how to proceed, even after class brainstorming and need to watch other children or talk with the teacher to get started.

Some children, after they've drawn or laid out representations of the candles, record numbers and add them. A few may even request calculators to add all those numbers. Most,

however, are content to count their lines, crayons, cubes, or other counters.

Ask your children to record their findings in some way before coming back to the rug to discuss the problem. It's fun to show them the box of Hanukkah candles when you're done. They generally come 44 to a box!

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## Geometry

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### SANTA CYLINDER TREE ORNAMENT

**You will need→**

red glitter

red yarn

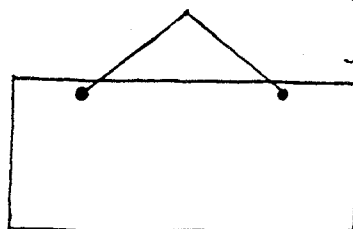
crayons

hole punch

glue

marshmallows (miniature)

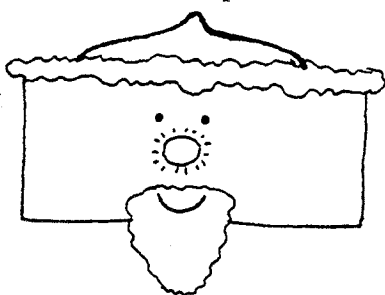
*for each child:*



a 4 X 8 piece of white construction paper (punched with two holes at top—see drawing)

2 cotton balls

Punch holes and tie yarn as illustrated before children start this project. In the center of the white strip draw two eyes close together, and a mouth. Place glue on one side of a marshmallow and dip it in the red glitter.



Quickly place a dab of glue where Santa's nose will go and set the "nose" in place. Stretch one cotton ball out to make it long and fluffy. Glue it on for a beard. Stretch a second cottonball out long and thin and glue it to the top of the white strip for hair.

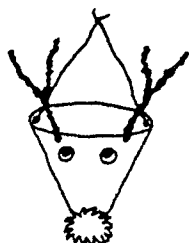
Place a line of glue down one end of the strip and curl the strip into a cylinder (with someone helping you).



### RUDOLPH CONE ORNAMENTS

**You will need→**

*for each child:*



a brown construction paper copy of the cone (see blacklines)

scraps of red and black construction paper

a pipe cleaner      glue

Red pompons from a craft store make adorable noses  
(if your budget allows)

Problem solve with the children how to roll  
their cut pattern into a cone and make it stay.  
Ask them to decorate it with a red nose, black

eyes and pipe cleaner antlers. Finish Rudolph  
by tying a yarn loop through the top so he can be  
taken home as a Christmas tree ornament.

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## Story Problems

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### You will need→

pictures of reindeer

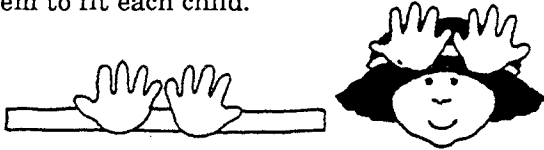
a map or a globe

a 2 X 24 strip of brown construction paper per child

two 8 X 8 pieces of brown construction paper per  
child (Have them trace around their hands and cut  
to make antlers.)

Teach the song Rudolph the Red-Nosed  
Reindeer. Bring in large pictures of reindeer  
if you can locate some. Point out where  
Lapland is on a map or globe. Discuss the  
Laplanders who care for the reindeer and how  
the reindeer help the people.

Make reindeer antler headbands from brown  
construction paper. Have parents help staple  
them to fit each child.



Over the next few days, have the children join  
you in telling and acting out some story  
problems. It is often helpful to tell the stories  
once and then ask the children to brainstorm  
the acting. (See Chapter 14 for Story Problems  
in script form for acting and creating a Big  
Book.) Here are some possibilities upon which  
to expand:

Once there were four reindeer getting ready  
to pull Santa's sleigh. As they began to pull,  
they realized the sleigh was too heavy. Four  
more reindeer came to help. How many  
reindeer were ready to pull the sleigh?

Five of Santa's reindeer were at the North  
Pole getting ready for the big Christmas  
season; Comet, Cupid, Donner and Blitzen  
joined them. How many reindeer were  
preparing for Christmas?

Santa took six reindeer for a practice flight.  
Two of them became a bit dizzy and had to  
stop off for hay. How many could still  
practice flying?

It was after Christmas and all eight of the  
reindeer were preparing for a long winter's  
nap. Mrs. Claus took them extra hay and  
some carrots. After they had eaten, four went  
to the stable to sleep. How many reindeer are  
still awake?

Santa wanted to give each of his reindeer  
three lumps of sugar. How many lumps did  
he need?

Santa had eight reindeer and twenty-six  
carrots. How many carrots did each of his  
reindeer get for breakfast that morning?

Ask the children to help make up some story  
problems to act out. If your children have  
enjoyed this activity, work together in small  
groups to prepare some Big Books of each story  
as in Chapter 14.

## Chapter 5: January

# CHANGES, CHANGES

## Nothing Stays The Same

### BEGINNING CHANGES

**You will need→** 5 or 6 items to observe in your classroom over a month's time (see suggestions below)  
prepared changes chart (see below)











Bring in a collection of things that will change over a month's time and a few that won't. Some possibilities:



- a carrot
- a piece of celery
- a jar of water (no lid)
- a nail in water
- a small plant
- a piece of cheese in a tightly-sealed container
- a unifix cube
- a pencil

It's best to limit your selection to 5 or 6 items—more at first gets unwieldy.

Tell the children you're going to leave the items in the classroom for a month. Will the items change in any way? How? Appearance? Length? Height? Weight? Discuss. Make a chart to record the class's observations week by week:

CHANGES CHART					
Item	How do we think it will change?	Week 1	Week 2	Week 3	Week 4
 weight = 6 tiles	• get rotten • get squishy • bend • change color	 It's bendy. 10" Parts of it are brown. weight = 5 tiles			
 weight = 31 tiles	• water will go down in jar • water will dry up, evaporate	 Water is going down. weight = 21 tiles			
 weight = 20 tiles	• cheese will get moldy, stinky, rotten, change color.	 cheese looks wet, greasy— 4" jar has 20" of water on it. weight = 20			
 weight = 2 tiles	• no changes • might get broken	 no changes weight = 2 tiles			
 weight = 13 tiles	• plant will grow if we water it and put it near window.	 plant is getting taller! weight = 19 tiles			

## MEASURING CHANGES

change items      balance scale      ruler

small metal washers or 1" ceramic tiles


Do a careful drawing of each item every week. Color carefully so you can reflect color changes. Measure items in inches or centimeters. Weigh them on the balance scale with metal washers or tiles for really heavy

objects. Children will want to help with these tasks. In fact, if you leave the items on a table with ruler and balance scale, many children will want to check them daily during free time.

## INDIVIDUAL OBSERVATIONS

**You will need→**      notes to go home with children  
teacher-prepared observation sheets

Have the children each bring in one item that they think will change. Be sure to include instructions for packaging items in your note home. Items that will mold or rot in any way should come to school in tightly sealed containers. (No potatoes, too smelly!) Children will leave their items on the 'Changes' table for a month. Have them each keep a record sheet on their item to include a careful drawing, plus length and weight measurements each week.

Item I brought:  Length: <u>11</u> inches Weight: <u>10</u> tiles	Here's what I think will happen to it: It wil git binde. It mit git smolr. It mit git roth or brown.	Week 1 Length: _____ inches Weight: _____ tiles
Week 2 Length: _____ inches Weight: _____ tiles	Week 3 Length: _____ inches Weight: _____ tiles	Week 4 Length: _____ inches Weight: _____ tiles

## GRAPHING CHANGES

**You will need→**      items the children have brought  
graphing mat (Materials Index)

If children have brought items in, you'll have lots of things to use in these graphs.

1. Which items have gotten moldy; which have not?

Why have some things gotten moldy and other things not? What's common to the things that are getting moldy? What do you think mold needs to grow? What is mold?

Record the children's speculations or have them write them down. Try to gather books,

films, filmstrips, etc., that would help children answer their questions.

2. Graph items or pictures of the items by the type of change that's taking place (possibilities include molding, dissolving, evaporating, rusting, not changing).

Why are some things changing and others not? Can you think of other things that would mold? Rust? Grow?

## STORY PROBLEMS

**You will need→** changes chart or the observation sheets children are keeping on their own items

This unit really lends itself to comparative story problems:

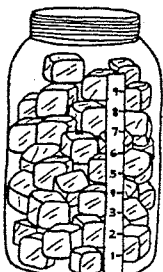
Our carrot was 11 inches long and now it's only 9 inches long. How many inches has it changed? Can we figure out a way to show that in a number sentence?

Our apple weighed 23 washers. Now it weighs 14. How much weight has it lost?

Children could look at the chart or at their own observation records to create comparison word problems. It will involve some problem solving on the part of first and second graders to come up with ways to record their problems with full number sentences.

## ICE CUBE MELT MEASURING

**You will need→** a quart jar with a screw-on lid



1-2 trays of ice cubes

ruler or unifix cubes

masking tape      tiles

pan balance or a pair of milk box scales (Materials Index)

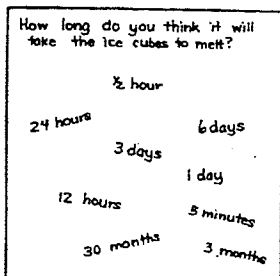
Fill a quart jar nearly to the top with ice cubes and screw on the lid. Ask the children what will happen. They'll all tell you the cubes will melt, but their estimates of how long it'll take may range from one day to thirty months! Run a strip of masking tape up the side of the jar and have a child help you mark the height of the cubes in the jar. Measure the height in unifix cubes, inches, or centimeters.

Ask the children to predict what the height of the water will be once the cubes have melted. Many are convinced that the water level will be lower because there are spaces between the

ice cubes but some are equally convinced that there will be no change.

Weigh the jar and ice cubes with tiles in a pan balance. Have them predict whether the weight will change. Some figure that because the water level will go down, the weight of the jar and water should decrease too.

After the ice has melted (it'll take about nine hours, so you'll have to do this the next day), measure the height of the water in the jar. It will go down substantially if you've used regular-sized ice cubes. Weigh the jar and water with tiles again. This experiment leads to some very interesting discussions.





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## I'm Growing and Changing

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*Children love to think about how they're changing, too. Brainstorm the ways in which they have changed since they were born. It's fun to have them bring in baby pictures and meet in small groups to discuss how they've changed (gotten thinner, more hair, bigger hands, longer fingers, longer legs, more teeth, etc.). They also enjoy bringing in articles of clothing they wore when they were little (clothing they wore any time before they were 5). Have them take turns demonstrating what happens when they try to put the clothes on.*



### MEASURING

#### **You will need→**

masking tape

picture of a newborn infant

unifix cubes

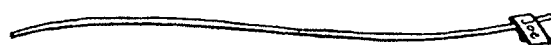
adding machine tape

measuring record sheets (see illustration below)

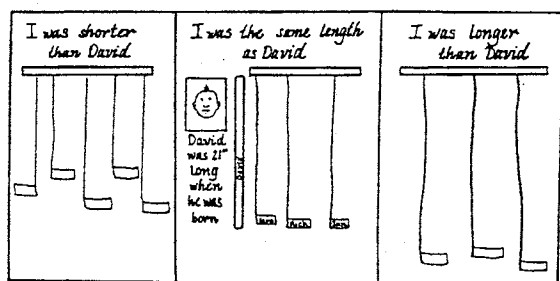
You need to find a picture of a newborn infant. Measure, obtain, or invent his or her length at birth. "Introduce" your class to this infant. Tell them the length/height of the child. Measure and cut a piece of adding machine tape to *show* how long the baby is. Tape it to the wall.

**Homework:** Ask your children to find out how long they were at birth. Have them cut a string that

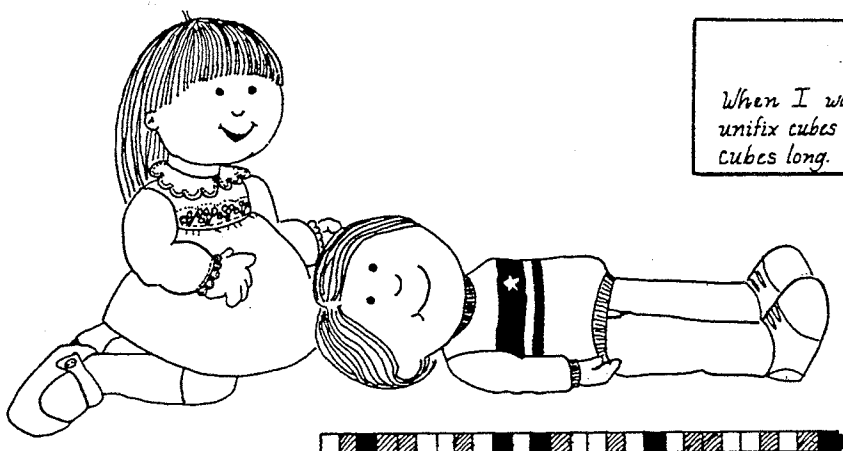
length (with Mom or Dad's help) and bring it to school the next day, marked with their name.



Have them compare their string to the adding machine tape you posted that showed the birth-length of 'Baby A', and add it to a graph. (Children's strings hang on masking tape set up with sticky side out.)



Have each child work with a partner to measure their baby strings in unifix cubes and their current heights in unifix cubes. They would each complete a record sheet.



name _____
When I was a baby, I was _____
unifix cubes long. Now I am _____ unifix
cubes long.

Children could use these record sheets to create word problems for a class Big Book. Here are some possibilities:

Kathy was 25 unifix cubes long when she was a baby. Now she's 62 cubes long. How much has she grown?

Mike was 23 unifix cubes long when he was a baby. Robby was 26 cubes. How much longer was Robby?

Kara is 65 cubes tall. Katie is 64. How many cubes would it take to measure both of them?

## MORE MEASURING—A VISIT FROM A REAL BABY

**You will need→** a real live baby, under the age of 8 months  
 string unifix cubes  
 measuring booklet (see blacklines)

If you can get someone to bring in a young baby for a half hour or so, your children will be fascinated. They enjoy hearing about the baby's routines and will have many questions to ask. Before the baby leaves, measure its length, the length of its foot, and the circumference of its head in unifix cubes. Ask the parent for its current weight. Enter this information on a chart.

After the baby leaves, your children can use the information on the chart to help them make a booklet comparing their own dimensions to those of the baby.

<p>baby's length _____ unifix cubes.</p>	<p>length of baby's foot _____ unifix cubes.</p>
<p>Circumference of baby's head _____ unifix cubes.</p>	<p>Baby's weight _____ pounds.</p>

## TIME/DURATION

**You will need→** chart paper

If you've done some talking about babies and growing up, it's fun to point out that while it takes a long, long time for such changes to happen, there are other personal changes that can happen very quickly. Challenge your group to brainstorm a list of at least ten ways they could change overnight.

*How could you  
change overnight?*

- get a haircut
- get a perm
- break my leg
- get a scrape
- take a bath
- change my clothes
- 
- 

## GRAPHING—LOST TEETH

**You will need→** all the Tooth Beary bags you've used so far this year  
vis-a-vis pen 3 X 5 index cards  
general math materials—unifix cubes, tiles, wooden cubes, pattern blocks

You may have been keeping a record of lost teeth in your classroom since September (see Tooth Beary, in the Calendar, Part III). If you have, this is a good time to look at what's happened so far. Lay the Tooth Beary bags down in the middle of the circle or post them where everyone can see them clearly. Total the number of teeth lost each month and record with a vis-a-vis pen right on the bears' bags.

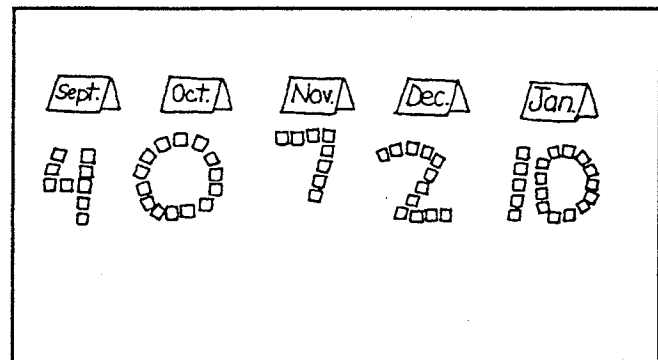
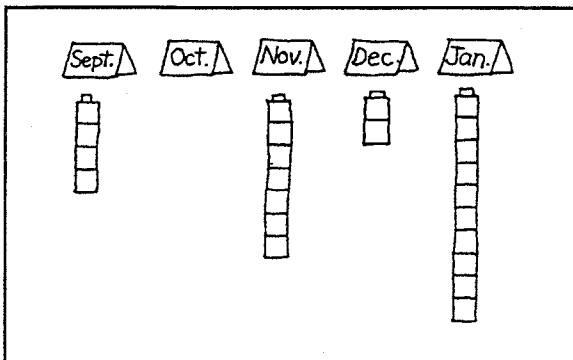


Discuss: In which month were the most teeth lost? The fewest? Were any months the same?

Were there any months in which no teeth were lost? What other information do the Tooth Beary's bags give you?

Extend the activity by challenging the children to represent the information in a different form. Tell children they will be working in small groups. Think about whether twos, threes, or fours will work out best. Give each team a set of month markers (3 X 5 index cards folded in half work fine). Assign teams to classroom areas where unifix cubes, wooden cubes, pattern blocks, tiles, junk boxes, or other manipulatives have been set out, and ask them to re-create the information shown on the bear's bags.












Below are two responses we've seen from first graders. Be open to other solutions too.



## THE TOOTH FAIRY GRAPH

**You will need→** a prepared graph  
student-made graphing markers

Do you believe in the tooth fairy? Have your children each draw a picture of the tooth fairy, cut it out, and paste it on a picture graph. Discuss.

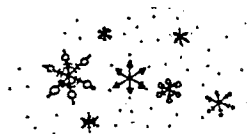
Do You Believe In The Tooth Fairy?	
Yes	      
No	   

## More January Activities

### Graphing

#### WINTER GRAPHS

**You will need→** prepared graphs  
graphing markers



Do you think we will have snow in January?  
Cut a snowflake for yes and a sun for no.  
Graph.

How do you like your hot chocolate? Plain, with marshmallows, with whipped cream?



Do you wear gloves/mittens to keep your hands warm?

### Extended Number Patterns

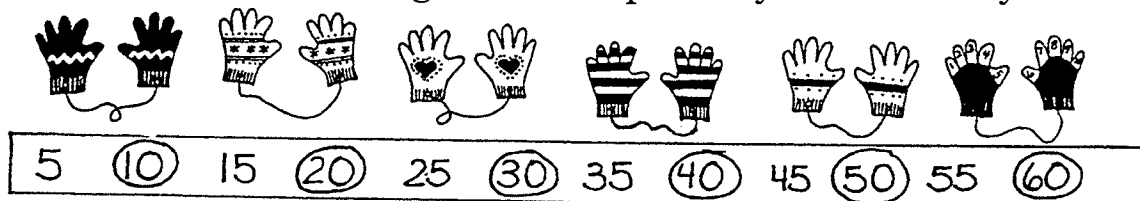
#### GLOVES

**You will need→** a piece of 6 X 12 construction paper for each child in your room

adding machine tape

yarn

crayons



Have each child trace around his/her hands on bright construction paper to create a pair of gloves. Use crayons to make them bright and beautiful. Punch a hole at the bottom of each

and tie yarn from one to the other to connect them. Post pairs of gloves along the wall with adding machine tape below to record fives and tens patterns.

## SNOWPEOPLE

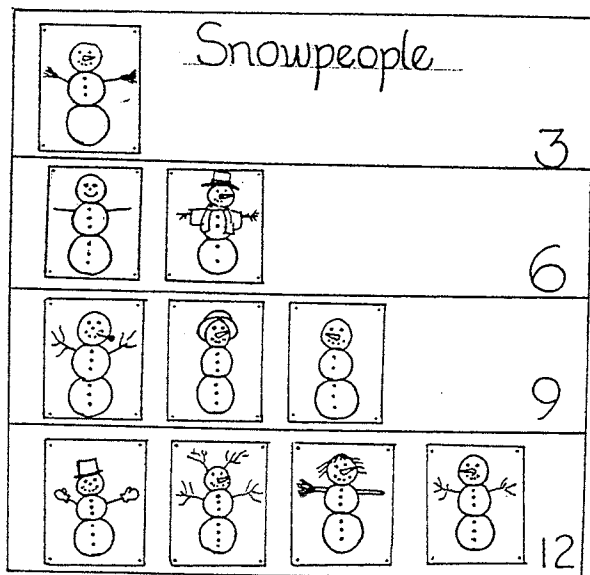
**You will need→**

art materials to create snowpeople

butcher paper for chart

large class hundreds matrix

dittoed copies of small hundreds matrix (see blacklines)



Have each child cut and paste, paint, sponge paint, collage, or draw a snowperson. The only rule is they have to use 3 circles (your standard snowman).

Paste them on a chart in rows (see illustration).

With second graders generate multiplication sentences for each row ( $1 \times 3 = 3$ ;  $2 \times 3 = 6$ ;...). Be sure to use appropriate language when you read them. "One times three equals three" is quite abstract. Rather say something like, "One snowman has three circles. Two snowmen, with three circles each, makes six circles. Three snowmen, with three circles each, makes nine circles."

Don't forget the matrix extensions. Circle this pattern on the big class matrix and then encourage children to try their own work with a printed matrix to circle the threes patterns and a blank matrix to write the numbers in the threes pattern (tricky!). (See Extended Number Patterns in Chapter 11 for a detailed description of this lesson.)

## Chapter 6: February

# HUGS AND KISSES

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## Sorting

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### CANDY HEARTS MYSTERY SORTING

**You will need→** a small box of candy conversation hearts



It is fun to start this mystery sort with a small package of conversation hearts hidden in your pocket or in a larger box. Have the children begin asking yes and no questions to determine what is in your pocket. It is very

challenging to them (and improves their questioning immensely) if you make this into a reverse hangman game. Draw a figure on the board and *erase* a part for each question asked—even when the answer is “yes”.

Stop every few minutes and list the things they know so far about what is in the teacher’s pocket. You’ll be thrilled with the amount of learning that happens in this activity. If your children don’t figure out what you have before the figure is gone, promise to bring it back tomorrow and start again. They won’t like this a bit but they will ask much better questions in future mystery sorts. They also talk about it at home and build wonderful math P.R. for your classroom. (See Chapter 10, Mystery Box Sorting, for additional details.)

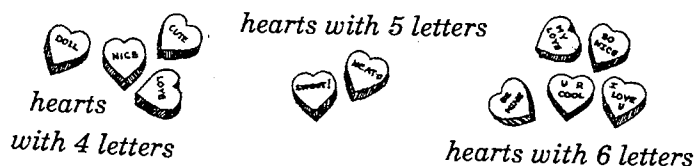
### SORTING THE CANDY HEARTS

**You will need→** one small box of candy conversation hearts for every four children in your class

By now, the children should have had enough experience with sorting to handle it well independently. Be sure, though, to model this activity with a small group before you send them out in small groups to work. (See Chapter 10, Collections Sorting, for more details.)

Give each group a small package of candy conversation hearts. Have them sort the hearts in as many ways as possible. Some possibilities would be—color, number of words on each heart, hearts that contain the word ‘love’ and those that don’t, broken and whole, etc. This takes some real cooperation and

problem solving. Each time a group sorts the hearts, have them raise their hands. When you see their hands up, have them tell you how they sorted. Some teachers like to leave a unifix cube with groups each time they find another way to sort. They are very careful, however, not to compare the number of cubes between tables, but rather to collect all the cubes at the end and count the ways the class found to sort the hearts.



After the sorting is over, ask children to figure out how to equally share the hearts with all their group members.

## VALENTINE SORTING

**You will need→** a valentine for each child

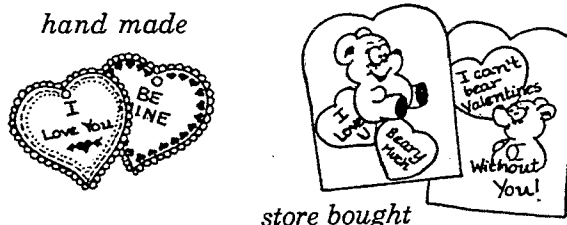
Ask each child to bring a valentine to school after the Big Day. First, read and enjoy the cards together. Brainstorm ways these cards

could be sorted. (See Collection Sorting, Chapter 10.)

## VALENTINE SORTING HOMEWORK

**You will need→** a teacher-prepared assignment sheet to send home with each child

Challenge children to sort the valentines they received in as many ways as possible. Have them record the ways they found to sort. Possibilities include: valentines received from boys/from girls; valentines with/without animal pictures; store bought/homemade valentines; valentines that were signed/unsigned.




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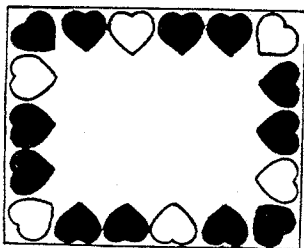
## Patterning

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### VALENTINE PLACEMATS

**You will need→** hearts cut from 2" squares of construction paper in 2 or 3 colors

12 X 18 white construction paper or butcher paper to fit your tables if you're making tablecloths



Give your children many hearts in two or three colors of construction paper to lay out as a border pattern for their placemats (12 X 18 construction paper) or tablecloths. Encourage them to look around at one another's patterns and try to be unique. This is a very challenging task but the outcome is usually fantastic!

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# Graphing

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## VALENTINE GRAPHS

**You will need→** graphing mat (Materials Index) or paper charts  
graphing markers prepared by students or teacher

Did you have more fun giving or receiving valentines?

Do you like to get valentines from secret admirers?

Which valentine book was your favorite?

(See Chapter 10, Graphing, for instructions, questions and extensions.)

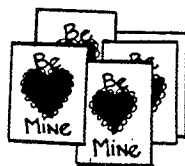
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## Place Value Counting

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### HOW MANY VALENTINES DID WE BRING?

**You will need→** the valentines each child has brought for the class on Valentine's Day  
unifix cubes



On the morning of the Big Day, have each student arrange the unopened valentines they brought to share with the other children by tens and ones on their desktop. When everyone is ready, have your group look around the room at all the valentines and estimate how many there are in the whole room. (Don't forget to set out the valentines you brought to share too!) Record their estimates.

Spend a couple minutes focusing on their estimates with questions:

**Teacher:** Let's look at our estimates. Which one is smallest?

**Children:** 174.

**Teacher:** Largest?

**Children:** 1,000.

**Teacher:** That's quite a range! What's the difference between 174 and 1000?

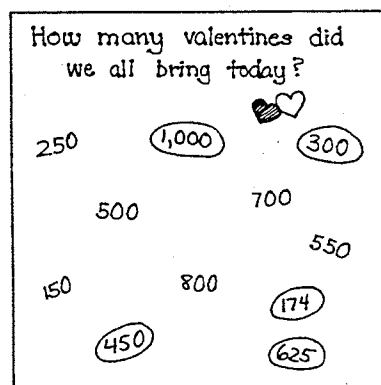
**Children:** Around 800! Lots! Almost 900!

**Teacher:** Which number has 4 hundreds, 5 tens, and 0 ones?

**Children:** 450.

**Teacher:** I see two numbers that are 325 apart. What are they?

**Children:** 300 and 625.



After another few questions, have each child report the number of valentines he or she brought. Record on a chart.



Nalaika	25
David	25
Shane	24
Robbie	26
George	25
Susan	24

Once everyone's number has been recorded, work with your class to figure out how to get the total. One possibility might be to have each

child count out and stack, by tens and ones, unifix cubes to represent the number of valentines they brought. Bring all the tens and ones to the front of the room and regroup into hundreds, tens and ones. There are other ways to determine the total. Be sure to acknowledge all the ideas your class may generate. This is a great chance to use your classroom set of calculators.

When you've gotten the total, estimate the number of valentines in the entire school, based on the number in your room.

# THE HUNDREDTH DAY OF SCHOOL

*If you have been doing the Numberline Strip on your calendar, your class will be anticipating the hundredth day with real excitement. If not, celebrate it anyway! This celebration could easily last a week.*

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## Place Value Counting

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### COLLECTIONS OF 100

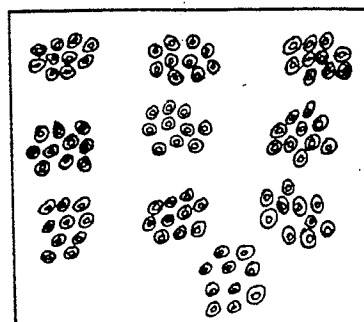
**You will need→** collections of 100 items, brought from home by each child

12 X 18 construction paper

Ask each child to plan ahead for a collection of 100 items he or she could bring for the hundredth day celebration. It's a good idea to brainstorm a list of possibilities so children don't go home and demand their parents buy them something major. Here are some possibilities: pennies, Cheerios, shells, leaves, buttons, raisins, baseball cards, magazine pictures.

When the hundredth day arrives, every child brings his or her collection to school—the excitement is wonderful! Give out large pieces of paper for each collection and have the

children lay out their items in groups of ten. If possible, invite another class and then go around carefully to each area and thoroughly inspect the hundreds. It is very impressive.



## SNACKS OF 100

**You will need→** a small cup of Cheerios for every two children in your classroom



Cheerios are fun for this because they look like little zeroes. Have your children work in pairs to count out 100 Cheerios and figure out how to

share them equally. After the children have finished eating, discuss the ways in which they decided to share.

## SNACKS OF 100, DIVIDED FOUR WAYS

**You will need→** 100 M&M's for every 4 children in your class (the small bags each contain about 57)

Give each group of four children 100 M&M's. Ask them to divide the treats equally. It's very interesting to note, and later discuss, the different strategies groups use to solve this

problem. Second grade teachers report that this takes awhile but children really get the idea that 100 divided by 4 equals 25!

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## Geometry

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### HUNDREDS DESIGNS AND STRUCTURES

**You will need→** tubs of general materials—unifix cubes, pattern blocks, wooden cubes, tiles  
a clock or timer

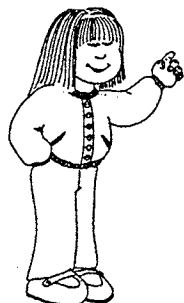
Assign small teams of children to set out tubs of general materials such as unifix cubes, pattern blocks, wooden cubes, tiles, etc. Get youngsters to help count out piles of one hundred. Determine how many piles you have and figure out how to divide children so all will have a pile of

100 to share. Set a timer for ten minutes and ask teams to create wonderful designs or structures using all hundred pieces in the given time. Display the results.

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## Time

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### DURATION

**You will need→** a watch or clock with a second hand

Tell the class you're going to ask them to stand for as much time as they think 100 seconds is. Have them think about ways they might know other

than watching a clock. Tell them that when you give them a "go" signal they should stand with

their eyes closed. Ask them to sit down quietly when they think the one hundred seconds have passed. Promise them you will ring a quiet bell when the time is really over so they will all know. (You won't believe how long 100 seconds take.)

## HISTORY

**You will need→** blank chart paper

Brainstorm with your class a list of things that were not in existence 100 years ago. If the

children are doing well on this, challenge them to come up with 100 things.

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## Measuring

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### WEIGHT

**You will need→** children's collections of 100  
balance scales or milk box scales (Materials Index)  
1" ceramic tiles



Talk again about the collections of 100. Does the class think there is any collection that might weigh about 100 tiles? Get out the balance scale and try out their guesses with 100 tiles in one pan and different collections in the other. Children also enjoy comparing the weight of one collection against another. Which is heavier—100 marbles or 100 pennies? This is a good activity for children to enjoy in their free time.

### LENGTH

**You will need→** string  
meter sticks or metric tape measures

Have each child cut a piece of string 100 centimeters long and use it to find things around the room that are shorter than, longer than, or the same length as 100 centimeters. Ask them to chart their findings.

<i>What's shorter than 100 cm?</i>	<i>What's exactly 100 cm?</i>	<i>What's longer than 100 cm?</i>
<ul style="list-style-type: none"><li>• pencil</li><li>• desk</li><li>• book</li><li>• 30 unifix cubes stacked together</li></ul>	<ul style="list-style-type: none"><li>• end of my table</li><li>• bookshelf</li></ul>	<ul style="list-style-type: none"><li>• across the rug</li><li>• Angie</li><li>• Fletcher</li></ul>

### DISTANCE

**You will need→** 100 2 X 12 strips of construction paper

Cut strips of construction paper into one foot lengths. Go outside and estimate how far down the playground one hundred feet will stretch. Brainstorm ways to make good guesses. (If it is

a windy day, bring along some masking tape.) Get the children to lay out their strips until 100 are end to end.

Look at a classroom wall map or a state map and try to figure out places that are 100 miles away. If other classes are celebrating 100, try

having 100 children hold hands in a line. See if they can join hands in a 100-child friendship circle. *Celebrate mathematics!*

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## Graphing

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### HOW MANY WORDS?

**You will need→** books graphing chart  
graphing markers prepared by teacher or children

Open any book to page 100. Does this page have less than 100 words, exactly 100 words, or more

than 100 words? Have the class make a graph of their findings.

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## Story Problems

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### HUNDREDS OF PENNIES, HUNDREDS OF DOLLARS

**You will need→** a few real items from the store that cost less than \$1  
catalogues coin stamps  
real coins—quarters, dimes, nickels and pennies

Brainstorm with your class things you could buy for less than a dollar—it would be helpful if you brought in a few sample items with prices still on so they could see. (With second graders, you might want to consider extending this to catalogue items for under \$100.)

Suggest some story problems using the items you brought. Develop some strategies to solve these story problems. Be sure to have coin stamps and real coins available. Remember, our task isn't so much to always find the perfect answer as it is to develop strategies for approaching new problems in our lives. Understanding mathematics is our goal!

#### Some possibilities:

Nancy bought a tiny package of cheese and crackers for \$.29, a small can of juice for \$.29 and a package of baseball cards for \$.40. The tax was \$.02. How much did Nancy spend and how can we prove it?

Gary earned \$1.00 pulling weeds. He went to the corner ice cream store and bought himself a double decker chocolate ice cream cone for \$.85. How much change should he get? How can we check our answer to be sure?

Kelly bought four packs of gum which were priced 4/\$1.00. How much did each pack cost? How can we set it up to be sure?

Karen's teenage brother earns \$5.00 an hour at his job. How many hours will he need to work before he can earn \$100?

Have your children work alone and together to make up some problems to fit this theme. You might want to put them into a Big Book. (See September Seasonal Math, Money.)

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## Homework

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**You will need→** teacher-prepared assignment sheets

1. Work with your family to begin learning how to count your change if you pay for items that cost less than a dollar with a dollar bill.
2. Try to earn \$1.00 so you can go shopping.

# MAPS

*February starts off with a bang but what's left after the Hundredth Day of School? Maps! This unit includes lots of work in reading and making maps, coordinate geometry and spatial problem solving.*

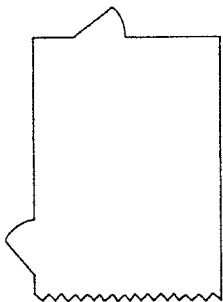
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## Geometry

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### ROOM MAPS

**You will need→**



one piece of 12 X 18 white construction paper for every two children in your room. (Each sheet should have a predrawn outline of your classroom on it.)

precut construction paper rectangles, squares, circles or trapezoids to represent desks/tables in your room. (cut these to a fairly accurate scale)

crayons, felt markers, construction paper scraps

glue or paste

Tell your children they will create maps of your classroom. They will work in partners using the predrawn outlines and precut shapes and then add other details.

Before the children begin their work, model how you figured out what the room outline on their papers should be. Look carefully at the placement of tables and desks in the classroom.

Ask them to pretend they are a spider on the ceiling taking an aerial view of the classroom. How does it look from above? How far are the tables from the outside walls? Show them how

you would locate the table shapes on a room map and ask them if that seems about right from their spider view.

Ask the children to look around and figure out what needs to be in the map besides the tables. They will suggest bookshelves, toy shelves, etc. Ask them to look carefully at the sizes of those items compared to the tables. Are they larger or smaller? Cut shapes from the construction paper scraps to represent the other furniture in the room.

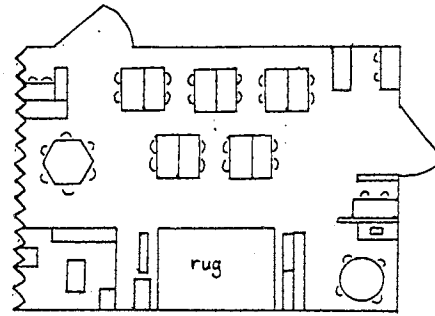
Ask the children to pretend once again they are spiders on the ceiling and ask what else they

can see in the room that could be in the map. They may suggest area rugs, mats for wiping feet, etc. Again, compare sizes to the other things that have been added to the maps and either cut these shapes from construction paper or draw them in with crayons or marking pens.

This is a very challenging project, but children rise to the occasion with enthusiasm. The most difficult thing for them to realize is they can't show bulletin boards as flat pieces and that things like room dividers and pocket charts must be represented by very skinny rectangles because they're being seen from a spider-on-the-ceiling viewpoint, that is, from the top down.

Be sure to put your own map completely out of sight before you ask the children to begin work so they are not copying your work, but instead,

really examining the room and deciding for themselves about size relationships, etc.



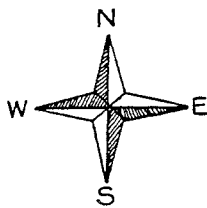
If you allow children to work through these dilemmas and you don't expect total accuracy, you'll see lots of creative thinking and spatial problem solving. You'll want to allow at least two forty-minute work periods for the children to work in partners creating their own room maps.

## DIRECTIONS ON CITY AND STATE MAPS

**You will need→** a collection of maps, city and state (children can bring maps from home)

a small car (Matchbox or Hot Wheels type) for every child in class (ask each child to bring one or two from home)

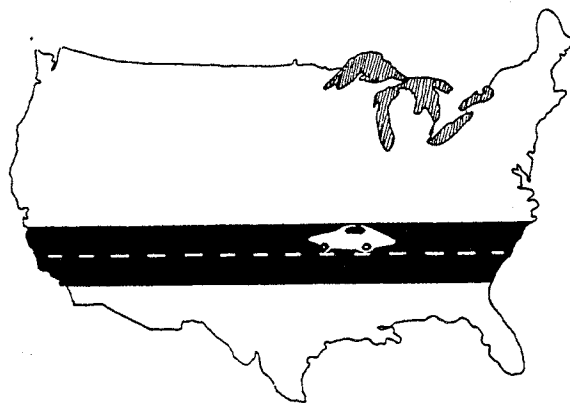
Ask children to examine a map with a partner. Give them several minutes to unfold their maps and just look at them. Have them tell you anything they can about their maps. You'll get many observations and maybe a few questions. Be sure you are circulating while they're working. It is such a good way of telling them you care that each class member is busy and learning.



If no one mentions it, point out the directional compass and ask children to find it on their maps. Be sure each group has located it. Ask if anyone knows what it is for. Yes? Great! No? Explain it.

Help them see that north is toward the top of their map, south towards the bottom, west to the left and east to the right.

Hand out little matchbox cars and ask the children to locate a road or highway that will take them north, east, west, or south from a starting point. Have them "drive" their silent cars along roads taking them in different directions.



## DIRECTIONS IN THE CLASSROOM

**You will need→** 4 pieces 6 X 9 white construction paper

Maps are fairly abstract. To make things more real we have our children explore directions in our classrooms also.

Use 6 X 9 paper to post north, south, east and west directions in your classroom. Be sure those labels are easily seen from around the room.

Take a few minutes for a couple of days to have the children practice facing each direction as they stand at different places in the room.

**Teacher:** Face north and what do you see?

**Children:** The windows, your desk and the door to the playground.

**Teacher:** Face south. What do you see?

**Children:** Word charts, the invention table, and the folding wall.

**Teacher:** Turn to the chalkboard. What direction are you facing?

**Children:** West!

Have children walk north, south, east or west. Walk across the room and ask them to tell you which direction you are going.

## MYSTERY NUMBERS

**You will need→** a hundreds matrix (Materials Index)

small copies of the matrix (see blacklines) cut apart and stapled into four-page booklets

Children have worked with directions on maps and in your room. Bring things down to smaller size again by having them locate "mystery numbers" on a hundreds matrix.

**Teacher:** Boys and girls, you're getting to be experts at writing and following directions using north, south, east and west. Today, we're going to work together to find numbers on our hundreds grids. Let's all find 34 and circle it. We're going to travel with our pencils to a mystery number using these secret directions:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

**Teacher:** 2 N, 3 W, 5 S. (Record these on the board.) Any idea what these mean?

**Children:** Does 2 N mean go north 2 steps?

**Teacher:** Yep. If we were going to go north, which way would we move our pencil on the paper?

**Children:** Up!

**Teacher:** Before we go on, let's mark our grids with the direction letters so we don't accidentally go the wrong way.

**Children:** OK.

									N
	1	2	3	4	5	6	7	8	9
	11	12	13	14	15	16	17	18	19
	21	22	23	24	25	26	27	28	29
	31	32	33	34	35	36	37	38	39
	41	42	43	44	45	46	47	48	49
	51	52	53	54	55	56	57	58	59
	61	62	63	64	65	66	67	68	69
	71	72	73	74	75	76	77	78	79
	81	82	83	84	85	86	87	88	89
	91	92	93	94	95	96	97	98	99
									S
W									E

**Teacher:** Now. We're going to travel with our pencils two steps up. Right?

**Children:** Yeah. Two numbers up. We'll land on 14.

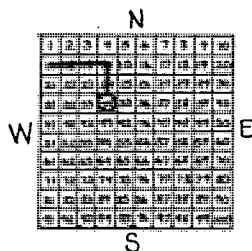
**Teacher:** Let's try it.

									N
	1	2	3	4	5	6	7	8	9
	11	12	13	14	15	16	17	18	19
	21	22	23	24	25	26	27	28	29
	31	32	33	34	35	36	37	38	39
	41	42	43	44	45	46	47	48	49
	51	52	53	54	55	56	57	58	59
	61	62	63	64	65	66	67	68	69
	71	72	73	74	75	76	77	78	79
	81	82	83	84	85	86	87	88	89
	91	92	93	94	95	96	97	98	99
									S
W									E

**Teacher:** 14. Yes. Now what do the secret directions tell us to do?

**Children:** Go 3 west—that will put us on 11.

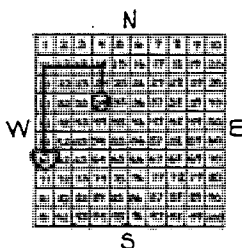
**Teacher:** Let's try it together. One, two, three steps to the west. OK, 11.



**Teacher:** Where will we end up? What's the mystery number?

**Children:** We have to go 5 south. The mystery number will be 61. Yeah! 61....

**Teacher:** Let's put a heart around 61. That's the mystery number.



Repeat this activity several times using directions such as:

[5] 9S 2E 3N

[1] 9E 9S 1W

[53] 2E 1S 2E 1S

Each time you write a new set of directions on the board, ask the children to predict the mystery number and then find it together. See blacklines for several sheets of mystery numbers the children can work independently. Children also enjoy writing codes for others to solve. Use the sheet of grids with blank direction boxes for this activity.

Be sure to tie all this direction work back to real maps by having children examine city and state maps again in partners. Can they find the directional compass? Can they locate north, south, east and west on their maps? Are there any special landmarks: oceans, rivers, lakes, parks, mountains, big cities to the north, to the south, east and west on their maps? Can they find roads that will take them from the center of their maps to these landmarks? Can they find roads that will take them from one landmark to another?

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## Coordinate Geometry

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*If children haven't yet noticed the letters and numbers around the perimeters of their maps and wondered about the indexes listing city or street locations, point them out. (You may want to draw the grid lines with a marking pen on a map so the children can really see what you are talking about.)*

*Explain that most maps are laid out and drawn in square sections. To find streets and cities on maps, people have to know how to read coordinate grids. You're going to help them learn how.*

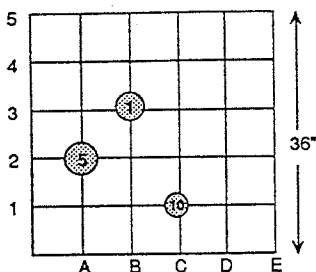
### CAPTURE THE MONEY

**You will need→** a large coordinate grid drawn out on 36 X 45 butcher paper

25 large paper coins, a random assortment of pennies nickels and dimes for first grade, add quarters for second grade



Seat your children in several semi-circular rows so they can all see the grid. Explain that this is a coordinate grid just like the ones on maps.



Place paper coins on several of the coordinate points. Tell children they will have a chance to capture coins for their team, but they'll have to be able to tell you exactly which coin they want by naming its coordinates on the grid.

**Teacher:** Watch my hand. (Run your hand vertically up and down a column.) We'll call these up and down lines columns.

**Teacher:** Watch my hand again (Run your hand horizontally across a row.) We'll call these lines rows, the lines that go from side to side.

**Teacher:** Which column is the dime in?

**Children:** The third column—the one that says C.

**Teacher:** Good. Which row is the dime in?

**Children:** The bottom one—the one that says 1.

**Teacher:** Super. To get that dime, your team would have to say C-1. People always name the letter first.

**Teacher:** What coordinates would you name to capture the nickel?

**Children:** Over to A, up to 2...A-2!

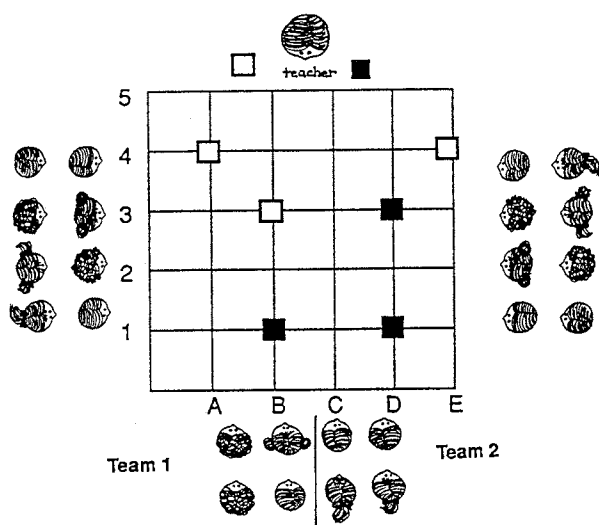
**Teacher:** Right! And the penny?

**Children:** B-3.

Cover all the coordinate points with coins. It doesn't matter which coin goes where. Quickly, ask the first two people sitting on Team 1 to name a coordinate. (We ask the rest of the team to be quiet while the partners work together until they agree on what to ask for. If the rest of the team isn't quiet, the team loses a turn. This builds in important "think" time.) Remove the coin from the coordinate they named and set it near their team. Ask the first two children from Team 2 to name a coordinate; remove the coin they request. Continue until all the coins have been removed. Help the children count the sums of money frequently. At the end of the game, the team with the larger sum of money wins the game. This game reviews money counting as well as teaching coordinate graphing.

## COORDINATE TIC TAC TOE

**You will need→** a large coordinate grid drawn on 36 X 45 butcher paper (If you made one for Capture the Money, it's perfect for this game.)



twelve 4 X 4 squares of red construction paper

twelve 4 X 4 squares of blue construction paper

Here's another game that will help your children learn to read coordinate grids. Seat the children around the rug. Divide them into two teams. Explain to the children that this time you'll place a colored marker on any coordinate they name. You'll use the blue markers for Team 1 and red markers for Team 2. The first team to place four in a row, horizontally, vertically or diagonally wins. Either team can block the other, of course.

Select two people at a time to work together to name a coordinate. (The rest of the group needs to stay quiet to provide “think” time or their team loses a turn.) If the partners get stuck, they can

ask anyone else on their team to help them. This game is so popular with children it can be repeated several times.

## COORDINATE DOT-TO-DOTS

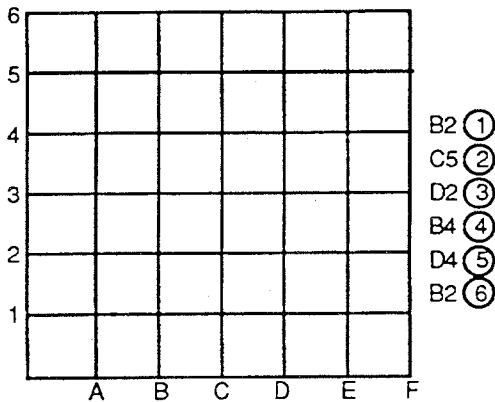
**You will need→** 3-4 sheets of easel paper with coordinate grids and instructions predrawn (see sketches below)

Coordinate Dot-to-Dot Worksheets (see blacklines)

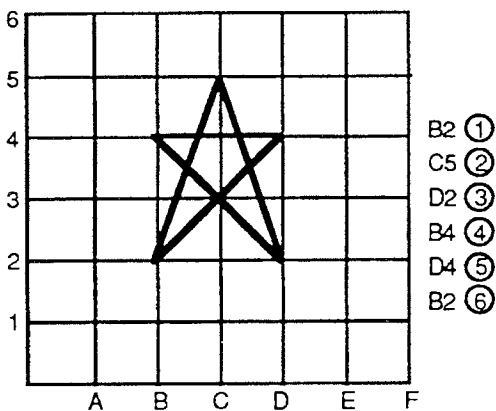
Blank Coordinate Dot-to-Dot Grid (see blacklines)

This game is another winner and can be repeated many times.

Have the children help you locate and number the coordinates on each sheet following the instructions, to create a dot-to-dot picture. This is very challenging but very fascinating to children. Here’s a sheet you’ll draw up.

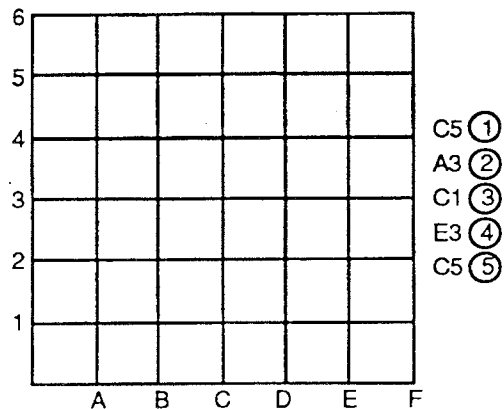


Here’s what it will look like after you’ve plotted the coordinates and connected the dots with the children’s help.



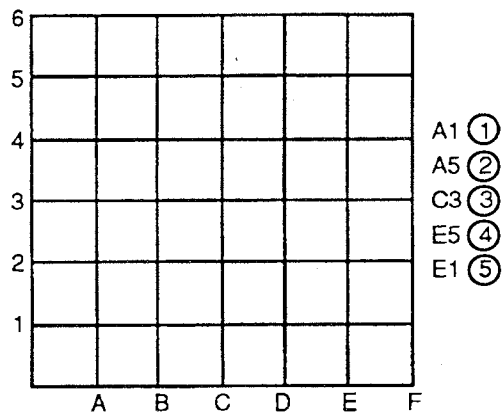
Sheet 2

This will make a diamond.



Sheet 3

This will make an M.

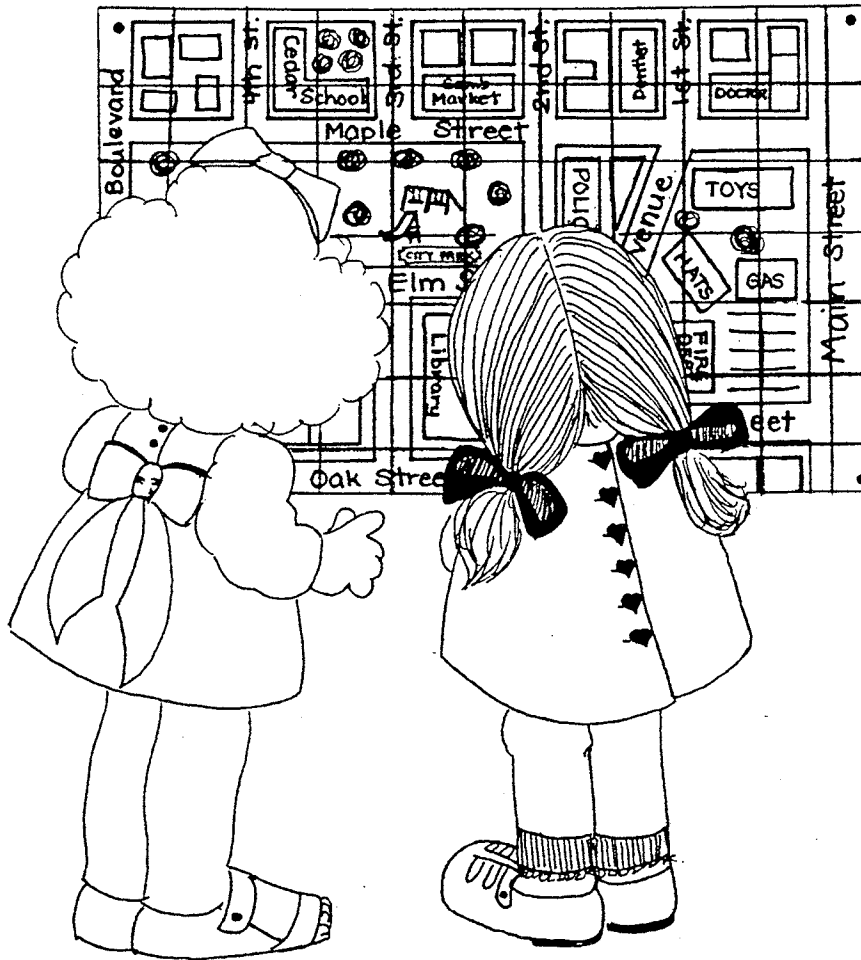


See the blacklines section for several sheets of coordinate dot-to-dot worksheets children can do independently following this whole group lesson. We’ve included a blank grid in the blacklines also. Frequently, very capable children like to invent their own dot-to-dot directions.

Return once again to city and state maps. We find it works best to hang one in an accessible display area in the room. Be sure to have a yardstick available to help children follow grid lines. Put up two or three challenge questions per day beside the map so interested children can try to find the solutions. Encourage children to keep their solutions a secret until the end of the day so there's adequate think time for all interested children.

Sample questions to hang beside the map:

1. What are the coordinates of Main Street and Fourth Street?
2. What is the nearest coordinate to our school?
3. What do you find at R-6?
4. Can you locate your street on the map? What are the nearest coordinates to where you live?



Chapter 7: March

# POTATOES

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## Sorting

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### MYSTERY BOX SORTING

**You will need→** a 10-pound sack of potatoes sealed in a box  
chart paper and a marking pen

Follow the procedure outlined in Chapter 10 for Mystery Box Sorting. If you've been playing this monthly, your children will be getting

better at asking questions and listening to one another.

### POTATO SORT

**You will need→** potatoes from the 10-pound sack  
a balance scale

Put all the potatoes in the middle of the circle. Have the children describe them. Do they see any differences? Brainstorm various ways to sort them. Some possibilities include: eyes, no eyes; dirty, clean; bumpy, smooth; size; weight

—use one potato as a reference and sort the others into two groups of lighter than and heavier than the “model” potato. (See Collection Sorting, Chapter 10 for more information on conducting this kind of lesson.)

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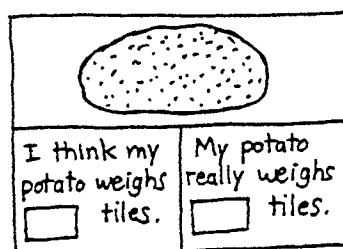
# Measuring

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## WEIGHING ONE POTATO

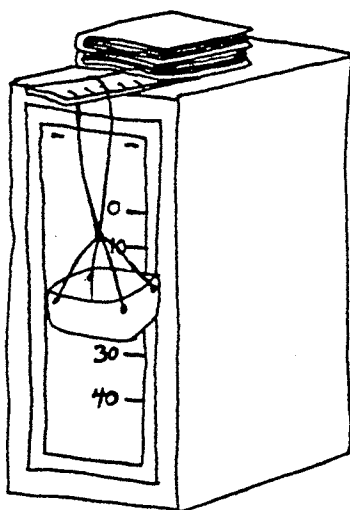
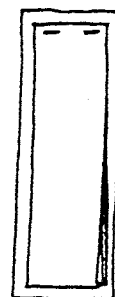
**You will need→** potatoes from the 10-pound sack  
several balance scales 1" ceramic tiles  
record sheets (prepare your own using the model below)

Have each child find the weight of a potato in tiles using a balance scale. (See the Teddy Bear weighing activities in Chapter 1 for more details if you haven't done this kind of activity before.)



## POTATOES ON THE CALIBRATED SCALE

**You will need→** several different kinds of potatoes (small red, giant baking potato, sweet potato, yam, small white)  
a milk box scale (Materials Index)  
1" ceramic tiles (seal up ten per bag—nine bags)  
a record sheet pad (staple fifteen sheets of 6 X 18 newsprint to an 8 X 20 piece of poster board)



Suspend the milk box scale from a ruler so it hangs in the front of a counter or off the end of a shelf over the record sheet pad.

Gather your class around the scale. Demonstrate how to calibrate a record sheet by making a line to indicate the level of the bottom of the scale. Put a bag of ten tiles into the scale and make another line at the base of the scale on your record sheet.

Continue in this manner until you have stretched the rubber band as far down as it will safely go—usually 90 tiles. Remove all the tiles.

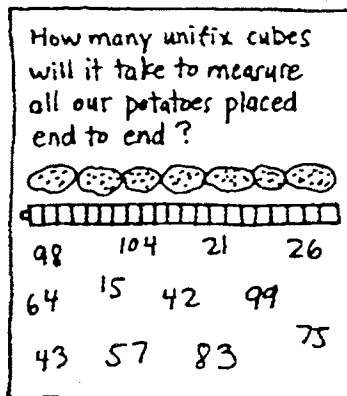
Place a potato in the scale. Mark the bottom of the scale again on your record sheet. Write down the name of the potato and how much it weighs. Continue in this manner until all the different potatoes have been weighed. Compare the weights. Arrange

the potatoes in order from the lightest to the heaviest. Discuss. Invite the children to bring other potatoes from home. Set the scale up at a back table so children can continue exploring this problem over the next few days.

## POTATO LENGTH

**You will need→** potatoes from the 10-pound bag  
unifix cubes  
chart paper, marking pens

How many unifix cubes would it take to measure the length of all the potatoes in the bag laid end to end? Record children's estimates on chart paper.



Have children work together to lay all the potatoes end to end and construct a unifix train of equivalent length. Before you count the cubes, ask the children if there are any estimates they'd like to eliminate.

**Teacher:** Jamey?

**Jamey:** I think we should cross out 26.

**Teacher:** Why?

**Jamey:** Because the train looks much longer than 26. I'm 68 cubes long and that train is longer than me. See?

**Teacher:** Class?

**Children:** Yes! Get rid of 26. Yeah! We should get rid of all the small numbers.

**Teacher:** Small numbers?

**Children:** Numbers less than 68. We can see that the train is much longer than Jamey and he's 68 cubes long.

**Teacher:** So...

**Children:** So cross out 26, 15, 21, 42, and 57.

**Teacher:** OK.

After you've crossed out all the numbers that no longer seem reasonable to the group, have them work together to break the train into tens. Gather the tens and ones in the center of the circle and count them together.

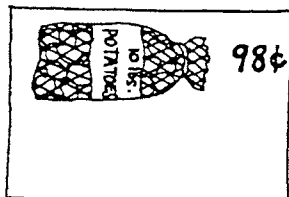
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## Money

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### HOW MUCH FOR A BAG OF POTATOES?

**You will need→** the price of a 10-pound bag of potatoes  
pennies, nickels, dimes and quarters

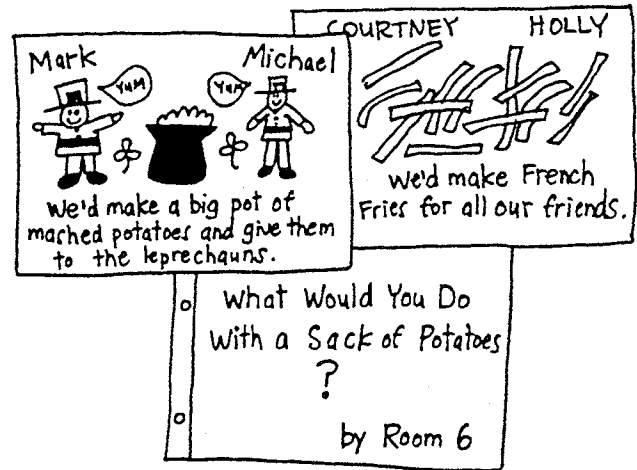
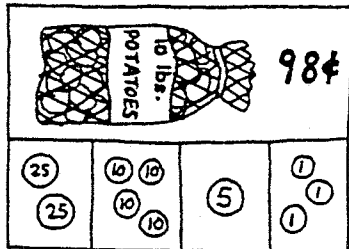


coin stamps—penny, nickel, dime and quarter—and stamp pad

12" X 18" construction paper

Draw a sack of potatoes along with its price on a piece of 12 X 18 construction paper.

Taking children's suggestions, lay out appropriate coins to determine how the sack of potatoes could be purchased. After various coin combinations have been explored, use coin stamps to record the price on the page.



Have children work in partners to prepare Big Book pages stating and illustrating what they think the class should do with all those potatoes.

## HOW MUCH FOR ONE POTATO?

**You will need→** a 10-pound sack of potatoes  
pennies, nickels, dimes and quarters

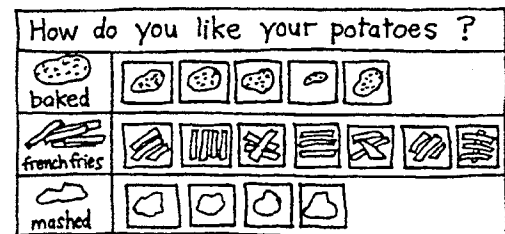
Have second graders calculate the price of a single potato based on the price of a sack.  
Figuring out how to do such a thing involves major problem solving.

## Graphing

### HOW DO YOU LIKE YOUR POTATOES?




**You will need→** a paper graph (see illustration)  
3 X 3 squares of white construction paper

Have the children make graph markers using the small squares of construction paper. See Chapter 10 for graphing questions and extensions.



### WHAT'S YOUR FAVORITE KIND OF POTATO CHIP?

**You will need→** a paper graph (see illustration)  
4 X 4 squares of yellow construction paper for children to cut as graph markers

What is <u>your</u> favorite kind of chip?		
		
regular	ruffled	barbecue

Pose the question to your class: Do you like ruffled, regular, or barbecued potato chips best? Have children cut markers to graph their responses—a flat yellow chip shape for regular, a flat yellow chip shape dotted with orange for barbecue, and a yellow chip shape accordion folded for ruffled.

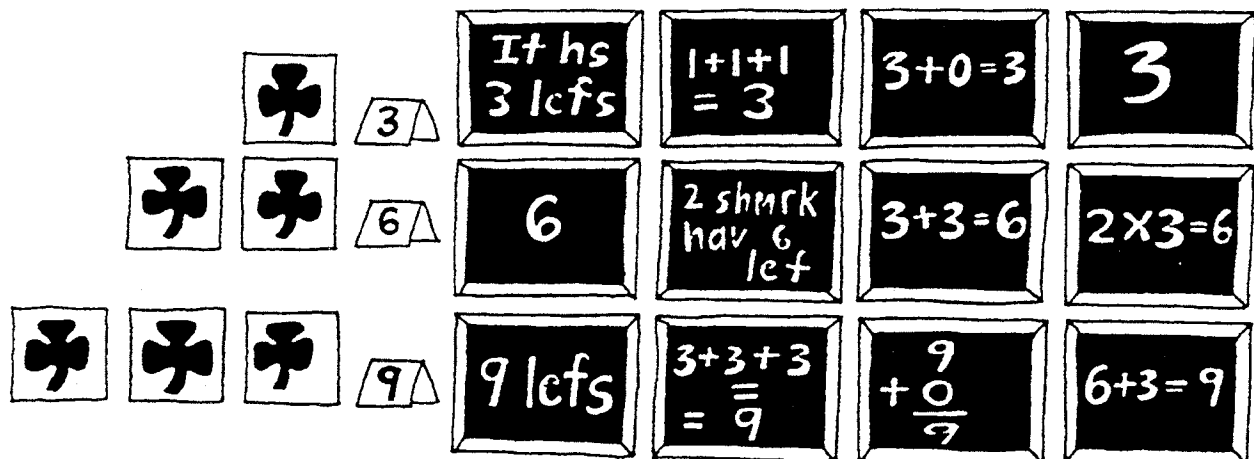
See Chapter 10 for graphing questions and extensions.

# SHAMROCKS

## Extended Number Patterns

### SHAMROCK LEAVES COME IN THREES

**You will need→** a real shamrock  
art materials for each child to make a shamrock  
individual chalkboards, chalk and erasers  
stand-up number cards (index cards folded in half)  
hundreds matrix (Materials Index)  
individual copies of a hundreds matrix (see blacklines)



Bring in a real shamrock. Have your class examine the leaves. How many are there to a cluster? Have each child draw a shamrock or give them a sham-

rock pattern, coloring sheet or art project. (The shamrocks the children make need to be fairly sizable—6" X 9" or larger—so they're easily seen.)



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

		3			6			9	
	12			15			18		
21			24			27			30
		33			36			39	
	42			45			48		

The next day, have the children bring their finished shamrocks to the circle. Distribute individual chalkboards, chalk and erasers. Follow the procedure outlined in Chapter 11, Extended Number Patterns, to explore patterns of counting by threes.

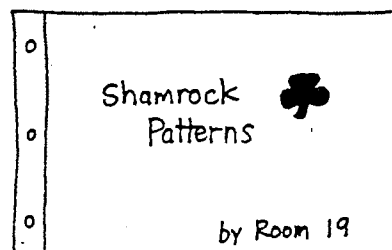
Don't forget the matrix extensions outlined in Chapter 11. Circle the threes pattern on the class matrix and then encourage children to try it on their individual copies of the matrix. Some children love the challenge of filling in the pattern on a blank matrix as well (see blacklines).

## SHAMROCK PATTERN BIG BOOK

**You will need→**


art materials for each child  
to create a small shamrock  
(no bigger than 4 X 4)

sheets of 12 X 18  
construction paper



Talk with your class about the shamrock number pattern they previously explored. Ask each of them to make a small shamrock. When

the small shamrocks are finished, follow the procedures outlined in Chapter 11 to create a Big Book.




$$3 + 0 = 3$$

$$1 \times 3 = 3$$

$$1 + 1 + 1 = 3$$

One shamrock had 3 lovely leaves and a leprechaun behind it.




$$2 \times 3 = 6$$

$$3 + 3 = 6$$

$$6 + 0 = 6$$

$$1 + 1 + 1 + 3 = 6$$

Two shamrocks have 6 pretty green leaves.



$$\begin{array}{r} 9 \\ + 0 \\ \hline 9 \end{array}$$

$$\begin{array}{r} 3 \\ \times 3 \\ \hline 9 \end{array}$$

$$3 + 3 + 3 = 9$$

$$1 + 1 + 1 + 3 + 1 + 1 = 9$$

We made 3 shamrocks.  
We had to use 9 leaves.

# THINGS THAT FLY

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## Experimentation and Data Analysis

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### FIRST TRIAL INVENTIONS: INVENTING SOMETHING THAT FLIES

**You will need** *for each child:*

9" X 12" pieces of aluminum foil, plastic wrap, tissue paper, newspaper—one sheet of each

a lunch bag                      a toothpick                      a paper plate

2 paper clips                      an index card                      a paper napkin

a 36" length of string

children will need access to such tools as scissors, staplers, masking tape, hole punches

Group your children by twos, threes or fours depending on their needs and abilities. Give each group a bag of materials. The group can use any or all of the materials to create models they think will fly, testing as they work. After a reasonable length

of time, ask each group to bring its favorite invention to the circle. (If your circle area is quite small, you may want to move to a different part of your room or even outdoors so there will be enough room for flight demonstrations.)

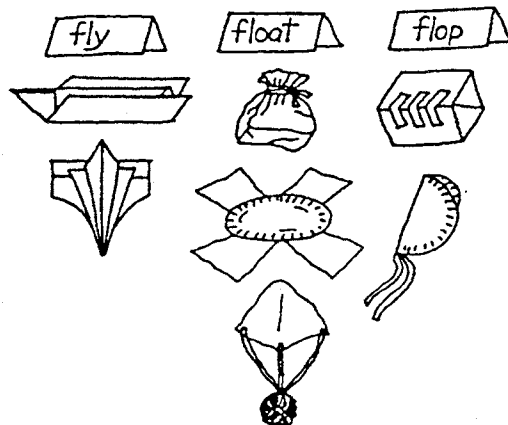
### FLIGHT DEMONSTRATIONS: FLY, FLOAT OR FLOP?

**You will need** *the children's inventions*

three 4" X 6" index cards folded in half lengthwise to form stand-up labels

chart paper, markers

When the children have assembled with their inventions, explain that you're going to have each group demonstrate its model. Discuss that fact that although inventors work very hard, not all first trial inventions are successful. The probable outcome of the demonstrations will be fly, float or flop. (You may want to establish definitions of these terms before the demonstration or have the group evolve definitions as the test flights are taking place.) Lay the graphing labels on the floor, let each group demonstrate its model, and set it next to the label that best describes the outcome of the demonstration.



When all the inventions have been tested, discuss the results:

Did more inventions fly, float, or flop? How many more? How many fewer?

Let's look at the fliers. What made each one fly?

Let's look at the floaters. What made them float? Could you change them in a way that they'd fly? How?

Let's look at the flops. What made each one flop? Can you think of any way to change them so they'd fly or float?

If you had a chance to make another flying invention, would you do anything differently? What? Why?

Do you think you could invent a flier that would fly farther than any of these did? How?

Do you think you could invent a floater that would stay up in the air longer? How?

As you discuss the test results, record the children's thoughts and findings on a large piece of chart paper.

## SECOND TRIAL INVENTIONS

**You will need→**

lunch bags

9" X 12" pieces of plastic wrap, aluminum foil, tissue paper, newspaper

paper clips

string, yarn

toothpicks

paper plates

paper napkins

index cards

cupcake papers

craft feathers (if you have some)

scissors, masking tape, staplers, hole punches, glue

Post the chart of findings from the first trial inventions and tests. Over a period of several days, have small groups visit the invention area you've set up and develop models that fly or float better than their first inventions. Although it takes time

and uses many materials, it's essential that you let children go back and try again many times.

Allow time for a second set of demonstrations and discussion. It's only in this way that young children begin to develop understandings and generalizations.

## THE PAPER WING (From Steve Caney's *Toy Book*)

**You will need→**

several pieces of 5 1/2" X 8 1/2" paper for each child

Tell your class that you really admire the flying inventions they've developed and you've discovered a wonderful new flier you'd like to share with them. Demonstrate the flight of a finished

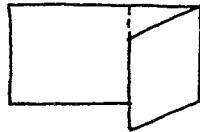
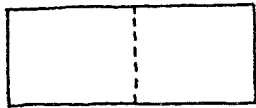
Paper Wing. Fold several in front of them explaining the directions as you go. Hand out paper and have them each fold one with you.

### Paper Wing Instructions:

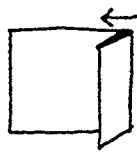
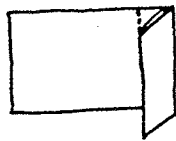
1. Fold a 5 1/2 X 8 1/2 piece of paper in half widthwise.



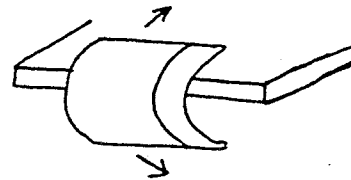
2. Open your paper up. Fold one side into the center line.



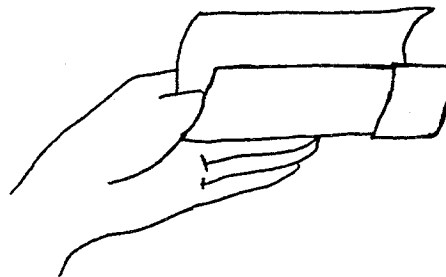
3. Fold that same piece over again, into the center line. Once again, fold it, overlapping the center fold.



4. With the folded side up, curve the Wing by sliding it back and forth over a table edge.



5. Fly the Wing by holding it with the folded part forward and underneath. Release it gently, don't push it forward. It should sail a long way before it comes down.



Let them practice flying their Paper Wings until they have the technique down. They get better flights if they're allowed to stand on chairs.

### MODIFYING THE WING

#### You will need→

chart paper and marker

tape, scissors, and hole punches

small and large paper clips

Once children have figured out how to fly their Paper Wings, have them leave the Wings at their desks and gather for discussion.

What makes the Wing fly so well?

Where is most of the weight? What would happen if the weight were at the back, or on top instead of underneath? (It's helpful to have a Wing available for testing their speculations.)

What would happen if you added more weight to the front or the back by attaching paper clips?

What other modification could you make on your Wings? (Possibilities include varying the depth of the curve, making additional cuts,

holes and folds, adding weight to the sides with paper clips, decorating the Wings with colors and adding paper parts by taping or gluing.) List children's ideas on a chart. Make the materials listed above available and give children a good amount of time to create the best Paper Wing they can. Initially, they'll modify the first Wing they folded but if an idea doesn't work out, they may want to fold another.

Older children might be gathered again to discuss the results of their modifications. We find it's easier with younger children to walk around and discuss modifications as they're made and tried. Successful ideas tend to ripple quickly around the room.

## DISTANCE TRIALS

**You will need→** the Paper Wings children have developed  
a prepared recording chart (see sample below)  
unifix cubes                      masking tape

When the children have each developed a Wing they really like, you're ready for distance trials. Explain to the children they'll each have a chance to find out how far their Wing can fly by launching it in the corridor (or other long testing area) and measuring the distance it flew in unifix cubes. Have them each estimate how many cubes their Wing will fly. Record their estimates on the chart.

Paper Wing Distance Trials		
Name	I think my wing will fly this far.	My wing actually flew this far.
Angie	80 cubes	
Caleb	200 cubes	
Ben	40 cubes	
Christina	75 cubes	

You can conduct the actual distance trials by having a parent volunteer take small groups out into the corridor. Have children stand behind a designated line to launch their Wings one at a time. Mark the landing spots with small pieces of masking tape labeled with children's initials. When everyone has had a turn, send children out in partners to measure their flight distances in unifix cubes.

Paper Wing Distance Trials		
Name	I think my wings will fly this far.	My wings actually flew this far.
Angie	80 cubes	53 cubes
Caleb	200 cubes	50 cubes
Ben	40 cubes	46 cubes
Christina	75 cubes	

Unifix trains should be broken into tens and ones to be counted and the actual distances recorded on the chart. You may want to have a parent volunteer help children measure, count and record.

Paper Wing Long Distance Trials		
Name	I think my wings will fly this far.	My wings actually flew this far.
Angie	80 cubes	53 cubes
Caleb	200 cubes	50 cubes
Ben	40 cubes	46 cubes
Christina	75 cubes	70 cubes
David	25 cubes	48 cubes
Eric	500 cubes	65 cubes
Sabrina	10 cubes	45 cubes

## DISTANCE TRIAL STORY PROBLEMS

**You will need→** the completed distance trials chart  
unifix cubes                      calculators (optional)

Using the chart, pose the following types of story problems to your class:

What was the longest distance flown?

The shortest distance?

Who had the biggest difference between their guess and their outcome?

Angie estimated her Wing would fly 80 cubes. It actually flew 53. What is the difference between her guess and her outcome?

What is the difference between your guess and outcome?

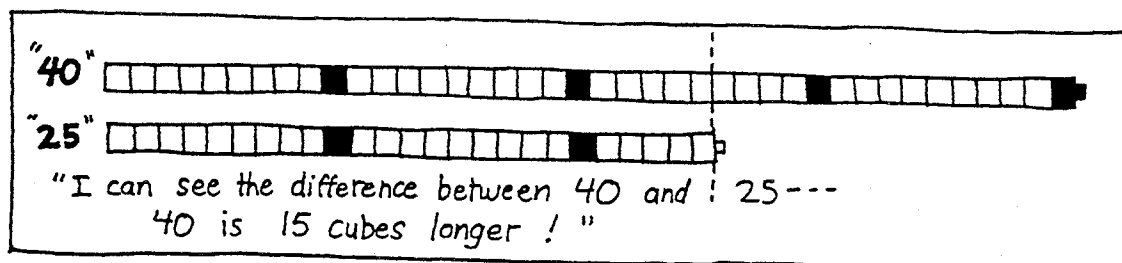
Christina's Wing flew a length of 70 cubes. Sabrina's flew 45. What is the difference between the two distances?

How much distance did our Wings fly altogether?

These are difficult story problems. Half the challenge will be coming up with strategies to solve them. Take suggestions from your class. Some children will count up from the smaller number to determine a difference or backwards from a large number. Some will be

interested in building the numbers with unifix cubes to determine the difference.

Be sure to encourage reasonable estimates in every case before you actually work things out. This may be a time to use calculators, too, if you have access to a class set.

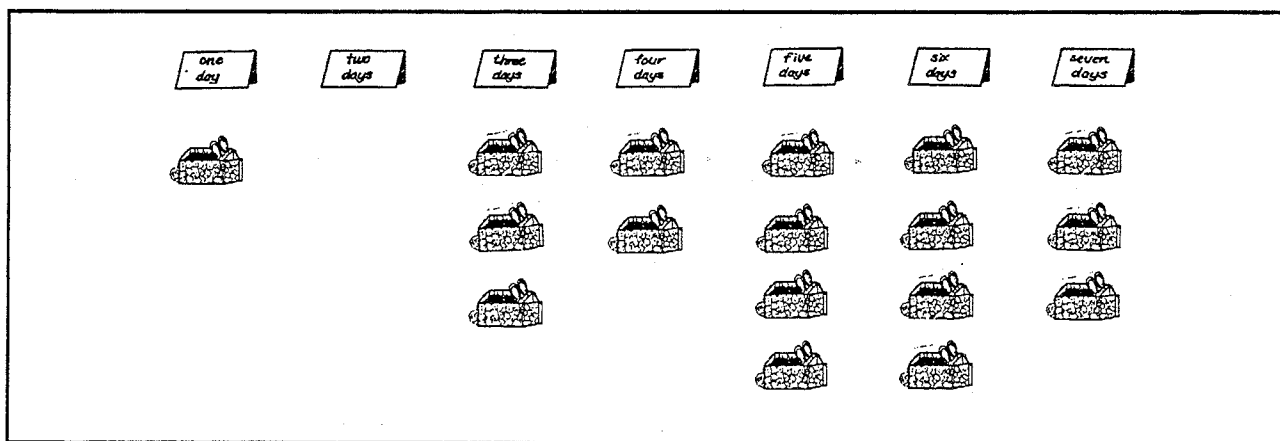


# BUNNIES, EGGS AND FARM ANIMALS

## BUNNY BOXES

rinsed quart or half gallon milk cartons  
white glue                      scissors                      a stapler or two  
cotton balls or a bag of polyester stuffing  
potting soil                      grass seed (or wheat berry seeds)  
a watering bottle

A hand is shown holding a milk carton. The carton has several labels: 'vitamin A&D', 'Low Fat Milk', '2% milkfat', '2% milkfat', 'vitamin A&D', '2% milkfat', and a large 'X' with 'MY-TE-MILK' written across it. The words 'MILK MILK MILK MILK MILK MILK MILK' are repeated vertically on the left side of the carton.

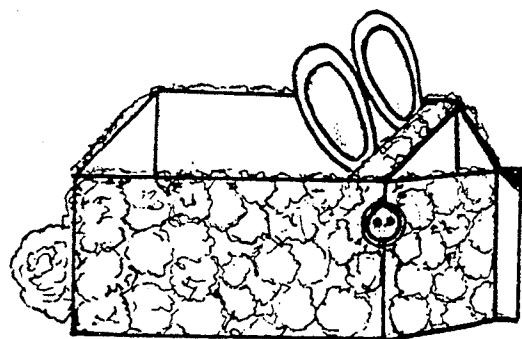


Poke two holes in the underside of the carton with a small nail to serve as drainage holes in case of flood!

Use a permanent marking pen to write child's name on the bottom of each "bunny".

Set these boxes aside. (The quality of the finished products will be much greater if they're done over two days.)

The next day, distribute "bunny" boxes to their owners. Have helpers distribute white glue and cotton or polyester stuffing. Also, lay out dampened paper towels on each table for wiping sticky fingers. Demonstrate how to take either a small handful of polyester or a cotton ball and stretch it out. Ask the children to make a pile of stretched "fur" before they use the glue.



Once their pile of "fur" is ready, they begin by covering all sides of their bunny with white glue. After they've wiped off their fingers, they carefully apply the "fur" to their bunny, continuing until all sides and ears are covered. Add pink button eyes or pink construction paper eyes. Once again, set the bunny boxes aside.

The next day, ask children to help spread out newspapers and set out containers of soil and grass seed (or wheat berry seeds which you can find at health food stores and which grow into very lush, sturdy grass) in a way that at least four children can work at a time. Model for the entire class how they will fill their boxes a quarter full of soil and then carefully sprinkle a generous layer of grass seed on top of the soil. Provide a watering bottle (a rinsed dishwashing detergent bottle works very well) so they can carefully saturate their soil. (Now you know why those drainage holes were needed.) Once the seeds have germinated, it helps to get the bunny boxes out daily into the sun.

It is interesting to discuss with children what they think will happen to their seeds and how long it will take. You can even graph their projections as shown in the illustration above.

Make a class graph of the actual growing results. It might look like this:

When did your grass come up?						
one day	two days	three days	four days	five days	six days	seven days
	Robby	Emily	Jake	Kelsey	Michael	Laura
	Clara	Sara	Josh	Adam	Paul	Maria
		Gina	Tia	Alan	Brandon	
			Colby		Chase	
			Wei-Ling			



Wait on the following projects until the grass is an inch or more high in the bunny boxes, usually 6-10 days.

## GETTING EGGS TO SCHOOL

**You will need→** notes to go home with children requesting they bring to school 4 hardboiled eggs carefully wrapped

Children love to color eggs. Have each child bring four *hardboiled* eggs from home. Be sure to talk about how many minutes the eggs should boil and how they should have an adult help whenever they're using the stove. This is another opportunity to help make time become more meaningful to the children. (You'll need

to bring an extra dozen or so, for those who forget or cannot bring eggs.)

Challenge children to find some way of inventing a container that will allow them to get four eggs to school uncracked.

## HOW DID YOU PACK YOUR EGGS?

**You will need→** eggs in containers children have brought  
6 X 9 cards, folded in half lengthwise, for labeling categories

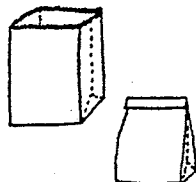
Once the packaged eggs have arrived, discuss all the various containers and strategies children used to protect their eggs. After each child has had a turn, sort the containers into

simple columns for graphing comparison. Discuss why some means of packaging were more popular than others.

egg cartons



paper



plastic



styrofoam



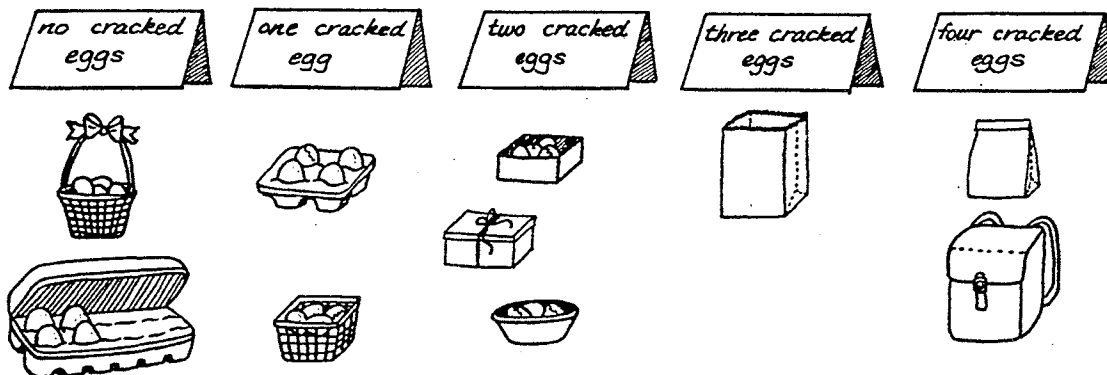
## HOW WELL DID YOUR PACKAGING IDEA WORK?

**You will need→** eggs in containers children have brought

6 X 9 cards, folded in half lengthwise for labeling categories

Now for the unveiling! Which containers did the job best? Have the children carefully open their containers to determine the success of

their packaging. Ask them to count their cracked eggs. Once again, create a simple graph.



## COLORED EGG GRAPH

**You will need→** hardboiled eggs the children have brought

egg dyes

4 paper eggs for each child to color

paper graph

Refrigerate the eggs until you plan to have the children color them. Use your favorite method of coloring. Children never seem to tire of using the commercial Easter egg dyes so don't feel you have to be incredibly creative.

As each child finishes coloring his or her four eggs, ask them to also make four colored paper eggs for a record of which colors they chose. This makes a nice graph for another day. Save

each child's paper eggs in an envelope for the graph.

*What colors did you choose?*

red	○ ○ ○ ○ ○ ○ ○ ○
yellow	○ ○ ○ ○ ○
blue	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
green	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
pink	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
lavender	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

## MORE EGG GRAPHS

**You will need→** paper graph

graphing markers made by teacher or students

*How Do You Like Your Eggs Cooked?*

boiled	○ ○ ○ ○ ○
fried	☉ ☉ ☉ ☉ ☉
scrambled	☼ ☼ ☼
not at all	○ ○ ○ ○ ○

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# Money

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## THE PRICE OF EGGS

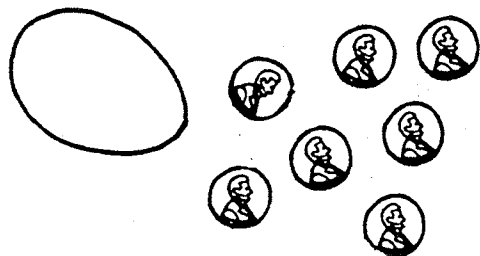
**You will need→**      a dozen eggs      coin stamps  
real coins—pennies, nickels, dimes and quarters

Bring in a dozen eggs. Have the children help you lay out the price and use coin stamps to make a record. How many ways can this be done?

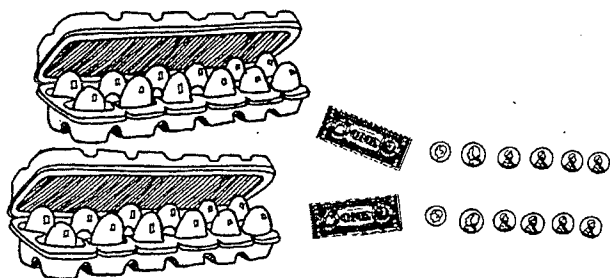
Challenge your class to try and find the cost of each egg. (Be sure you have lots of pennies on

their own approaches to mathematical problems.

Challenge them to find out how much two dozen eggs would cost. Be sure to have them estimate before you actually begin with coins. How about three dozen? Don't forget, with coin stamps, you can make a record of the ways they try to figure this out. It is so helpful in the learning process to see various ways to try to reach a solution.



hand along with an assortment of other change.) Problem solving skills come about with lots of practice. Try out all suggestions, right or wrong, so the children begin to develop



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## Extended Number Patterns

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### EGGS IN BUNNY BOXES

**You will need→**      individual chalkboard, chalk, erasers  
bunny boxes, each filled with 4 colored eggs  
4 X 6 index cards for number stands

Once all the bunny boxes are complete and have grown beautiful green grass, add the four colored eggs and use them to create an extended number pattern. (See Extended Number Patterns, Chapter 11, for "how to" details.)

Other extended number patterns might involve favorite two-legged and four-legged farm ani-

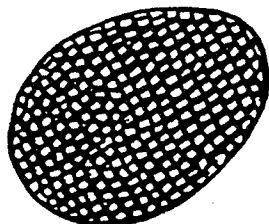
mals. Have children make drawings, paintings, or cutouts of animals to use for charts or Big Books. With second graders, it's a fun way to write multiplication sentences.

Bunny ears (twos) or bunny whiskers (sixes) would work also.

# Estimation and Place Value Counting

## THE MARSHMALLOW EGG

### You will need→

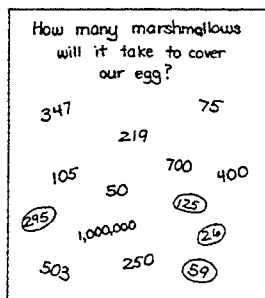


two bags of colored or white miniature marshmallows  
 white glue                      an oval tag egg (10 X 16)  
 unifix cubes                    blank chart paper  
 a large bowl                    a 6 X 9 counting paper per student  
 a brown bag to hold marshmallows  
 one light and one dark piece of 12 X 18 construction paper

This activity is popular with children and it's great for Open House! (If you can't find colored marshmallows to make an Easter egg, make it a nice white farm egg with white miniature marshmallows.)

Bring in the marshmallows sealed in a brown bag so you can do the Mystery Sorting as described in Chapter 10. If you are doing the Hangman version, it may take two or three days for your children to figure this one out but many will talk it over at home and come back armed with new questions. (We think this is what school is supposed to be about—lots of puzzling, gathering new information and trying again.)

Once they know it's marshmallows, pour a bag into a large bowl and show them the tag egg. Ask them how many marshmallows they believe it will take to cover the tag egg. Quickly, record their guesses on the chart.

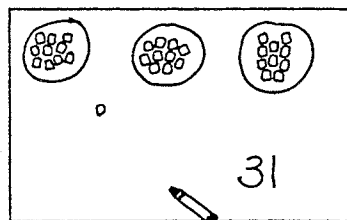


Try not to react to the "off the wall" guesses with shock. It takes a long time to learn to estimate with large numbers.

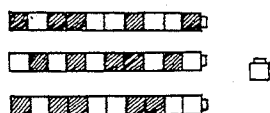
Spend a couple minutes focusing on your chart with questions, for example:

1. Which number represents five dimes and nine pennies?
2. Which number has a 6 in the ones place?
3. Which number is 5 less than 300?
4. Which number would come next in this pattern? 25 50 75 100?

Back to the marshmallows: Tell them in a few minutes each child will be getting a small handful of marshmallows by reaching into the bowl quickly with only one hand just like you are doing. They will then carry their marshmallows and counting paper to their table to count their marshmallows into tens and ones to find out how many they have. Show them how to count their marshmallows into groups and loop their tens on the paper. Have them help you count your handful and then label your paper. (Remember, a major goal in mathematics is to help children establish order.)

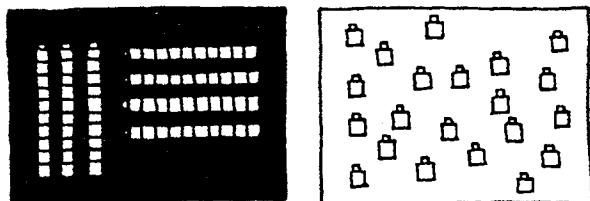


Show them that once they've finished counting, looping and labeling their marshmallows, they will go get an equivalent number of unifix cubes which will be snapped into tens and ones.



The cubes are left at the tables as they gather all their marshmallows and carry them to the egg and carefully arrange them as close together as possible onto the already generously spread wet glue. Usually about four children can be doing this at one time with adult supervision.

As soon as they've been able to get their marshmallows glued, they bring their unifix cubes on their counting paper to the class circle. (Sometimes, the last few marshmallows don't fit the egg, so the last two or three children need to adjust their cubes to show how many marshmallows they actually put on the egg.)



As soon as everyone is finished and back to the circle, ask them to lay all their tens onto a

large piece of dark construction paper. Have them place their ones on a light piece of construction paper. Regroup the ones into tens until no more tens can be made. Move the tens to the dark sheet of paper.

Now ask the group to help you count the tens to see if any hundreds can be made. Each time you make a hundred, have a few helpers quickly snap them into a long "train" of cubes. Continue with this until no more hundreds can be made. At last, you can find out how many marshmallows it took to cover the egg (see illustration below).

Go back to the chart to cross out the guesses that were not in the ball park, if you wish, but be very careful to value every child's efforts. It is often helpful to children to get an idea in this way of what people mean by reasonable guesses. (If you have a classroom set of calculators, write each child's number on the board and have the children add all the numbers on their calculators to confirm the total of hundreds, tens and ones they laid out.)

When the egg is thoroughly dried, hang it on the wall!

" Five hundreds, two tens, and six ones. "

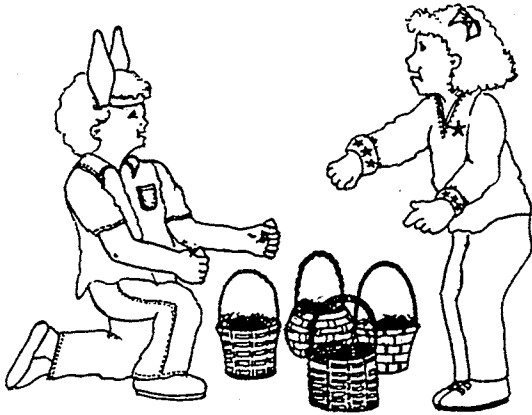
## Story Problems

*There are so many good stories children can generate this time of year. Here are a few samples just to help you get started. Remember, children love to act things out—they love even more to make props to help with the acting. The props seem to increase the quality of the stories they create and write. Don't forget another class Big Book or two this month. (See the Story Problems lessons in September and October Seasonal Math for more details.) How about one around a farm theme and the other around an Easter theme? Children love to remember all the holidays no matter what time of year, so they get out good Big Books over and over if you've helped them see how special the books are.*

## EASTER STORIES—ADDITION AND SUBTRACTION

**You will need→** hollow plastic Easter eggs  
4-6 small Easter baskets  
unifix cubes for helping solve larger problems

The Easter Bunny has four beautiful Easter baskets to deliver. Each basket has two gorgeous eggs in it. How many eggs will the Easter Bunny be delivering?



(Children love to take a story like this and act it out several times with different number combinations so they can really see if their

strategies are working to solve other similar problems.)

The Easter Bunnies were all gathered at Grandfather Bunny's Palace of the Easter Eggs to begin getting the eggs into the baskets for the big event. In one room, there were 34 eggs, another room had 25 eggs and still another room had 25 eggs. How many eggs were there altogether?

And, of course, do some easier problems as well. For those youngsters who needed more time to gather mathematical understandings, it feels good to face something that now seems a bit easier. *Most* of all, remember, after you get things started, children can make up wonderful story problems. Let them know you value their work as they present new problems to be solved. Encourage them to add details and eventually save their stories in a Big Book.

## EASTER STORIES—MULTIPLICATION AND DIVISION

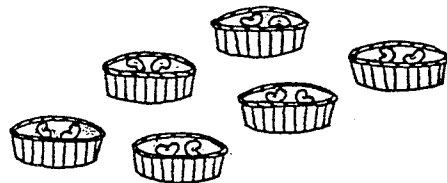
**You will need→** *for each child:*  
lima beans  
10 1-oz. portions cups (Materials Index)

The Easter bunny has sixteen eggs to deliver. Each basket will hold only two. How many baskets will he need?



The Easter bunny has 18 eggs. He will divide them among 6 baskets. How many will he put in each basket? What if he uses 5 baskets? If he uses 3 baskets?

The Easter bunny has six baskets with two eggs in each. How many eggs will he deliver?



## FARM STORIES

**You will need→** materials to help children act out and solve these problems (unifix cubes or portion cups and beans are fine)

The farmer went into the hen house and discovered three setting hens. Each hen was sitting on four eggs. How many chicks can the farmer expect will hatch?

The farmer needed to have shoes put on four of his horses. How many shoes will the blacksmith need to make?

The farmer needs to leave six inches between each corn plant he puts in. He needs 50 corn plants this year. How many feet will he need to save for rows of corn plants in his garden? What can we use to help us solve this problem together?

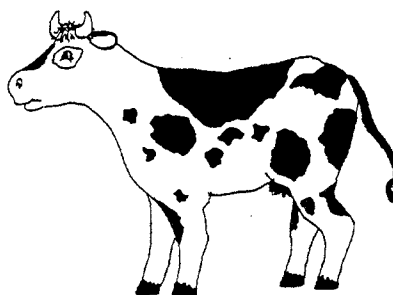
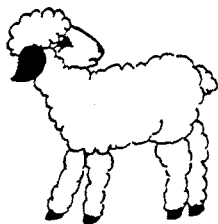
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## Patterning

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### THEATER PATTERNS

**You will need→** chart paper



Repeat the theater patterns from October but this time use farm and/or Easter themes.

You can begin by asking your class to think of three animals they might find on a nearby farm. List those animals, and have children tell you what's special about them.

chicken  
two legs  
some go cock-a-doodle-doo  
some cluck  
gives eggs  
small

After a list has been generated, ask the children to list ways people could portray these animals so others would recognize them.

ANIMALS	WHAT'S SPECIAL?
---------	-----------------

cow	It moos gives milk big four legs eats grass chews cud
sheep	It goes baaa gives us wool four legs eats grass medium-sized

cow	We could act like we had four legs and moo—we could even chew our cud and pretend to eat grass.
-----	-------------------------------------------------------------------------------------------------

We could have someone pretend to be a farmer and pet us, feed us some grass and carry away a bucket of milk.

sheep      We could stand like we had four legs and baa. We could pretend to eat grass.

The farmer could pretend to shear the sheep.

chicken      We could squat down real short and "cock-a-doodle-doo." We could make clucking noises.

The farmer could gather eggs.

Once some good ideas have been discussed and listed, ask for volunteers to be each of the animals. Have the class help direct the "animals"—that is, where they should be to form this farm pattern and which actions they should do.

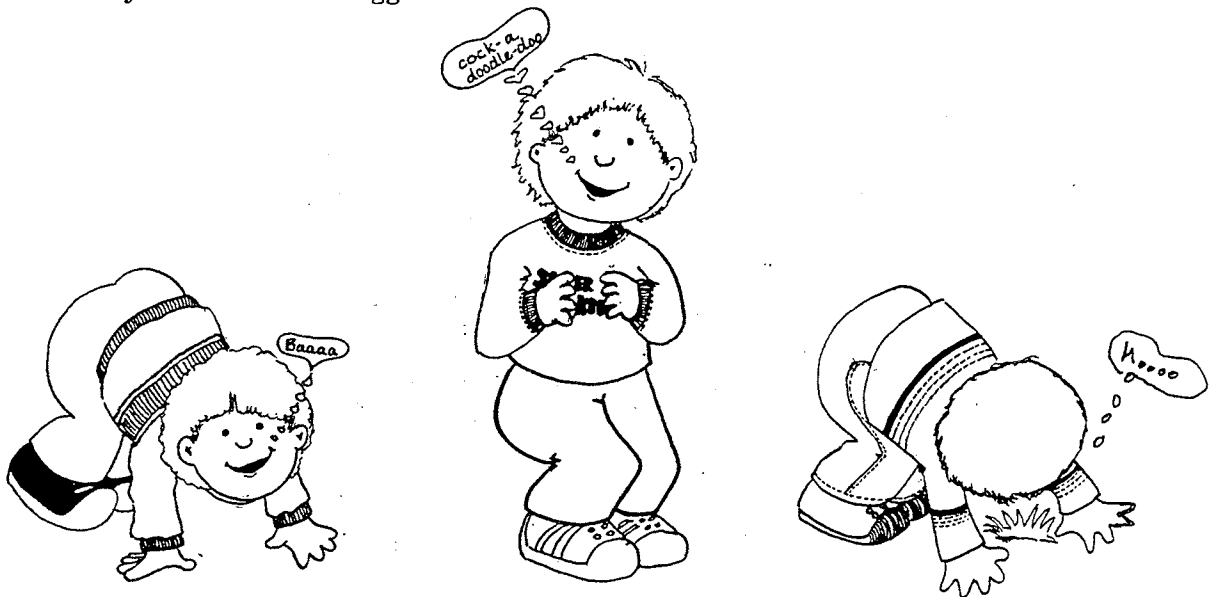
Make the acting quick so more children can have turns to try out the various suggestions

and if their interest holds, perhaps ideas no one first thought of.

Ask them to be planning for another day during the week when you'll have them work in teams to brainstorm, direct and act out either more farm patterns (farm machinery, people on the farm, more animals) or Easter patterns (the Easter bunny coloring eggs, assembling baskets, hiding eggs).

Encourage them to think of ideas that nobody else might think of so their productions can be extra special.

We hope you'll be pleasantly surprised at the good ideas many teams present. Have the audience guess each group's patterns and prove they've "got it" by adding the next few units without changing the pattern. You'll notice second graders try to fool classmates by creating very hard patterns.



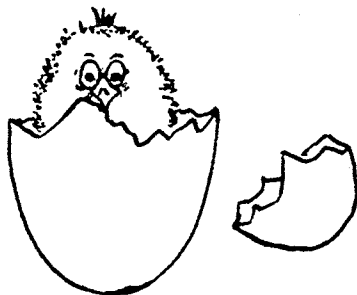


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## Time

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### DUCKS, CHICKS, AND EASTER



The following questions concern time. Pick one or two to post as challenge work and make

sure you have resources available for children to answer those questions.

1. Can you find out how long baby chicks take to hatch?
2. How long do ducks take to hatch?
3. If the hen laid her eggs on the third of the month, when should the eggs hatch?
4. If the duck laid her eggs on the third of the month, when should they hatch?
5. Does Easter come on the same date every year?
6. How many days until Easter?
7. What are the other months that have 30 days?

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## Measuring

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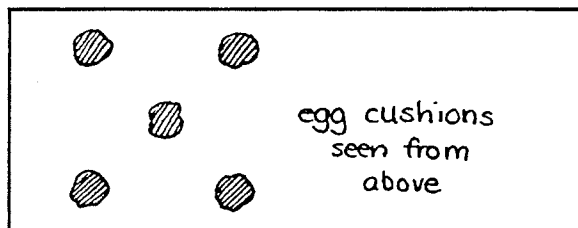
### SUPER EGGS

**You will need→**      5 uncooked eggs  
                                 bathroom scales      school modeling clay  
                                 a small 1/2" sheet of plywood (about 12 X 12)  
                                 12 X 18 white construction paper for a Big Book

(This lesson adapted from Scienceland, Volume VIII, No. 67.)



How strong is an egg? How much weight will it support? Begin by discussing with your class how clay cushions could be formed at the top and bottom of each egg.



Once the clay cushions have been formed, arrange the five eggs in a domino pattern, pointed ends down (see sketch).

Set your plywood square on top of the egg cushion. Ask the children what they think will happen if we put a dictionary on top of the board. Write their predictions as a Big Book page. (Be careful not to selectively praise some ideas or you'll stop the discussion!)

***What if we put one dictionary on our eggs?***

*21 think all the eggs will break.*

*9 think all will crack.*

.....  
*None cracked or broke.*

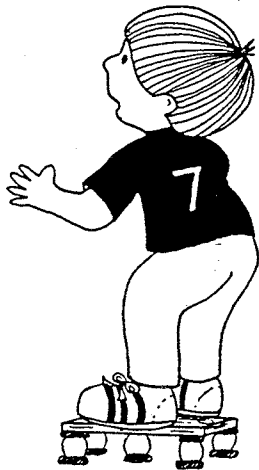
Carefully balance the dictionary in the center of the platform.

Continue in this manner, asking children what will happen if another dictionary is added. Create another Big Book page for each dictionary to be added. Record the outcomes.

You may want to weigh the dictionaries. Ask your class to brainstorm ways they can figure out how much weight each egg was holding. Record their ideas on a chart and try some of them out until the group is satisfied they've come upon a reasonable answer.

(A possible solution might be to count out the number of unifix cubes equivalent to the number of pounds of dictionaries; for example, 15 pounds, 15 cubes. Those cubes could then be divided into five piles. Record the solution and outcome on another Big Book page.)

If your eggs are holding out, suggest removing the dictionaries in order to lift a very small child onto the center of the platform.



Have the students again predict what will happen. How much weight is each egg supporting now? Write this happening on another page of the Big Book and complete the page. (Be sure the page includes the actual weight in pounds of the child.)

The eggs held Kevin!  
Kevin weighs 56 pounds.  
We counted 56 unifix cubes and  
divided them into 5 piles—one  
pile for each egg. Each egg got  
11 cubes. There was one cube leftover.  
That means each egg held up  
more than 11 pounds!

If your eggs are still intact, suggest to the class that it might be a good idea to keep the child on the platform and add more weight. You could do this by weighing and adding dictionaries one at a time. Hand them to the child on the platform. Weigh a book and have the children calculate how much weight will be on the eggs with the child plus one book. Record the results on another Big Book page. Have the children again figure out how much weight each egg is holding.

Continue weighing books and handing them to the child (don't forget to make a new Big Book page for each addition) until the eggs break.

Once the event is over and weights have been calculated both for total weight and how much weight each egg had to support each time, write down a few of the children's comments as a final page, send the pages out with small groups to be illustrated and when all are finished, assemble them into a Big Book to help remember this wonderful problem.

## Chapter 9

# WATER, WATER, WATER

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## Mystery Box Sorting

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### INTRODUCTION TO SINKERS AND FLOATERS

**You will need→** a large tupperware or other plastic container with a lid, half-filled with water—this will serve later as a water container for testing items that float and sink, so a see through container that holds several quarts of water is ideal

a box in which to seal the water container

chart paper and a marking pen

#### What's In The Box ?

- not something to eat
- not green
- not alive
- not red
- not triangular ▲
- partly plastic
- can be found at home

Play the Hangman version of Mystery Box Sorting (see Chapter 10.) If you play this game monthly,

your children will improve their questions and listen more closely to one another. Be sure to stop and ask what they know every five or six questions. List their information on chart paper. When they're "down to the wire" ask children to talk over their ideas with neighbors before they pose their last few questions. If they don't figure it out the first day, put the box away but leave the chart posted for them to ponder. They'll have a fresh start the next day. Once they know what's in the box, you're ready for the next part of this activity.

## WHAT SINKS? WHAT FLOATS?

**You will need→**

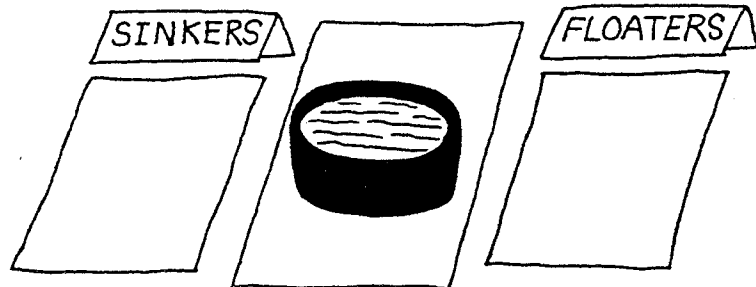
chart paper and marking pen

3 towels

two 4 X 6 index cards

your half-filled water container

FLOATERS	SINKERS
<ul style="list-style-type: none"><li>• plastic and metal lids</li><li>• aluminum foil</li><li>• rubber bands</li><li>• wood scraps</li><li>• unifix cubes</li><li>• bread tags</li></ul>	<ul style="list-style-type: none"><li>• tiles</li><li>• metal washers</li><li>• pennies</li><li>• keys</li><li>• beans</li></ul>



Brainstorm together things that might float or sink in the water.

Set the water container out on one towel. Lay a towel on either side of the container. Fold your index cards in half to make stand up labels—"sinkers" and "floaters"—and place a label by each towel.

Excuse the children in partners to find two items in the room, one they think will float and one they think will sink. When they've all returned to the circle with their items, have them come up with their partners, test their items in the water and lay them on the appropriate towel. When all the items have been tested, discuss the results.

Did more items sink or did more float? How many more? How many fewer? How can we find out? Can we compare the two groups

without counting? (If no one responds, propose matching the items one to one to form a graph.)

Did the results of our tests match your predictions?

What are the floaters made of? What are the sinkers made of?

Many of the items that sank were metal. Do you think metal objects always sink?

Many of the items that floated were wood. Do you think wood always floats?

Which objects do you think are heavier? (This would be a great time to have your balance scale available.)

Can you think of any heavy objects that float?

What happens to objects made of paper or cardboard?

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## Data Analysis

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### FIRST-TRIAL INVENTIONS: CAN YOU INVENT A FLOATER?

**You will need→**      *for each group of children:*

9" X 12" pieces of aluminum foil, wax paper, construction paper, newspaper (one sheet of each type)

a sandwich bag      a small cardboard box

a metal lid (or frozen orange juice top)

a plastic lid (cottage cheese, yogurt, margarine)

4 popsicle sticks

a cardboard tube (paper towel or toilet paper)

2 rubber bands      a student milk carton

Children will also need access to scissors, masking tape, string, glue, staplers, paper clips, floral wire, brass fasteners.

You'll want a fairly large place to test the floating inventions: a large sink, a water table, a baby bath tub or a small wading pool. You may want to place your water source outdoors if you can do so safely or provide several towels at the water area(s) if you do this inside.

Group your children by twos, threes or fours based on their needs and abilities. Give each group a bag of materials. The groups can use any or all of the materials to create models that they believe will float. After a reasonable time, ask the groups to bring their favorite inventions to the water source. Allow each group to present their model and explain why they think it will float. When all the models have been presented, test them giving each a one minute-trial. You may be able to test several at once, depending on the size of your water source. Once tested, you may want to set the models on towels with Floater and Sinker labels.

When all the inventions have been tested, discuss the results:

Did more inventions float or sink?

Let's look at the floaters. What made each one float? Do you think these inventions could float for more than a minute? How long?

Let's look at the sinkers. What made them sink? Can you think of any way to change them so they'd float?

If you had a chance to make another floating invention, would you do anything differently?

Do you think you could invent a floater that could carry some weight—some cargo? How would you do it?

As you discuss the test results, record the children's findings and thoughts on a large piece of chart paper.

## SECOND TRIAL INVENTIONS—CARGO CARRIERS

**You will need→**      ten 1" ceramic tiles (not bagged)

                             1" ceramic tiles bagged in groups of ten (50 to 60 bags)

                             aluminum foil, construction paper, waxed paper, newsprint and cardboard cut into 9 X 12 sheets

                             styrofoam meat packing trays and hamburger boxes

                             popsicle sticks and small wood scraps

                             cardboard tubes      student milk cartons

                             sandwich bags      small cardboard boxes

                             rubber bands      metal and plastic lids

                             masking tape, glue, scissors, brass fasteners, paper clips, staplers, string, floral wire

                             a water source for testing inventions

*This activity is most successful when done with half of your class at a time.*

Post the chart of outcomes from the first-trial inventions and tests. Over the next several days, have each small group invent and test another floater taking the first trial results into account. Challenge them to develop floaters that hold cargo this time. They will use the individual tiles and bagged ceramic tiles as cargo. Allow groups to invent, test, modify and test again until they have the best cargo carrying floaters they can develop.

How much cargo can your floater carry for one minute?		
	guess	check
group 1	20 tiles	40 tiles
group 2	20 tiles	45 tiles
group 3	10 tiles	28 tiles
group 4	50 tiles	40 tiles
group 5		

When the groups are ready, have them bring their inventions to the water source. Allow each group to present their second model explaining the special features. Have the children estimate how many tiles each group's floater will carry with the understanding that the "ships" and cargo have to stay afloat for at least one minute. Record the estimates and actual numbers of tiles as each group demonstrates.

When the inventions have been tested, discuss the results:

Which carrier held the most tiles? The fewest?

Why do you suppose some carriers held more than others?

If you were going to design another cargo carrying floater, what would you do differently?

Which carrier do you think could stay afloat with its cargo for the longest time? Let's try it out!

## CARGO CARRIER STORY PROBLEMS

**You will need→** the chart of results from the cargo carrier demonstrations

unifix cubes

calculators (optional)

How much cargo can your floater carry for one minute?		
	guess	check
group 1	20 tiles	40 tiles
group 2	20 tiles	45 tiles
group 3	10 tiles	28 tiles
group 4	50 tiles	40 tiles
group 5	15 tiles	10 tiles
group 6	60 tiles	53 tiles
group 7	40 tiles	36 tiles

Using the chart, pose the following types of story problems to your class:

We estimated that group two's carrier would hold 20 tiles. It actually held 45. What was the difference between our estimate and the actual results?

Group four's carrier held 40 tiles. Group three's carrier held 28. How many fewer tiles did group three's carrier hold?

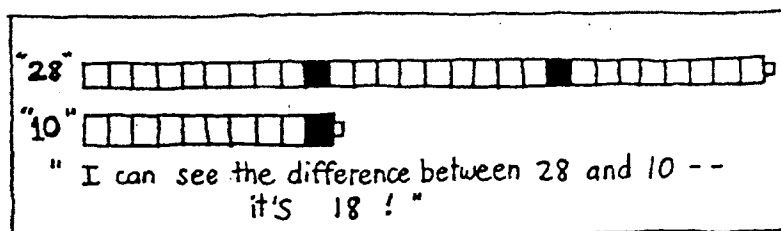
Can you put the weight in order from least to most?

How much weight—how many tiles—did carriers one and six hold together?

How many tiles did our cargo carriers hold altogether?

These are difficult story problems. Half the challenge will be coming up with strategies to solve them. Elicit suggestions from your class. Some children will suggest counting up from the smaller number to determine the difference or backwards from a larger number. Some will be interested in building the numbers with unifix cubes to determine the difference.

This is a golden opportunity to encourage reasonable estimates and possibly a time to use calculators if you have access to a class set.




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## Money

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### SORTING ADS: SHOP THE ADS FOR WATER FUN!

**You will need→** newspapers, catalogues and magazines that advertise items people use for recreation in water—pools, wading pools, rafts, air mattresses, boats, water toys, etc.

scissors

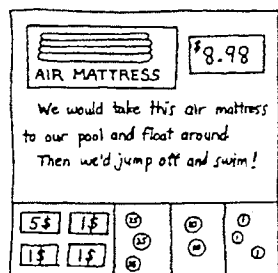
**Teacher:** I'm going to push the ads back together. What's another way we could sort them?

**Teacher:** OK, let's try that.

Sort the ads in several more ways and then have children work in small groups of two, three or four to sort all the ads they cut. Each group will need 10-15 ads. (See Chapter 10, Collection Sorting, for more information on conducting sorting lessons.) Save each group's ads for another day's lesson. (You may want to precut the ads and have the children proceed directly to the sorting.)

**You will need→**

- ads for water fun items saved from the previous lesson
- coins—quarters, dimes, nickels and pennies
- coin stamps                  play money (see blacklines)
- 12" X 18" sheets of white construction paper



108



and coin combinations have been explored, use coin stamps and play bills to record the price on the page. Record children's ideas of what they'd do

with the item too. Have children work in small groups to create similar pages for a class Big Book Catalogue.

## Measuring and Graphing

### ONE CUP A DAY

**You will need→**

four quart jars

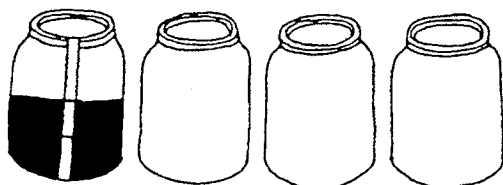
food coloring

a gallon container

a one-cup measure

If you start at the first of the month, you can explain that you are going to set up one quart jar and each day at calendar time, you'll add one cup of colored water to a jar. They'll discover quickly that

May  
2nd



four cups will fill a quart jar. When you have filled all four quart jars, it's fun to pour them into a gallon jug and start again. Keep going until the end of the month.

Here are some interesting questions to ponder with your class. Be sure the water jars are in plain view.

How many cups in a half quart (a pint)?

How many cups in a gallon?

How many cups in a quart? Two quarts? Three?

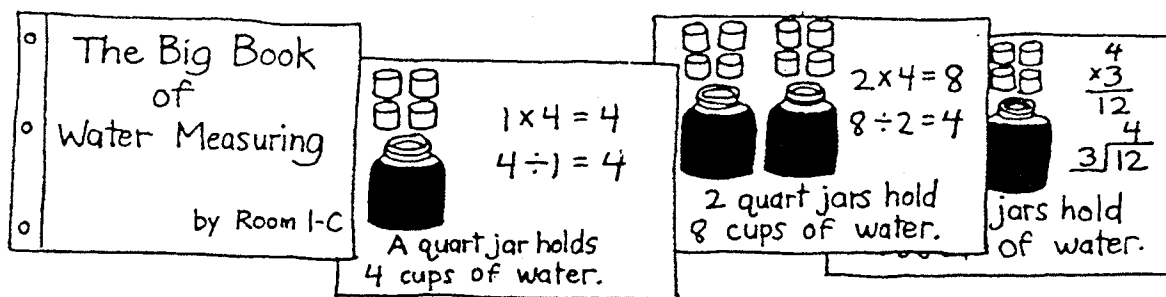
We have two cups in this quart jar. What fraction of our container is filled? How many more cups will it take before it is full?

### CREATE A BIG BOOK

**You will need→**

chart paper or sheets of 12" X 18" construction paper

Hundreds Matrix (Materials Index)



Create a chart or Big Book of the cups and quarts in picture form. As an extension, record the counting pattern on a hundreds matrix. See the Extended

Number Patterns chapter for directions for making charts and books and for using the hundreds matrix.

## GRAPHING IDEAS

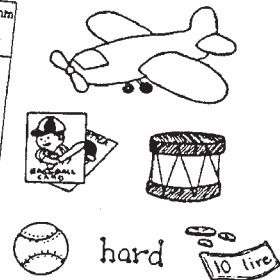
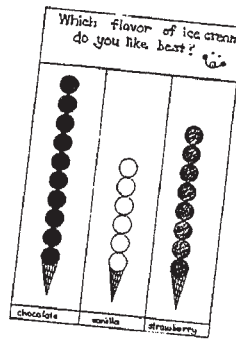
Here are some Water graph ideas. See Chapter 10 for more detail on graphing.

1. Which do you prefer—a bath or a shower?
2. Would you rather go swimming or water skiing?
3. Have you ever been to an ocean?
4. Have you ever ridden on a ship?
5. Have you ever ridden in a sailboat?
6. Do you know how to row a boat?
7. Do you like to go fishing?

# Organizing Information

How Often Do You Sleep With Your Teddy bear?

	Frank	
	April	Shaun
	Travis	Kelly
Autumn	Katie	Monty
Gretchen	Christopher	Bruce
Tera	Michelle	Robbie
Kara	Tammy	Benito
Matt	Jennifer	Lisa
Danny	Angie	Fletcher
always	sometimes	never
6	9	8





## Chapter 10

# SORTING

*We have found in our own classrooms that children who understand sorting seem to make so much sense of their learning world. We particularly like the following quote:*

*"Probably the most essential and important intellectual jobs that we all perform day in and day out aren't counting and measuring and ranking events in time, but just classifying things, sorting objects into groups for simplicity's sake and reasoning about things, analyzing classifications and interpreting them, drawing conclusions. Together, these skills might be called logic."*

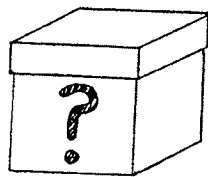
Your Preschooler Ages 3 and 4  
Richard Rubin and John Fisher III

*There are several types of sorting in the Seasonal Mathematics strand. Hopefully, the following instructions will help you conduct each type.*

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### Mystery Box Sorting

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This activity requires children to find out what you have hidden in a box, bag or your pocket. They can only find out by asking you questions about its attributes which can be answered "yes" or

"no." (Is it green? Is it round? Can it be used in the kitchen? Could we eat it?)

The first half of the year, many children will have difficulty asking such questions. They

tend instead to ask, "Is it a ball? Is it a candy bar?" Tell them there are probably a million things that would fit in the box but in order to really figure it out, they'll need to be detectives and gather clues. Some of the clues that would help would be its color, size, what people do with it, its shape, etc. Give them some examples of appropriate questions.

After the children have asked a few questions, have them tell you what they know so far. List that information on the board or a chart and then go on with more questioning. Stop every

few questions and add to the list of what they know so far:

round ?	yes
sweet ?	yes
bigger than a ring?	no
blue ?	no
red?	yes

**Children:** Is it an apple?

**Teacher:** Let's look at the information we know so far. Could an apple be round?

**Children:** Yes.

**Teacher:** Could an apple be sweet?

**Children:** Yes.

**Teacher:** Could an apple be bigger than a ring?

**Children:** Yes.

**Teacher:** Could an apple be red?

**Children:** Yes.

**Teacher:** Could an apple be blue?

**Children:** Oh no!

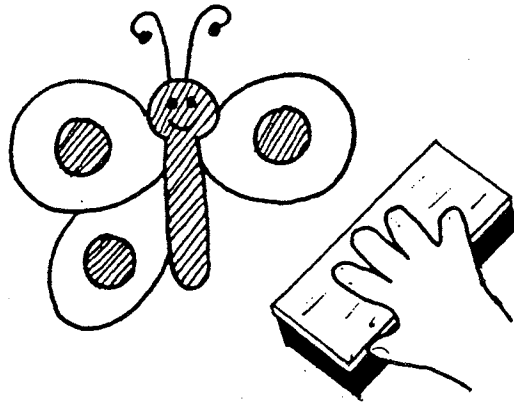
**Teacher:** Is there anything else that would match the information we know so far?

**Children:** A cherry? A pomegranate? A red cookie?

Often this activity is extremely challenging to young children and they persevere at asking specific questions, "Is it a doll?" etc., despite your best efforts.

You can often improve their questions by adding the game of Hangman the third or fourth time you play. Add a body part to the

hanging person each time any question is asked (yes or no). If the drawing of the Hangman is complete before your class has figured out what is in the box, promise to let them try again the next day. They won't like this a bit but their questions will improve dramatically. (They will often have talked it over at home.) They'll listen to each other better and work more cooperatively.



A more graphic version of the Hangman technique is "Erase a Part." It is played the same way, but this time the teacher draws a complete figure (a person, animal, insect, etc.) and erases a part for every question asked (yes or no). Children seem to recognize more easily when they are running out of questions with this method.

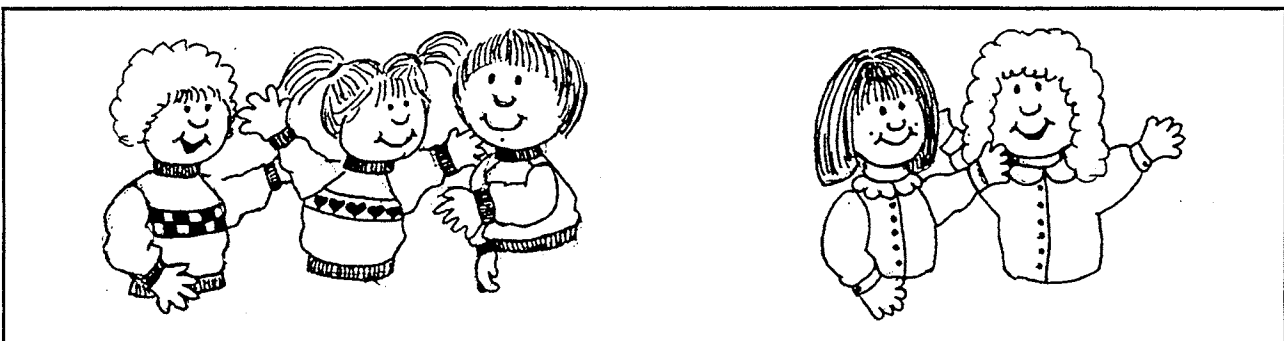
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## People Sorting

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### PEOPLE SORTING: LEVEL ONE

**You will need→** 2 pieces of 8 1/2 X 11 paper for classroom labels



The activities under People Sorting, Levels One, Two and Three, involve using one attribute (such as length of hair, color of pants, type of shirt) to sort your class into two groups. The first several times you try People Sorting with children who have had limited sorting experience, tell the children what your People Sorting categories will be.

**Teacher:** Today, we're going to sort the children in our class. Children with pants will stand up front to my left under the "pants" sign and children with skirts will stand to my right, near the "skirts" sign.

**Children:** There are going to be more kids in the pants group!

**Teacher:** Really? Let's try it out and see if your prediction is correct. Courtney, will you come up and stand by me? Boys and girls, where should Courtney go...by the pants sign or the skirts sign?

**Children:** By the skirts sign?

**Teacher:** Why?

**Children:** Because she's got a dress on. That's like a skirt.

Continue calling children until about half the class is standing.

**Teacher:** Which group is larger?

**Children:** It looks like there are more kids on the pants side.

**Teacher:** How could we find out?

**Children:** Count them!

**Teacher:** OK, let's try it.

**Children:** Nine pants and seven skirts. Yep, more pants!

**Teacher:** Is there any other way we could show there are more children with pants?

**Children:** Hmmmmm...

**Teacher:** What would happen if every child in the pants group up here tried to find a partner in the skirt group?

**Children:** Some of the kids wearing pants wouldn't get a partner.

**Teacher:** Why?

**Children:** 'Cause there are too many of them!

**Teacher:** Let's try it.

Have each child in the pants group find a partner from the skirt group and sit down with his or her partner on the spot.

**Teacher:** Why are these two children still standing?

**Children:** Because there were too many pants kids to find partners! There weren't enough kids with skirts left!

You can revisit this lesson several times. Let the children suggest the sorting categories too.

## PEOPLE SORTING: LEVEL TWO

**You will need→** 2 pieces of 8 1/2 X 11 paper for classroom labels

This time, let children know what one category is, but not the other.

**Teacher:** We're going to sort the children in our class today but it's going to be a little more tricky than usual. Children with velcro shoes will stand up front to my left near the picture of the velcro shoe. I'm going to send some other children to my right, to stand under the label with the question mark. That's the mystery side. There will be something the same about all of those children too—but I'm not going to tell you what it is yet. I bet you'll be able to figure it out if you really watch!

Call children up one by one placing those with velcro shoes to your left and tie shoes to your right.

**Teacher:** We've got two children under the question mark. What do you notice?

**Children:** They're both wearing blue jeans!

**Teacher:** That's true. Shayne, I'd like you to join the question mark group.

**Children:** Oh, oh! Shayne doesn't have blue jeans on. She's wearing a dress.

**Teacher:** But she's in the right spot. I'd like David to join that group too.

**Children:** He has red pants on. Oh, I see! They all have pictures on their shirts.

**Teacher:** That's true. Brian, would you join the question mark group too?

**Children:** But he doesn't have a picture on his shirt, it's just plain blue.

**Teacher:** Well, maybe the thing that's the same about these children doesn't have to do with their clothing. What's the same about the other group?

**Children:** Velcro shoes...that's it, look at their shoes! Yeah! They all have ties.

**Teacher:** I'd like Joshua and Carissa to join the question mark group too.

**Children:** They both have ties on their shoes. That's got to be it!

### PEOPLE SORTING: LEVEL THREE

Explain to the children that you are going to sort them into two special groups and their job is to try to figure out how you're sorting. Let them know you will draw a large happy face and that as soon as the face is drawn, no one can talk, not even the teacher!

Once the face is drawn, touch a child and motion him or her to follow you to the special place for that group (remember...no talking!)

After you have two or three youngsters in each group, touch a new child, snap your fingers to get everyone's attention, and silently mime that you want the group to point to where they think you'll send that child. Continue this way so your entire group will stay involved *thinking* very hard about how you are sorting.

When you have sorted at least half of your class into the two groups, erase the happy face briefly and ask a few questions to help focus the guessing. Your questions will depend upon how you are sorting but here are some examples:

1. Am I sorting by the kinds of shoes the children are wearing?
2. Am I sorting by the color of their pants?
3. Am I sorting by girls and boys?

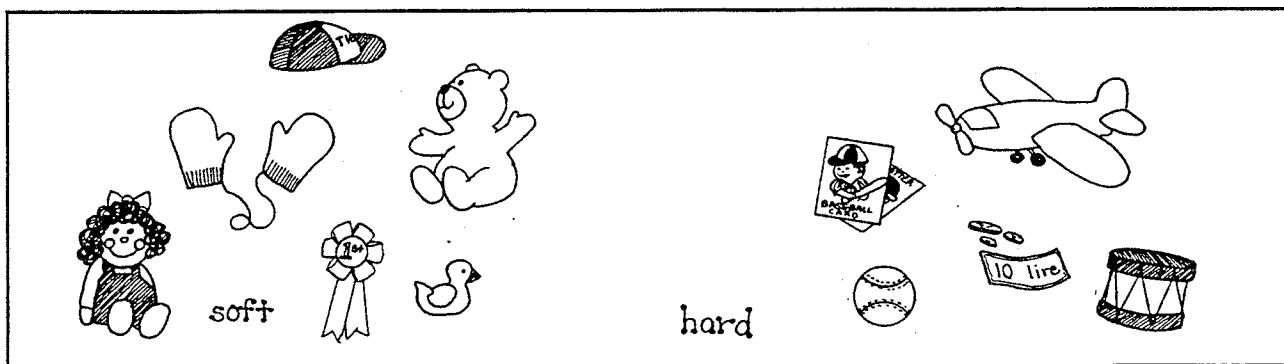
4. Does my sorting have anything to do with their hair?

Kids quickly answer "yes" or "no" and then the happy face is redrawn to keep the momentum. Be sure you have asked a question or two that helps focus on how you are sorting. It is so exciting for children to have a chance to figure it out before the sorting is finished.

When you have finished the sort, or your group is getting too wiggly to continue, once again erase the happy face and ask them if they can guess how you have sorted them. When the categories are known, have the group help verbally label each group with you: "These are the children wearing sweat shirts. Those are the children wearing other kinds of tops."

This activity can be repeated many, many times throughout a school year. Children love to be the leaders too, but it's a good idea to have them tell you beforehand how they will sort the group.

Later in the year, as your children know each other well, you can sort by less obvious





attributes: missing teeth—lots, a few; bus riders/non bus riders, soccer players/non soccer players, Brownies/non Brownies, etc. Don't do this frequently since it is so difficult but children love occasional strenuous mental exercises. Warn them ahead that this day's sorting will be much harder to figure out.

You can apply this activity to things as well as people. Try this extension of sharing sometime: have the children lay their sharing items in the middle of the circle. Draw the happy face. Sort the items into two groups, holding each one up for inspection before you place it. (It is often very helpful if the items being sorted are placed on sheets of dark and light construction paper or looped with a jumprope so the space is clearly defined.) Once

again, after you've gotten two or three items into each pile, motion for the group to point to where they think the next item will go. When you've sorted about half of the items, erase the happy face and ask a few questions: Am I sorting by color? By shape? By how things are used?

Again, draw the happy face and continue the sorting so more children have a chance to figure it out.

When you have finished, ask the children to guess how you sorted and verbally label each group. Because there are so many ways to sort, this procedure can be repeated several times with the same collection of items.

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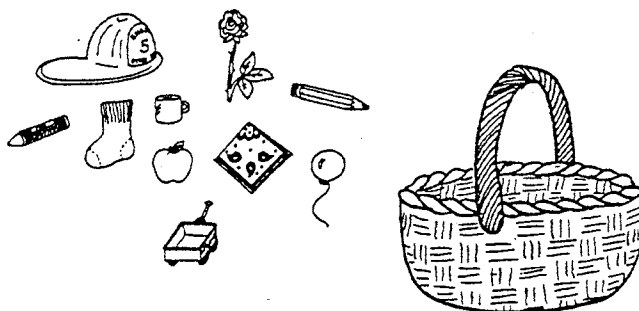
## Sorting "Collections"

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For children to grow in their understandings of a concept, it is important they practice their growing skills in a wide variety of tasks. Dr. Raymond Barsch of Northridge University, Northridge, California speaks of the need for "diversified stimulation and diversified redundancy." We like to think of this as surrounding children with multiple opportunities to explore and understand a big idea and its many parts. So often, you will see children who seem to have a grasp of a particular skill but they are unable to transfer that skill to any other area. Therefore, here are still *more* ways to offer group instruction and practice in sorting.

### **COLLECTION SORTING (WHOLE GROUP)**

You'll need a collection of 15 to 20 everyday common items. Once again the items the class brings for a large group sharing day work well. Another possibility is a basket of red things (or any other single color) which you've collected around your home: an apple, a bandana hanky, a hat, a cup, a red sock, a pen or pencil, a silk rose, a toy fire engine, a radish, etc. As the children sit in a circle around you, take the items out one by one. (Kids love seeing things from *your* house.)



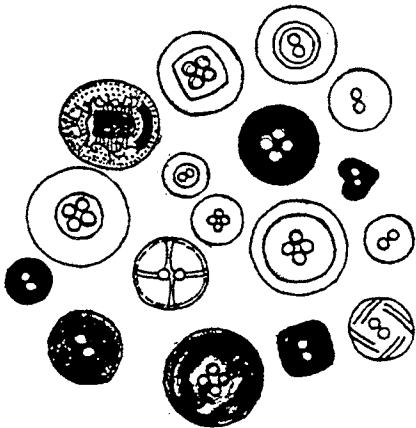
Then ask them to tell you which items could be grouped together. Someone might tell you to sort by shape or size but more than likely they will have you group the toys together, the round things and perhaps the red and white. Push the items back together and ask the kids to help you sort them in a different way. If you do this several different times, you're likely to begin getting opposing category kind of sorting, that is, toys/not toys, red/red and white, round/not round, containers/not containers, and so on.

What you're *not* likely to see in most primary classrooms (unless the structure has already been tightly set by the teacher) is sorting into related categories: shapes (round, rectangular, square, etc.), size (large, medium, and small), function (to play with, to eat, to decorate, etc.).

You can guide them in this direction as the year progresses. Suppose a child suggests you put the washcloth with the envelope because they are both square. Do so and ask if there is anything else that could go in the square pile. When all the squares have been sorted, hold up something that's *not* square. Have the children name the new shape and then find all the things that will fit that pile. Continue with new shapes until everything has been sorted. Have the children name each group: squares, rectangles, ovals, circles, etc. Tell them they've done a wonderful job of sorting by *shape* and push the items back together. Repeat several times sorting by a different attribute each time. Your children will eventually be comfortable sorting even tiny objects into many related categories as well as opposing categories.

As children become proficient at sorting, you'll want to try some sorting with the collections in your junk boxes, for instance, small shells, bottle caps, nuts and bolts, buttons, etc. This activity needs to be modeled well with several children in front of the group before you send them out to work in small teams independently.

**Teacher:** *Let's see if we can sort these buttons. I'll take a small handful out of the box. What can you tell me about them?*



**Children:** *They are different colors.*

**Teacher:** *Anything else?*

**Children:** *Some are big...some are little and some are medium.*

**Children:** *Some have four holes and some have two holes, some even have little things on the back.*

**Children:** *Most of them are plastic but these are metal.*

**Teacher:** *Let's try sorting them. How shall we do it first?*

**Children:** *By colors!*

Work together with your little group to sort the buttons by color as everyone watches. When you're finished have the children help verbally label each pile as you point it out. Push the buttons back together and sort several more times using other attributes the children initially volunteered.

If you think your class understands, tell them they will be working in small groups. Think about whether twos, threes or fours will work best. It may vary according to different children who will be working together to sort other collections from the class junk boxes. Assign teams to classroom areas where junkboxes have been set out and ask them to work together with a *handful* of junk from their own box to begin sorting.



Each time a team sorts their collection, have them raise their hands. When you see their hands up, go to them quickly and ask them to name each pile and tell you how they sorted: "Gray, white, and gray and white shells—we sorted by color." Then they will push their items back together and sort them still a different way, once again raising their hands as soon as they finish the sorting.

It is often helpful to leave a unifix cube with each group for each new way they've sorted. It gets the group to speed up and stay focused on their purpose. Be very careful at the end not to compare numbers of cubes between tables but

rather to celebrate the many ways the class found to sort junk.

Children who understand sorting often like to move after a few minutes to another box and try

sorting it also. This can be done on a given signal so that every team moves at the same time. Many classes will enjoy several opportunities to move.

# GRAPHING

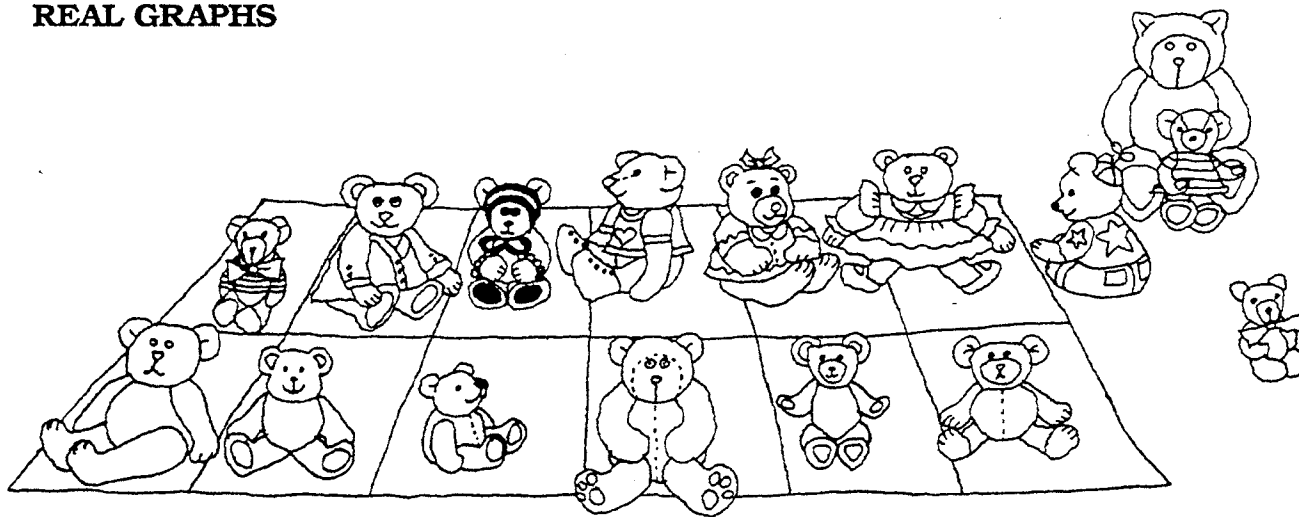
*Graphing is an extension of children's natural interest in comparing and sorting things. Along with counting, graphing is one of the most powerful tools young children have for arranging information and establishing order. It brings them such delight that we've included many graphing experiences in the Seasonal Mathematics portion of this book.*

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## Types of Graphs

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### REAL GRAPHS



Children arrange real objects, such as bears, shoes, toys, mittens, on the floor, or on a graphing mat (see Materials Index). The "mini mat" insures one to one correspondence, but also requires children to extend order beyond the mat.

Here's an example of a real graph lesson:

**Teacher:** Boys and girls, today we are going to graph our snack. Please write your name on the napkin that was given to

you and bring it to the circle as fast as you can.

(Children quickly label their napkins and sit in circle.)

**Teacher:** We have two kinds of crackers today...round and square. When I come around, please choose one off the tray. You'll need to take the one you touch so think very carefully about which you'll choose. Please be very quiet as the tray goes around so each person can make his or her own choice. Let's predict what might happen. Raise your hand if you

*think more people will choose Saltines. Raise your hand if you think more people will choose Ritz. (Let each child choose one cracker from the tray.)*

**Teacher:** Look around! Do you think your prediction was correct? Let's find out. I have the graphing mat to help us organize the crackers. I'll put a round orange circle beside the row for Ritz crackers and a white square beside the Saltine row.

**Teacher:** I'd like the people with black hair who chose a Ritz cracker to bring their napkin and cracker to the graph. Let's put just one napkin in each space on the mat. I'd like anyone else who chose Ritz to add their napkin now.

**Teacher:** Will all the people with brown hair who chose Saltines bring their cracker now...and now everyone else, please.

**Teacher:** Did all the crackers fit on the mat?

**Children:** No, lots went off the end.

**Teacher:** How did you know where to put yours when there wasn't any more room?

**Children:** We could just see they should keep going in a straight line and the Ritz crackers should be across from the others.

**Teacher:** Which row has more?

**Children:** Ritz.

**Teacher:** Why do you suppose that happened?

**Children:** More people like Ritz. Yeah...you can have Saltines any time.

**Teacher:** Which row has fewer?

**Children:** Saltines.

**Teacher:** How many more people picked Ritz than Saltines?

**Children:** Five.

**Teacher:** How do you know?

**Children:** Because we can see extra ones sticking out.

**Teacher:** How many fewer people picked Saltines than Ritz?

**Children:** Five again!

**Teacher:** How do you know?

**Children:** There are empty spaces on the Saltines side.

**Teacher:** How many people put a cracker on our graph?

**Children:** Twenty-five.

**Teacher:** How did you figure it out?

**Child:** Easy! There were ten on the Saltines side and I just kept counting...10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25.

**Teacher:** How did you figure it out, Tera?

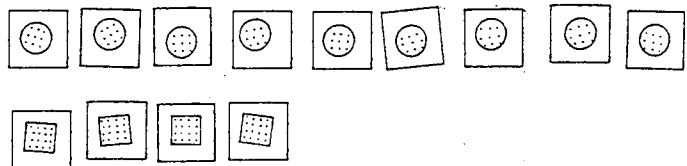
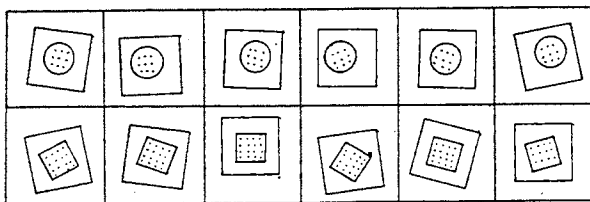
**Tera:** I counted them all.

**Teacher:** How about you, Robby?

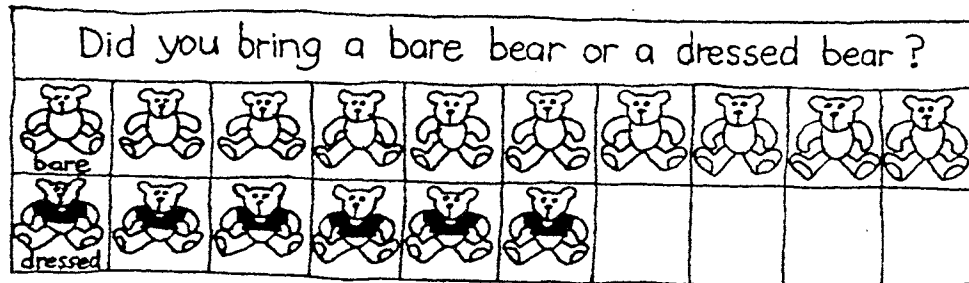
**Robby:** I counted from the fifteen on the Ritz side.

**Teacher:** In a minute, I'd like all the people with buckle and tie shoes to get their cracker. You may sit down in the circle and eat as soon as you get it. Go now.

**Teacher:** Now I'd like everyone with velcro or slip-on shoes to get their cracker. (Keep going till the graph is empty.)



## PICTURE GRAPHS



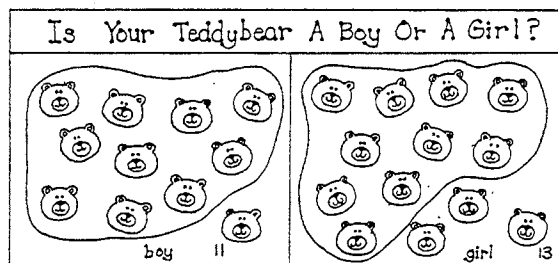
Children draw or cut out pictures to represent real objects. They paste them on paper charts that have been folded or marked to create columns.

Picture graph lessons are conducted very much like real graph lessons. Some teachers post graphs on the board and have children come up, a table at time, to paste on their pictures. Some

teachers like to lay their charts on the floor and have students paste on their pictures. When they finish, they sit down in the circle to wait for others. If you have a large or very wiggly class, it's helpful to have children prepare their pictures, paste them on the graph and return to their desks to do some pre-assigned task. Save the discussion for later.

## SCATTER GRAPHS

Objects or pictures are scattered randomly over a display area that has been divided in half or in thirds instead of being arranged in columns. Children must create order to discuss



the graph. If it's a real graph, they often choose to rearrange the objects, matching them one to one to form columns. If it's a picture graph and

the pictures have been pasted, they are content to count and compare the numbers. If the numbers are large, children can be encouraged to loop the pictures in groups of ten so they are easier to count.

Although most of the graphs in Seasonal Mathematics could be real or picture, we feel it's important, especially for kindergarten teachers, to start the year with real graphs and return to them periodically throughout the year. They set a foundation for other graphing experiences. Most of the graphs could be done in columns but be sure to include some scatter graphing. Children need many opportunities to organize their world.

## Conducting Graphing Lessons

## HOW MANY COLUMNS?

Two, three and four column graphs offer children terrific opportunities to compare quantity. We find these opportunities diminish if our graphs extend beyond four columns. Young children don't seem to make "visual

leaps" effectively enough over more than one or two columns to draw good comparisons. We like to start with two column graphs in September and work up slowly as the year progresses.

## GRAPHING QUESTIONS

Standard questions to ask your class after a graph is complete include:

Which column (or side) has the most?

Which column (or side) has the least?

Are there more \_\_\_\_ or \_\_\_\_?

How many more? How do you know?

How many fewer? How do you know?

How many people participated in our graph?

Why do you think fewer people chose \_\_\_\_?

What do you think would happen if we asked Mrs. Boulland's class to do the same graph?

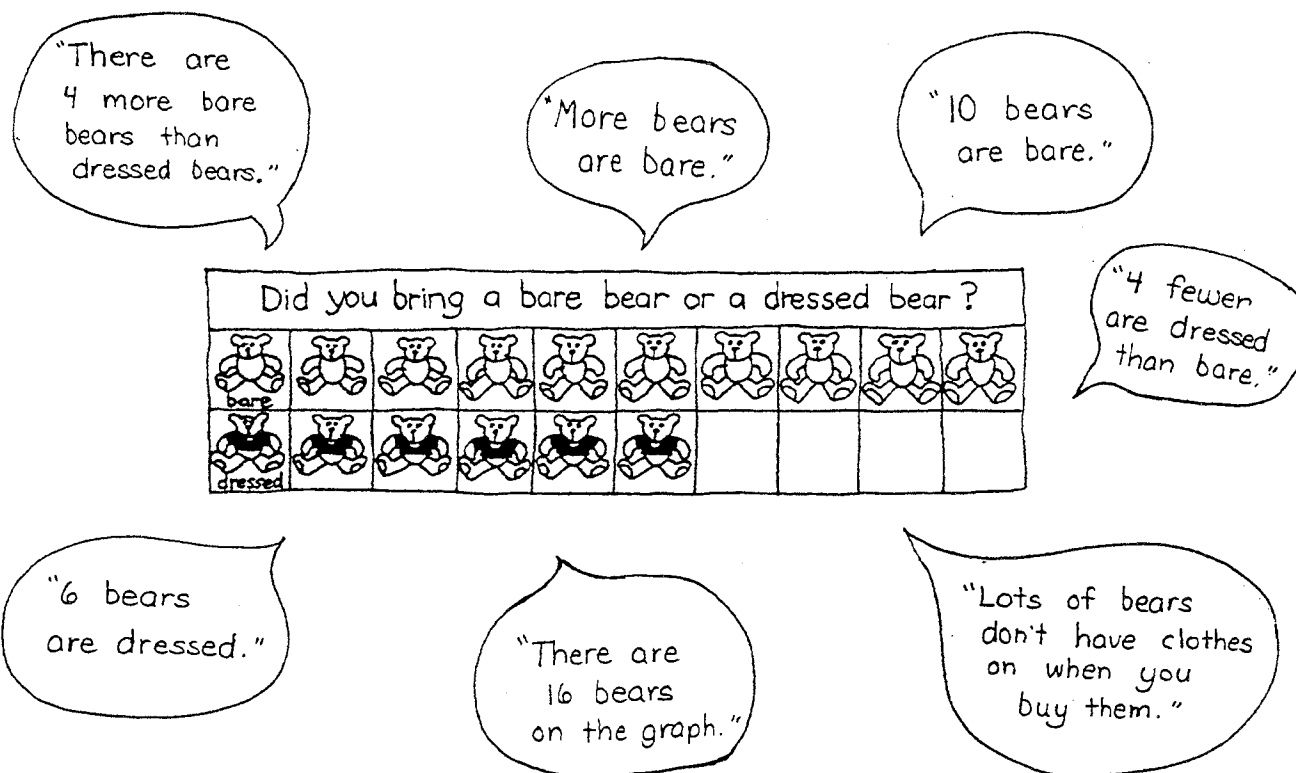
Would adults feel the same way? How could we find out? Let's have that be our homework today...be sure to check with two or more adults.

At some point, we hope you'll want to extend graphing to higher level activities such as the ones suggested below.

## THE TALKING GRAPH

Ask children to tell you as many things as they can about a picture or symbolic graph you've made together. Record their observations on

paper "bubbles" and post them with the graph. This is an excellent display for Open House.



## GRAPHING EQUATIONS

Ask children to help you figure out number sentences about a picture or symbolic graph you've made together. Post their ideas on a chart near the graph.

$$\begin{array}{l} 6 < 8 \\ 8 > 6 \\ 9 > 8 \quad (6+8) > 9 \\ 9 > 6 \\ 9 + 6 + 8 = 23 \\ 9 - 6 = 3 \\ \begin{array}{r} 8 \\ + 6 \\ \hline 14 \end{array} \quad 6 + 3 = 9 \quad \begin{array}{r} 9 \\ + 8 \\ \hline 17 \end{array} \end{array}$$

## CAN YOU ASK ME?

Challenge children to think of questions to ask *you* about a graph they've just created. Many

will find it's much more difficult to *ask* a question than it is to answer one!

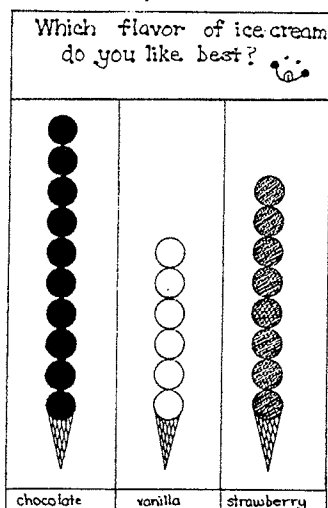
## RE-CREATE A GRAPH

It's fun to have children work in teams to re-create a graph you originally made with different materials. Can they take the information from a picture graph and represent it with unifix cubes, tiles, cut squares, graph paper, chicken rings, etc.? Can they demonstrate their understandings of a real graph

by somehow transferring the information to paper?

This is a great problem solving opportunity. If it tickles your fancy, there's a detailed example in January Seasonal Mathematics (Graphing—Lost Teeth).

## READING AND WRITING EXTENSIONS



Suppose your class has created a graph like this. Here are some written extensions.

1. Which flavor is most popular?
2. Which flavor is least popular? What's your guess as to why?
3. How many more people prefer chocolate than vanilla? Write a number sentence about it.
4. How many fewer people would rather have vanilla than strawberry? Write a number sentence about it.

How Often Do You Sleep With Your Teddy bear?		
	Frank	
	April	Shawn
	Travis	Kelly
Autumn	Katie	Monty
Gretchen	Christopher	Bruce
Tera	Michelle	Robbie
Kara	Tammy	Benito
Matt	Jennifer	Lisa
Danny	Angie	Fletcher
always	sometimes	never
6	9	8

5. Do you think chocolate would be the most popular flavor in any classroom? How could you find out?

List five facts the Ice Cream Graph graph tells you:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Graphing can be so *exciting*! Be sure to include many different experiences during each school year. Second grade teachers—don't forget the newspaper frequently has weather, sports and rain tables and very interesting graphs. Bring some of these in occasionally to explore with your class.



## Chapter 11

# EXTENDED NUMBER PATTERNS

*Children love multiple counting opportunities in their early years of school. Extended number patterns can be very magical and because the children work from the "real pattern" level to the final level of making a record of those experiences, they often have very fond memories of the activity and cherish the final chart or Big Book.*

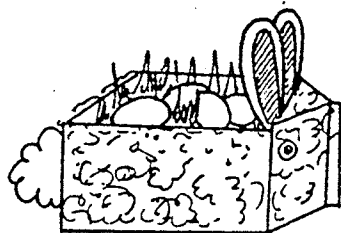
*We've used Easter Boxes in this write-up but you'll find more suggestions in many of the first and second grade Seasonal units. With time you and the children will think of other possibilities.*

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## Easter Bunny Boxes

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### You will need→



bunny Boxes (see April Seasonal Mathematics)

individual chalkboards, chalk and erasers

stand-up number cards (index cards folded in half)

large hundreds matrix (Materials Index)

individual copies of hundreds matrix (see blacklines.)

Have your children bring their bunny boxes, each with beautiful green grass and four gorgeous colored eggs to the circle area.

Distribute chalkboards, chalk and erasers to each child. It's fun to have them pick up needed

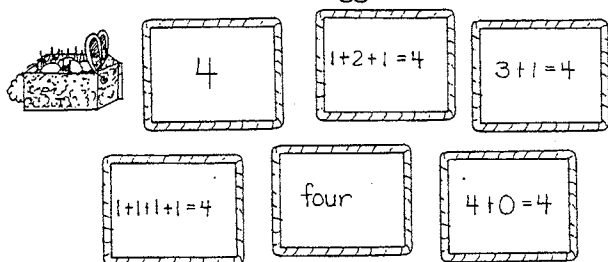
items by calling birthday months. "Will all the people born in the month of May get their boards. Now all the people born in the month of June. How about people born in the month we celebrate Easter this year...which month is that?...and so on until all materials are out. In

this way, you not only keep them from creating a riot as they go for needed supplies, you build in learning once again. In fact, as they become good at the calendar, make those questions harder so they include seasons, presidents' birthdays, the only month with twenty eight days, etc.

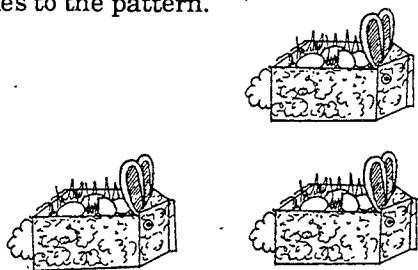
To begin, tell the children you're going to look at patterns of counting by fours today and you want them to explore those patterns in many ways. (It is so important to set the stage by telling them what your lesson goal is so they will know you have learning plans for them.)

Ask one child to begin the pattern by setting his or her box in the middle of the circle.

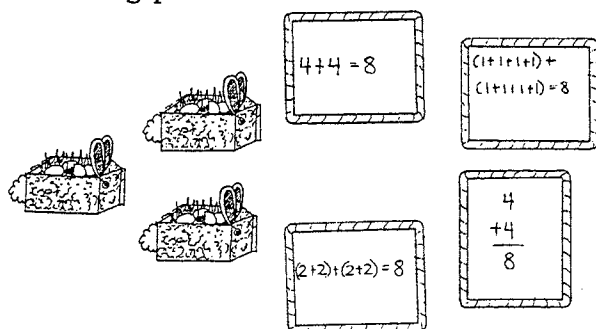
Ask the children if they can write a number sentence for that box of eggs.



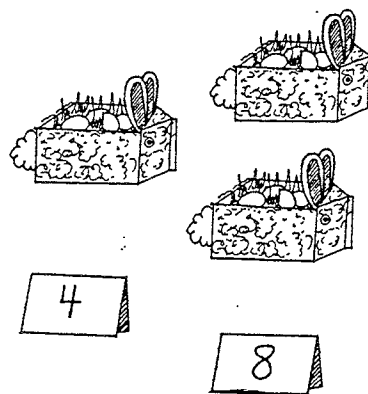
Be sure to congratulate your children on their many different efforts. Have them erase their boards and ask two more children to add their boxes to the pattern.



Remind the children you're looking for patterns of fours and ask them if they can write number sentences for the newest part of the extending pattern.



Once you've explored their efforts, go back and set some stand up number cards beside the boxes to help keep track of the pattern so far.



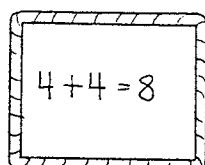
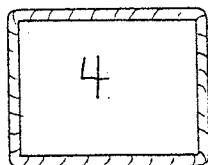
Have the children continue adding boxes, stopping every other turn or so to write number sentences. Be sure to add the stand up number cards as the pattern grows. (Your pacing depends on how wiggly your group is.) Once they get the idea of how this is all working, ask them to project ahead how many eggs there will be when the next boxes are added and to write number sentences for the next step. This step is so important to begin setting a transition level so children puzzle about the growing pattern even before the materials are there. It is often worthwhile to have children briefly close their eyes and think about how many eggs there were when there was only one box, how about when three children had set out boxes?...etc. These are the transition activities that help them begin to make the counting patterns part of their own memory banks.

As the children are writing number sentences, encourage them to help one another. Talk openly about how there are so many ways to learn. We like to ask different individuals to explain how they figured out their answer. Children say things in ways that help others understand quickly. Don't forget the purpose of any of these activities is to teach, not to test—children should feel comfortable making mistakes, asking each other for help and copying one another. We're trying to help children take risks and discover many ways to approach problems, to see that there are many ways to explain mathematical happenings.

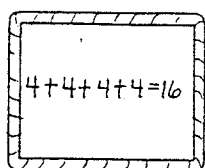
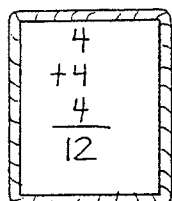
Once all the boxes have been set out (or you don't have enough boxes to complete the next step), review the pattern by quickly telling the story of its growth.

"Joey put out one box and we had \_\_\_ eggs.  
Susan and Emily set out boxes for the second  
part of our pattern and in their two boxes we had  
\_\_\_ eggs."

"Let's look at the pattern this time in addition  
sentences. We began with  $4 + 0$ , then we had  
 $4 + 4$  and we went from there to  $4 + 4 + 4$ ...that  
made 12 and so on." (Ask partners to record the  
different sentences on their chalkboards  
quickly so those can be set by the growing  
pattern.)



etc.



"How about trying it in multiplication  
sentences? I'll write on the chalkboard as we  
figure it out."

baskets		eggs	
1	X	4	= 4
2	X	4	= 8
3	X	4	= 12
4	X	4	= 16

Go to the class matrix and loop the numbers in  
your Easter Box Patterns. See if the children  
can figure out how to extend the pattern to the  
end of the matrix. This is easier if they tell  
stories as they go. It is also more meaningful if  
each child has a ditto copy of the matrix and  
marks as you do. Many will project ahead of

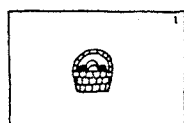
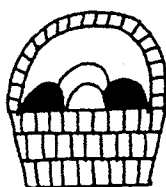
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

you and mark using the class matrix for  
confirmation of their guesses.

"If Jim's sister made a box with four eggs and  
added them to our 28, what number would we  
need to mark next? And Juan's family made a  
box for their grandpa with four eggs?" If they  
can't quickly tell what number comes next,  
count on...33, 34, 35, 36.

## Extended Number Pattern Charts or Big Books

On another day, help the  
children recall the Easter  
Basket pattern. Provide art  
materials for each child to  
make a tiny Easter basket  
or two with four colored  
eggs. When the boxes are  
finished, create a chart to hang in the room or a  
Big Book of Easter Basket patterns for the  
class.



If you plan to make a Big Book, have children  
glue their boxes of eggs on large 12 X 18 sheets.

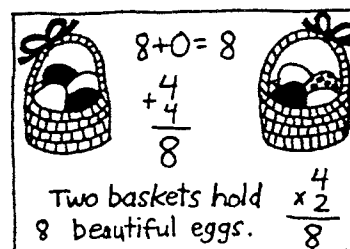
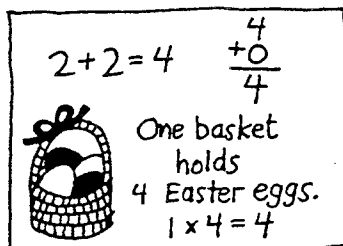
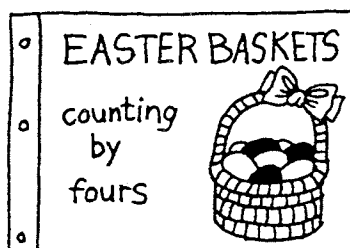
As the sheets are completed, hand them off to  
small groups along with scratch paper. Have  
each group compose a delightful descriptive  
statement about their page and all the possible  
number sentences on the scrap paper. The  
spelling is then edited by an adult before each  
group's secretary writes on the large sheet with  
crayon or felt pen. (It's nice to have scraps of  
white paper and glue sticks available to band-  
aid mistakes.)

You can have a pocket chart or other display  
area in your room that asks two or three

questions each day that will help children reexamine previous experiences. Your questions about this chart or Big Book might be:

1. If the Easter Bunny left 12 baskets, each with four eggs at your house, how many eggs would you have?
2. What number comes just after 72 when you're counting by fours?
3. Can you complete this pattern?

4 8 12 16 20 24



4. What's wrong with this pattern?

16 20 24 29 32 36 40 43 48 52

5. What number comes just before 56 when you're counting by fours?
6. Jim, Dustin, Mario, Andrew and Meagen received twenty Easter eggs. If each of their baskets had four eggs, how many baskets did the bunny leave?

# The Calendar

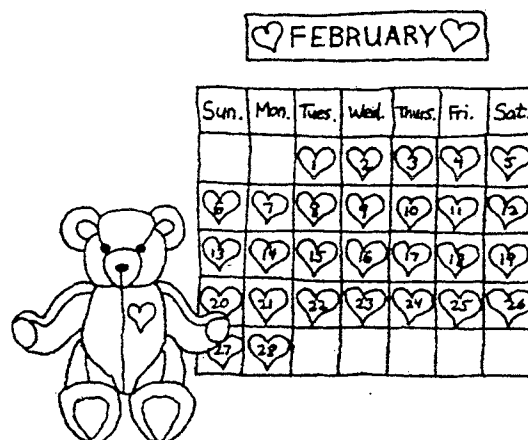
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# THE CALENDAR

*The calendar affords incredible opportunities to teach, reinforce and extend primary math skills. It is exciting to the children and holds their interest day after day. It helps teach the following skills:*

- *counting (ones, fives, tens)*
- *visual and number patterns*
- *names of days and months*
- *the year*
- *time and duration*
- *number combinations (a vast variety)*
- *weather observations*
- *graphing*
- *daily schedule*
- *children's growth and changes*
- *understanding hundreds, tens and ones*



*Your classroom calendar needs to be hung in the largest space available close to your group instructional area.*

*The calendar instruction usually requires ten to twenty minutes per day (depending upon your group). Your instructional emphasis will change somewhat with each month as your group matures and understands the concepts you've been practicing. Even though it is a big job to get all the calendar parts ready, most of it can stay up all year with just a few monthly changes. New things can be added as your group matures and grows in understandings. Teaching the calendar can be loads of fun—we hope you'll enjoy it as much as your children do.*

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## Component: Numberline Strip

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### HOW MANY DAYS HAVE WE BEEN IN SCHOOL?

#### Skills Taught

Numeral recognition

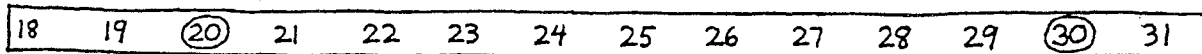
Counting by ones, twos, fives, and tens

Counting on

Counting backwards

Duration (How long is a week? How long is a month? How long is a school year?)

Time line of special events



#### Instructional Ideas

Record a number on the strip for each day of the year you're in school. All the numbers except tens are written in black. The tens should be written in red and circled. You may also wish to note the fives in between by drawing a triangle around them. Some teachers also draw a line under the twos.

**Teacher:** How many days have we been in school so far this year?

**Children:** 32!

**Teacher:** How do I write 32?

**Children:** Three for the thirty and two for the ones.

**Teacher:** Let's count up to 32 starting at 20.

**Children:** 20, 21, 22, 23, 24, 25, etc.

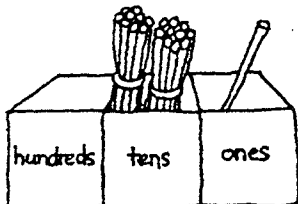
**Teacher:** Let's start at the beginning and count to 32 by tens and ones. Ready?

**Children:** 10, 20, 30, 31, 32...

(Have your kids clap on 31 and 32 so they notice they are changing counting patterns from tens to ones, a critical skill in counting money.)

### THE NUMBERLINE STRAW BOXES

Children seem to understand the numberline numbers better when strawboxes are posted nearby.



A straw is placed in the appropriate box for each day of school recorded on the numberline. Each

time the tenth straw is placed in the ones box, the ten straws are rubber banded together and moved to the tens box. When ten groups of ten are reached, they are banded together and moved to the hundreds box. What a celebration that is!

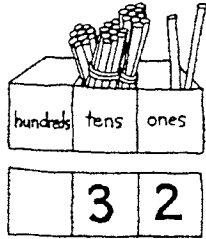
#### Making Instructions

Cut down three half gallon milk cartons and staple them together side by side. Spray paint or cover with contact paper and use a permanent marking pen to label them hundreds, tens and ones.



## THE NUMBERLINE RECORD

Many teachers like their children to count the straws each day and record the appropriate numeral under the straw box as well as on the Numberline.



**Teacher:** Let's find out how many straws are in our straw box from yesterday. How will we need to start counting?

**Children:** By tens!

**Teacher:** Good for you. Let's count the tens.

**Children:** Ten, twenty, thirty!

**Teacher:** We have one more straw in this ones box. Do we count that by tens?

**Children:** No! That's not ten straws. You just say thirty-one!

**Teacher:** You really figured that out!

Whisper to a friend how many we'll have when we add today's straw.

(Children whisper.)

**Teacher:** Does anyone want to tell your guess?

**Children:** We think there will be thirty-two 'cause when you count, it goes thirty, thirty-one, thirty-two...

**Teacher:** Let's put in today's straw and count.

**Children:** Ten, twenty, thirty...

**Teacher:** Don't forget, we have to change counting patterns!

**Children:** Thirty-one, thirty-two!

**Teacher:** Great! Now let's figure out how many bundles of ten we have.

**Children:** Three, there are three.

**Teacher:** I'll write a three under the tens box on our record card. How many ones do we have?

**Children:** Two, there are two straws in that box. You need to write a two.

**Teacher:** That's correct. I'll write a two under the ones box. How do we read this number?

**Children:** Thirty-two...it means three tens and two straws in the ones box!

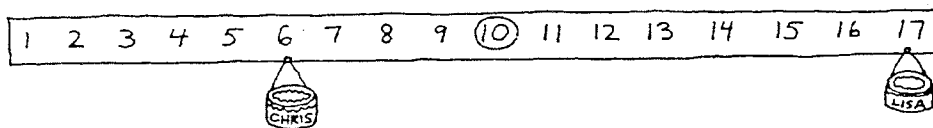
### Making Instructions

Use colored paper and construction paper to create a three part card to fit directly under your straw box. Be sure to laminate this card so you can write on it with any wipe-off pen.

## THE NUMBERLINE AS A TIMELINE

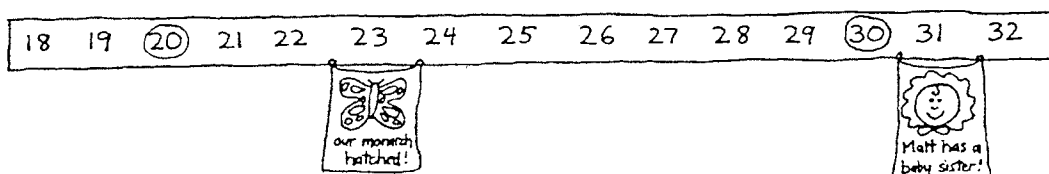
Many teachers like to make the numberline into a timeline of special class events. It's a wonderful way to set foundations for understanding historical timelines. Some possibilities for the timeline include:

1. Hang a small birthday cake with the child's name under the appropriate number to remember birthday celebrations.

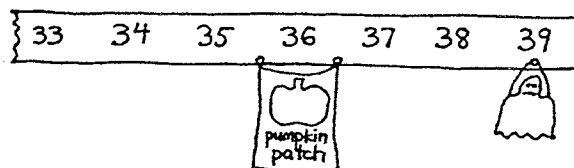


2. Have a child make a special picture to note very important class events such as the day the Monarch butterfly emerged from the chrysalis

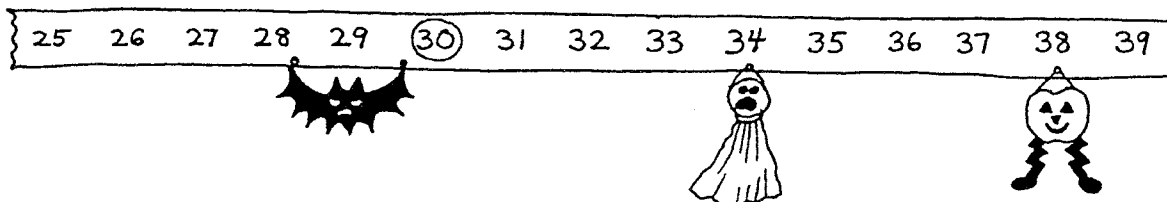
or the day someone announced a new baby brother or sister, etc. Once again, hang these under the appropriate numbers.



3. Have a child make a symbol for each special holiday to hang under the appropriate day's number.



4. Nancy Goldsmith of San Jose asks her kindergartners if someone would volunteer



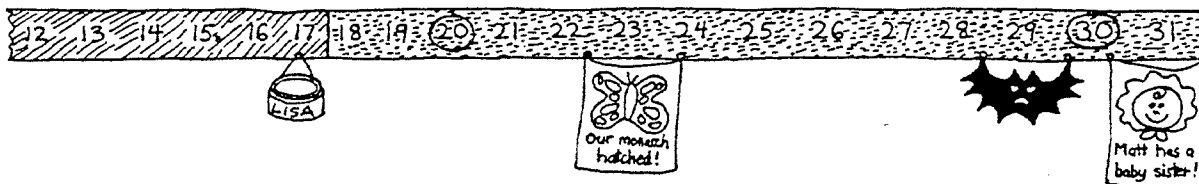
Note: Since you'll probably be moving your monthly sections of the numberline to another place, glue, staple or tie the timeline items to the numberline each time so it will be easier to move.

### Making Instructions

Make ten strips, 4" wide by 6-1/2" long, in ten different colors, one for each month. In September, post the first strip

a completed art project each week to place under the day the class worked on that project. Those samples are placed under the appropriate number for the day on which they were constructed. Nancy says it generates such happy memories as the class looks back. She asks questions such as: Which day did we make the flying bats? What did we make on the 34th day of school? How many days after that did we make the pumpkin puppets?

above your calendar board. Record a number for each day of school. When the month is over, post the strip somewhere else and put up the October strip. Continue the sequence of numbers until October is over, then post the October strip beside the September strip. You'll end up with a long multi-colored strip at the end of the year.



## Component: Birthday Train

### Skills Taught

Counting

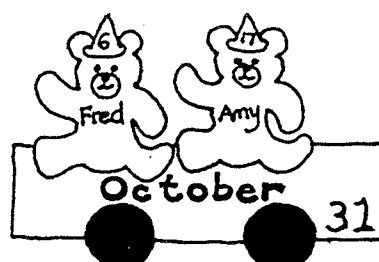
Comparing

Month Names

Number of days in each month

### Instructional Ideas

As a month is completed, and before the pattern grid is emptied, it is nice to notice how many



days the month had and to write that number on the appropriate train car for the month. As the

school year progresses, children are able to see how many days each month had.

For counting, have the children count how many birthdays are in the current month.

For comparing, ask them to find a month that has fewer birthdays than October or the months with one more birthday. You can also determine whether more boys or more girls have their birthday in any given month.

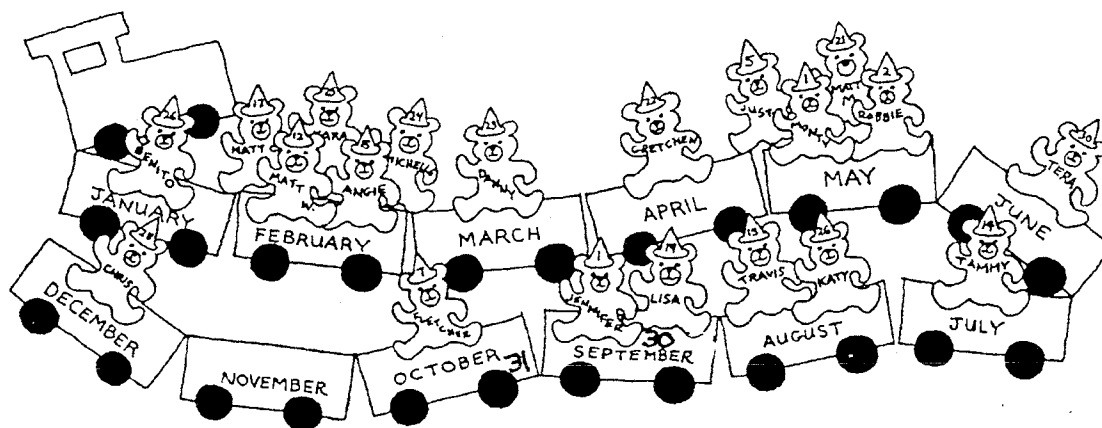
The birthday train is a great way for children to learn the names of their months. It's also a good

way to help them know which month came just before December, just after March, etc.

Use the birthday train to discuss and reinforce ordinal numbers with your class. What is the fifth month? Or, what month is August? This questioning strategy is an easy way to work this math concept into your calendar time.

### Making Instructions

Locate the Calendar Patterns in the blacklines. You'll need the birthday train engine and cars (cut at dashed lines on engine pattern for the cars) and the birthday bears. Each set of patterns has specific construction details.



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## Component: Tooth Beary

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### Skills Taught

Counting

Honoring children's growth and change

Gathering information over a long period of time

Graphing

(See Changes in January Seasonal Math)



### Instructional Ideas

Did anyone lose a tooth yesterday? Come and show us which tooth is gone. Did the tooth fairy come? Let's write your name on one of our paper teeth and add it to this month's Tooth Beary bag.

How many teeth have been lost so far this month? Are there any Tooth Beary Bags already completed

that have an equal number of lost teeth? Are there any with less?

Note: The Tooth Beary stays up on your calendar all year. You'll change her bag each month and move the previous month's tooth bag to a nearby wall. By the end of the year, you'll have ten bags of teeth, a complete record of lost teeth for the year.

## Making Instructions

Locate the Calendar Patterns in the blacklines section. You will need the large bear pattern. We like to make our Tooth Beary from a shade of brown that is different than our Day Bears so each activity seems very special. Each set of

patterns has construction details included. These are a lot of work but they stay up all year and add a magic touch to your classroom. Children are so proud of lost teeth at this age, it's a natural to use as a mathematical experience.

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## Component: Weather Graph

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### Skills Taught

Weather observation

Counting







Comparing

Graphing

Gathering information over a long period of time.

### Instructional Ideas

Have a weatherperson mark the weather each day by slipping a unifix cube over a pin in each column appropriate to the weather of the day. (A day might be overcast, rainy and windy.)

Weather Report					
•	•	•	•	•	•
•	•	•	•	•	•
•	•	•	•	•	•
☐	•	•	•	•	•
☐	•	•	•	•	•
☐	•	•	•	•	•
☐	•	•	•	•	•
☐	☐	•	•	•	•
☐	☐	☐	•	•	•
☐	☐	☐	•	•	•
☐	☐	☐	☐	•	•
 sunny	 rainy	 cloudy	 windy	 foggy	 snowy

Have your class help you select a color to represent each weather condition and make a key so the same colors will always be used. (Perhaps they will choose yellow for sunny,

black for rainy, white for snow, etc.) Cubes can be kept in clear plastic tumblers below each column.

At the end of the month, remove all the cubes and snap together by color groups. Compare the stacks of cubes. Which kind of weather was most prevalent? Which least? Were there more rainy days or more sunny days? See the graphing chapter for more questions and extensions. You'll also run into extending ideas in the Seasonal Mathematics section.

### Making Instructions

You'll need a piece of white poster board 21" by 28". Mark off the 21" side into six columns each 3 1/2" wide using a fine tip marking pen. Mark a line across the chart, 4" from the bottom. Draw a picture in each resulting box and label with weather conditions appropriate to your geographical area. Draw the rest of the horizontal lines 1" apart to the top of the chart. Post the chart on a pinning board. In each section, hammer straight pins for the unifix cubes to fit over as weather is recorded each day.

# Component: Pattern Grid

## Skills Taught

- Counting
- Numeral recognition
- Names of the days
- Visual patterns
- Number patterns
- Prediction

## Instructional Ideas

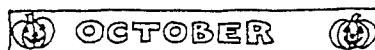
The pattern grid provides one of the most elegant transitions from visual patterns to number patterns you're likely to see in a primary classroom, but you have to guide the discussion in that direction consistently.

Midway through the month, after the pattern sequence is clear to everyone, you might ask if anyone sees any other patterns forming on the grid.



Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	

In October, children are likely to notice the pumpkins and ghosts are running in diagonal lines and the vertical pattern for Thursday is "pumpkin, pumpkin, ghost." They might speculate that Sunday and Wednesday have the same vertical pattern and perhaps Monday and Thursday do too.



Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
			1	2	3	4
5	6	7	8	9	10	11
12	13					

You can push their understanding of pattern along by asking them to use it as a predicting tool.

**Teacher:** Halloween comes on October thirty-first. Any ideas on whether it will be a pumpkin or a ghost?

**Children:** Pumpkin, pumpkin, it's going to be a pumpkin. No, a ghost!

**Teacher:** Raise your hand if you think it will be a ghost.

**Teacher:** OK. Raise your hand if you're pretty sure it will be a pumpkin.

**Teacher:** Sherry, why do you think it will be a pumpkin?

**Sherry:** I just said the pattern and that's how it turned out.

**Teacher:** Let's try that and see what happens. Let's see...today is a ghost, the 15th. What comes next?

**Children:** Pumpkin!

**Teacher:** And then?

**Children:** Pumpkin, ghost, pumpkin, pumpkin, ghost... (They keep chanting as you point to each square on the grid.)

**Teacher:** It should turn out to be a pumpkin.

Let's look at our calendar pieces and see if that's what it really is. Here it is... you're absolutely right!

**Teacher:** Did anyone have a different way of figuring out what it was going to be besides saying the pattern?

**Randy:** Well, every third one had a ghost and 31 wasn't a third one! It had to be a pumpkin!

**Teacher:** Let's check Randy's idea. We'll count by threes and see if we land on a ghost each time. Ready? I'll point to the shapes and you say the number each time. Ready?

**Children:** 3, 6, 9, 12, 15, 18...they are all ghosts!

And so it goes. They probably won't start picking out number patterns until spring unless you have an unusually bright class but stick with it. At the end of every month it's nice to ask the class what multiple they'd like to examine—twos, threes, fours, fives, sixes? Once they have chosen the multiple, take off all the shapes except the number they have chosen. For instance, they've chosen fours.

♥♥ FEBRUARY ♥♥						
Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
		.	.	.	♥	.
.	.	8 ♥	.	.	.	♥
.	.	.	16 ♥	.	.	.
20 ♥	.	.	.	24 ♥	.	.
.	♥					



**Teacher:** OK. Fours. Help me out. What's the first shape we want to leave up?

**Children:** Four, the red heart!

**Teacher:** Here we go. One off, two off, three off, four stay! Which number will be next to stay?

**Children:** Eight, the pink heart?

**Teacher:** Let's check it. Off, off, off, stay. Yes, an eight. What will be next?

**Children:** Twelve! Yes, twelve!

Proceed until only the fours are left up. Discuss the pattern that has magically emerged. The children will have lots of observations. Later in the year in second grade, you might want to use this activity to generate a multiplication counting pattern.

## Making Instructions

**The Grid:** You can buy a commercially prepared blank calendar grid or make your own. If your bulletin board affords the space,

it's nice to have a grid that has 4" or 5" squares so that children can create the pattern markers each month. They are *overjoyed* when they come in on the first day of each month and find their new calendar markers ready to go. It gives them so much investment in the calendar and makes your room look so magically childlike.

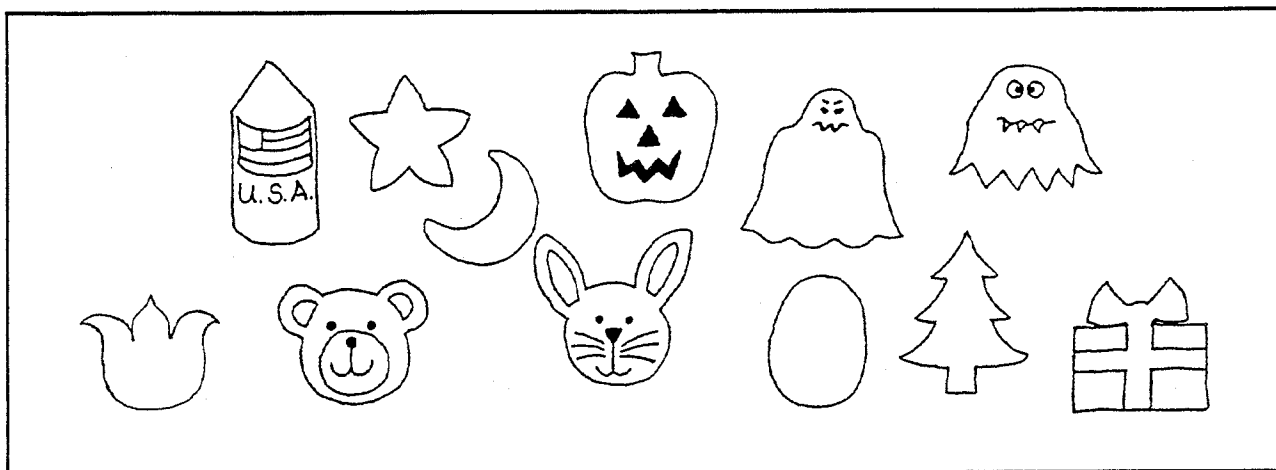
**The Markers:** Teachers usually do the September markers themselves so the calendar will be ready when the children arrive and so they get a chance to see what the markers are used for. We have included a bear pattern in the Calendar blacklines to help you get started with a beary cute September.

As October nears, it's exciting to let the children make the new markers as a special art project. We like to plan with the children things they think would be nice for the new calendar and then we premake simple samples of the possibilities and hang them. We provide cut paper from which the children choose appropriate colors for the marker each will want to make. If your class is small, ask several children to make more than one. Encourage the children to carry their marker to the calendar grid as they begin cutting to be sure it will be large enough for everyone to see but small enough to fit the grid (spatial math).

Once the markers are completed (perhaps the next day), lay them out with the class and sort them by kind. Problem solve together what kind of a pattern can be constructed with the available pieces. Try out the different ideas until you find one that will work. (Often you'll need to ask for a couple volunteers to make a few missing pieces. If there are extras of one kind or another, use them to decorate other areas).

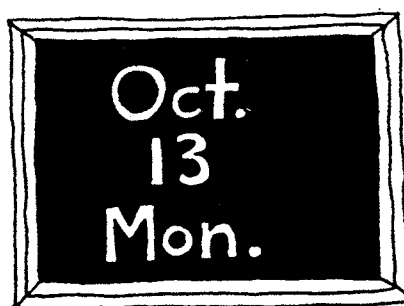
Once the pattern has been determined, take your black marking pen and have the children tell you which number to write on each piece of the pattern. The calendar pieces are now ready to be hung when the new month begins.

Some of the pattern pieces that have been popular in our classes are sketched below to give you ideas.



## THE CHALKBOARD DATE

Many teachers find it very helpful to their children to write the day, date and month on a student chalkboard after the Pattern Grid is completed each day. It is a good way to look at abbreviations and to even show the shortest notation and give it meaning by counting the birthday train cars (10/13/87) so children can see the relationships of each of those numbers.



### Making Instructions

Pin a student chalkboard into your calendar area. Keep chalk and an eraser nearby.

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## Component: Day Bears

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*First grade teachers will want to focus on the Day Bears and teach the described lesson for several months. After that, a calendar helper can change the bears' shirts and dates each day without class participation. Second grade teachers may focus on the bears during the first month of school and then turn it over to the calendar helper. Even though they are not a primary focus, they are so cheery in the room as their hats change each month.*

### Skills Taught

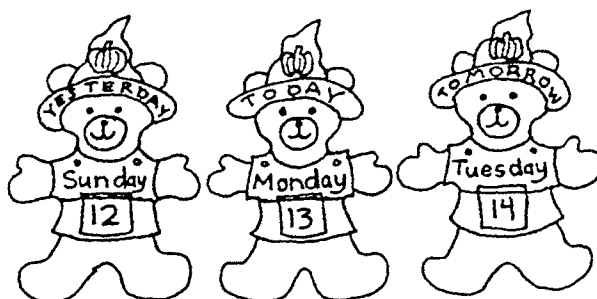
Names of days

Concepts of yesterday, today and tomorrow

Prediction

Counting

Numeral recognition to 31



### Instructional Ideas

**Teacher:** When we said the days of the week we decided today was...

**Children:** Wednesday!

**Teacher:** But what shirt is the Today Bear wearing?

**Children:** Tuesday...

**Teacher:** Oh, oh, how can we fix it?

**Children:** Change his shirt. Put on his Wednesday shirt.

**Teacher:** Jennifer, would you come and change his shirt. What should Jennifer do with the Tuesday shirt? Where does it belong?

**Children:** On our Yesterday Bear.

**Teacher:** And what about the Tomorrow Bear. Poor thing must be freezing with no shirt on.

**Children:** He needs the Thursday shirt.

**Teacher:** OK. But the Thursday shirt doesn't have a number. What number should Jennifer put on the Tomorrow Bear's new shirt?

**Children:** Let's see...12, 13, 14. Put a 14 on his shirt.

### Making Instructions

Locate the Calendar section of the blacklines for the patterns to construct and dress the bears.

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## Component: Tally Pad

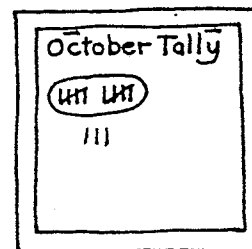
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### Skills Taught

Counting by ones, fives and tens

Tallying

Exploring addition combinations: (12 is  $5 + 5 + 2$ , or  $10 + 2$ , or  $4 + 1 + 4 + 1 + 2$ )



### Instructional Ideas

**Teacher:** How many days have gone by so far in October?

**Children:** Thirteen.

**Teacher:** How can I fix our tally so it has thirteen marks?

**Children:** Add one mark.

**Teacher:** Will it be a straight or diagonal mark?

**Children:** Umm...straight,

**Teacher:** Why?

**Children:** Because you only have three marks now in the new group. You need five before you make a diagonal mark.

The tally sheet can also be used to introduce the language of multiplication, even in first grade.

**Teacher:** Today's the fifteenth. How many marks do I need to add to the tally sheet?

**Children:** One.

**Teacher:** How many groups or sets of five do we have now?

**Children:** Three fives.

**Teacher:** I'm going to write a multiplication sentence showing what we have on our tally pad. (Write  $3 \times 5$ .) Three fives, three sets of five...three times five is...?

**Children:** Fifteen!

**Teacher:** Let's count to be sure.

**Children:** Five, ten, fifteen!

**Teacher:** Let's read our multiplication sentence together.

**Children:** Three fives make fifteen. Three sets of five make fifteen. Three times five equals fifteen.

### Making Instructions

Cut ten pieces of 8 X 8 newsprint. Write the name of one month at the top of each sheet from September through June. Staple the sheets to a piece of 9 X 9 poster board.



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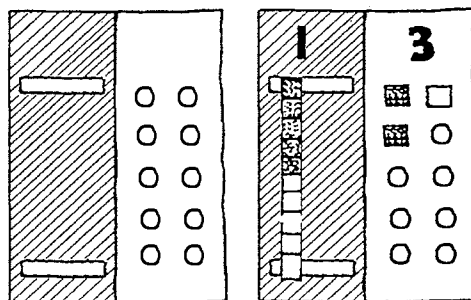
## Component: The Date in Tens and Ones

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*Kindergarten teachers may want to save this until spring. First grade teachers may wish to postpone beginning this until November. Second grade teachers may only focus on this lesson until February and increase the students' attention by representing the date in money as well as Incredible Equations. If there are children who need lots of continuing work in tens and ones, choose them to be the calendar helpers to change the date in tens and ones so it will be correct after the group has completed the other parts of the calendar.*

### Skills Taught

- Counting by ones, fives and tens
- Numeral recognition
- Understanding tens and ones
- Teaching even and odd numbers
- Teaching addition strategies of tens and ones, doubles and neighbors



### Instructional Ideas

**Teacher:** *Today is the thirteenth. How many cubes should I add under the place value board?*

**Children:** *One more.*

**Teacher:** *What number should I write on the lavender side?*

**Children:** *One!*

**Teacher:** *Why?*

**Children:** *Because there is one ten.*

**Teacher:** *What number needs to go on the white side?*

**Children:** *Three?*

**Teacher:** *Why?*

**Children:** *There are three cubes on that side.*

**Teacher:** *What do we call the number I've written on the place value board?*

**Children:** *Thirteen!*

**Teacher:** *Let's check to see if we really have thirteen cubes up here. Help me count by starting with the stack of ten. Ready?*

**Children:** *10, 11, 12, 13!*

You can also use the unifix cubes to introduce and reinforce the ideas of even and odd, doubles and neighbors. Children understand that 13 is an odd number because one of the cubes doesn't have a partner, only an empty dot across from it. Fourteen is an even number because all the cubes have partners. Thirteen is the sum of two neighbor numbers—seven blacks and six whites:  $6 + 7 = 13$ ; fourteen is a double, the sum of seven blacks and seven whites (twin numbers),  $7 + 7 = 14$ .

### Making Instructions

Use a piece of white cardstock 9" X 12" and glue a 4 1/2" X 12" piece of lavender construction paper to the left side of the cardstock. Laminate. Center 4" strips of self-adhesive velcro on the lavender side of the board (one strip 4" down from the top and one strip 2" up from the bottom, as shown above). Place ten 1" dots of self-adhesive velcro evenly spaced on the white side (see above). Attach appropriate self-adhesive velcro dots to the back of unifix cubes (sixteen of each of two colors). Record with a vis a vis pen on the top of the card as you build and trade each day.

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## Component: Even/Odd—Another Way

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### IS TODAY AN EVEN NUMBER OR AN ODD NUMBER?

#### Skills Taught

Numeral recognition  
Counting by twos  
Even and odd numbers

Odd or Even ?															
1	3	5	7	9	11	13									
☐	☐	☐	☐	☐	☐	☐	•	•	•	•	•	•	•	•	•
☐	☐	☐	☐	☐	☐	•	•	•	•	•	•	•	•	•	•
2	4	6	8	10	12										

#### Instructional Ideas

Hang a unifix cube for each passing day of the month (including weekends) and write the appropriate numeral above or below.

Add a new cube daily and examine the lines of cubes to decide whether they're in pairs or single. Help children see the partnered cubes generate a by-twos pattern (even numbers) and sets of cubes ending in an unpaired cube represent odd numbers. Ask children to help you count by twos and ones to record the appropriate numeral.

#### Making Instructions

Cut a piece of unlined tagboard 6" X 18" inches. Measure off two rows of pin dots at one inch intervals (16 per row) and laminate. Push sturdy straight pins into each dot at an upward slant to hold unifix cubes. Keep a vis a vis pen nearby for writing the numerals each day. At the end of each month the numerals can be cleaned off with a damp cloth. Or make with two strips of self-adhesive velcro on the laminated tagboard. Attach self-adhesive velcro to the unifix cubes as well.

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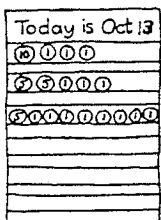
## Component: Money Pockets

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#### Skills Taught

Coin names  
Coin worth  
Counting small sums of money  
Problem solving

#### Instructional Ideas



**Teacher:** Today is the thirteenth day of October. Does anyone have an idea for a way to make 13¢ for our top pocket?

**Children:** That's easy. We can put in one dime and three pennies.

**Teacher:** Let's count it together as I put in the money and see if that works.

**Children:** 10, 11, 12, 13!

**Teacher:** Good! You remembered to change counting patterns when we

got to the pennies. Does anyone know another way?

**Children:** We could do 13 pennies!

**Teacher:** You really love seeing all those pennies in the pocket. OK, help me count them.

**Children:** 1, 2, 3, 4, 5, etc.

**Teacher:** Any other way?

**Children:** Yep! Two nickels and three pennies!

And so it goes as each of the pockets is filled. Be sure to try out even wrong suggestions. Children

learn lots when they try out things that don't work. The group helps fix any errors.

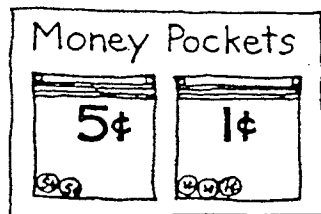
### **Making Instructions**

You'll need a box of real money handy to count into these pockets each day. If you have a very large class, be sure they are close enough to really see. (If having real money in your classroom seems too risky to you, cut colored paper coins and label with appropriate numbers and the cent sign.)

To make the pocket board, cut a piece of poster board 10" X 16" and six pieces of clear acetate 3/4" X 10". Label the top of your board "Today is \_\_\_\_." Laminate. Tape the acetate strips of the board in rows leaving an inch or so between each row. (Or purchase ready-made chart from MLC.)

### **MONEY POCKETS (other versions)**

You may want to focus your children on a particular pair of coins for a month or so at a time in addition to using the money pocket above. (Don't leave it out because those children who only think of money as counting each coin one by one will need to see the thirteen pennies set out in a pocket in addition to the step below.)



**Teacher:** *Let's think about today's date again. It is the thirteenth. Let's look at our ziplock bags so we can practice counting our nickels and*

*pennies again. How could we set up the thirteenth in just nickels and pennies?*

**Children:** *Let's try two nickels!*

**Teacher:** *How many pennies is a nickel worth?*

**Children:** *Five.*

**Teacher:** *Good. How could we find out if two nickels will be thirteen?*

**Children:** *Do you still have all those pennies in your box?*

**Teacher:** *Yes, there are quite a few of them here.*

**Children:** *Let's put our nickels in a row and then put five pennies under each one.*

**Teacher:** *That way we could count all the pennies to find out if two nickels make today's date.*

And so it goes, problem solving with the class finding ways to figure out how many nickels and how many pennies the bags will need to make the thirteen for the day's date. Your bags could also be dimes and pennies at another time if your children need practice building the date in dimes and pennies.

Note: You may want to leave the coins in the pockets at the end of the day and merely build and trade from the prior day's total.

These are particularly valuable activities to focus children on changing counting patterns for different coins.

### **Making Instructions**

Staple two sturdy ziplock bags onto your pinning area. Label them and keep a box of appropriate money nearby.

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## **Component: Incredible Equations**

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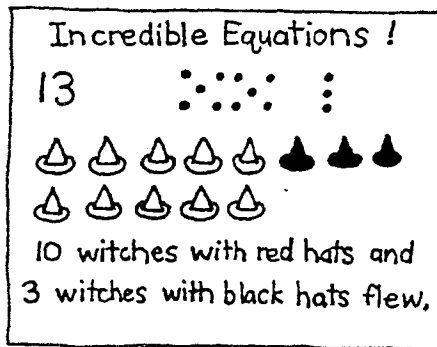
### **Skills Taught**

Problem solving

Equations

Inventing and reading story problems

## Instructional Ideas



Ask the children to tell you anything they know about the number that represents today's date. You'll get a combination of words and numbers in response. Children may give you word problems or facts about the number. They may look at the tally, the calendar pattern grid, the

place value card, or the money pockets to create the number sentences or they may dream up their equations in an abstract manner.

The Incredible Equations time is a very exciting time for the children once they get the idea. Trust the struggles in the beginning as worth the effort, you'll be happy you stuck it out! If a child gives you an incorrect number sentence, go ahead and write it on your chalkboard and have the children help you fix it.

## Making Instructions

Use large sheets of paper taped to the chalkboard for recording the equations. Let the youngsters take turns taking these home through the year; it's great public relations!

## Component: Whose Turn?

Once your children are gaining confidence with the calendar, it is very exciting to have them become Calendar Teachers or Calendar Helpers (depending upon their maturity.) You'll need a fair way to select those helpers. If your children have cubbies, number each cubby. If they have assigned seats, have their name tags numbered. If they have special coat hooks, number those. (Each child keeps the same number, no matter how many things you can find to number.)

Make up a grid, it could be 3 X 9, 3 X 10, or 3 X 11 depending upon the number of children in your class. (Future grids could be different, 4 X 7 or 5 X 5, for example.)

Number the grid with as many numbers as children in your group. Decide which pattern you'd like to explore first, for instance, even numbers. Once all the even numbers have been colored, go back and color the odd numbers in a different color. On another occasion, you might choose to do fives. Once all the fives have

Whose Turn?			
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

been colored, you might go back and color two, skip three (including the fives) until you finish coloring the entire grid. The possibilities are endless and the children may enjoy suggesting various ideas if you repeat this all year.

The appropriate number in your pattern is colored and that child becomes the Calendar Teacher for the day. It is fun for children to anticipate when their number will come up.

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## Component: The Daily Schedule

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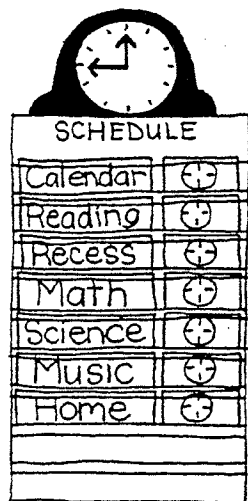
### Skills Taught

Reading

Time and sequence

Planning

### Instructional Ideas



As your day begins it is often very reassuring to point out the daily schedule so children know what to anticipate and begin to get some feeling for the passing of various amounts of time. It seems to make best sense to start this activity by just showing the activity sequence without clocks for the first month or so. Once the children are comfortable with that format, it is a good place to help children become aware of time.

Questions to help children become aware of the daily sequence of events could include:

1. What will we be doing first this morning?
2. What happens right before lunch?
3. What are the second and third things planned for the morning?
4. What is the final activity for this day?

Questions to help your children relate the daily schedule to time could include:

1. Who knows what time we'll go to P.E. today?
2. What will our class be doing at 10:45?
3. How much time have we saved for science today?
4. What is the second thing that will happen after lunch today?

If you work on a flexible schedule, you may wish to have a child draw the hands on a blank clock face when you begin a new activity. They would look at the wall clock, set the hands on a

class teaching clock to look the same as the wall clock and then guide the helper to draw it on the blank clock. As you are introducing the addition of time to your daily schedule take some time to teach the children things about the clock, the fact that the minutes can be counted by ones or fives—practice it; the fact that that clock hands go clockwise, the fact that the hour hand is shorter, etc.

As you focus on the daily schedule, take time occasionally to do some teaching of telling time. Include the children's chalkboards so they are responding by drawing clocks and sketching in the hands in response to your lessons (it gives you instant assessment and keeps them focused). Be sure to focus often on digital time, the clock hands then make better sense to many children. Telling time with confidence and accuracy requires many years of practice. These lessons help children develop an awareness of time.

### Making Instructions

You will need: one 18 X 35 piece of tag, fourteen 1 1/2 by 18 strips of acetate, or fourteen 1 1/2 by 7, plus fourteen 1 1/2 X 11 strips taped together, sixteen 2 X 7 tag strips (time), twenty 2 X 10 tag strips (activities), clear tape, felt tip pen.

Mark off your 18 x 35 piece of tag with lines spaced at 2 1/2" intervals. Tape your acetate strips (on the bottom) to each line. Once all your strips are taped in place, tape the sides of your tagboard to hold the strips on the sides.

Create time cards and activity cards appropriate to your classroom.

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## Component: Fantastic Fractions

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### Skills Taught

Inventing and recording fractions

### Instructional Ideas

Take a look at the Tooth Beary for the month. Ask the children to read the names of the people who lost teeth that month. Have those youngsters stand together in a group. Count how many people have lost teeth. Separate the lost teeth children into male and female. Write the information up first as a story problem: "Five people have lost teeth so far this month. Three out of those five people are girls and two of those five people are boys." Show the class how to record that problem as a fraction.

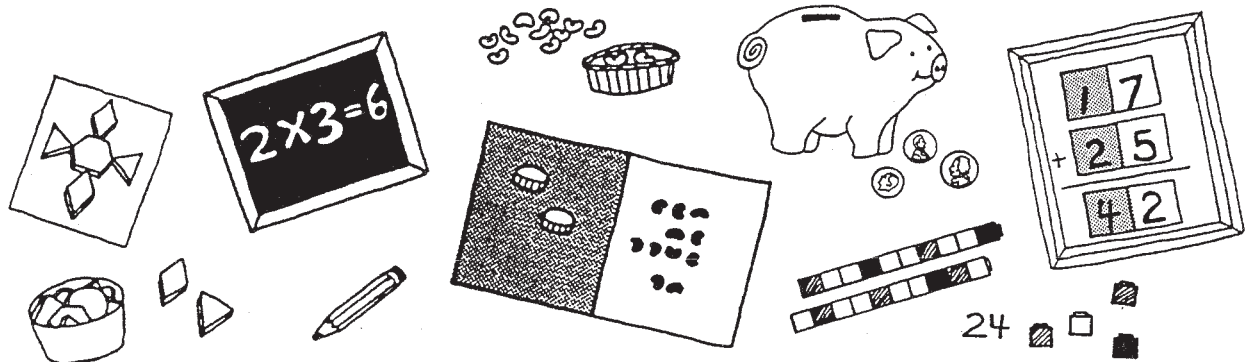
Study the calendar pattern grid. If you have an AAB pattern on the grid ask the children to determine how many days have gone by this month. How many of those were Easter bunnies? Write this again as a word problem

and then record the number as a fraction of the total. "Fifteen number markers have been added to our calendar so far this month. Ten of those fifteen are Easter eggs. Five of those fifteen are Easter bunnies." If your children seem interested and ready, build the fraction in unifix cubes, that is, ten blue unifix cubes and five white cubes. Study the stack and see if they can find any way to rename it besides  $10/15$  and  $5/15$ .

### Making Instructions

A large piece of paper works just fine on this job. You may only want to do this activity once a week but it's nice to leave the record sheet somewhere on the wall so they begin to notice fractional possibilities in their daily activities.

# Concept Instruction







# DISCOVERY TIME

*An activity-centered math program cannot exist without manipulatives. In the first stages of learning a new concept, children use concrete materials under the teacher's direction (Concept Instruction). In later stages, children extend and consolidate their understandings through independent activities involving manipulatives (Independent Practice Time). In each case, the use of manipulatives is not random, but carefully structured. Unifix cubes, pattern blocks, geoboards, ceramic tiles, coin stamps, scales, and the like are seen not as toys but as tools through which to investigate both simple and complex mathematical concepts. There is one caveat, however: Primary children respond best to structured use of materials when given the opportunity to play with them first.*

*Youngsters don't initially see mathematics in the various manipulatives we use. They see, instead, houses and train stations, bridges and staircases, castles and fortresses, faces and trees. They may examine, count, sort, and pattern as they build, but their initial impulses are probably more creative than mathematical. If children aren't allowed to pursue their own ends during the first few weeks of school, they will do so during structured lessons throughout the year. The cubes which you intend them to use for turkeys in a story problem will be snapped together and held up for telescopes. The pattern blocks which are to be counted into groups of six will grow into fantastic designs of eight, ten, or twenty. The bread tags which are to be sorted will be used for earrings when you turn your back. Young children simply cannot attend to **our** purposes until they've been allowed to attend to their own.*

*Discovery Time provides a legitimate opportunity to explore. During this two to seven week introduction to Independent Practice Time, children play with the "general materials" that will help them learn math all year. They snap unifix cubes into long, long trains. They build endlessly beautiful flowers, snowflakes, rocket ships and designs with pattern blocks.*

*Discovery Time also allows the teacher to establish rules and procedures children will need to follow all year during Independent Practice Times. Whether the materials in use are ten tubs of general manipulatives in September, twelve activities from the Pattern Practice and Enrichment Boxes in October, or eleven activities from the Money Boxes later in the year, children need to know how to function in the classroom, make a choice, complete a task, share with others, work cooperatively, and clean up properly.*

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## How Do I Get Started?

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### ORGANIZE YOUR MATERIALS

Collect the materials listed below. (See the Materials Index for purchasing information and for making instructions.) These “general materials” are the backbone of Box It or Bag It Mathematics. They are used with every set of boxes and many times over during Seasonal Math and Concept Instruction lessons.

- unifix cubes
- ceramic tiles
- geoboards and rubberbands
- pattern blocks
- junk boxes
- wooden cubes
- Story Mats

Other frequently used manipulatives you may want to introduce during Discovery Time include:

- playdough and cookie cutters
- coin stamps and stamp pads
- rubber stamps of other sorts
- templates cut to match the shape of pattern blocks and crayons
- student clocks
- small mirrors and letter or number cards (ten 3" X 3" squares of tagboard, with a letter or numeral written on each card)

Find sturdy containers such as dishtubs or heavy cardboard boxes for the loose materials that come in large quantities—unifix cubes, wooden cubes, pattern blocks, ceramic tiles, geoboards, and objects to weigh. The other items can be boxed in junk boxes, half boxes, or standard boxes available from MLC. Establish a shelf for these manipulatives as described in the introduction.

You'll use materials from this shelf for Discovery Time as well as many other times during the year.

Once your Discovery Time is going smoothly, you may wish to add the following materials which will be used in many measuring and comparing activities throughout the year. These will be very popular and work best if you have class lists posted so every child knows you play fair and everyone will get equal turns.

- balance scales
- milk box scales
- spring scale
- rice and jars

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## Introduce your general materials and routine slowly and carefully over a period of several weeks

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You can think of your September math as threefold. About a third (20-30 minutes) of your math time will be spent in whole group instructional activities—setting a positive environment and routine for your class, counting and estimating activities, group lessons to set foundations for patterning activities, story problems—concepts you'll be addressing in the next few months. Another third (20-30 minutes of your math time) will be Discovery Time (exploring and playing with your general materials) and the last third (hopefully at a different time of the day) will be spent on The Calendar (see Part Three). This

suggested schedule is charted on the following page. Be careful to acknowledge and celebrate the value of play. Discovery Time can be the very *best* time of your year. It allows the children experimentation, repetition, practice at building good work habits, and opportunities to increase attention spans. It helps children learn to make responsible choices, to work side by side with peers—sharing, listening and planning, and even resolving differences. Discovery Time encourages imagination and removes some of the fear of taking risks at school since there isn't a clear right or wrong.

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## How many weeks should Discovery Time last?

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Time decisions ultimately depend upon you and your group. What are the needs of your group? Have they ever used these materials before? Do they seem to work well together from the beginning or are you having to build toward those skills? Do they respect one another's working space and offer to repair things they accidentally damage or will you need to teach all of those skills?

We find it best to allow kindergartners four to seven weeks of Discovery Time. Remember, you'll be using more than half of your math

time for group lessons (Introduction to Pattern, Counting, Seasonal Math and the Calendar).

We feel first graders need three to five weeks of Discovery Time, again remembering more than half of their math time will be for group lessons (Introduction to Pattern, Beginning Arithmetic, Seasonal Math and the Calendar).

Second graders profit by two to four weeks of Discovery Time. More than half of their math time will be utilized for Introduction to Pattern, Arithmetic, Seasonal Math and the Calendar.

First Week:

Monday	Tuesday	Wednesday	Thursday	Friday
Introduction to "Hands On" Math, Why and What? Ground Rules	Review Monday "Good News"  Review Ground Rules	Introduction to Pattern group lesson  Introduction to Story Problems  Review Ground Rules	Introduction to Pattern group lesson  Introduction to Story Problems  Review Ground Rules	Seasonal Math
Discovery Time  Unifix Cubes Pattern Blocks Tiles	Discovery Time  Unifix Cubes Pattern Blocks Tiles Wooden Cubes	Discovery Time  Unifix Cubes Pattern Blocks Tiles Wooden Cubes Geoboards	Discovery Time  Unifix Cubes Pattern Blocks Tiles Wooden Cubes Geoboards	Seasonal Math
Calendar _____				→

Second Week:

Monday	Tuesday	Wednesday	Thursday	Friday
Introduction to Story Problems  Discovery Ground Rules	Review Monday "Good News"  Introduction to Story Problems	Seasonal Math	Introduction to Pattern  Discovery "Play Copycat"	Seasonal Math
Discovery Time  Unifix Cubes Pattern Blocks Tiles Wooden Cubes Geoboards Play Dough	Discovery Time  Unifix Cubes Pattern Blocks Tiles Wooden Cubes Geoboards Play Dough Junk Boxes	Discovery Time  Unifix Cubes Pattern Blocks Tiles Wooden Cubes Geoboards Play Dough Junk Boxes	Discovery Time  Unifix Cubes Pattern Blocks Tiles Wooden Cubes Geoboards Play Dough Junk Boxes Story Mats	Seasonal Math
Calendar _____				→

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## What is my role during Discovery Time?

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Don't forget you'll be using part of your math time to teach group lessons (Concept chapters and Seasonal Math). More importantly you'll be given a golden opportunity to get involved with your children, to get to know them individually and as group members.

For the Discovery portion of your math time, you will no longer be the focus of every lesson. The children at work and play will be the focus.

Ask your helpers to set out the appropriate materials in their designated places—you may wish to have hanging labels or table and rug markers to match container labels so children can easily deliver items to the same place each day. (Pour out unifix cubes and pattern blocks in four to six foot lines for easy access.) Excuse a few youngsters at a time to find an area to begin their work. (Remind them if they get tired of working there, it's OK to move to another area if it isn't already crowded.)

Once everyone is involved, you'll circulate continuously nestling in here and there to talk with individuals about their creations, to listen, to observe, to encourage, to redirect. It is helpful to carry a class list with open spaces in which to write so you can keep a few notes that may help you to know your children better—who gets started quickly and stays involved, who needs help to find a job, which children converse easily and work together well, who seems shy and needs to be invited to try new things, who hasn't yet learned social behaviors necessary to function in a group, etc. If you want to give yourself a test in terms of how well you are observing, take a blank class list after your children have gone home and write down one or two special things you know about each child's work in math. If you find you can't write anything for several of your children, make a special point of observing those youngsters the next few days.

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## What do I do with the notes I make about Discovery Time work and behaviors?

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You'll use that information to help establish a positive, cooperative learning climate. After clean-up, comment on the many positive things you've observed that day. (Those comments can be addressed to the children's work instead of praising individuals: "The pattern blocks were used in incredible ways today. I saw patterned walls, there were robots, there were magnificent designs, what a sight! There must have been a lot of working together to make those unifix cubes into such a long train." When you compliment work, you're not quite so likely to have someone feel hurt because you didn't mention his or her name. Try to stay global in your compliments so everyone can in some way identify with the success of the group's efforts.)

You may also want to generate a Good News Chart. One of the nice things about this is you

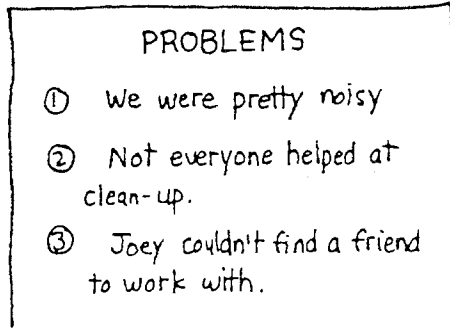
### Good News !

- ① Everyone worked SO hard today.  
The pattern blocks were built into patterns, designs, forts, stars, and flowers.
- ② The unifix cube train was 13 people long.
- ③ There was a GREAT pyramid.
- ④ The Polar bears and the jungle birds became beautiful patterns.

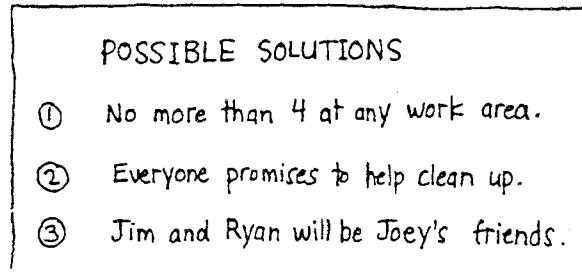
can make sure the children understand that with all the hard work and creativity going on in your classroom, there is *no* way you can see it all. You can increase their awareness of great happenings by calling them over to see areas that have outstanding work. This will

help them to describe a few marvelous happenings for the Good News Chart each day.

If you or the class saw some problems, class members may be able to help solve them. Make a list on your chalkboard of two or three of the difficulties experienced that day.



Brainstorm solutions until some consensus has been reached and then write those solutions on chart paper. Be sure to review the solutions the next day before your children are sent out to work.



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## After my children seem to work well together in Discovery Time, what is my role?

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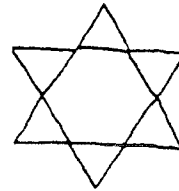
Don't deprive yourself of the great luxury of watching and listening often. You really can get to know your class during these weeks. You never stop circulating; in fact, in an activity-centered math program—you will be circulating the entire year; observing, assessing, instructing, redirecting.

Three instructional strategies that can be used as you circulate are 1) describe to children what you're seeing, 2) encourage children to express their ideas verbally, 3) play copy cat. These strategies will enrich Discovery Time once the children are comfortable with the materials.

### DESCRIBE TO CHILDREN WHAT YOU'RE SEEING AS YOU CIRCULATE:

**Teacher:** *I see you have a yellow hexagon in the middle of your design. It looks like you've surrounded it with some green triangles. How many triangles have you used?*

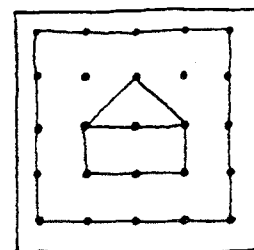
**Children:** *1, 2, 3, 4, 5, 6...six triangles. It's a flower!*



**Teacher:** *I wonder if you'll be adding a stem. I'll come back later to see.*

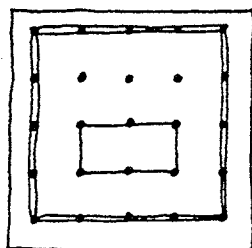
**Teacher:** *Look at this geoboard. You have rubber bands all around the edge in a square. There's a rectangle in the middle and a triangle above the rectangle.*

**Children:** *That's the house and this is the fence!*



You can tailor your descriptions to individual needs. Some children will need to hear color and number words. Others will benefit from geometric and spatial words and phrases.

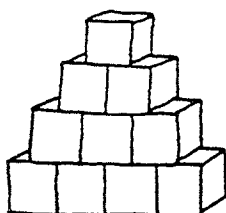
**Teacher:** Look at this!  
There are rubber bands all around the perimeter of your board and a rectangle in the middle. How many nails are inside the rectangle?



**Children:** Six since I used only one rubber band and stretched it to make my rectangle.

**Teacher:** I see you've made a triangle with the wooden cubes today.

**Children:** Yeah, it's like a staircase!



Don't overlook the rich language children can ascribe to their work. Stop often and ask them to tell you about their creations. When other youngsters hear those descriptions, they often chime in with comments of their own and everyone gains.

Here's a list of words you may want to post as a reminder to you of the language potential of Discovery Time.

#### COLOR WORDS

red	green	yellow
blue	purple	magenta
black	brown	orange
white		

#### GEOMETRY WORDS

rectangle	circle	square
hexagon	diamond	rhombus
trapezoid	horizontal	vertical
perimeter	line	corner
side	open	closed
triangle	area	balanced
circumference		symmetrical

#### POSITION WORDS

over	above	under
on	off	on top
bottom	beneath	underneath
high	inside	upside down
outside	within	without

in	beside	adjacent to
before	middle	enter
halfway	sideways	beyond
after	front	

### ENCOURAGE CHILDREN TO EXPRESS THEIR IDEAS VERBALLY

Because children are creating their own designs or buildings rather than performing a more structured task, there's as much expressive language in Discovery Time as the stories you might hear in a story writing time. Take a minute to admire the Cookie Jars of cookies and you might hear a wonderful bakery story or a story about the Cookie Monster. Stop by the Nightmare Story Box and you may hear about vanquished Nightmares.

#### PLAY COPYCAT

Become the great imitator. Stop by a group that's working with pattern blocks, for instance, and solicit help from the children so that you can copy one of the wonderful designs you see.

**Teacher:** I like your design. Do you think I could copy it?

**Children:** Sure!

**Teacher:** What should I do first?

**Children:** Put this one here!

**Teacher:** Do you mean I should put the yellow hexagon down first?

**Children:** Yeah!

**Teacher:** Now what?

**Children:** Put the red ones here.

**Teacher:** I see. You want me to put a red trapezoid on either side of the hexagon.

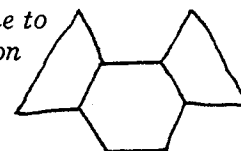
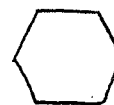
**Children:** Yeah, on the top.

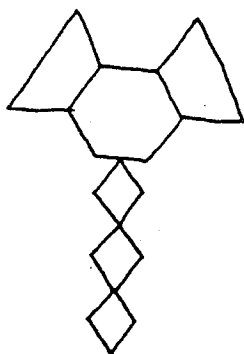
**Teacher:** What's next?

**Children:** You need some blue ones.

**Teacher:** I need some blue diamonds end to end below the hexagon. How many did you use?

**Children:** One, two, three!

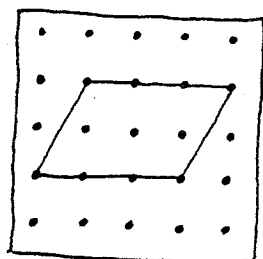




And so it goes until you've copied the design. In the process you've had children thinking about sequence as you've provided lots of mathematical language.

Sometimes you'll want to make a mistake as you're copying a design or structure.

**Teacher:** I see you've made a parallelogram on your geoboard.



**Children:** Yes. It's a square that got pushed down!

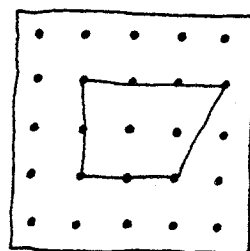
**Teacher:** Do you mind if I copy it on another geoboard?

**Children:** Sure, you can copy it!

**Teacher:** What should I do first?

**Children:** Well, take a rubber band and put it on that nail, then stretch it till it looks right.

**Teacher:** All right. I put my rubber band on the second nail in the middle row and then stretch it like this. Does it look like yours?

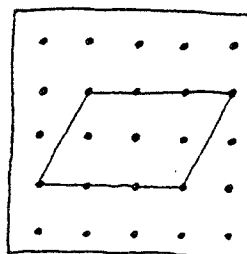


**Children:** No! That's pretty funny.

**Teacher:** How can I fix it?

**Children:** Move your rubber band to that nail.

**Teacher:** I see. If I move this corner one nail to the left, I'll have it.



You'll notice a ripple effect as you circulate during Discovery Time. When you stop to talk with one child, several other children get involved and often begin to play their own versions of Copy Cat.

You are the key to much of the language enrichment that's possible during Discovery Time.

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## Will children need to explore all the Boxes we'll be using for concept instruction?

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No. Once you begin leaving Discovery Time with your general materials (the things that will recycle all year), you will start

introducing tasks to go with these materials. Those tasks will be boxed. Every boxed activity has specific goals.



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## What if the activity level and noise is more than I can stand?

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There are groups of children that seem to push every one of the teacher's "buttons" in trying to work together. First of all, really take a good look at the actual problems. Could the chaos have to do with the number of children using any particular material? Have you had your class brainstorm solutions including how many should be at any area? Have you posted class lists for very popular areas so everyone

can count on turns? Have you role played problems and solutions so children know you have high expectations? Have you removed children from the work areas if they cannot be cooperative? Have you made sure they understand why they're not being allowed to participate?

### SOME QUIETING ACTIVITIES

Sometimes there is lots of noise because every offering for work in the room involves construction with something noisy. If you have a large, active group you'll want to consider

adding "recording" to some areas. This creates quieter pockets in your room.

### Pattern Block Design Records: Templates

**You will need→**      pattern block shape templates  
                                 small containers of pattern blocks  
                                 6 X 9 white construction paper  
                                 pencils, crayons

Children use a limited number of pattern blocks to create a small design. They copy their designs on to white paper using templates, pencils, and crayons.



Note: To make pattern block templates, trace the shapes on to translucent margarine tub lids and cut out with small scissors.

### Pattern Block Design Records: Cut Paper Shapes

**You will need→**      paper pattern block shapes (see instructions below)  
                                 small containers of pattern blocks  
                                 6 X 9 black construction paper  
                                 paste or gluesticks

Find the pattern block sheets in the blacklines. Run a supply of each on the appropriate color of

construction paper. Have parent volunteers cut them for you.

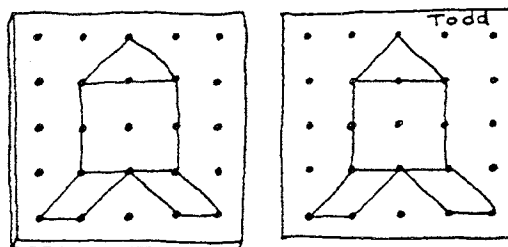
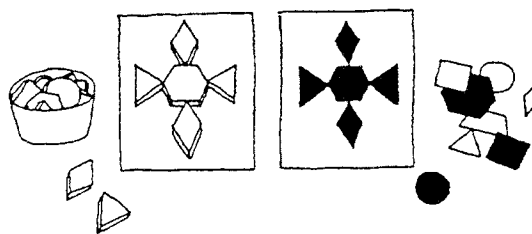
Children use a limited number of pattern blocks to create a small design. They make a copy of their design by pasting cut pattern block shapes on black construction paper.

### Template Designs

Make some simple templates cut from margarine lids available for children to draw patterns and designs on paper. (See Calendar Patterns and Template Patterns in the Pattern Packet for ideas.)

### Geoboard Records

Run copies of Geoboard Dot Paper (see blacklines) so children can copy some of their favorite geoboard designs onto paper.



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## Suppose even those solutions don't solve all my problems?

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Begin moving into the Boxed activities for Patterning. Some classes have been so conditioned to think that math is only done on paper that they need the structure of the Boxed activities to convince them this is math. Don't forget, however, you'll need to keep trying to get things smoothed out. Be sure to define each work time as math and to evaluate each work session in terms of the learning goals for the day and the progress made toward those goals. Also, be sure the children know how much you value this way of working. If you are inadvertently

giving them the message that these materials are for messing around after they finish their "real math" papers, they won't ascribe great value to these activity-centered learning opportunities either. Help them see that when they learn math concepts in ways they can understand, there are *no* learning ceilings—the sky is the limit! If you are using workbooks, try using them another time of the day so children see they have a different function—drill and practice.

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## What about children who need more time to play?

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There are children who would love to play all year and probably need that. However, most of us are faced with accountability through curriculum guides, self-imposed pressure, parent pressure, administrative pressure and/or standardized testing. We insist children begin to work on our goal-directed tasks (the Boxes) during math time as we leave Discovery Time.

It's often very helpful to tell the children you'll let them use the general materials during their "choosing time", or on rainy days if they're stuck in your room at lunch, or every other Friday, or whatever will work for you. It is important for all young children to have opportunities to use these materials in their own way many times throughout the year.

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## How can I communicate to parents why I'm not sending home workbook sheets every week?

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You *will* want to communicate. This is a grand opportunity to put out some newsletters bragging about your classroom, especially the mathematical happenings! (Be careful to discuss current happenings so that you don't make promises you can't keep if you begin to run low on resources—this way of teaching and growing is a long-term goal, it doesn't all happen in one year.)

We have several favorite ways of letting parents know how terrific our classrooms are. Here are some possibilities:

### File Folder News

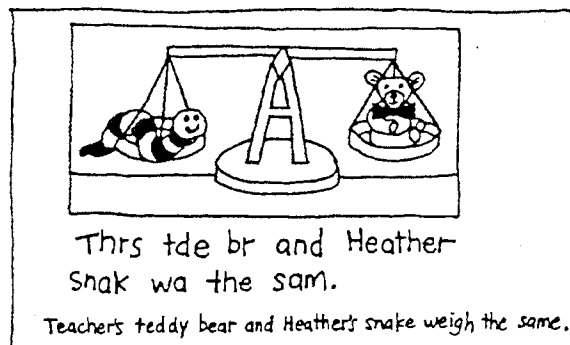
Take photographs of great happenings in your room, glue them to a manila file folder and write brief descriptions under each picture making sure your comments relate to mathematics and cooperative work. Laminate them along with a class list and begin sending them home overnight with each child. (If you have a very large class, make sure you've made up several different folders so that every child will get one within a week or two.)

### Newsletters

Shoot a roll of either black and white film or colored film of great happenings in your classroom. Trim the finished photographs on a paper cutter (that gets rid of the things you didn't mean to have in the picture) and mount them on 8 1/2" by 14" paper. Write descriptions under each picture and copy them at school or at your favorite copy shop. (The classier the copier, the better the quality of newsletter.) Run copies for every child and send them home periodically. They will be real family treasures! (Some families have let Donna know they have all of her class newsletters from years back when their children were young.)

### Single Photo News

Have the children write comments (Best Guess spelling is fun) about particular pictures. Write the comments again in grown-up spelling and copy those on your school copier or at a favorite copy shop.



### Weekly Letters

Write a few paragraphs about the current happenings in your room including suggestions for follow-up activities at home and run copies of those for every child.

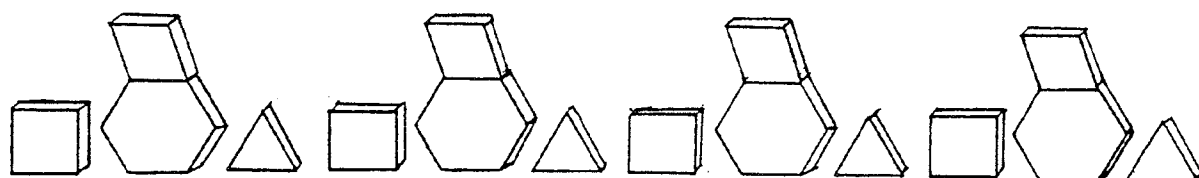
### Parents' Nights

Invite the parents to spend an hour at school with the children. Put out some of the Practice and Enrichment Boxes or a guess and check activity and, most importantly, share your philosophy about how children learn. It's always easier to be proactive instead of reactive.

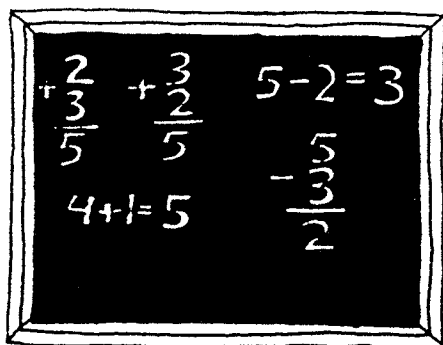
The point is—*communicate!* Most parents want the very best for their children. They want maximum learning opportunities provided. So many of them will say they were never this lucky when they were in school.

## Chapter 13

# PATTERN



A group of kindergartners had been telling and acting out addition and subtraction story problems one spring. The teacher decided it was time to include number sentences for each of the stories as they were completed. He began writing those on his chalkboard.



Mark suddenly jumped to his feet, arms waving in the air and raced to the chalkboard. "Look, it's a pattern. It's just a backwards pattern—it goes over and over!"

He pointed to  $2 + 3$  and  $3 + 2$ . Then his arms waved even faster as he pointed out  $5 - 2$  and  $5 - 3$ . He was discovering relationships through his understanding of pattern. The whole class seemed to share his excitement even though many didn't yet understand what

Mark was able to see. We've seen beginning readers pick up repetitive stories with ease as they delightfully exclaim, "It's just a pattern."

A teacher who had assigned her second graders a page of difficult addition told us that as she walked around the room, she heard some of the usual murmurs as children worked the problems:

" $6 + 7 \dots 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 \dots$  yeah, it's 13."

" $6 + 7 \dots 7, 8, 9, 10, 11, 12, 13 \dots$  that makes 13."

Then she listened to Andrew. " $6 + 7 \dots$  that's easy 'cause  $6 + 6$  is 12 and one more makes 13.  $8 + 8 \dots$  all right, that's 16!  $7 + 8$ , mmmm...  $7 + 7$  is 14 so one more makes that 15!"

" $9 + 6 \dots$  OK. That's the same as  $10 + 5 \dots 15$ ."

Needless to say she was astonished and Andrew finished very quickly.

We know that children who comprehend patterns get things more quickly—in math, in reading, in spelling, in music, in everything we teach. There are children who don't see

patterns, who have to reinvent the wheel every time, who never realize that words ending in silent “e” frequently have a long vowel sound. Often it takes them a very long time at any learning task. The question is, how do we help every child recognize and use pattern?

It’s not as if we have to start from ground zero. Every child comes to school with five or more years of training in pattern, training that started at birth. Mother smiles or she frowns. The light is on or it’s off. It’s day and night and then day again. If I drop my spoon, it always falls to the ground. Children learn to function in the world as they recognize patterns and predict what will happen next. Just learning to talk requires an amazing grasp of pattern.

Children come to us with some real, but usually unstated, understandings about pattern. Our job is to help them put these understandings into words; to help them name what they know. We start with simple visual, auditory and kinesthetic patterns—green, red, green, red; up, down, up, down. We help children to recognize those as patterns, and to predict what will happen next. We move along to more complex patterns—ABAB becomes AABB, ABC or ABBC. Children learn to copy, extend, translate and create patterns. Children in first and second grade make the transition to number patterns—5, 10, 15, 20...what comes next? Anyone who has devoted much time to pattern instruction knows the joy of hearing children exclaim, “It’s a pattern!” in reading, art, science, and music lessons, as well as math. Children know the universe has symmetry and order—patterning gives them a way to re-create that order and describe it to us.

The lessons and activities in this chapter are designed to help children develop the following understandings:

1. A pattern is something that repeats over and over.
2. I can copy and extend someone else’s pattern.
3. I can create my own patterns.
4. I can translate patterns from one medium to another; if someone claps a pattern I can show it with unifix cubes and many other materials.
5. I can copy or create simple patterns, ABAB, AABAAB, ABBABB, or more complex patterns, ABCABC, ABBCABBC, ABACABAC, etc.
6. I can sort things so I can pattern.
7. I can pattern by color, shape, size, type, texture and many other attributes.
8. I can pattern objects by position and quantity also.

Because pattern is so central to mathematics it’s a good way to begin formal instruction. We set beginning foundations by giving children opportunities to experience pattern in many, many ways. Our children hear, see, touch, taste, act, sing and dance patterns. Teachers should involve children in many group pattern lessons before they begin gradually replacing Discovery Time materials with Pattern Boxes during Independent Practice Time.

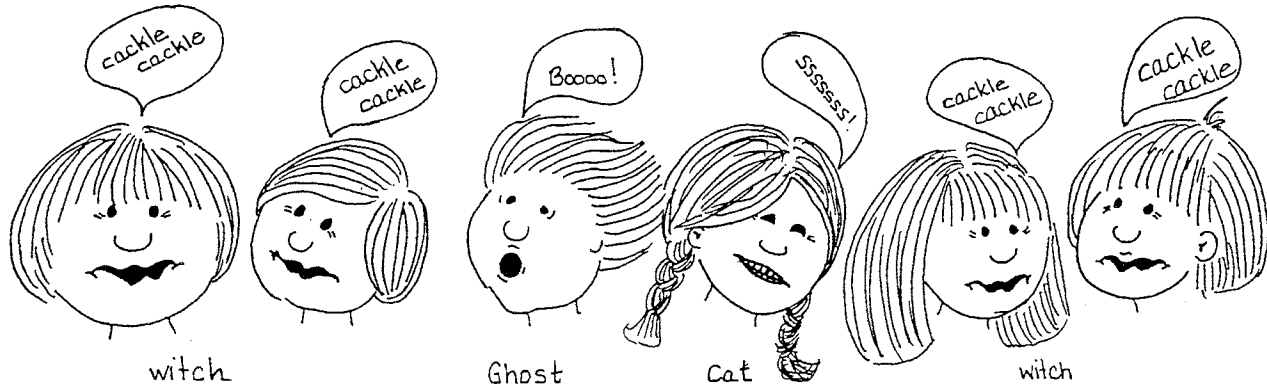
Pattern isn’t dropped after children have completed their work with the Pattern Boxes, but revisited every month in Seasonal Mathematics and many times over in the daily Calendar activities.

# Group Lessons

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## Theater Patterns

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Have children generate a list of things they associate with Halloween; vampires, ghosts, witches, etc. Then have the class select two or three and develop actions and sound effects for each. Finally, have eight to ten children come up and act out a pattern as the others watch. Halloween is only one category from which to

pull characters—how about the zoo, the farm, winter weather, insects, vehicles, things to do in summer, etc. See Seasonal Math for more detail on Theater Patterns.

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## People Patterns

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Most children love to perform. They feel lots of personal investment in group lessons when they are actually part of the teaching. Begin creating People Patterns by sorting the children in your classroom by one attribute or another (see People Sorting in Chapter 10). Once the children have been sorted, brainstorm possible patterns and then have the class tell each People Pattern actor what to do as the pattern is being created.

If your group enjoys a good challenge, do secret patterns. Line up eight children in front of the group and have the others try to figure out your

pattern. Once they think they know what the pattern is, get another child up and ask the class whether he or she would fit the next part of your pattern.

This helps children think through what attributes are really represented in the pattern and extend that knowledge. Finally, ask them to choose two to three more children who will fit the next parts. When children are good at this, some will volunteer to create a Secret People Pattern for the class to figure out.

# Magazine Picture Patterns

**You will need→** 50-70 magazine pictures of children

glue

long strip of butcher or shelving paper

Lay out the pictures you have previously cut. Have the children help you sort them in various ways.

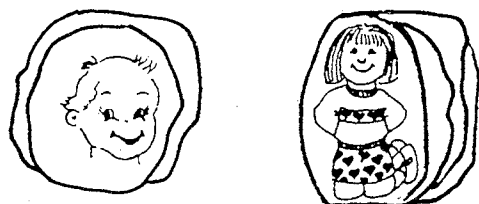
**Teacher:** *Here are pictures of children I cut out. Tell me which ones belong together.*

**Children:** *Put all the girl pictures in one pile and all the boy pictures in another pile.*

**Teacher:** *OK. Angela, Barry, and Sharon...why don't you help me.*

Once the pictures have been sorted, discuss how they've been sorted. Push the pictures back together and say, "How else could we put these pictures together?"

"How about if we put all the babies in one pile."  
"Yeah, and all the big kids in another pile."



Sort and label categories verbally. Continue sorting the same pile of pictures several more times.  
(Children will begin to notice how the children in

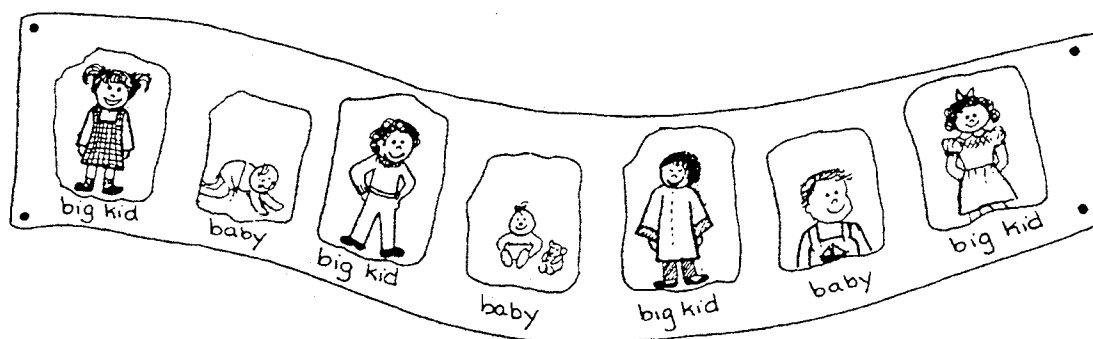
the pictures are dressed, hair colors, happy/sad, ages, etc.)

The last time pictures are sorted, ask the group if they think a pattern could be created using the sorted groups they've just generated.

Once the group has agreed on a pattern, ask every child to take turns gluing a picture onto the long strip of paper to form a permanent record of this sorting and patterning activity. Write labels under the first several parts of the pattern. Here's a good chance to ask children to spell in their Best Guess spelling. (You write their suggested letters on the chalkboard and then make any needed corrections to show them the grown-up way of spelling those words. Children have amazing skills at getting some of the letters, even in kindergarten! It's important to let them know that you'll be able to read much of their Best Guess spelling in things they're writing and that you'll always be able to help them fix things up for the whole class to read.)

It is often helpful to a class to choose one of their Magazine People Pattern strips to copy by acting it out with children in the class. It takes them full circle by asking them to take information from the printed page and once again make it real.

You can also adapt this to other themes by using pictures of animals, vegetables, foods, etc.



# Hand and Feet Patterns (clapping, snapping, tapping)

Clap, clap, snap, clap, clap, snap...begin a hand pattern. Children join you as soon as they figure it out. You can do this many times over. It only takes a minute and it gets their attention or helps you focus them for the task at hand.

Once the children are proficient at copying a simple snap and clap pattern, ask them to invent other motions.

**Teacher:** What could we do for the clap?

**Children:** Let's jump.

**Teacher:** What shall we do in place of the snap?

**Children:** We could bend down and touch the floor.

**Teacher:** OK. Here we go

(The kids join you in jumping and bending down, jumping and bending down...)

**Teacher:** Let's think of things we like to eat.

**Children:** Spaghetti!

**Teacher:** Great! I like spaghetti too. What sounds do you make when you eat spaghetti?

**Children:** Slooooooop!

**Teacher:** OK. What is something that's good with spaghetti?

**Children:** Salad!

**Teacher:** Salad, oh yum! What's a sound we make when we eat salad?

**Children:** Crunch...crunch...

**Teacher:** Let's make a pattern with those sounds. How many sloooooops and how many crunches do you want to have?

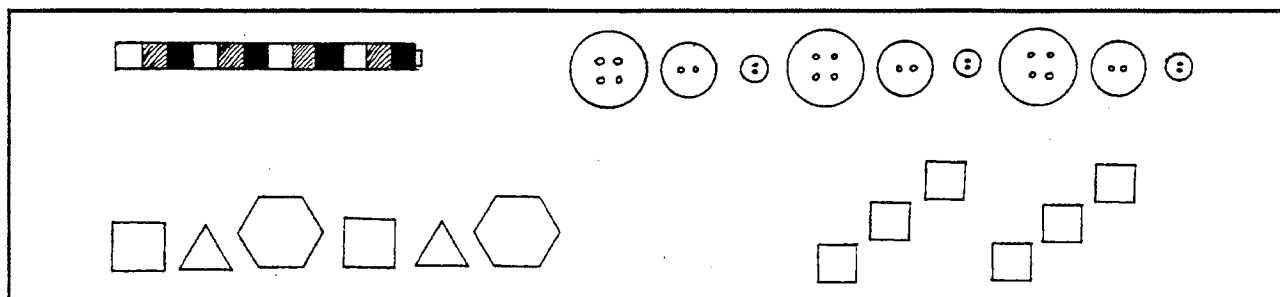
**Children:** Two sloops and three crunches.

And the pattern begins with "sloop, sloop, crunch, crunch, crunch; sloop, sloop, crunch, crunch, crunch..."

Later, as you move children into translating patterns from one form to another, you might tap out a pattern and ask your kids to verbalize your pattern with vehicle words. Snap, snap, tap, tap, clap, snap, snap, tap, tap, clap...might become train, train, car, car, boat, train, car, car, boat, with sound effects and/or motions to match. Other categories you might ask them to use over the year are food, farm animals, colors, shapes, weather, flowers, zoo animals—the possibilities are endless.

You might also use a xylophone or piano as a change from hand and feet patterns. Sound the notes C, C, G, G. Kids might verbalize the pattern in some way, move the pattern (hop, hop, shake hands, shake hands), line themselves up in some way (pants, pants, shorts, shorts), or use classroom math materials to reproduce the pattern (red, red, blue, blue).

As your children become proficient at patterning, sound a pattern and ask the children to use any of your math materials to reproduce the pattern. If you sound a C, E, G pattern, you will probably see creations such as these around the room.





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## Feely Box Patterns

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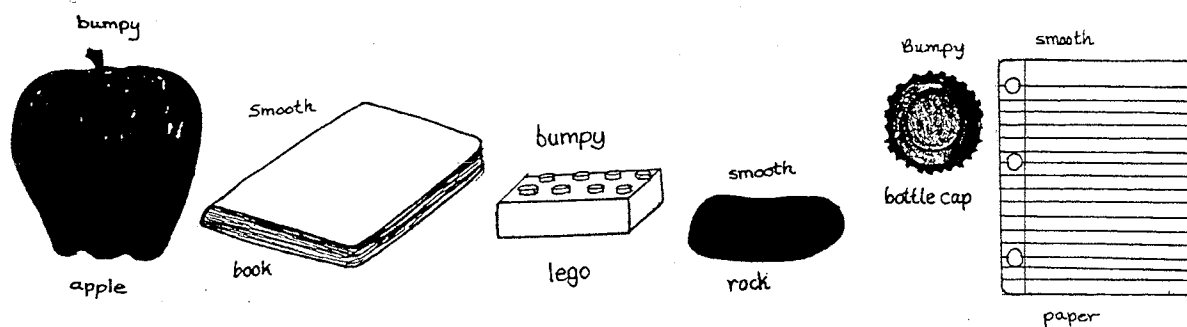
**You will need→** 2 Feely Boxes (Materials Index)

20-30 small items for each box (buttons, lids, plastic bread tags, dried fruit pits, shells, rocks, etc.)

Brainstorm and list “feely words” with your class. It may help to pass around several objects as you do this (a conch shell, an orange, a plastic dinosaur, etc.) There are lots of things that might elicit words from children. Once you have a list, pick two, perhaps bumpy and smooth. Have each child find something in the classroom to bring back to your circle that matches one description or the other. Then have them pattern their objects across the floor: bumpy, smooth, bumpy, smooth...(see illustration below).

Another day, get out the list of “feely words” they developed and read through them with the group. Pick two—perhaps holes and no holes. Start the Feely Boxes around the circle in opposite directions taking turns reaching in and finding an item that will fit the pattern.

NOTE: If this is the first time you have used Feely Boxes in your classroom, you may want to take the can and its contents out of the sock and show them. Children need to know they’re sticking their hands into something safe.



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## Tasty Patterns

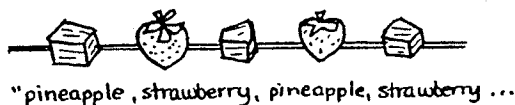
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**You will need→** fruit

If you’re searching for multi-sensory input, here’s a winner! Have each child bring a fruit to school. Be sure to bring extras so everyone can participate. Have children sort and graph their fruits and discuss the outcomes. Set up an area or two where, after careful handscrubbing, children will all get turns to wash and cut the fruits onto large platters. After the fruits are all cut, have each child go to a platter with a

wooden skewers

wooden skewer and create a patterned fruit kabob. Fun to make and fun to eat!



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## Nature Weavings

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### You will need→

styrofoam meat-packing trays

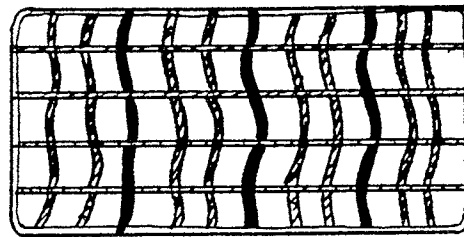
yarn

inch-wide strips of fabric

natural materials collected by children  
such as leaves and grasses

There are so many patterns to be found in nature. If you have a field or natural area near your school, it's fun to take a walk with your class and simply look for different patterns along the way. You can also have children collect grasses and long skinny leaves to go into weaving projects. Back in the classroom add different types of yarn and strips of fabric. Have ready styrofoam meat trays warped with string or durable yarn (use a stitchery needle or notch the ends of the styrofoam tray). Child-

ren weave in their collected materials, the yarn and fabric strips.

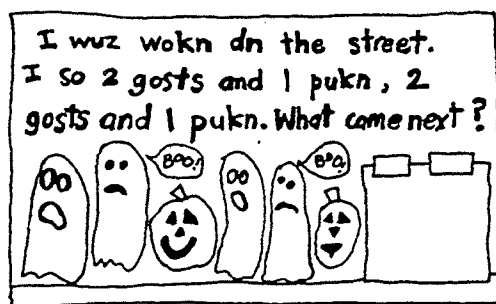


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## Pattern Story Problems

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In an attempt to connect reading, writing and math, we make an effort to have children either dictate or write (in their Best Guess spelling) pattern word problems. They write things like Frank's "I wuz wokn dn the stret. I so 2 gosts and 1 pukn, 2 gosts and 1 pukn. Wat kam nxt?"

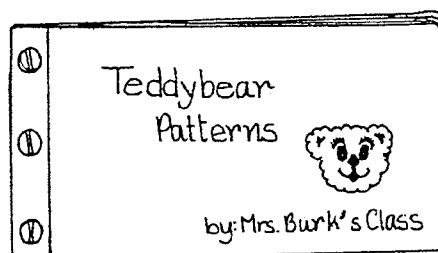
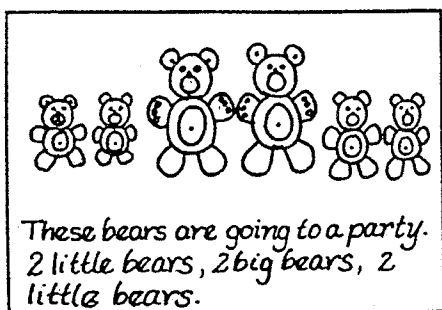


Frank's teacher had shown them some secret door and folding techniques. As the teacher read the children's stories to the class, the class would predict the answer. Then the secret door or magic fold would be opened to reveal the answer.

We always ask our kids to read their finished work to us so we can pencil in any words that

we wouldn't possibly be able to decipher later so as not to embarrass anyone when we are reading finished work to the class. We write those corrections on small Post-It notes so as not to tamper with the children's precious efforts. Don't fix up all the words this time, however, because children need to know you really can figure out most of what they're writing. Many beginners are able to write more than they can read if given the opportunity to use their Best Guess spelling. Remember, squiggles and lines are important beginnings and tell you that child is becoming aware of the forms letters take.

When your children bring teddy bears or stuffed animals for September math, they'll find many ways to sort and pattern them (old, new; panda, polar, black, brown and koala; fat, skinny; large and small.) These activities will also generate Pattern Story Problems and may lend themselves to a Big Book. (When things are going to be read by the class, we help children edit so corrected spelling will go into the Big Book pages.)




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## Prediction Patterns

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**You will need→** magazine pictures (cut out and mounted on tag) or study prints that show a happening

examples:

a little boy lying in bed with a dog licking his face

a little girl in a bathtub with a band-aid on her arm

a family all wrapped up in towels

a bottle of nail polish next to spilled polish

a little boy sitting on a stool in very muddy clothes

Hold up one card at a time. Ask each time what might have happened before the picture was taken and what might have happened after the picture was taken. Children will have many different ideas.

If your children enjoy this activity, send them off in small groups to create a Big Book page using pictures that have been gathered ahead of time.

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## Sorting as a Pattern Tool

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The best way to help children learn to pattern objects by size, shape, texture, type and attributes other than color is to do lots of sorting. Every sorting lesson you do contributes to children's understanding of

pattern. Be sure to read Chapters 10 and 11, Sorting and Graphing, and to regard those lessons and all the Seasonal sorting suggestions as Pattern concept instruction.

# Moving To the Boxes

*If you've done lots of the group lessons described so far, many of your children will be getting very excited about Pattern. You'll notice patterns cropping up during Independent Practice Time while your children are using the Discovery Materials, even before you introduce the Pattern Practice and Enrichment Boxes. The ubiquitous unifix cube trains will become colorful pattern trains. Or patterns blocks are arranged to create an expanding symmetrical design. The Pattern Boxes are a solid, delightful way to help children extend and consolidate their understandings.*

*When you feel your class is ready, introduce one or two Pattern Boxes at the beginning of each Independent Practice Time. Be sure to model new box activities thoroughly, demonstrating the activities from start to finish including clean-up. Each time you introduce a new box, put one of the Discovery materials away. It will take a week or more to complete the shift to Pattern. Aim to offer eight to twelve Pattern Box activities at varying levels of difficulty. If you have more to offer, that's great. You'll be able to keep children's interest extra high by occasionally exchanging a new Pattern Box for one that's no longer used.*

## **Here is a list of the activities in the Pattern Practice and Enrichment Boxes**

(Make the ones that will best suit the needs of the children in your class)

Playdough Patterns

Unifix Cubes Patterns

Alphabet Stamps

Tile Patterns (1-2)

Coin Patterns (1-2)

Pattern Blocks and Mirrors

Sticker Patterns

Clock Patterns (1-2)

Calendar Patterns (1-2)

Pattern Blocks

Template Patterns

Rubber Stamp Patterns

Geoboards, Nuts and Washers

Mirror Patterns

Feely Box Patterns

Pattern Shapes Race (K-1)

Quilt Patterns (1-2)

## Chapter 14

# ARITHMETIC

*Despite the fact that, at this writing, computers can perform two billion correct computations in one second, and that most adults wouldn't dream of keeping their checkbooks balanced without a calculator, there is great pressure on primary teachers to teach "the facts". In most districts, first grade children are expected to know addition and subtraction facts to ten; second graders, to eighteen. Success is often measured by how quickly children can write the answers to a series of problems. Teachers are painfully aware of how difficult this is for many children. Studies have shown that although basic computation is a major focus of instruction in the early grades, many children don't achieve fact mastery until years later.*

Some say the problem is that students don't receive enough drill. However, the ideas that youngsters must understand if they are to deal with facts such as  $9 - 4 = 5$  in a meaningful way are complex.



To begin, children must be thoroughly familiar with small quantities. Show first graders six blocks, then hide a few. The children who can instantly tell how many you're hiding by looking at how many still remain may be ready to learn more about addition and subtraction. How many counting experiences does it take to reach such a level of conservation, to know six in all its parts—a hundred, a thousand?

Children must also see relationships between numbers. Five-year-old David can only count to nineteen. Many of his kindergarten friends count to 100. But David seems to spend a lot of time thinking about numbers in relation to one another. He wants a new toy, he says, that costs \$6.00. He only has \$4.00, so he has to save \$2.00 more, he observes. Another day he tells his Mom that he did have five candies, but now he's down to one, so he must have eaten four. This ability to move easily back and forth between

numbers surely contributes to fluency with addition and subtraction facts later.

Children need to understand that addition and subtraction are real world transactions; events that happen in their everyday lives. There are five children at the party. Two more arrive. Now there are seven. Two sets have been combined or added. Danny had four goldfish but one died, now he has only three. Subtraction is sometimes tragic but it happens all the time.

Furthermore, children must transfer their understandings of process to symbols. This connection is critical and it takes a long time to establish. Edward, a first grader, was asked by his teacher to solve the problem  $7 - 3$ . He wrote four without much hesitation. The teacher then asked Edward to show what the problem meant with wooden cubes. He laid out seven and then separated three from the set. When asked to show the four, he pointed to the pile of four. When asked to show the three, he pointed to the pile of three. When asked to show the seven, Edward reached into the basket and took out seven more. Kim was asked to do the same task. She responded just the same as Edward at each step until the last. When she was asked to show the seven, her hand wavered over the basket. Suddenly, her face brightened. She pushed the piles of three and four together and said, "Why there it is!"

The teacher showed Joan a stack of nine blocks and then took four off the top of the stack. He asked Joan to describe what had happened. Joan told him he'd taken four off the top of the stack and now he only had five left. He handed her a pencil and asked her to write a number sentence about what had happened. She considered the blocks for a moment and wrote " $4 + 5$ ". These tests were conducted in late

May. These first graders had all been studying addition and subtraction for a full school year. It sometimes takes longer than we're willing to acknowledge for children to develop strong foundations.

The activities in the first section of this chapter, Learning the Processes, allow children to experience addition and subtraction as processes that occur in the real world. Students are taught to use symbols as tools to read about and record real transactions. The second and third sections, Facts to Ten and Facts to Eighteen, are designed to give youngsters a sense of number combinations and relationships.

First and second grade teachers will want to start the year by offering group lessons from Learning the Processes. When most children seem to be developing reasonable understandings, often five to eight weeks into the school year, present group lessons from the second section, Facts to Ten, and introduce corresponding activities from the Arithmetic Practice and Enrichment Boxes.

We suggest you then turn to other topics, Measuring, Money and Place Value Counting. Children who have been struggling with addition and subtraction often welcome the change and develop insights that help when they return to Arithmetic. Plan to make a few varied Arithmetic Boxes available during Independent Practice Time nearly all year after they have been introduced. Children need chances to revisit Arithmetic over and over. We feel most comfortable presenting group lessons from section three, Facts to Eighteen, and introducing the corresponding Boxes, after Place Value Counting instruction. See Part Five, Planning, for detailed year plans.

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## Learning the Processes

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### STORY PROBLEMS AND BIG BOOKS

One of the very best ways to help children understand addition and subtraction as everyday transactions and introduce them to the language of the processes, is to tell stories and have students act them out. The Story Problems section of Chapter 1, Teddy Bears, describes a set of lessons in which the teacher and the children tell story problems. The

children act them out and, over a period of months, learn to record appropriate equations and write their own story problems.

Be sure to repeat similar lessons every month; they're in nearly every Seasonal unit. You may be

pleasantly surprised at the quality of children's stories and illustrations as the year progresses.

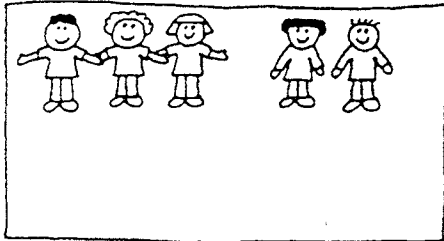
For more experiences with story problems, see *Posing and Solving Problems with Story Boxes*.

## PEOPLE PROBLEMS

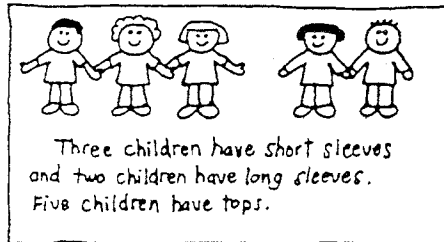
**You will need→** individual chalkboards, chalk, erasers

Ask a group of four or five children to stand in front of the group. Divide them into two smaller groups—long sleeves and short sleeves.

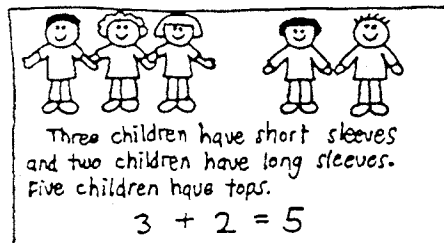
Everyone in this group has tops but some have short sleeves and some have long. Let's count how many have short sleeves—one, two, three. And let's count how many have long—one, two. How many tops with sleeves up here? Five? We can say (as you point to each group)  $3 + 2 = 5$ . I can draw a picture about these people on the board.



I can also write out a short story about their tops.

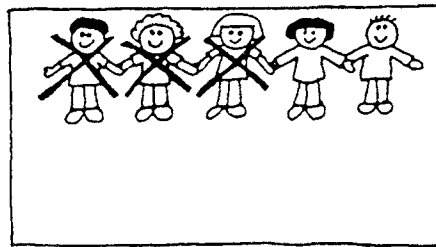


There is even a "short-cut" way to tell that story. I'll write a number sentence this time and you can see my quick way to tell the story.

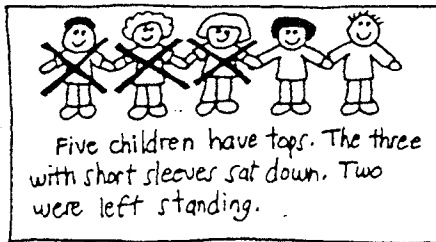


Have the two groups join hands so they're all standing together. Ask: How many children are standing in line? Five? OK, let's have all of you who are wearing tops with short sleeves sit down right where you are. How many children just sat

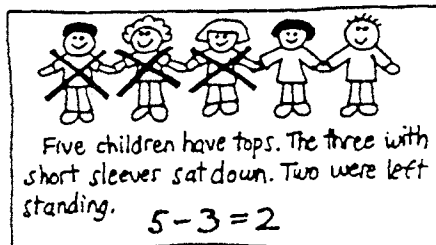
down? How many are left standing? How many children used to be standing? Let's have all five stand again. I'll draw a picture about them on this sheet. There were five children standing. (Redraw the five tops.) The three with short sleeves sat down so I'll need to cross them out. How many tops are left?



Have the group return to their seats and you write a quick story under the shirts as the children tell you the events.



After the children have recalled the story, show them once more how the story can be written in short fashion with a number sentence.



Repeat the entire procedure several times asking the children to help retell the story and figure out number sentences for each group. Distribute individual chalkboards and ask them to draw and practice writing the number sentences along with you as you go.

Revisit this lesson often. Other sorting possibilities include: velcro fasteners on shoes/other fasteners, long/short hair, pants/skirts, curly/straight hair, people who like scary movies/those who don't, on sharing day—people with toys/other items.

If children have brought teddy bears to school for Seasonal Math, it's fun to use bears for the lesson. Then the sorting possibilities are truly endless.



Two bare bears and three dressed bears...

## STORY MAT STORIES—ADDITION AND SUBTRACTION

**You will need→** a set of Story Mats (Materials Index)

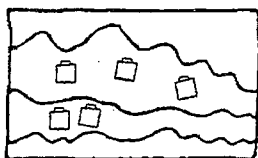
Unifix cubes in colors to match the Story Mat theme  
(Each child will need 8 of each color you have chosen.)

individual chalkboards, chalk, and erasers

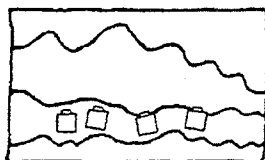
*Note: The sample lesson below features the Polar Bear Story Mats and white Unifix cubes, but this activity can be done with any of the Story Mats listed in the Materials Index, along with Unifix cubes in appropriate colors.*

Gather six to eight children around you in a circle. Give each child a story mat and Unifix cubes. Take turns around the circle telling addition and subtraction stories. As each person tells a story, the others act it out with their Unifix cubes and story mats (The white Unifix cubes are meant to be polar bears in this lesson. This will take a bit of imagination, but with the polar background of the story mat and a few stories from you to get started, it shouldn't be long before those little white cubes are acting just like polar bears!)

Five polar bears stood on the iceberg. Oops! Two slipped down into the icy, cold river. How many were left on the slopes?

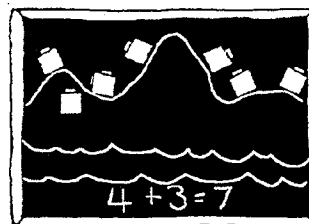


Two bears were fishing in the river. The fishing was so good, two more came to join them. How many bears in all?



After each child has had a turn to tell one story, distribute chalk and individual chalkboards. Explain that you'll be using the chalkboards instead of story mats this time. Children enjoy drawing appropriate backdrops on their own boards to match the counters they'll be using. Have them save a little space at the bottom for writing number sentences. Again, have children take turns telling addition and subtraction stories as the others act them out with their Unifix cubes and chalkboard/story mats. Each time a story is told and counters arranged, discuss the numbers that would be needed to record the story and have everyone write the appropriate number sentence. Since children are just learning to do this, you'll need to participate and serve as a good role model throughout all the steps. (Make this a learning time, not a testing time.)

Four baby polar bears were out on the slopes enjoying the sunshine. Three more came over and asked them to play. How many in all?





## STORY MATS AND UNIFIX CUBES—NUMBER CHARTS

**You will need→** a set of Story Mats for each table along with Unifix cubes in the appropriate colors (Materials Index)

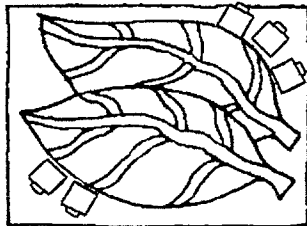
individual chalkboards, chalk and erasers

chart paper (butcher paper or large newsprint)

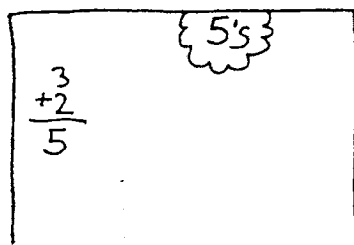
Ask children to arrange five Unifix cubes on a story mat in a way different from anyone else at their table, thinking of a story to accompany their arrangement.

**Teacher:** Would anyone like to share their story?

**Child:** It was Spring. There were three yellow caterpillars and two green caterpillars sitting on a leaf just waiting to start nibbling!



**Teacher:** Good story! Can you all help me figure out what number sentence I can write on my Fives chart to go with that story?



**Child:**  $3 + 2$  makes 5!

**Teacher:** Who else thought of a story they'd like to share?

**Child:** There were five lady bugs on the little boy, four on his hat and one on his big toe.

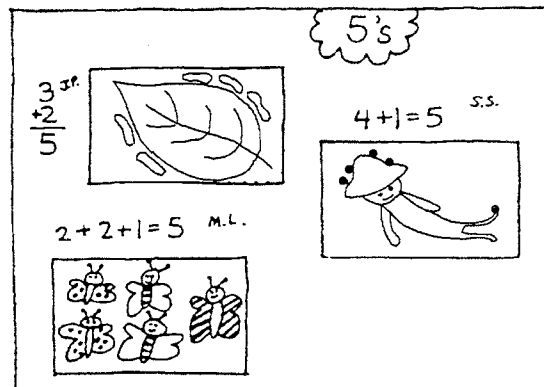
**Teacher:** Great! What number sentence should I write this time?

**Child:**  $4 + 1 = 5$ !

Continue in this fashion until you have a good assortment of number sentences on your Fives chart.

Ask children to remember which sentence was volunteered from their table.

As sentences are claimed, mark them with the child's initials. Those children can work with small groups later to draw pictures illustrating the stories that led to their particular number sentences. (We find it best to give them pieces of paper on which to make their illustrations. Then we use a glue stick to add them to the chart.)

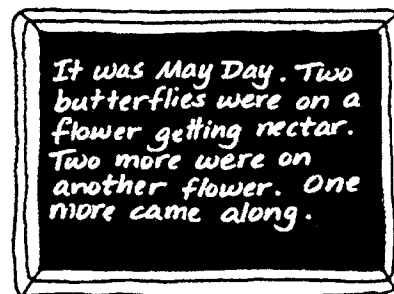


Here is one more twist to accompany this activity:

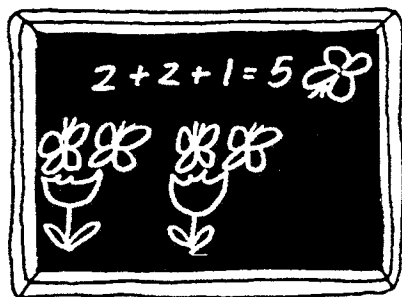
**Teacher:** Wow! What a lot of ideas! Can anyone tell me a story about this one?  
 $2 + 2 + 1$ ?

**Child:** I can. That's how I did my story.

**Teacher:** I'll write it here on the chalkboard. Let's read the story together. Can you each draw a picture of this story on your chalkboards?



Let's read the story together. Can you each draw a picture of this story on your chalkboards?



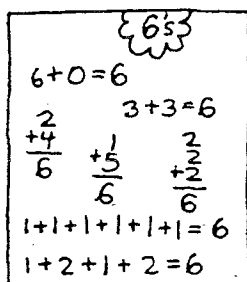
What numbers would we use to write this story the short way? Let's try writing it on our boards.

Repeat these lessons other days to make charts for Sixes, Sevens and Eights. Be sure to see Fact Family charts in Chapter 2 for a delightful Halloween version of this activity.

## STORY MAT ADDITION

**You will need→** a set of Story Mats (Materials Index) for each table  
Unifix cubes in appropriate colors  
6 X 9 white paper  
crayons, pencils, felt markers

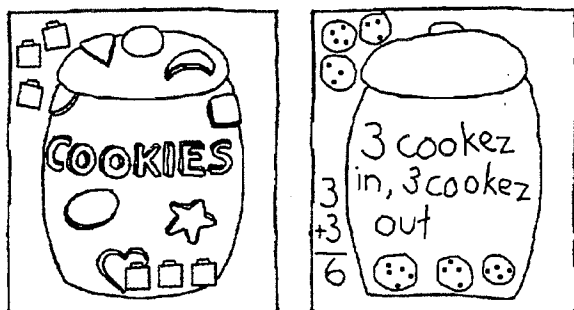
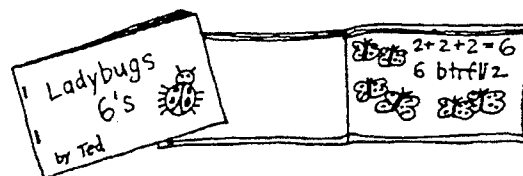
Display one of the number charts your class generated in the previous activity (Story Mats and Unifix Cubes—Number Charts).



may enjoy adding words or a sentence written in Best Guess spelling to their pictures.

You may want to have each group staple their papers together to make small books. Completed books could be read to the rest of the class. Many youngsters also enjoy making several pages of their own for individual books to take home.

Each child uses a story mat and some Unifix cubes to re-create one of the number sentences on the chart, imagining a story to go along with it. Children then draw pictures to illustrate the stories they have set up, labeling each with an appropriate number sentence. Some



Don't forget the previously generated number charts are very helpful for children who aren't quite sure where to begin or for the children who want to come up with many different number stories for a given number.

# Facts to Ten

## SHAKE THOSE BEANS

**You will need→** for each child

Shake Those Beans (fives) record sheet (blackline supplement)

five white lima beans, spray painted green on one side

individual chalkboard (to be used as a writing surface)

pencil

Ask each child to bring a pencil and join you on the rug. Distribute chalkboards and record sheets.

Shake Those Beans ⑤					
0+5	1+4	2+3	3+2	4+1	5+0

**Teacher:** Take a good look at your record sheets. What are the numbers along the bottom?

**Children:** They're different ways to make five.

**Children:** Yeah,  $1 + 4$  and  $2 + 3$ .

**Teacher:** This game will help you become very familiar with the combinations of five. Did you notice that your record sheet is a graph? We're going to use these green and white beans to help us fill in our graphs.

**Children:** How do you do that?

**Teacher:** I'll toss these five beans and we'll watch to see how many come up green and how many come up white.

**Children:** They came up two greens and three whites.

**Teacher:** Right! What number combination would we write for these beans?

**Children:**  $2 + 3$  or we could write  $3 + 2$ .

**Teacher:** That's true. How about if we make a rule. Let's always read the

green beans first, then the white beans. We'll all think about the same number combinations that way.

**Children:** OK. That one is  $2 + 3$ .

**Teacher:** Let's all record that on our graphs.

Continue tossing the beans, reading the combinations and graphing the results. After you've done this seven or eight times, challenge the children to predict which combination will be the "winner". Have them put a star at the top of the column they think will win.

Shake Those Beans ⑤					
		★			
		2+3			
		2+3	3+2		
	1+4	2+3	3+2		5+0
0+5	1+4	2+3	3+2	4+1	5+0

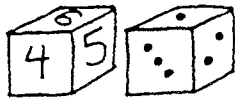
Distribute five beans to each child and ask them to continue playing independently until three or more columns have filled. Some children enjoy marking columns 1st, 2nd, and 3rd as they fill.

Add the boxed version of this game to your Independent Practice Time.

## DICE TOSS

### You will need→

two large dice made from milk cartons or foam (marked with dots—1, 2, 3, 4, 5, 6—on one and numerals—0, 1, 2, 3, 4, 5—on the other)



for each child:

a Dice Toss record sheet (blackline supplement)

an individual chalkboard to use as a writing surface

Have each child bring a pencil to the rug. Distribute record sheets and chalkboards. Roll the dice and have children total the resulting combination by counting on from the numeral to the dots.

Ask them to find the seven column on their record sheet and write in the combination you just rolled ( $5 + 2 = 7$ ). Continue rolling, counting and recording until one or more columns are filled to the top.

“Five, six, seven.”

At first, it will be difficult for the children to record this. Many don't seem able to look first at the total and then write its parts. Don't despair, with time and practice, it will smooth out!



DICE TOSS				
		$5+2=7$		
5	6	7	8	9

When many of your children understand this game, add it to your Arithmetic Box collection and remove a Pattern Box.

## PIGGYBANK SUBTRACTION

### You will need→

a Piggybank Subtraction record sheet for each child  
(blackline supplement)

• a Piggybank (see Making Instructions below)

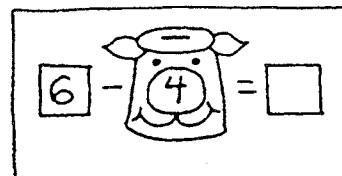
individual chalkboards (to be used as writing surfaces)

a set of piggybank subtraction cards (fives or sixes, blackline supplement)

five or six pennies

Have children bring a pencil and join you on the rug. Distribute record sheets and chalkboards.

**Teacher:** You're really learning a lot about addition and subtraction. Today, we'll try telling some Piggy-bank Subtraction stories. Look, here's my piggybank and some pennies. I even brought some subtraction cards to help us tell our stories.



**Teacher:** The first one says “6 – 4.”

Hmmm. We need to think of a story to go along with  $6 - 4$ .

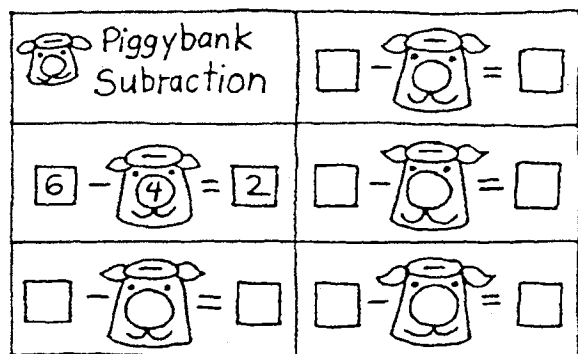
**Child:** I know the answer. It's two!

**Teacher:** Two...OK! Can we think of a story for the combination?

**Child:** I can. My Mom gave me six pennies. I put four in my piggybank to save.

**Teacher:** Let me try it out for everyone to see. Mom gave me six pennies—here they are. I put four in my piggybank...one, two, three, four. I have some left to spend. How many?

**Child:** Two!



**Teacher:** Let's write the number sentence for that on our record sheets. You write along with me. Ready?

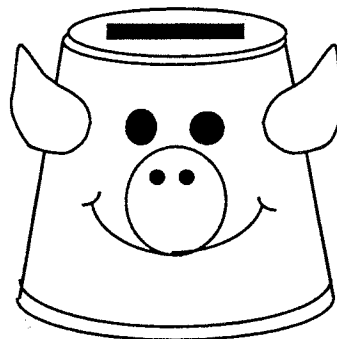
Continue to generate, act out, and record stories for each card until the record sheets are complete. Add the boxed version of Piggybank Subtraction to your Independent Practice set immediately. If you wait

more than a day or two, children are likely to forget how to do the activity.

## Making Instructions

### Piggybank

It's great if you can find a solid pink or beige bathroom Dixie cup—the sturdier kind. Cut a slit in bottom (it will now become the top). Make the cup into a pig by adding felt or construction paper ears, eyes, and snouts. If you can't find Dixie cups, any plain small paper cup will do.



### Subtraction Cards

Run blank Piggybank Subtraction cards (use record sheet) on cardstock. Make them up for all fives or sixes (5 - 0, 5 - 1, etc.), or whichever number facts you decide to focus on for the whole group lesson. If you make two or more number family sets, it is helpful to write each set in a different color marking pen to make them easier to sort. Laminate if desired and cut apart.

## MONSTER MATH

### You will need→

problem cards (see Making Instructions)

large monster face (blackline supplement, see making instructions)

unifix cubes and a chalkboard

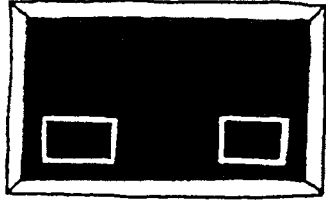
for each child:

chalkboard, eraser and chalk

20 unifix cubes or plain wooden cubes

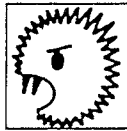
small monster face (blackline supplement; see Making Instructions below)

Ask the children to join you on the rug. Distribute chalkboards, chalk, erasers, monster faces and counters to them. Tell them they'll be practicing addition and subtraction with pairs of cards as well as comparing the answers they get. Put the problem cards facedown in a pile in the middle of the rug and have your large monster face close at hand.



**Teacher:** Please draw rectangles just like mine on the lower left and right sides of your chalkboard. Now let's take a look at this new game.

**Child:** What are these little monster guys? My brother really likes monsters!



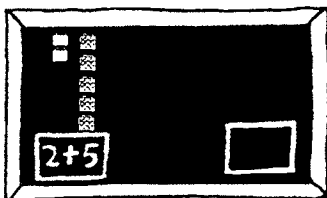
**Teacher:** Aren't they funny! We'll be using them to help us compare our answers after we've solved some problems. This game is pretty hard. Some of the older boys and girls in our school have a hard time with some of their worksheets when they have to figure out problems like these.

**Child:** My Mom had to help Krista with her math last night. Krista was having a hard time!

**Teacher:** I like to teach this game because it will help you understand a bit more about problems where you compare the answers. Let's get started. Did everyone get your boxes drawn? Those will be the spaces where we'll write our number sentences. Let's get a card out of the stack to begin.

**Child:** Can I choose one?

**Teacher:** Sure... $2 + 5$ ; would all of you write that problem in your left hand box so your board looks just like mine?



**Teacher:** Can you set that up with counters just above that box?

**Child:** I think I'll use red and black. I'll use two red and five black.

**Teacher:** Did everyone get it set up?

**Child:** Yeah...that makes seven.

**Teacher:** Good. Let's take another card. Jackie, would you choose one and read it to us?

**Jackie:** I took  $6 - 2$ .

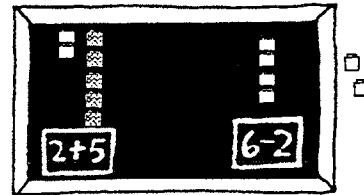
**Teacher:** Thanks, Jackie. Will everyone write that down in your right hand box?

**Teacher:** Can you set that up also?

**Jackie:** I'm going to stack up six blocks and then have two of them fall off. That way, everyone will know I'm subtracting.

**Teacher:** Good idea! What is the answer to  $6 - 2$ ?

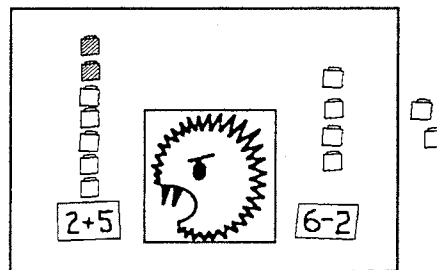
**Jackie:** Four!



**Teacher:** See this monster—he is quite hungry and he'll want to eat the greater amount. Which set of counters would he want to face?

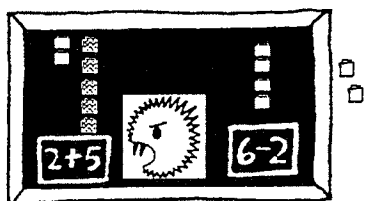
**Jackie:** If he's hungry, he'll go after the seven.

**Teacher:** You're right! I'll put him between my piles with his big mouth and giant teeth getting ready to chomp that set of seven.



**Teacher:** Do you think you could place your monster with a big mouth so it would face your seven?

**Child:** That's easy.



**Teacher:** Great! You've been careful to have the monsters all face your set of seven.

**Teacher:** Let me read this to you the way older children have to read it. (Point to each set as you read so children can see what you mean.)

**Teacher:** Two plus five is more than six minus two. Sometimes they even use the word "greater" for more. Let's try reading it both ways.

**Child:** Two plus five is more than six minus two. Two plus five is greater than six minus two.

Continue in this manner exploring several pairs of problem cards. Be sure you try several problems

## MORE SUBTRACTION ACTIVITIES

Piggybank Subtraction for Independent Practice Time is an Arithmetic Practice and Enrichment box activity. Arithmetic Boxes also include materials for Alligator Subtraction and Mountain Subtraction, activities similar to Piggybank Subtraction.

that will end up with equal sums and/or differences also. (Don't expect all of your children to develop comfort with this game.)

After you've done six or seven problems, have children put their materials away. Plan to come back to this activity several times in the next month or two.

## Making Instructions

### Problem Cards

Using 3 X 5 cards cut in half (making cards that are 3 X 2 1/2), make up two dozen or more addition cards and two dozen or more subtraction cards at an appropriate level of difficulty for your class.

### Monster Faces

Run the monster blacklines on paper. Make one large one for yourself and enough small monsters for each child. Cut out each monster and fold on the dotted line. Glue or tape the two sides together.

Conduct lessons like the one described above until many of your children understand the activities. Add the boxed versions to your Independent Practice set.

# Moving to the Boxes— Facts to Ten

*If you've done group lessons from section one, Learning the Processes, and section two, Facts to Ten, you've set some wonderful foundations. Children will need many more opportunities to sort out the processes of addition and subtraction and to become familiar with number combinations. Now's the time to complete your shift from Pattern to Arithmetic Boxes. You may already have introduced Dice Toss, Shake Those Beans, Piggybank Subtraction, Alligator Subtraction, and Mountain Subtraction. Introduce some of your other Arithmetic Boxes over a three or four day period, modeling each thoroughly until you have a set of ten to twelve boxes available.*

*Plan to allow your class three to five weeks with this set, removing boxes as they become less popular and introducing new ones in their place. You might want to hold some in reserve too. We like to make a few Arithmetic Boxes available during Measuring, Money and Place Value Counting to insure continuing practice.*

**Here is a list of the activities in the Arithmetic Practice and Enrichment Boxes that deal with facts to ten:**

Shake Those Beans  
Dice Toss  
Piggybank Subtraction  
Alligator Subtraction  
Mountain Subtraction  
Add, Tell, Spin and Win  
Subtract, Tell, Spin and Win  
Add and Think (Level 1)

Math Magic  
Addition Lotto  
Subtraction Lotto  
Subtraction Top Draw  
Rock Pile  
Go For It  
Number Muncher



# Facts to Eighteen

Many of these whole group activities are based on some very useful strategies for helping children understand combinations above ten. We learned and adapted the strategies from the teachings of the late Bob Wirtz. Not every child will be ready to see these particular number relationships; but, for many, Doubles, Neighbors, Fast Tens and Fast Nines are helpful tools as they work to sort out facts to eighteen.

## BUILDING DOUBLES

**You will need→** an overhead transparency of a ten frame board or a chalkboard drawing of the ten frame

for each child:

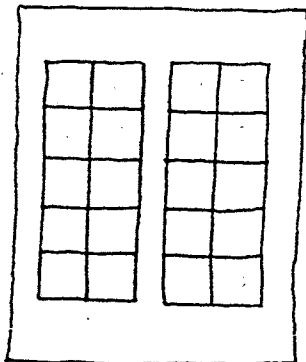
unifix cubes (10 each of 2 different colors)

1 copy of the ten frame board (Materials Index)

$1 + 1 = 2$	$6 + 6 = 12$
$2 + 2 = 4$	$7 + 7 = 14$
$3 + 3 = 6$	$8 + 8 = 16$
$4 + 4 = 8$	$9 + 9 = 18$
$5 + 5 = 10$	$10 + 10 = 20$

Distribute the cubes and ten frame boards to each student.

**Teacher:** Can you put your board in front of you so that the frames are in a vertical line (or run in a line the direction you grow taller). How many squares do you see in each rectangle frame?



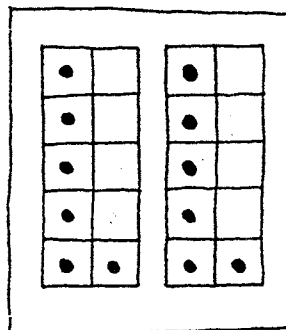
**Children:** Ten...

**Teacher:** That's correct so we'll call these "ten frames". Each of your boards has two ten frames on it.

**Teacher:** Watch what I do. I put four on my left frame and four on my right frame. Can you do that on your board? Good. We call this a double because the numbers are the same, alike, even, equal. How many do we have altogether?

**Children:** Eight!

**Teacher:** Good. Let's make another double. Please build six and six in your frames. (Model in your frame.) Now we have  $6 + 6$ ...how many altogether?



**Children:** Twelve!

**Teacher:** Right! Let's read our boards together.

**Children:** Six and six make twelve!

**Teacher:** Can anyone think of another double we could make?

**Children:** How about eight and eight?

**Teacher:** OK. Eight and eight is a double, they're twins. Let's build eight and eight on our boards. Good. Let's read our boards.

**Children:** Eight and eight are sixteen.

**Teacher:** Would someone who answered sixteen be willing to tell us how they figured it out.

**Child:** Yeah, I counted all of them. It came out sixteen!

**Teacher:** That worked out well. Did anyone figure it out a different way?

**Child:** I looked at the eight and then counted nine, ten, eleven, twelve, thirteen, fourteen, fifteen, sixteen!

**Teacher:** That's a good way. Any other ways?

**Child:** I counted by twos to sixteen.

**Teacher:** Good...are there more ways?

**Child:** I knew that eight and two more makes ten and six more would be sixteen.

**Teacher:** Super job, everyone!

**Teacher:** Can you think of more doubles we could make?

**Children:**  $5 + 5$ ;  $3 + 3$ ; etc.

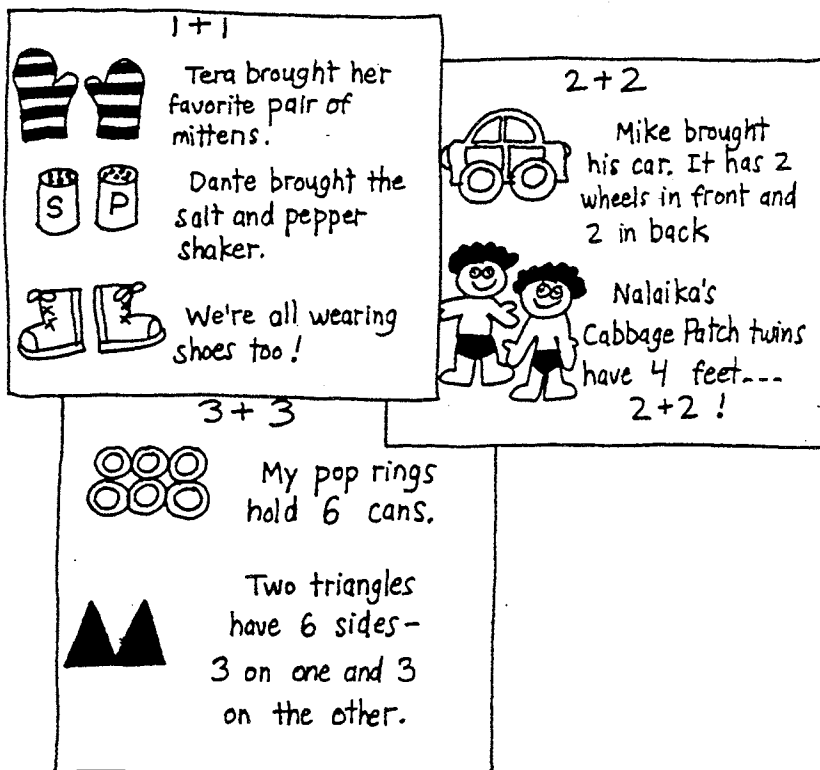
## DOUBLES, DOUBLES, EVERYWHERE

**You will need→** doubles items that children bring from home

12 X 18 white construction paper

Ask your children to bring things from home that illustrate doubles combinations. Items that might arrive include winter gloves ( $5 + 5$ ), egg cartons ( $6 + 6$ ), empty pop cartons or plastic ring holders for sodas ( $3 + 3$ ), ice cube trays ( $8 + 8$ ), Cabbage Patch twins ( $1 + 1$ ), salt and pepper shakers ( $1 + 1$ ), etc.

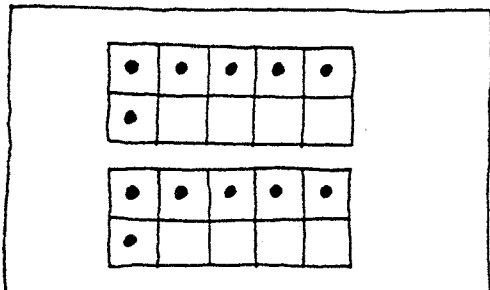
Have children share the doubles they brought and then ask them to work in partners or small groups to create Big Book pages by drawing and labeling the items that have been shared. Be sure to brainstorm other doubles before they begin.



## SEEING DOUBLES

**You will need→** a set of Doubles Discussion Cards, laminated (Materials Index)

**Teacher:** Does anyone remember what we call these combinations?



**Children:** Twins? No, Doubles!

**Teacher:** You've got it!

**Teacher:** Let's review some of our Doubles with these Discussion Cards. I will hold up the card while you think about how

many you see altogether. When I signal you by raising my hand, tell me what you see. Ready? (Give signal.)

**Children:** Twelve!

**Teacher:** Let's say the whole number sentence together.

**Children:**  $6 + 6 = 12$ .

Go through the rest of the Doubles Discussion Cards in a similar manner. Learning Doubles is largely a matter of memorization at this point. You may wish to post a doubles chart in your classroom and have children practice chanting the doubles at school and home. Be sure also to model the game Doublesland from the Arithmetic Packet and make it available during Independent Practice Time.

## BUILDING NEIGHBORS

**You will need→** unifix cubes (Each child needs 18 in any single color and one red cube.)

ten frame boards (Materials Index)

overhead transparency of the ten frame or chalkboard drawing of it

$1 + 2 = 3$	$6 + 7 = 13$
$2 + 3 = 5$	$7 + 8 = 15$
$3 + 4 = 7$	$8 + 9 = 17$
$4 + 5 = 9$	$9 + 10 = 19$
$5 + 6 = 11$	

Distribute cubes and the ten frame boards.

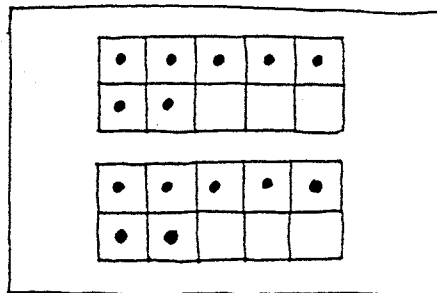
**Teacher:** We've been working with doubles. Today, we're going to look at a type of combination we'll call neighbors.

**Children:** Do they live next door?

**Teacher:** You might say that. Who can figure out a doubles combination we could build?

**Children:** How about  $7 + 7$ ?

**Teacher:** OK. Let's lay that out. I'll work up here so you can all see. You lay out seven and seven on your boards but **don't** use that one red cube you have.

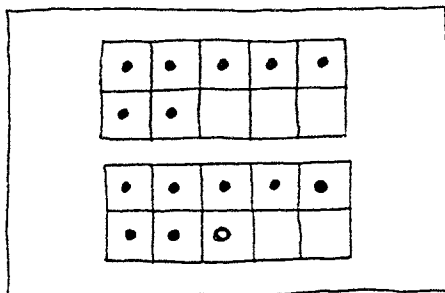


**Children:** Why not?

**Teacher:** That one will be our neighbor cube. You'll need it in just a minute. Has everyone built their doubles of seven? OK. Please read together with me.

**Children:**  $7 + 7$  is 14.

**Teacher:** Great! Now pick up your red neighbor cube. Show it to me. Put it on your bottom frame. What two numbers are we looking at now?



**Children:** Seven and eight!

**Teacher:**  $7 + 8$ . That's a big combination. When I was in second grade I used to figure that out by counting on...7, 8, 9, 10, 11, 12, 13, 14, 15. Can anyone see an easier way to figure it out?

**Children:** What about seven plus seven? Yeah! And one more makes fifteen.

**Teacher:** Let's all say that. Seven and seven is fourteen and one more makes fifteen.

Repeat this procedure a number of times. Each time, you and the children first build a double, then place the red neighbor cube on one of the frames and talk your way through the combination.

## SEEING NEIGHBORS

**You will need→**

Neighbors Discussion Cards, laminated (Materials Index)

a vis-a-vis or overhead projector pen

**Teacher:** This is a Neighbors Card. Can anyone tell us what the double was before we added one more?

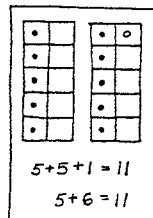
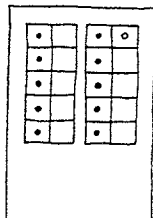
**Children:** Five and five!

**Teacher:** Right! Let's read it together. Ready?

**Children:** Five and five make ten and one more makes eleven.

**Teacher:** I'll write that on the Discussion Card with my vis-a-vis pen.

**Teacher:** I can also write  $5 + 6$ .



Go through the rest of the Neighbors Discussion Cards in a similar manner.

After you've repeated this lesson a few times, plan to introduce some Boxes that reinforce these strategies during Independent Practice Time. Aside from Doublesland, we haven't included specific games for Doubles and Neighbors but it's very easy to make up Number Muncher as a Doubles and Neighbors game. Math Magic is also fun with Doubles and Neighbors combination cards. You could also box versions of Add, Tell, Spin and Win, and Subtract, Tell, Spin and Win with these doubles and neighbors combinations (see Arithmetic Packet).

## FAST TENS

**You will need→**

an overhead transparency of the ten frame board or a chalkboard drawing of it

for each child:

unifix cubes (ten each of two colors)

a ten frame board

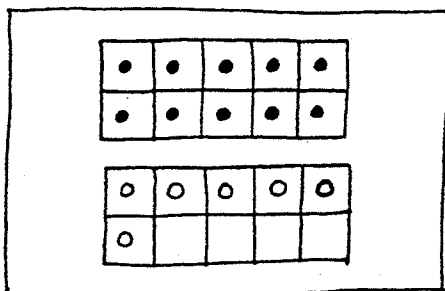
$10 + 1 = 11$	$10 + 6 = 16$
$10 + 2 = 12$	$10 + 7 = 17$
$10 + 3 = 13$	$10 + 8 = 18$
$10 + 4 = 14$	$10 + 9 = 19$
$10 + 5 = 15$	$10 + 10 = 20$

Distribute cubes and ten frame boards.

**Teacher:** We've been working with doubles and neighbors. Here's another good way to solve some big facts quickly—Fast Tens.

**Teacher:** Let's all set out ten cubes on our top frame. Use all one color.

**Teacher:** Now let's set six of the other color on the bottom. How many cubes do we have altogether?

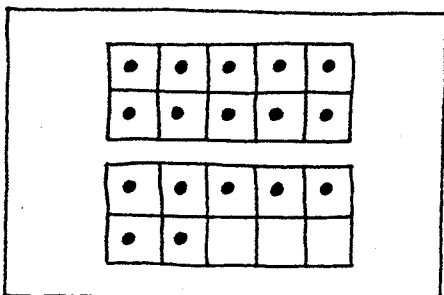


**Children:** 16!

## SEEING FAST TENS

**You will need→** a set of Tens Discussion Cards laminated (Materials Index)

**Teacher:** This is a Fast Tens Card. I'll hold it up while you think about how many you see altogether. When I signal you by raising my hand, tell me what you see. Ready? (Give signal.)



**Teacher:** How did you figure that out so quickly, Ben?

**Ben:** Easy—I can hear it—ten and six makes sixteen.

**Teacher:** How'd you know it was sixteen, Michael?

**Michael:** I counted on—10, 11, 12, 13, 14, 15, 16—16!

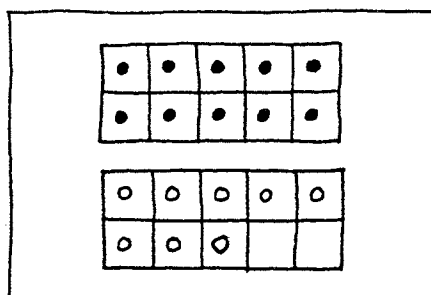
**Teacher:** How 'bout you, Angie?

**Angie:** I saw three rows of five and one more.

**Teacher:** Interesting. Let's try another one. Let's keep ten on top, and set eight on the bottom.

**Children:** That's easy! Yeah! Just add two more.

**Teacher:** Let's read the combination on our board.



**Children:** Ten plus eight equals eighteen!

Continue building fast tens with the children and discussing their answers.

**Children:** Seventeen!

**Teacher:** Let's say the whole number sentence together.

**Children:**  $10 + 7 = 17$ .

Go through the rest of the Tens Discussion Cards together. Some of the children in your class have probably already discovered this addition strategy on their own. Others may begin to see some kind of pattern at work. After several lessons, one little boy commented that these Fast Tens were very easy. "The ten just picks up the other number in his backpack and carries it away!"

## FAST NINES

**You will need→**

an overhead transparency of the ten frame board or a chalkboard drawing of it

for each child:

unifix cubes (10 of one color, and 9 of another)

a ten frame board

$9 + 1 = 10$	$9 + 6 = 15$
$9 + 2 = 11$	$9 + 7 = 16$
$9 + 3 = 12$	$9 + 8 = 17$
$9 + 4 = 13$	$9 + 9 = 18$
$9 + 5 = 14$	$9 + 10 = 19$

Distribute cubes and ten frame boards.

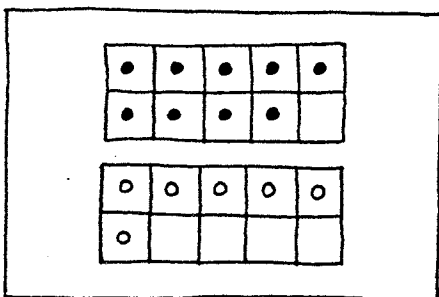
**Teacher:** Fast Tens seem very easy for lots of you.

**Children:** Yeah!

**Teacher:** Let's try something a little more tricky today—Fast Nines.

**Children:** Hmm...will they be like tens, but with nine on top?

**Teacher:** Yes. Let's set out nine of one color in the top frame. I'll draw on the chalkboard—you use your ten frame boards. Now let's set six on the bottom.



**Children:** OK.

**Teacher:** What two numbers are we looking at?

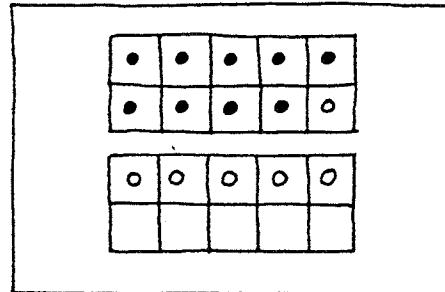
**Children:** Nine and six.

**Teacher:**  $9 + 6$ . Wow! That's a hard combination. How could we figure it out?

**Children:** We could count on.

**Teacher:** Sure. Any other ideas?

**Children:** I know! Let's move one up to the top frame and make it into a ten!



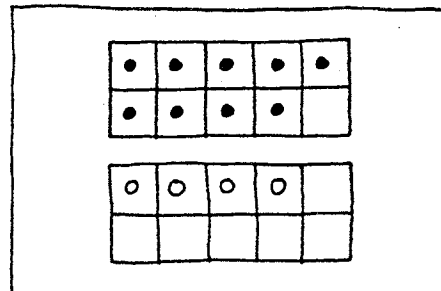
**Teacher:** Great idea! Let's try it together.

Here's something to say while we do it.

Ready? Move one up, this makes it  $10 + 5$  and that's 15. So we know that  $9 + 6$  is 15.

**Teacher:** Let's try  $9 + 4$ . Can you set that up?

**Children:** Sure.



**Teacher:** How can we solve it?

**Children:** Move one up to make it  $10 + 3$  and that's thirteen.

**Teacher:** So we know that  $9 + 4$  equals...

**Children:** Thirteen!

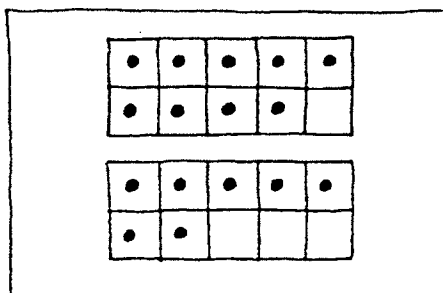
Children need repeated opportunities to set up the cubes and move them before they get the idea of Fast Nines, so be sure to repeat this lesson several times working with most of the combinations each time.

## SEEING FAST NINES

**You will need→** a set of Nines Discussion Cards laminated (Materials Index)

a vis-a-vis or overhead projector pen

**Teacher:** This is a Fast Nines Discussion Card. Can you see what two numbers are being added?



**Children:** Nine and seven.

**Teacher:** How could we add them quickly?

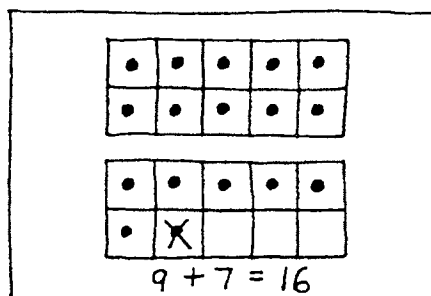
**Children:** Move one up, but how can you move one of those dots?

**Teacher:** I'll cross it out with my pen and move it up like this.

**Children:** Now it's ten plus six—that's sixteen.

**Teacher:** So we know that...I'll write it on the card and you say it...

**Children:**  $9 + 7 = 16$ .



Go through the rest of the Nines Discussion Cards together. Be sure to repeat this lesson several times. This strategy, along with Fast Tens, Doubles and Neighbors, helps many children "talk their way through" difficult combinations.

## FAST NINES AND FAST TENS DICE TOSS

**You will need→** 3 dice (one will have 9's and 10's on all six surfaces; one will have 0, 1, 2, 3, 4, 5; and the last die will read 4, 5, 6, 7, 8, 9)

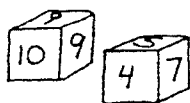
a grid drawn on large butcher paper or on your chalkboard

a record sheet for each child (blackline supplement)

**Teacher:** Here's a game to help you practice Fast Tens and Fast Nines.

**Teacher:** I'll begin the game by rolling my nines/tens die and this zero-to-five die.

9 + 5 = 14	
Fast 9's	Fast 10's



**Children:** You rolled a nine and a five. That makes  $9 + 5$ . That's Fast Nines.

**Teacher:** Watch how I write that in the Fast Nines half of my record sheet. Can you write it down too?

**Child:** I bet we're supposed to start at the bottom and go up like on some of our graphs.

**Teacher:** That would be fine!

Play continues in this manner with the teacher rolling the nines/tens die and switching the zero-to-five die for the four-to-nine die frequently. When one column is filled, the record sheet is complete.

This makes a good team game with teams alternating the rolls of the dice on their turns. The first team to fill a column wins the game. When children understand the game, make the boxed version of Fast Nines and Fast Tens Dice Toss

available during Independent Practice Time. Two other boxes from the Arithmetic Packet, Fast Tens and Fast Nines, will provide additional practice to children in each of these strategies.

## DOUBLES, NEIGHBORS, FAST NINES, FAST TENS AND LEFTOVERS

**You will need→** a copy of the Doubles, Neighbors, Fast Nines, Fast Tens and Leftovers sheet for each child (blackline supplement)

an overhead transparency of the record sheet or a copy drawn on large chart paper

two dice numbered 4-9 and 5-10

Once your children have been exposed to all four strategies, use this group game. It helps many children focus on what kind of combinations they are trying to solve.

D, N, +9, +10, L Dice Toss <small>Art. Bell</small>					
4					
3					
2					
1					
Round	D	N	+9	+10	L

Distribute the record sheets. Explain to your children that they are going to work as a team to play Round One against you.

**Teacher:** Are you ready to start? I'll roll the dice for my turn first so you'll know what to do. Hmmmm...I rolled nine and six. (Write  $9 + 6$  on the chalkboard.) Help me decide which column I should mark on my record sheet. Is  $9 + 6$  a Double?

**Children:** No....

**Teacher:** Is it a Neighbor?

**Children:** No! Those two numbers don't live next door to each other!

**Teacher:** Is it a Fast Nine?

**Children:** Yes!

**Teacher:** Then I'll write it in my Fast Nine column. Can you help me figure out the answer?

**Children:** Just move one from your six in with the nine and you'll have  $10 + 5$ . That is an easier way than counting all of them!

**Teacher:** So  $9 + 6$  is fifteen?

2					
1			$9+6=15$		
Round	D	N	+9	+10	L

**Children:** Yep!

**Teacher:** Now it's your turn. Aaron, will you roll the dice for your team?

**Children:** OK.

**Children:** Aaron got six and seven

**Teacher:** (Write  $6 + 7$  on your chalkboard so everyone can look at it while they're thinking.) What kind of combination is  $6 + 7$ ? Is it a Double?

**Children:** No...

**Teacher:** Is it a Neighbor?

**Children:** Yes! We get to mark our Neighbor box.

**Teacher:** How much is  $6 + 7$ ?

**Children:** Thirteen...because  $6 + 6$  is 12 so  $6 + 6$  and one more is thirteen.

**Teacher:** My turn now. I got  $9 + 7$ . What kind of combination is that?

**Children:** It's a Fast Nine.

**Teacher:** I can't write it because in this round I've already filled my Fast Nines box. I need a Double or a Neighbor.

**Children:** You could have used a Fast Ten or a Leftover too! It's our turn now.

**Teacher:** Sharonda, will you roll the dice.

**Sharonda:** OK. I got  $5 + 7$ .



**Teacher:** Is  $5 + 7$  a Double?  
**Sharonda:** No...  
**Teacher:** Is it a Neighbor?  
**Sharonda:** No...  
**Teacher:** Is it a Fast Nine or Fast Ten?  
**Sharonda:** No...  
**Teacher:** Then it is a Leftover. If you can't use any of the four strategies to solve the problem, it's called a Leftover.

D, N, +9, +10, L <small>DICE Toss Sharonda</small>					
4					
3					
2					
1		$6+7=13$			$5+7=12$
Round	D	N	+9	+10	L

(Children record the number sentence in their Leftover column.)

**Children:** Now we have two boxes filled. We're ahead!

**Teacher:** What if you didn't know the answer to  $5 + 7$ . How could you figure it out?

**Children:** You could count on from the larger number, 7... 8, 9, 10, 11, 12.

**Teacher:** That would work. Any other ideas?

**Child:** You could just think it up. I'm getting so I can remember!

**Teacher:** We all are working on figuring out ways to solve problems quickly. You're doing very well coming up with answers.

Continue taking turns until you or the children have filled every box in the first row. Put the papers away for another day.

Make the boxed version of this game available once you've played three or four rounds with your class. By then, many children will be getting proficient at identifying strategies and will enjoy playing independently.

## 21

**You will need→** gamecards for 21 (blackline supplement)

Though you can't play this game as a whole group, you can prepare children to play and do some nice lessons on column addition at the same time.

**Teacher:** Today, I'm going to get you ready to play a new game. This game requires a little strategy, you have to be able to add more than two numbers together. Let's take three cards off the top of the stack. Let's see. We got a seven, ten and three. Wait, we don't have to add them in that order just because they came up that way. Does anyone want to move any of the cards to make them easier to add?

7

10

3

**Child:** Yeah...move the seven down by the three.

**Teacher:** Why?

**Child:** 'Cause  $7 + 3$  is 10 and  $10 + 10$  makes twenty.

**Teacher:** Any other ideas?

**Child:** I think you should leave them in the same order.

**Teacher:** Why?

**Child:** Well,  $7 + 10$  is seventeen and three more makes twenty.

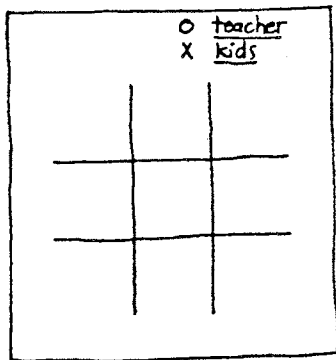
**Teacher:** Another good way. Any other ideas?

Continue pulling three or four cards at a time off the top of the stack. Discuss strategies each time so children begin to see some ways they might organize their cards. It is important for children to see you don't always add top to bottom; there are often better strategies. Repeat this lesson several times before you add the boxed version to your Independent Practice Time activities.

## TIC TAC TOE

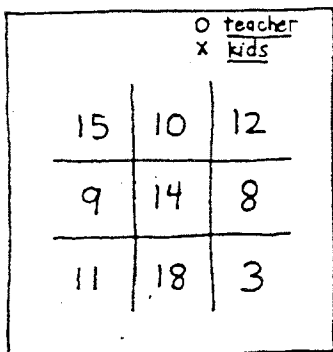
**You will need→** two dice (each numbered 4-9)

a Tic Tac Toe paper for each child (see blackline supplement)



Draw a Tic Tac Toe grid on the chalkboard just like the children's record sheets. The children will be playing against you so decide who will be X and who will be O. Have them label the record sheets accordingly.

Ask the children to take turns volunteering a number for each section of the grid. Any number from eight to eighteen can be chosen and it's fine to repeat a number. (All grids will have the same numbers filled in.)



Take turns rolling the dice and marking your sheets.

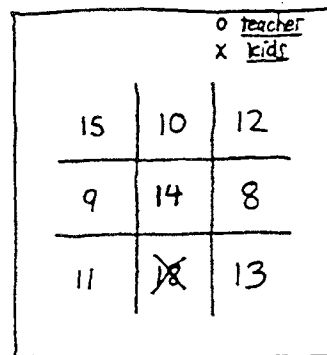
**Teacher:** You can be first today. Yeh Ching, will you roll the dice?

**Yeh Ching:** OK. I got 9 + 9.

**Teacher:** Class?

**Children:** It's eighteen!

**Teacher:** So we have to put an X on eighteen, even me.

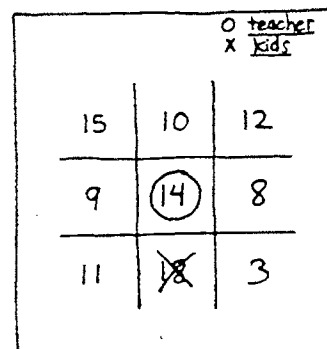


**Teacher:** Now it's my turn. I rolled 6 + 8.

**Children:** That's fourteen.

**Teacher:** Let's check it out by counting on from the larger number...

**Children:** 8...9, 10, 11, 12, 13, 14. It is fourteen. Rats! You got the middle box.



Continue taking turns. Each person marks his or her paper for every turn (unless the answer has been used already in which case that turn is lost).

The first team to get three X's or three O's in a row wins.

This version of Tic Tac Toe is a wonderful "sponge activity" that children never seem to tire of playing as a group. It also makes a nice partner game when most children begin to understand how the game works. Be sure to add it to your set of Practice and Enrichment Boxes.

## Moving to the Boxes— Facts to Eighteen

*The group lessons just described will provide many of your children with strategies to understand facts above ten. We're aware that others won't begin to sort out the number relationships or to make sense of these combinations until long after second grade. Nevertheless, we like to allow all our students a chance to practice, to sort things out for themselves. Some will cope by counting on, some will make use of other strategies, a few will memorize the facts. We offer these boxes once we are beginning to move out of Place Value Counting Boxes. When you've been able to move the children comfortably into using these boxes, you will begin introducing Place Value Addition and Subtraction lessons.*

**Here is a list of the activities in the Arithmetic Practice and Enrichment Boxes that deal with facts to eighteen:**

Doublesland  
Fast Tens  
Fast Nines  
Fast Nines and Fast Tens Dice Toss  
Doubles, Neighbors, Nines, Tens, and Leftovers Dice Toss  
Tic Tac Toe  
Add and Think  
2 1  
What's Missing?

In addition, you can modify many of the facts to ten games, simply by making higher fact cards. Games easily modified include:

Add, Tell, Spin and Win  
Subtract, Tell, Spin, and Win  
Math Magic  
Subtraction Top Draw  
Rock Pile  
Number Muncher

## Chapter 15

# UNDERSTANDING MEASURING

*Comparing and measuring are real world skills near and dear to the hearts of children. Well before they enter kindergarten, youngsters are interested in making comparisons between things in the world around them. Which carrot is shorter? Which car goes faster? Which piece of cake is bigger? Who has more blocks—you or me? Long before they understand centimeters or kilograms, they want to know how tall they are and how much they weigh. It is surely the rare child who isn't fascinated by the household tape measure or who doesn't want to help bake cookies.*

We like to capitalize on children's early interest by offering them many experiences with length, weight, capacity, duration, circumference, perimeter and area. Kindergartners develop beginning understandings by comparing; becoming familiar with such concepts as heavier, lighter, longer, shorter, bigger, smaller, more, less, and the same. Grade Ones and Twos measure using nonstandard units. We believe children are much more likely to understand inches, centimeters, kilograms, liters, square feet, pounds and all the other standard units of measure in use today if they've had many opportunities to deal with measurement in very concrete ways. A child who has measured across the rug with unifix cubes, popsicle sticks and tiles may understand centimeters, and meters later. Moreover, he or she may see a real purpose for using standardized units of measure. A child who has covered the counter top with squares and

counted them to determine area will hopefully bring some very real understandings to later tasks such as calculating the acreage of Farmer Smith's field.

The Understanding Measuring activities offer rich problem solving opportunities. We have seen children develop some unique strategies and begin to formulate surprising generalizations. One bright Grade One tackled the task of measuring a friend in unifix cubes and popsicle sticks. He first measured the friend in popsicle sticks. He then figured each popsicle stick to be about eight unifix cubes long and said, "Now, if I only knew how much 7 eights were, I'd know how tall Joey is in unifix cubes!" Needless to say, even after we worked together and decided that  $7 \times 8$  made 56, he laid out the cubes beside his friend to check. Young children love to count, it provides joy and confirmation of their guesses.

We can't move primary students beyond their need to count, but we can engage them in some fairly sophisticated thinking if we allow them to use units that can be counted, as

opposed to instruments that give a ready-made *right* answer. When a meter stick tells you the line segment is 28 centimeters long, what need is there to pursue the question?

## Group Lessons

*Because measuring has to be experienced directly by the learner many times to be understood, Seasonal Math is filled with measuring lessons. Children have opportunities to practice measuring in some form nearly every month. These lessons set foundations for the Measuring Boxes, which help children further extend and consolidate their understandings. If you haven't been able to conduct Seasonal activities on a regular basis, at least go through the first several chapters of this guide and select and do a few of the measuring activities with your class before you introduce the Measuring Boxes.*

*You may also want to do the following lessons as you bring out the first few Measuring Boxes.*

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### Measuring Length

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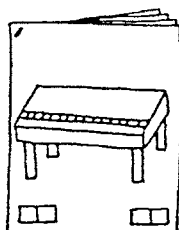
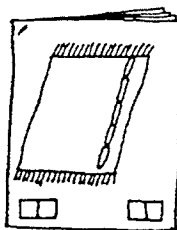
**You will need→**

unifix cubes (4-6 baskets)

popsicle sticks (4-6 baskets)

one mini booklet for measuring length—one booklet for every two children (blackline supplement, instructions below)

To make the mini booklets, use the Measuring with Popsicle Sticks and the Measuring with Unifix Cubes blacklines. Run enough copies for a fourth of your class. Cut the copies into fourths and collate the little pages into small booklets for half of your class. Each booklet will have two Popsicle Sticks and two Unifix Cubes pages.



Call the children to the rug and choose someone to measure. (To be fair, you may want to pull a name from your teacher Feely Box.)

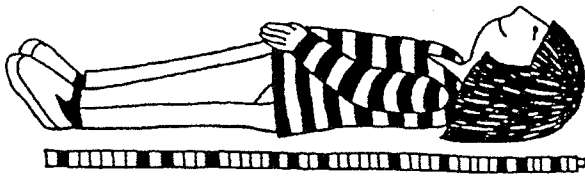
**Teacher:** *We're going to measure Sarah today. Boys and girls, I'm going to snap enough unifix cubes together to make a train as long as Sarah. How many cubes do you think I'll need? How long do you think Sarah is in unifix cubes? Raise your hands and I'll record your estimates on my chart.*

*(Children volunteer guesses.)*

**Teacher:** *We have lots of guesses. Let's hook cubes together and see what*

21	103
45	18
236	100
97	25
72	56
	49

*happens. Sarah, will you help me?  
(Sarah and the teacher snap unifix cubes together to make a train that looks about right. Sarah lies down next to the train and adjustments are made.)*

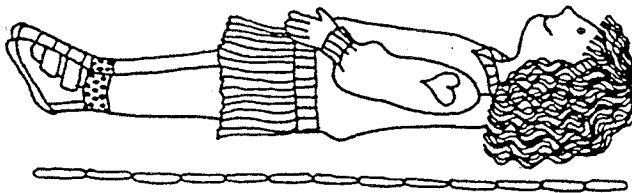


**Teacher:** Jason, would you come check this train? It needs to go right from Sarah's heels to the top of her head. Does it look right to you?

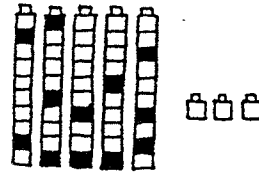
**Jason:** Yep!

**Teacher:** Great! Now, I could count these cubes one by one but it would take an awfully long time. Can anyone think of a faster way?

Discussion ensues and the class decides that breaking the train into tens and ones would be the best way.



**Teacher:** Sarah, why don't you hop up and we'll work together to break this train into tens and ones. That was fast. Everybody, help Sarah and me count.



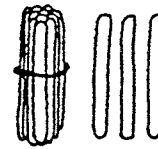
**Children:** Five tens and three ones!

**Teacher:** What does that make?

**Children:** 10, 20, 30, 40, 50, 51, 52, 53...53!

Model measuring with popsicle sticks in the same manner.

Finally, show children the mini booklets. Explain that they will work in partners to measure things around the room with popsicle sticks and unifix cubes. Once they understand the task, have monitors set baskets of cubes and sticks around the room and send children out to work.



"Ten ... eleven, twelve, thirteen!"

## Determining Weight

**You will need→** a balance scale      tiles

a variety of things to weigh (can of soup, small book, candle, block, rock, large onion, clay ball, chalkboard eraser, etc.)

Since you can't see weight, it's helpful to children to have a point of reference before they try to estimate the weight of other objects. Weigh one of the objects, the candle perhaps. Put it on one side of the balance scale and dump tiles into the other side until the scale balances. Dump the tiles out and count them by ones, then by tens and ones. Set the tiles aside for later reference.

Leave the candle on the scale and try the can of soup on the other side. Which is heavier? Will it weigh more tiles than the candle or fewer tiles? Have children guess how many tiles it will weigh.

Leave the can in one side of the scale and load tiles into the empty side until it balances. Dump the tiles out and count them into tens and ones. Compare the results to the pile of tiles

you've saved for the candle. Did it take fewer or more tiles to weigh the can than the candle? Try the activity again with another object so the

children have a chance to focus another time on the strategies involved in weighing and comparing.

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## Weighing Booklets

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**You will need→**      3 or 4 sets of various balance scales and/or milk box scales (Materials Index)

Balance Scale record sheets (blackline supplement)

ceramic tiles set out in several areas

items to weigh

This activity will give children a chance to weigh some things independently. It is important to demonstrate how to do the weighing and complete the weighing record sheets for the whole class.

You may want to have half of your children complete this activity the first day while the others work at another set of activities in a different part of the room and then complete the weighing the second day by reversing groups.

## Moving to the Boxes

*Seasonal measuring activities help to pose questions and build understandings about measuring. The Measuring Practice and Enrichment Boxes offer children a chance to explore concepts even more thoroughly. First and second grade teachers often get out the Measuring Boxes for two to four weeks in the late fall or early winter after they've worked on Arithmetic awhile. We feel the Boxes provide practical exposure to Place Value Counting because children count the measuring units by tens and ones.*

*When you're ready to shift into Measuring, simply introduce one or two boxes at the beginning of each Independent Practice period. Be sure to model new boxes thoroughly, demonstrating the activities from start to finish, including clean-up. Each time you introduce a new box, put one of the less frequently used boxes from your prior set away so you don't have an excess of activities going on at once.*

## Here is a list of the activities in the Understanding Measuring Practice and Enrichment Boxes.

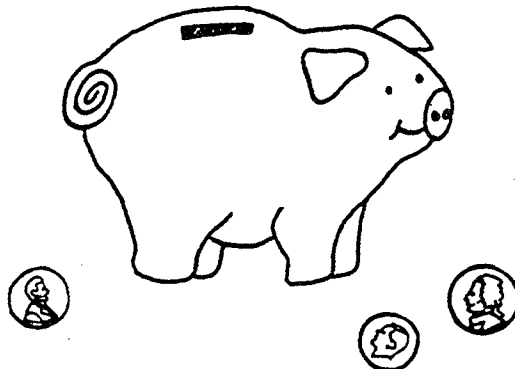
To offer your class a well-rounded experience, you'll want to construct nearly all the Boxes.

Box Name	Skills Explored
How Long Is It? Measuring with Unifix Cubes	Estimating and measuring length, counting by tens and ones
How Long Is It? Measuring with Popsicle Sticks	
How Long Is It? Measuring with Tiles	
Weighing Things with Tiles The Balance Scale The Pan Balance The Calibrated Scale	Estimation, weighing, comparing, counting by tens and ones plus calibrating a weighing device
Rice Spoonfuls Calibrated Jar	Estimating, measuring capacity, calibrating a measuring jar
Perimeters	Estimation, measuring perimeters, counting by tens and ones
How Big Around?	Estimating and measuring circumference, counting by tens and ones
How Big Is It? (Small Areas) How Big Is It? (Large Areas)	Estimating and measuring area, counting by tens and ones
Sinkers	Estimating and measuring duration.



## Chapter 16

# MONEY



*Money may be the most complex mathematical concept we teach in the early grades. Coins by their very nature are abstract. Most four year olds are convinced that fifteen pennies is a much greater fortune than four dimes. What a leap of faith we ask our primary children to make when we tell them that a nickel is worth five times as much as a penny and that one skinny little dime is worth twice as much as that nice fat nickel which looks so much like a quarter it's hard to tell the difference! The counting skills necessary to count even small sums of money are formidable: rote counting, one-to-one correspondence, and all the possible combinations of counting patterns for ones, fives, tens and twenty-fives.*

*It takes children a long time and many, many experiences to gain the skills and understandings to deal with money. The good news is that money is magic to many youngsters. It supplies students with a wonderful real-life reason to learn. By the time you're ready to start teaching Money, many of your students will have started to piece some understandings together, particularly if you've done Seasonal Math and Calendar activities, some of which provide daily practice in the skills necessary to count money. (See Part Three, The Calendar, for The Numberline Strip, The Tally Pad, The Date in Tens and Ones and Money Pockets.) Your large group instruction and provision for independent practice will help children understand many more parts of the puzzle.*

*Our money instruction goals aim for the following understandings:*

### **First Grade:**

coin recognition, coin names, coin values:  
penny, nickel, dime, and quarter

counting mixed coins: pennies, nickels, dimes  
and (if ready) quarters

adding/subtracting coins

dollars and cents notation

writing and solving simple story problems  
about money

calculating prices

## Second Grade:

coin names, coin values: pennies, nickels,  
dimes, quarters, half dollars

dollar values: ones, fives, tens

adding and subtracting money

dollars and cents notation

writing and solving money story problems

calculating prices

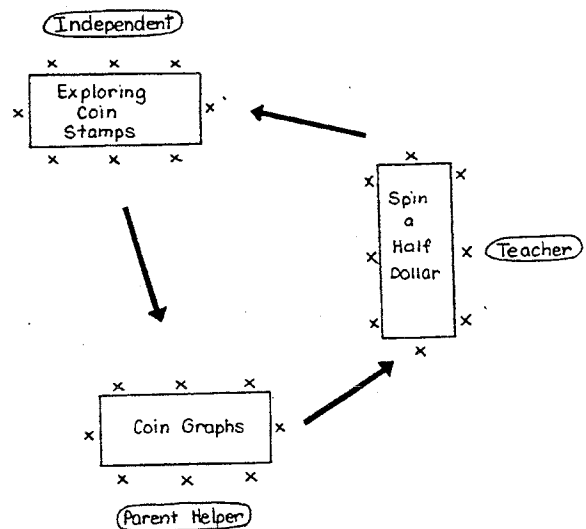
making change (if child is ready)

Plan to offer concept instruction for two to three weeks using the group lessons that follow. Some of the group lessons are whole-group versions of the Boxes and provide direct instruction as well as introducing the games children will use for practice and reinforcement. As children seem to understand these activities, add them to the set of boxes you are currently using and remove some of the less popular boxes. In this way, Independent Practice Time will gradually change from your previous topic to Money.

A few of the lessons are short—you'll want to do two or three of them in one period. A few of them

work best with small groups (one third to one half of your class). Depending upon your class size, you might want to set up three activities. Supervise one yourself, get a parent helper or older child to supervise another and have children work independently at the third. Divide your class into three groups and rotate them three times allowing about ten minutes per activity.

Another possibility is to have half your children work at Boxes while you take half for large group instruction. Switch groups midway through your math period.

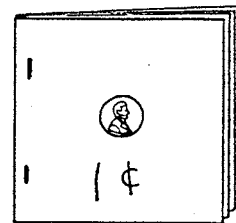


## Group Lessons

### Coin Recognition/Coin Worth

#### EXPLORING COIN STAMPS (Small Group)

**You will need→** coin stamps (Materials Index)  
paper (3 X 3 sheets)  
silver and brown crayons



Children stamp coins and then color them in appropriate colors of silver or brown. First graders even enjoy writing the amount

stamped if they are ready for this skill. When they finish this activity, they staple their pages into a little booklet.

## COIN GRAPH (Small Group)

**You will need→**

real pennies, nickels and dimes

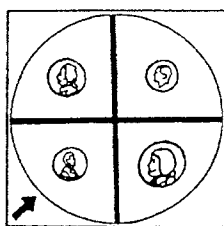
coin stamps (Materials Index)

spinner (blackline supplement)

















copies of Coin Graph record sheet (blackline supplement)











There are several ways to use the record sheet:





1. The easiest way is to spin the spinner, call out the coin name and place the coin in the appropriate column. Work continues until a column is filled. (See first graph below.)



2. Another way is to spin the spinner, call out the coin name and color a box in the appropriate column. (See middle graph below.) Work

			
			
			
			
			
			
1 ¢	5 ¢	10 ¢	25 ¢

			
			
			
			
1 ¢	5 ¢	10 ¢	25 ¢

1 ¢			25 ¢
1 ¢		10 ¢	25 ¢
1 ¢	5 ¢	10 ¢	25 ¢
			
1 ¢	5 ¢	10 ¢	25 ¢

continues until a column is filled (though many children enjoy trying to fill all the columns).

3. A variation is to have children stamp and color the coin indicated by the spinner. Work continues until at least one column is filled.
4. Another variation is to have children write the coin value in each column after they have had some guided instruction in writing the numerals and cent signs. (See third graph below.)

Once most of your children seem to understand this activity, add the boxed version to the set of activities you are currently using during Independent Practice Time. You'll want to remove a less popular box from the old set.

## SPIN A HALF DOLLAR (Whole Group)

**You will need→** Spin A Half Dollar spinner (see blacklines)

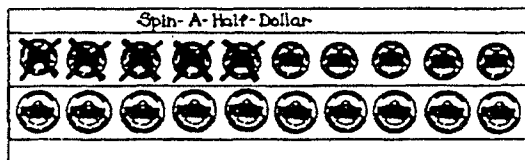
*for each child:*

Spin A Half Dollar gameboard (see blacklines)

a blue or red yarn necklace

### To Play:

1. When the teacher spins the spinner, he/she calls out "nickel" and the class responds with "five cents" and then marks off five of their pennies.



2. Play continues until the gameboard has been completely marked off. (Encourage children to help one another as they work. Stop often to count the money that has been marked off, as well as the remaining money.)

After the children understand the game, it's fun to break into partners and play again. An easy way to manage this is to have two sets of yarn loop necklaces, blue and red, perhaps. That way, you call out "blue spin...a dime" or "red spin...a nickel" as teams take turns responding by calling out the value and marking off the appropriate number of pennies on their game sheets.

Add the boxed version of this game to the set of boxes currently in use. (You may wish to remove one of the older boxes if you don't like having too many materials out at any one time.)

## MONEY MARCH (Small Group)

**You will need→** Money March spinner (see blacklines)



a copy of the Money March gameboard for every two children in the room (see blacklines)

*for each child:*

unifix cube game marker

a blue or red yarn necklace

### To Play:

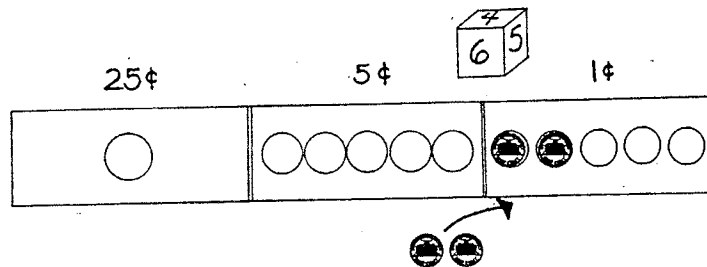
1. Partners put on a red or blue yarn necklace.
2. The teacher spins the spinner and calls out the coin name "dime" for the blue team.
3. The blue partners call out "10¢" and move their unifix cubes forward ten spaces.
4. The teacher spins and calls out a coin name for the red team.

5. The reds call out the proper value and move their markers forward the appropriate number of spaces.
6. Continue in this manner until one of the teams reaches the pot of gold.

Once most of the children understand how the game is played, add it to your Independent Practice Time collection.

## SPIN 25 CENTS (Small Group)

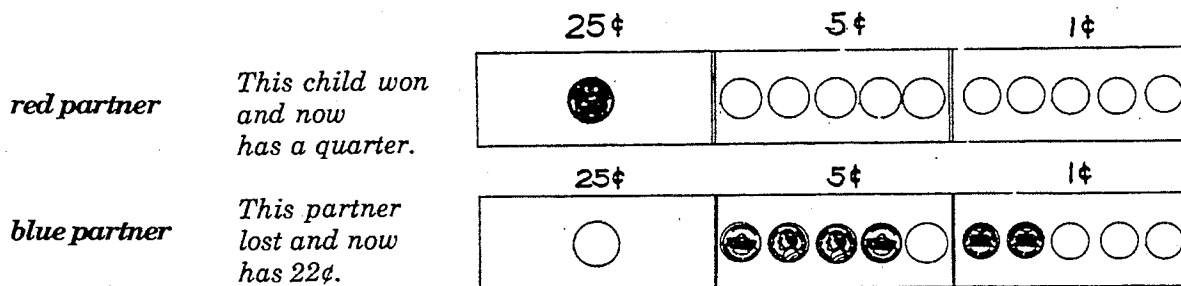
**You will need→**      copies of trading boards for each player (see blacklines)  
                                  5 pennies and 5 nickels per player  
                                  die marked 1-6  
                                  yarn necklaces to label partners



### To Play:

1. Roll die. All players call out the amount indicated.
2. The red players set out that amount, show partners and then move the coins onto their trading board. (See illustration above.)
3. Play continues in turn with partners setting out appropriate amounts and making coin trades when needed until one of the partners reaches 25¢. (See illustration below.)
4. It's fun to reverse the game at this point and race back to zero. To go backwards, play begins exactly as the boards were when one partner won. This keeps the spirits high for the losers!

As soon as most everyone understands the game, add it to your Independent Practice Time collection.




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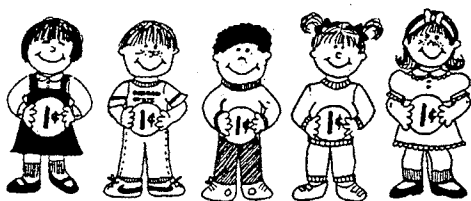
## Counting Sums of Money

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### PEOPLE COINS WARM-UP (Whole Group)

**You will need→**      36 large paper "coins" cut from gray and brown paper  
                                  labeled: 1¢, 5¢, 10¢ and 25¢ (10 pennies, 10 nickels, 10  
                                  dimes and 6 quarters)

individual chalkboards, chalk and erasers



Hand out the pennies to five different children. Have them form a line in front of the group and hold their coins in front of them. Ask the audience to figure out, silently, how much money is up front. Call someone to report the total. (We like to pull a name card from our

Feely Box. If that child is unable to respond, he or she is free to ask another child to help.) After the total has been reported, have everyone count the sum together, 1, 2, 3, 4, 5...five cents!

Repeat using five nickels, then five dimes and for second graders, five quarters. Discuss which counting pattern will need to be used in each case.

It is nice for first and second graders alike to record the counting pattern on their chalkboard as they count.

## PEOPLE COINS—Counting Mixed Sums (Whole Group)

Hand out two kinds of paper coins, nickels and pennies, for example, to five to seven children in random order. Have each child go up to the front of the group with the coin as he or she is chosen so you wind up with the coins in random order.

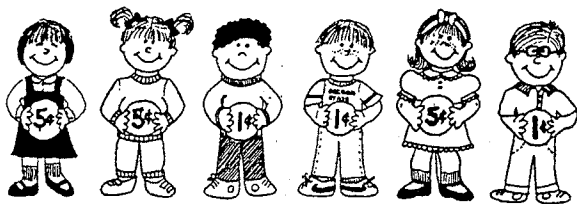


**Teacher:** Sometimes people like to move coins around to make them easier to count. I'm going to pull a name out of the Feely box. That person may move one coin-holder. Coin-holders if you're asked to move, please do so. Here comes a name! Mark!

**Mark:** I'm going to move Jake next to Maurice.

**Teacher:** Why?

**Mark:** 'Cause he's holding a nickel and I think the nickels should be together.



**Teacher:** Here's the next name, Tera!

**Tera:** I want Michelle to go stand by Jake now.



**Teacher:** Here comes another name, Daven!

**Daven:** OK. Terry, move up close to Benito so all the pennies are beside each other.

**Teacher:** Do we need to move anyone else?

**Children:** No!

**Teacher:** OK, let's try counting together.

Ready? (Point to coin-holders as everyone counts.)

**Children:** 5, 10, 15...

**Teacher:** Oh, oh! Now what? Should we keep counting by fives?

**Children:** No...

**Teacher:** Why not?

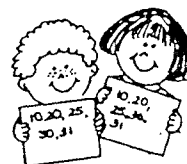
**Children:** 'Cause we're counting pennies and they're only one cent!

**Teacher:** OK. What does come after fifteen?

**Children:** 16, 17, 18—18¢!

Repeat several times, using different combinations of coins. Continue to hand them out in random order and have children in the audience figure out how to group them for easiest counting.

A variation that's sure to hold children's attention longer is to have them record the counting patterns on their chalkboards. Encourage them to help one another as this is being done. It's much less threatening to have two children share a chalkboard and work together to figure this out as they are first learning how to do it. You'll have instant and ongoing assessments of their growing skills as you see them try to write these patterns and you'll know better how to plan future lessons.



## FEELY BOX MONEY AND MAGNIFYING GLASSES (Whole Group)

**You will need→** 40 pennies 10 nickels 10 dimes  
enough tiny magnifying glasses for partners to share  
two large Feely Boxes (Materials Index)

This activity can be used for pennies and nickels, nickels and dimes, nickels and quarters, dimes and half dollars, etc. Here's a beginning version you may wish to adapt for later lessons:

1. Place half of your pennies, half of your nickels, and half of your dimes in each Feely Box.
2. Have children sit on the class rug in partners sharing magnifying glasses.



3. Pass the Feely boxes (in two directions) asking each child to find a penny inside.
4. Once all the children have their pennies, ask them to explore them with their magnifying glasses.

Guide the exploration with some of the following questions:

Can you find any of the letters in your name?

Who is that person on the penny? Is he wearing a tie? Does he have a beard? Can you see both eyes? Is he wearing a hat? How about a jacket? How many buttons are on his coat or shirt?



Turn your penny over. Look at the building. How many pillars are holding up the roof? If you look very hard, you can see the statue of a man sitting inside. Does anyone know who that is? Do you know the name of the building?

Can you find any numbers on the penny? Do you know what they stand for?



Is the penny older or younger than you are? How could we find out?

There are some words on the penny—*E pluribus unum*. What do you think those words mean? How could we find out? Make a chart of what



the children think the words might mean and ask them to try to find someone who knows before tomorrow.

After everyone has had ample opportunity to explore their penny with a magnifying glass, ask partners to join other classmates sitting in a circle.

Reach into the Feely Box for a name and have that child pass his penny to the person on his right. That child then passes her pennies (now two) to the right. That child hands his pennies (three) to the right and that child hands her four pennies to the person at her right.

Ask the children to guess how many pennies Joey (child number five) might be holding.

Count to check. Ask if there is any other coin for which Joey could trade his pennies. Joey trades his pennies for a nickel from the Feely Box. Joey hangs onto his nickel for now and the penny passing resumes again until five more are gathered. Continue in this fashion making trades until no more nickels can be gathered. Once all the coins have been gathered and all possible trades made, count the total amount of money by fives and ones. Ask the children if the amount of money gives any clues as to how many children participated in the activity. How can they be sure?

Repeat this activity by exploring nickels and then dimes and finally making appropriate trades.

## **ART SUPPLY STORE**

### **Counting Sums Of Money And Problem Solving (Small Group)**

#### **You will need→**

six or seven containers of art supplies

colored paper

ribbons

toilet paper tubes

sequins

cotton balls

old greeting cards

string and yarn

wallpaper samples

fabric scraps

pipe cleaners

glitter

six or seven small margarine tubs to set beside the above containers of art supplies

price tags to put on each of the margarine tubs  
(first grade—10¢ or less, second grade—25¢ or less)

tape, glue, scissors, hole punches, staplers, etc.

a “bank” with enough coins for six to eight children to work at once—Be sure to have a variety of coins appropriate to the amount the children need to count out.

first grade—begin with 25¢ to spend

second grade—begin with 50¢ to spend





(This is a good activity to repeat often in your room. It's a meaningful way for children to handle money and it's lots of fun.)

Show your class the art supply bowls and money bowls in a line on your counter. Tell them for the next few days they will use the class Art Supply Store for a special art project and at the same time get to practice counting money. Tell them each day, you'll reach into your Feely Box to get names of people that will get their turn until everyone has participated.

(The first few times you try this activity it is wise to decide what the project could be. You can try things like: make a flower, a dog, a cat, a teddy bear, or if it is a special time of the year, the project might be a Santa, an Easter bunny, a valentine, a ghost or witch. Do not give the children a model. Instead discuss the materials available and some potential uses.) Be sure to provide tape, glue, scissors, hole punches and staplers free.

Once the children know what to do, choose names from the Feely Box so children can begin counting

out their allotted money from the bank and go to the Art Supply Store to begin purchasing the materials they would like to use for the project. They may not spend more money than their allotment but it isn't necessary for them to spend it all. If they have some left, they can save it in case they decide they need to buy more supplies or they can give it back to the bank. (If the bank runs low, return money from the money tubs to the bank.)

The finished products are displayed and admired by all. Price tags can be attached to show the creators' names and the cost of the materials.



## POST OFFICE

### You will need→

a small part of your room to be the "Post Office"

pennies, nickels, dimes

address cards for each student

a chart of helpful words

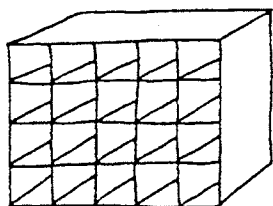
colored pens, pencils

stationery and envelopes

class mail box

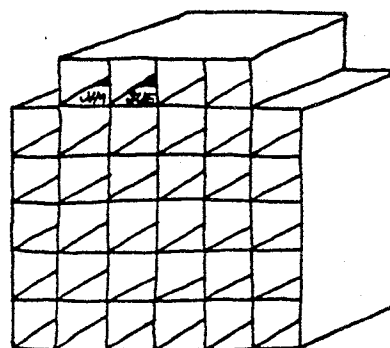
a mail box for each child

stamps (either the kind you gather from Christmas seals, junk mail at school, etc., or kid-made)



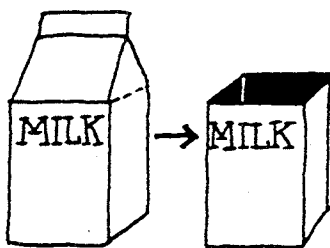
### Address Cards:

Prepare address cards for each child using 4 X 6 pieces of tag. Write each youngster's complete address and paste his or her xeroxed picture on the address card. Laminate the cards if you plan to use this activity for several months.

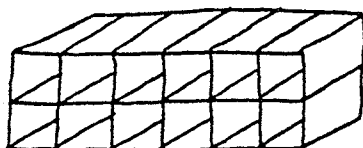


### Individual Mailboxes:

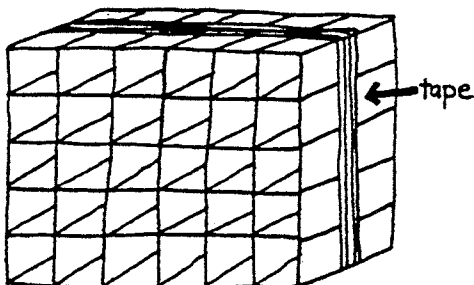
Make mailboxes for every child by collecting one quart milk cartons and trimming off the tops.



Line them up six in a row—four, five, or six rows, and staple them together. If you have an odd number of children, place the few boxes for that extra row on top of the large rectangle and staple in place.



Run strapping tape around the large rectangle of compartments. You may want to cover the outside of your rectangle with contact paper.



Label the floor of each compartment with the child's name and picture. (Clear contact paper is a nice way to hold labels in place.)

### Stamps:



Either use free stamps collected from Christmas seals or Weekly Reader advertising and the like, or have the children make stamps using 4 X 4 squares of paper and black pens. (You'll

reduce these on a copier and set them up on sheets to run. Be sure each stamp is priced with money amounts appropriate to your classroom needs at the time.)

Store the stamps by price in margarine tubs or film canisters with prices written on the tops.

### Class Mailbox:

Find a rectangular box (a computer paper box would work well) similar in shape to the large corner mailboxes.



Cut a mail slot in the side and ask your children to paint and label the mailbox.

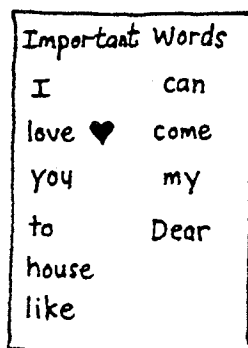
### Stationery:

Set up an art table with rubber stamps, marking pens, stickers, and sheets of ditto paper or newsprint. Show them different samples of stationery and ask them to decorate only around the edges so there will be room to write in the center.

### Getting Started:

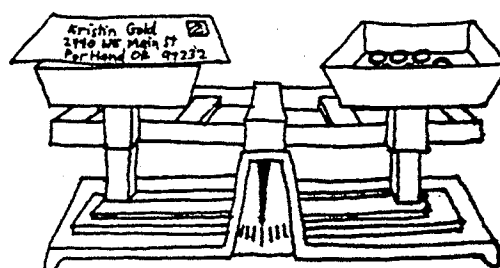
The class preparation for the Post Office will have generated a lot of excitement and anticipation. Show the children all their finished Post Office supplies along with the address cards and envelopes. Brainstorm together to create a chart of words that are helpful to have when writing letters.

Discuss some of the reasons people write letters. Select a sheet of stationery from the children's stationery supply and draw a name from the Feely Box to demonstrate how to write a letter to someone special. Fold the letter and place it in an envelope. Use the child's address card to write the address on the envelope.



class a chart of mailing costs based on the weight of the letters. The children will use your most sensitive balance scales to weigh their letter with small washers or paper clips to determine the appropriate stamp to buy.

Once the letter has been weighed and the mailing price determined, a stamp is purchased using money from the class bank. (You may want to have a list to determine the post office clerks for each math period.) The difficulty of this activity can be minimized by having only pennies in the class bank or maximized by having only nickels, dimes and/or quarters in the bank. The postal clerks will need pennies if change is to be made.



### The Class Bank:

Set up a bank of real money—a junk box with sections for each denomination of coins, labeled with how many of each, or provide coins in coin tubes marked with permanent ink lines for accountability. The bank should have enough coins so four to eight children can work at once.

### Mailing Prices:

If you want to increase the mathematics involved in this lesson, generate with your

## BIG COINS IN THE POCKET CHART (Whole Group)

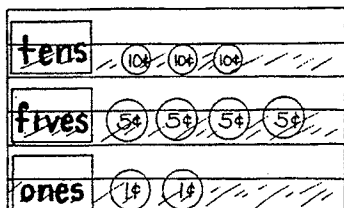
### You will need→

a pocket chart      large paper coins

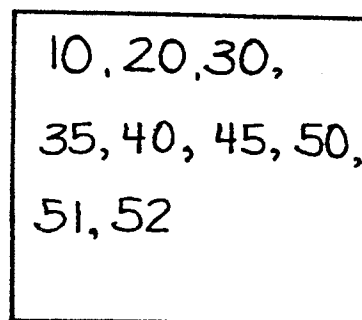
four 3 x 9 tag strips labeled with the counting patterns for money (ones, fives, tens, twenty-fives.)

An alternative to asking children to hold the large paper coins is to place them in a pocket chart. If you set out a random collection using two or three different kinds of coins, the children can rearrange them to make counting easier, labeling each row with its counting pattern card.

Coins placed in the pockets in random order are rearranged by the children beside the appropriate counting pattern labels.



Have everyone record the counting sequence on their chalkboards.



## ZIPLOCK BAG MONEY COUNTING (Whole Group)

**You will need→** a ziplock bag of coins (2 quarters, 5 dimes, 10 nickels, and 10 pennies) for every four children in your class

pocket chart

large paper coins

Ask your children to sit in groups of four on the rug. Give each group a ziplock bag of money. Let them dump out the coins and count how many of each denomination they have.



Ask the groups to set out a sum of 45¢, for instance. When every group has a solution, gather reports. Place large paper coins in the

pocket chart to represent each combination as it's reported. Have the entire group check the combinations by counting.

10¢ + 10¢ + 10¢ + 10¢ = 5¢

When all the groups have reported, discuss the differences. Ask your group if they can think of any other possibilities. Repeat three or four times with different sums. (Adjust the difficulty of the sums to the needs of your group.)

### **MONEY STORY PROBLEMS (Whole Group)**

**You will need→** pocket chart      large paper coins  
individual chalkboards, chalk and erasers

Here's another good use for the large paper coins. Have the children read and think about a story problem you've written on the board or a piece of chart paper. Here's a possibility:

Monty went to the store yesterday. He bought a small bag of peanuts for 49¢ and a tiny notebook for 37¢. How much money did he have to pay altogether?

It's important to ask for estimates before you work it out together. Ask children who give estimates to explain their thinking. (We need to have children puzzle over what would be a reasonable answer so they might take a second look at unreasonable solutions.) After a bit of discussion, set up the large paper coins in your pocket chart to represent each sum. Discuss with the children the easiest way to figure out

the total. Would it help to group the coins together? Have the children help rearrange the coins for easiest counting and record the counting sequence on their chalkboards.

10¢ 10¢ 10¢ 5¢ 1¢ 1¢ 1¢ 49¢

If you use the names of children in your classroom and have some real store items as props to accompany your story problems, this activity holds interest for a good amount of time.

## DIG FOR BURIED TREASURE (Whole Group)

See Seasonal Math, Chapter 6, Capture the Money, for a detailed description of playing this game with a large group.

Make the boxed version available when children seem to understand how it works.

## MAKING CHANGE (Small Group)

### You will need→

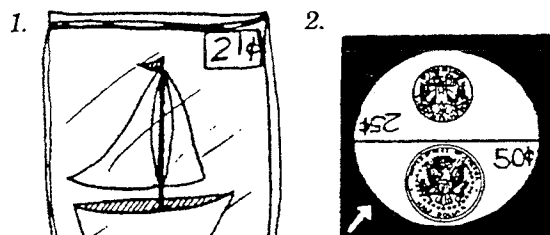
Making Change spinner (blackline supplement)

a collection of coins (quarters, dimes, nickels and pennies)

a collection of toys or small grocery items, each marked with a price less than 35¢

### To Play:

1. Choose an item to buy.
2. Spin the spinner to see what coin you'll start with.
3. Pick up the coin indicated.
4. Problem solve together how to figure out how much change you'll get. Try out all the suggested ideas.



3. They get the half dollar and talk over the possibilities.

This is such fun to watch with children. Some whiz kids just do it immediately. Grin, marvel at their talent, and send them to the supermarket to apply for a job! Others need lots of trial and error. Generally, we've seen them begin this the following way:

They get four dimes and talk over the possible solutions. Often, they decide to trade for smaller value coins. They might put their four dimes in the box and take out forty pennies. Now it's easy! They pay the 21¢ for the boat and see they have 19¢ left.

We continue this way several times and then discuss whether there would be any other way we could do this besides all pennies. If we are working on the above problem (21¢—four dimes), somebody, thank heavens, will suggest a different method.

Eventually, for those who are ready, we hope they'll put aside one dime, and take nine cents in change. Somehow, some way, the "lights come on" for a few and they do it quickly with ease. It may take many opportunities but it's worth it. Those who don't get it have many more years in school. Don't panic!

Make the boxed version of Making Change available when your group seems ready.

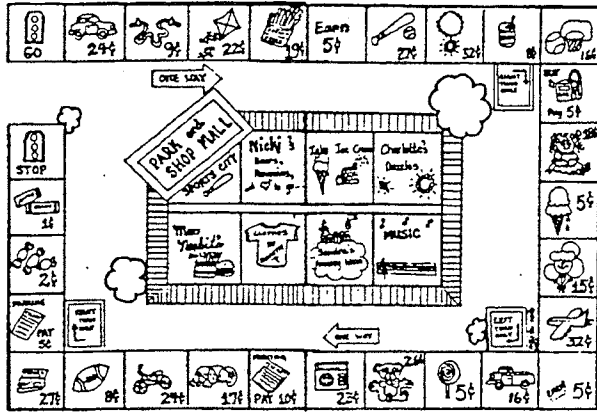
## PARK AND SHOP (Whole Group)

### You will need→

a dittoed copy of the gameboard for each child (see blacklines); hinge the two sections on the back with scotch tape

a unifix cube or other marker for each child

large paper coins—20 dimes and a collection of  
nickels and pennies



1. Divide children into two teams. They can play on the rug or at tables as long as the pocket chart can be seen. Everyone should have a gameboard and a game marker. Place ten paper dimes at the top of the chart for Team A and ten at the bottom for Team B.

2. Team A rolls the die. Everyone on the team moves the correct number of spaces.
3. If Team A decides to buy what's in the space, they pay the correct amount by sending a person to the pocket chart to follow their directions for using the paper coins to pay. They may need to get change from the bank. (You can be the banker.) If they don't want to buy, that's OK. They just stay there until their next turn. If the space they land on says "Earn five cents" they get the nickel from the bank and put it in their pocket on the pocket chart. If it says "Pay five cents" they pay from the chart to the banker.
4. Teams take turns until both are off the board. The team that spent the closest to \$1.00 without going bankrupt wins.

## Moving To The Boxes

*Some of the boxes your children are using already deal with money if you've made boxed versions of the group games available one by one. You may have phased in Coin Graphing, Spin A Half Dollar, Money March, Spin 25 Cents, Dig for Buried Treasure, Making Change, and Park and Shop. (Introduce the rest of your Money Practice and Enrichment Boxes over the next week or two, modeling each thoroughly.) Aim for eight to twelve boxes at varying levels of difficulty. If you have more, that's great, just remove a box from the collection in use each time a new one is added so the total doesn't exceed 12-14.*

Choose the ones that will best meet the needs of your children.

<b>Box Name</b>	<b>Skills Explored</b>
Coin Graphs	Coin recognition, coin worth
Money March	Coin recognition, coin worth
Spin 50¢	Coin recognition, coin worth
Spin Two Dollars	Coin recognition, coin worth, counting sums including quarters
Drop the Money	Counting and recording different sums of money
Count, Tell, Spin and Win	Counting and comparing sums of money (sums of money vary depending upon how you make your games)
Earn a Dime	Coin recognition, coin worth, learning combinations for ten
Top Draw	Counting sums to 50¢ or more, comparing sums of money
Money Sock Boxes	Coin recognition by sense of touch, counting sums of money
Money Puzzles	Coin recognition, counting sums to 50¢ or more
The Store	Counting sums of money, figuring out what one can buy with one's money
Stamp the Price	Reading prices and counting sums of money
Stamp The Price Twice	Counting sums of money, problem solving
Coin Stamp Booklets	Counting sums of money, problem solving
Dig for Buried Treasure	Counting sums of money, coordinate graphing
Shop the Ads	Reading and counting large sums of money, problem solving
Money Trading Game	Understanding tens and ones
Park and Shop	Counting sums to \$1.00, making change
Penny Push	Counting sums of money, making change
Shopping Spree	Counting sums of money, making change
Make Change	Paying, making change

## **SPECIAL CONSIDERATIONS**

### **Why do you use real money in the Boxes instead of plastic or paper coins?**

Money is so abstract that we want to give children every chance to understand. The change Mom gives them to use at the store is real; the coins that they find between the couch pillows aren't paper. The money they buy their school lunch with worries them if it's not exactly the denominations they're used to carrying.

The fact that the money in our boxes is real creates some of the magic that leads children to make sense of very difficult concepts.

### **What if real money won't work for me?**

Some teachers report they have such constant turnover in classroom populations that it's impossible to establish respect for learning materials. Other teachers tell us their children just haven't learned respect for other people's property. These can be very difficult situations, especially in classrooms with changing populations. Of course, our ideal dream would be that we could help those children learn more respect for things not their own. The reality is, most teachers spend many,

many personal dollars per year on their classrooms and feel hurt and angry when things are taken. We feel that way also.

Be sure to help your class understand the money is there to help them learn, that it came from your personal funds, or perhaps from the P.T.A. budget. Let them know that you, along with some parent volunteers, have worked very hard to assemble these spinners, etc., so learning can be fun for them. (If children think classroom supplies just magically appear, they're not likely to worry much about them disappearing.)

A Kansas City, Missouri, teacher sent a note to her families asking that they send in a few pennies, nickels and dimes if they could spare the change so she could make up games to help their children learn about money. Over the next few weeks, children brought small amounts until the class money box was quite full. Games were constructed with the money and some was even left over. Jean reported her children often voted to dip into the classroom money pot to pay for milk if someone forgot money that day. To her knowledge, no money was ever stolen from the games or the money box.



## Chapter 17

# PLACE VALUE COUNTING

*Most first graders arrive in our classrooms with solid foundations for numerals 1-10. They have dealt with concrete models of those numerals in real life over and over at home. "You may have three friends come over. Please set five cups on the table for me. No, Honey, no more candy—you've already had six pieces." Their kindergarten experiences usually have helped solidify those skills—offered them the beginnings of school language; more/less, plus/minus, etc.*

*We have incredible responsibilities with first and second graders to provide the same rich and real experiences to help them begin sorting out our number system beyond ten. We must provide a variety of whole group lessons mixed with rich language and real world links to help set foundations for lifetime understandings of our number system. In addition to whole group lessons, we must offer multiple opportunities for practice and enrichment in small group, partner and independent activities, that is, the Place Value Counting boxes. The fourth step is to help children tap into their growing memory banks of all those experiences and recall the ideas without always needing to have a physical model.*

You've been addressing estimating and counting with place value activities every month through your Seasonal Mathematics activities. Your children have therefore experienced some pieces of the puzzle already and many will be eager to learn more. Your Concept Instruction and eventual provision for independent practice with the boxes will help your students understand many more parts of the puzzle.

Our goals for this set of lessons and activities aim for the following understandings:

1. Our number system is based on groups.  
We'll be learning to set up, read and write about hundreds, tens and ones.
2. Zero means more than "none at all".
3. There are predictable patterns in our number system.

4. There are ways to organize large quantities so they can be counted easily, and amounts written in understandable ways.
5. 137 is really  $100 + 30 + 7$  and that is more than 125 which is  $100 + 20 + 5$ .
6. Trading games help set foundations for adding and subtracting hundreds, tens and ones.
7. Our dollars, dimes and pennies are hundreds, tens and ones.

We begin our formal Place Value Counting instruction with the following lessons several weeks before our children will be using the Place Value Counting boxes. That is, we still have Money boxes going on during independent work time, but the children are doing well enough at those activities that we can begin preparing them for the next concept during our direct instruction time.

How do you begin? The following activities will help you get started. Don't forget that any new concept is difficult when you first begin teaching it.

If you have a very large class (30 or more), you may want to have half of your group working on Independent activities and half of them with you. When we first begin this instruction, it seems critical to conduct these lessons at least four days per week. With such big classes it's helpful if you can have a parent volunteer available to children working independently so they don't have to interrupt you.

We begin formal place value concept instruction by working in number bases smaller than ten. It is easier for children to quickly tell how many items they have at a glance and regrouping happens frequently. By linking this instruction to a story line, it becomes fun and memorable. It also gives us a chance to show children how pattern is important to our place value work. We spend two to three weeks on Base 4 and Base 5 (more if needed) and then move on to work in Base 10. Even if *you've* struggled with understanding lower bases, give the following lessons a try. It's worth the struggle!

	Concept Instruction	Practice and Enrichment Boxes
2 or 3 weeks	<b>Base 4 and Base 5</b> <ul style="list-style-type: none"> <li>• The Cookie Factory Game (Base 4)               <ul style="list-style-type: none"> <li>Day 1</li> <li>Day 2</li> <li>Day 3</li> </ul> </li> <li>• Mission Control (Base 5)               <ul style="list-style-type: none"> <li>Day 1</li> <li>Day 2</li> <li>Day 3</li> </ul> </li> </ul> <p>Choose two or three of the following games to provide more practice in lower bases:</p> <ul style="list-style-type: none"> <li>• The Marineland Game (Base 4)</li> <li>• The Lucky Stars Candy Factory (Base 5)</li> <li>• The Doughnut Shop (Base 5)</li> </ul>	<p>Money Boxes</p> <p>Arithmetic Boxes</p>
2-4 weeks	<b>Base 10</b> <ul style="list-style-type: none"> <li>• Cherry Pickers</li> <li>• Easter Bunnies</li> <li>• The Base 10 Project (00 to 239 to 00)</li> </ul>	<p>No boxes— the Base 10 lessons extend over the entire math period each day. Make the Money and Arithmetic Boxes available to children as they finish Base 10 Project.</p>

# Group Lessons

## Introduction to Place Value Counting

### THE COOKY FACTORY GAME (Base 4)-Day 1

**You will need→**

*for each child:* CLEAN HANDS

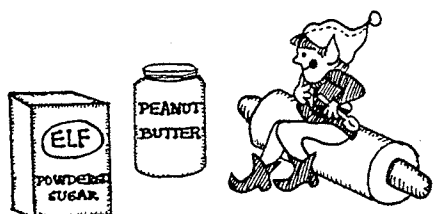
cookie dough (recipe below) on a paper plate

a paper towel for sticky fingers

a 9 X 12 piece of construction paper (the "kitchen")

a piece of wax paper (about 5 X 8 to staple on right side of "kitchen")

3 "cookie sheets" (each cookie sheet is a 3"-square of construction paper or tag)



The following recipe can be prepared and refrigerated the day before or made in class the hour before this math lesson.

#### No Bake Peanut Butter Cookies

(Individual Recipe)

2 T. peanut butter

2 T. dry powdered milk

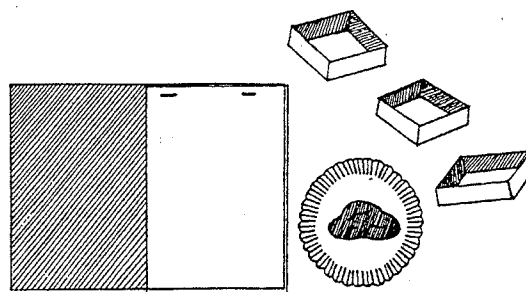
1 T. light Karo syrup

Mix peanut butter, dry powdered milk and syrup in a cup until well blended.

1 T. powdered sugar

Pour a spoonful of powdered sugar on a paper plate. Spoon cookie dough onto the powdered sugar and knead until it's no longer sticky. Leave it on your paper plate. Wash your hands.

**Teacher:** All right, Cookie Elves, are you ready to begin? Have you set out your kitchens? Did you put the wax paper on the right-hand side like mine? Do you have your cookie sheets close by? Is your cookie dough ready?



Post the rule chart when you are ready to begin the game.

#### Cooky Factory Rules

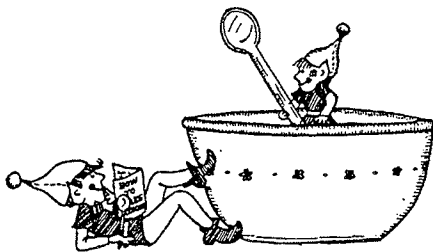
1. No more than four cookies may be on your wax paper at one time.
2. As soon as four cookies are prepared, they must be moved to a cookie sheet and placed in the "oven".

**Children:** Yes, all ready!

**Teacher:** Let's read through our Cooky Factory Rules together.

(Everyone reads.)

**Teacher:** It was late at night at Grandma's house and Grandma was sleeping very soundly in her upstairs bedroom. The Cooky Elves had heard that Grandma was tired of making cookies after so many years. They decided to sneak into her kitchen and make some delicious peanut butter cookies as a surprise. What ingredients did the elves use?



**Children:** Some peanut butter. Yeah, and some powdered milk, the dry kind. She used powdered sugar and syrup too.

**Teacher:** Those elves measured and stirred, measured and stirred until the cooky dough was just right.

**Teacher:** Will you pretend to be the elves now?

**Children:** Sure! Do you get to eat the cookies?

**Teacher:** We won't eat them yet, but we'll end our story with some eating.

**Children:** Good! Mmmmm.

**Teacher:** The elves washed their hands and looked for special places to work in Grandma's kitchen. They posted a special lookout elf at the foot of the stairs to be sure that Grandma didn't wake up and come down while they were working. It would have ruined their big surprise! They decided to start by putting each cooky they made onto their wax paper so Grandma's kitchen would stay real clean. They were also very careful to keep their extra cooky dough on their paper plates.

**Teacher:** Elves, please break off a small piece of your cooky dough.

**Children:** How much do we need?

**Teacher:** Why don't you break your dough in half, just like mine, and then break each of those parts in half again.

**Children:** Oh, you mean we'll have four pieces!

NOTE: Each of these four pieces will be broken into three or four smaller pieces. Each child will wind up making fifteen cookies.

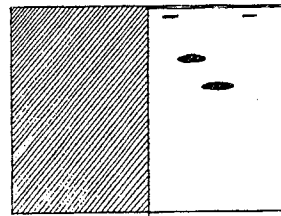
**Teacher:** That's right. Help each other so we can stay together.

**Teacher:** Elves, pick up one piece of your cooky dough and break off a small piece so you can make a nice cooky.



Put that cooky on your wax paper.  
Good, now make another.

**Children:** Now we have two. They sure look good.



**Teacher:** We'd better tell the lookout elf how many cookies we've got so far. Let's see...it looks like zero cooky sheets and two cookies.

**Children:** OK! Zero cooky sheets and two cookies.

**Teacher:** Let's look at your kitchens. Do you have any filled cooky sheets yet?

**Children:** No...we'd need four cookies.

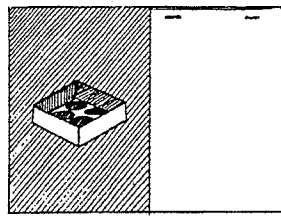
**Teacher:** Make another cooky.

**Children:** That makes zero cooky sheets and three cookies.

**Teacher:** Make another.

**Child:** Oh, oh. That's four cookies. I thought we couldn't have four on the wax paper.

**Teacher:** True. Very carefully move your cookies to one of your cooky sheets and put it in the "oven" (the left-hand side of the sheet).

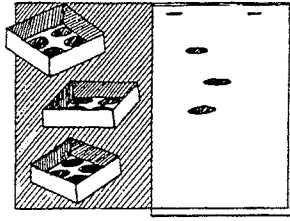


**Teacher:** Let's tell the lookout elf how our kitchens look now.

**Children:** We have one cooky sheet and zero cookies.

**Teacher:** Great! Let's keep going.

Continue making a cooky at a time and adding it to the kitchen. Each time there are four cookies, move them to a tray. Make cookies until you reach three cooky sheets and three cookies.



**Teacher:** Oh, oh! I hear the lookout elf calling.  
He says Grandma is starting to wake up.  
He wants to know how our kitchens look now?

**Children:** We've got three cooky sheets and three cookies.

**Teacher:** How many cookies are in each tray?

**Children:** Four!

**Teacher:** You're super elves. Grandma will be very surprised.

**Teacher:** Let's pretend now to be Grandma.  
The elves have left as quickly as they arrived so Grandma arrives in the kitchen to a wonderful surprise.

**Child:** Sure wish the elves would go to my Grandma's house.

**Teacher:** Grandma sees the cookies. "Oh, my goodness, who did this? How did they get in? Oh it smells so good. I wonder how they taste."

**Teacher:** Grandma is going to begin eating some cookies. Remember, you are Grandma. Grandma chooses a cooky from the wax paper and eats it.

**Children:** Mmmmm....that's good!

**Teacher:** Yes, she really liked that so she eats another.

**Children:** Yum. Now there are three cooky sheets and one.

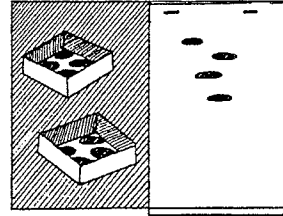
**Teacher:** She can't resist.  
She has one more.



**Children:** Three cooky sheets and zero.

**Teacher:** Those are so delicious. Grandma wants another but can she take one out of the cooky sheet?

**Children:** No! She can't just reach into the oven and take one! She'll have to take a whole cooky sheet out, slide the cookies onto the counter (the wax paper) and then eat one.



**Teacher:** Let's do that. Slide the cookies from one cooky sheet onto your wax paper and then you may eat one.

**Children:** Mmmmm. Now there are two cooky sheets and three.

**Teacher:** Grandma likes these so much, she eats two more.

**Children:** Wow! Two cooky sheets and one cooky!

**Teacher:** And she eats another.

**Children:** Two cooky sheets and zero.

**Teacher:** There's a knock at the door. Her two grandchildren have come. They each eat a cooky.

**Children:** We get two more. How do we get them? I know. We could empty another sheet on the wax paper and then eat two.

**Teacher:** Good. Now we have...

**Children:** One cooky sheet and two.

And so it goes, eating cookies and reporting on the kitchen as the cookies are consumed until you are back to zero cooky sheets and zero.

Once the activity has ended, be sure the kids clean up and wash their hands. The paper towel they each have should help.

## THE COOKY FACTORY GAME (Base 4)–Day 2

**You will need→** *for each child:*

a place value board (Materials Index)

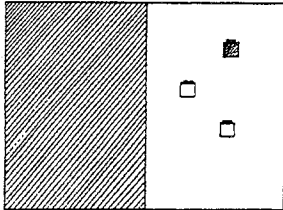
15 unifix cubes

three 3" squares of construction paper

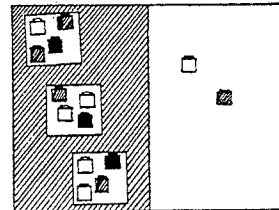
Review yesterday's activity with questions like these:

Have children add one, two or three unifix cube "cookies" at a time until you get to three cookie sheets and three.

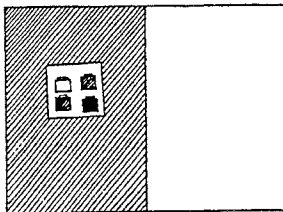
1. The elves made three cookies. Show me how the kitchen looked.



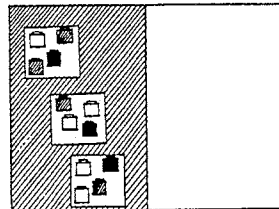
1. Grandma ate a cookie. How did it look?



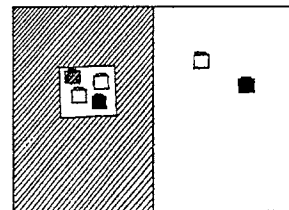
2. They added one more cookie. How did it look?



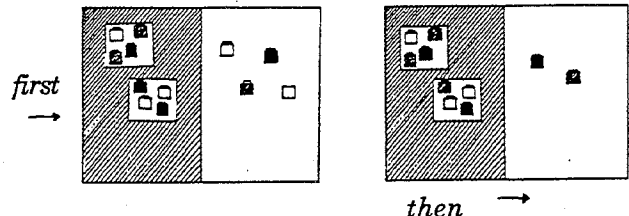
2. She ate another and another.



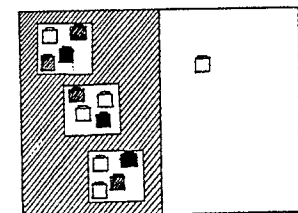
3. They made two more. Can you show me?



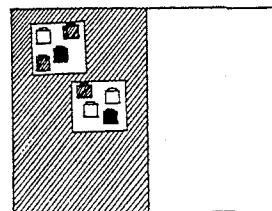
3. She wanted two more cookies. How did she get them?



4. They were nearly finished. They had three cookie sheets and one.



4. Her grandchildren each wanted one. How did it look?



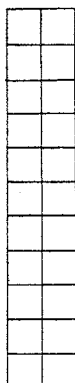
Once again, continue the story until all the cooky sheets are empty and the cookies are gone. Be sure to call attention to *zero* each time

it occurs. It's difficult for children to acknowledge zero as a placeholder when they first begin.

## THE COOKY FACTORY GAME (Base 4)–Day 3

**You will need→**

a felt tip marking pen



a giant place value strip (Cut 6 pieces of white construction paper, 6 X 18, and tape into a long strip. Don't worry about careful measuring, but fold it down the center to establish your middle line and then draw cross lines about two inches apart. See sketch.)

for each child:

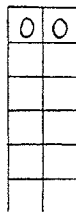
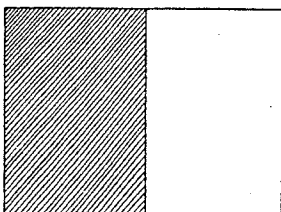
3 portion cups (Materials Index)

15 beans

a place value board

Tell the children you're going to work one more day with the cooky game but this time you'll make a record of it.

**Teacher:** Let's pretend our place value boards are the kitchens again. Help me "read" the kitchen now.



**Children:** Do you mean "Zero cooky sheets and zero"?

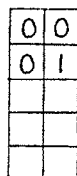
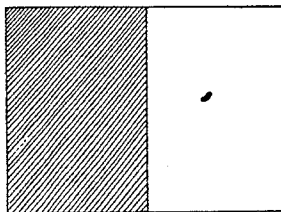
**Teacher:** That's it. Let's all try it.

**Children:** Zero cooky sheets and zero.

**Teacher:** I'll write that at the top of my giant strip.

**Teacher:** Let's add a cooky.

**Children:** Zero cooky sheets and one.

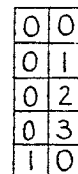
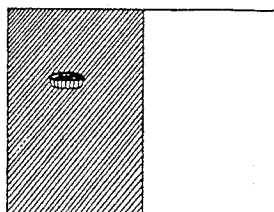


**Teacher:** And one more...I'll write it just the way you said it. Let's add another cooky.

**Children:** Zero cooky sheets and three.

**Teacher:** And one more...

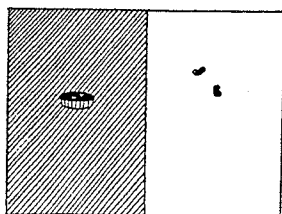
**Children:** Oh, oh! We have to put them in a cooky sheet. Yeah! And we have to put the cooky sheet in the oven. Move it over!



**Teacher:** Add another...and another....

**Children:** One cooky sheet and two.

**Teacher:** Let's take a look at my strip. Here's the oven side and this is the wax paper side. Help me read the wax paper side.



0	0
0	1
0	2
0	3
1	0
1	1
1	2

**Children:** Zero, one, two, three, zero, one, two...

**Teacher:** What do you think is happening?

**Children:** It's a pattern!

**Teacher:** What do you think the next number will be?

**Children:** Three!

**Teacher:** And the next one?

**Children:** Four—no maybe not...

**Teacher:** That's a hard question. We'll find out soon.

**Teacher:** Let's read the oven side.

**Children:** Zero, zero, zero, zero, one, one, one.... That's a pattern too! It's gonna have another one and then some twos.

**Teacher:** That might be a good guess. Let's keep going and see if you're right. Put on another cookie.

**Children:** One cookie sheet and three.

**Teacher:** And one more...

**Children:** Two cookie sheets and zero!

**Teacher:** Let's loop those patterns. Help me read the cookie side.

**Children:** Zero, one, two, three, zero, one, two, three, zero. The pattern starts with zero and ends with three!

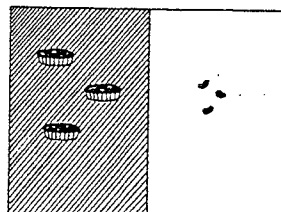
**Teacher:** Good. I'll loop it. How about the cookie sheet side?

**Children:** Zero, zero, zero, zero, one, one, one, two...it has four of a kind!

Continue adding cookies until you reach three cookie sheets and three. Loop the patterns and draw a Stop and Turn Around Line.

0	0
0	1
0	2
0	3
1	0
1	1
1	2
1	3
2	0

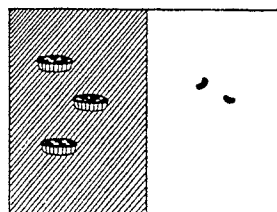
**Teacher:** Let's see what happens to the pattern if we start going backwards. What does your kitchen look like right now?



**Children:** Three cookie sheets and three cookies.

**Teacher:** I'll write that again under the stop line so we can remember where we began. Ready to go backwards? Grandma ate one cookie.

**Children:** Three cookie sheets and two.



**Teacher:** And another.

**Children:** Three cookie sheets and one.

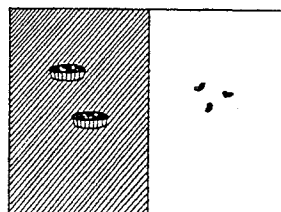
**Teacher:** And another.

**Children:** Three cookie sheets and zero.

**Teacher:** Good! You remembered zero.

**Teacher:** Grandma gave a cookie to her grandson.

**Children:** Dump a cup and take away a bean. Now it's two cookie sheets and three.



Continue removing one bean at a time, predicting and confirming, then looping the patterns back to zero.

0	0
0	1
0	2
0	3
1	0
1	1
1	2
1	3
2	0
2	1
2	2
2	3
3	0
3	1
3	2
3	3
3	3
3	2
3	1
3	0
2	3



## MISSION CONTROL (BASE 5)—DAY 1

**You will need→** a pre-written chart of Mission Control Rules (see sketch below)

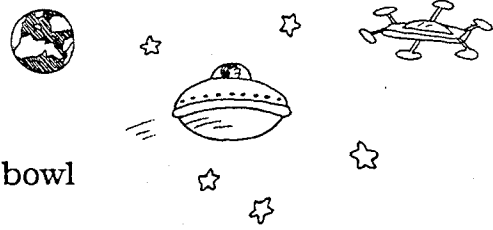
for each child:

beans

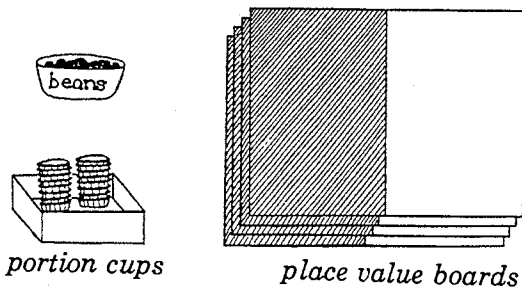
5 portion cups

a margarine tub or paper bowl

place value board



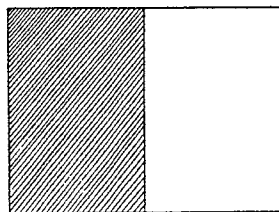
Have the needed materials set out in two or more areas so they can easily be picked up by several children at a time. Excuse five or six at a time to quickly gather materials.



Explain to the class that you're beginning to work on place value, that is, learning about the groups in number systems. "Today we'll work with groups of five...grown-ups call this Base 5. Do you have all of your materials ready?"

**Teacher:** Welcome to Mission Control! Today we're going to launch some space craft into outer space. Take a look at your launching pad (place value board). Put your hand on the white side. This will be the waiting room for our astronauts.

**Teacher:** Now touch the lavender side. This is where the flying saucers will be prepared for launch.

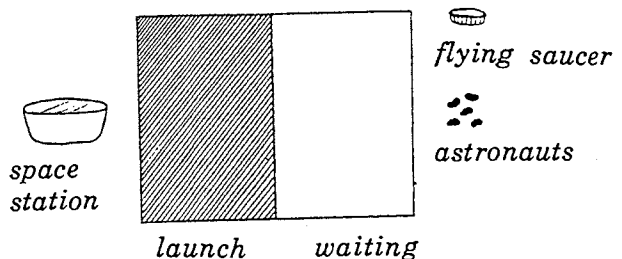


launch pad      waiting room

**Teacher:** Point to a portion cup. These are the flying saucers today.

**Teacher:** Please set your margarine tub to the left of your place value board just like mine. This tub will be the station out in space where the astronauts will live and study space.

**Teacher:** I almost forgot. Those beans will be your astronauts!



**Children:** That's pretty funny!

**Teacher:** Let me sketch our setup on the chalkboard with the names to help us remember.

**Teacher:** Mission Control has very strict rules. I've written them for you on this chart. Let's read them together.

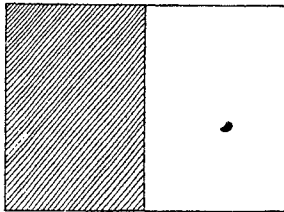
Mission Control Rules	
1. Any time there are 5 or more astronauts in the waiting room, 5 must immediately board a flying saucer.	
2. Any time there are 5 flying saucers on the launch pad, they must blast off and fly immediately to the space station.	
3. No more or no less than 5 flying saucers can be at a space station at one time.	

**Teacher:** Are you ready?

**Children:** Yep!

**Teacher:** It's very early in the morning at Mission Control. The waiting room has been cleaned and today's newspapers have been delivered. There's even fresh orange juice! Here comes the first astronaut. Where should he go?

**Children:** To the waiting room!



**Teacher:** And now another arrives. Where should she go?

**Children:** The waiting room....

**Teacher:** Here come two more. Can they go to the waiting room?

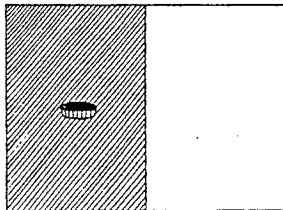
**Children:** That makes four. That's OK.

**Teacher:** Oh, I see another. She's going in the waiting room also.

**Children:** That's five. The rules say any time there are five they have to go to a saucer.

**Teacher:** Good! Pick up your astronauts and help them board a flying saucer. Where should we put the flying saucers?

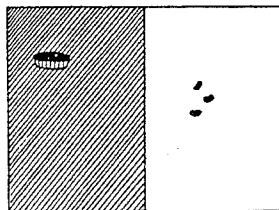
**Children:** On the launch pad!



**Teacher:** Pretend you're a news reporter flying over Mission Control. How would you describe the situation so far?

**Children:** It's early in the morning and Mission Control is getting ready for the Big Launch. So far we see one loaded flying saucer.

**Teacher:** Super! Back to Mission Control. I believe three more astronauts have driven up. Yes, they're going to the waiting room.



**Children:** Put out three more.

**Teacher:** Another van is arriving. Look! There are three astronauts getting out. They're on their way to the waiting room too.

**Teacher:** Let's look at the Mission Control rules. Read the first rule.

**Children:** Any time there are five or more astronauts in the waiting room, five must immediately board a flying saucer.

**Children:** But there are six in the waiting room. Should they all go to the launch pad?

**Teacher:** No. Remember only five can be aboard each flying saucer.

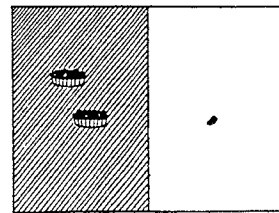
**Children:** OK. This guy wants some juice anyway. He can stay.

**Teacher:** Did you move the five?

**Children:** Yes.

**Teacher:** What would the reporter say now?

**Children:** There are two flying saucers almost ready to go and one astronaut is drinking juice while he waits.



**Teacher:** Terrific! Super reporting. Let's all practice reporting. Begin with the saucers...

**Children:** There are two flying saucers and one astronaut.

**Teacher:** Here comes another astronaut. She seems eager to go.

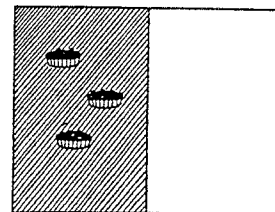
**Children:** Two flying saucers and two in the waiting room.

**Teacher:** Look...three more are arriving..

**Children:** That makes five. Put them in a saucer.

**Teacher:** Reporters???

**Children:** Three flying saucers and nobody in the waiting room.



**Teacher:** We could say three flying saucers and zero. Zero is very important in place value and I'd like you to begin using it when the waiting room is empty.

**Children:** Three flying saucers and zero in the waiting room.

**Teacher:** Here comes a bus. Six astronauts are getting out. They seem to be in a hurry.

**Children:** That's too many for the waiting room. Five of them will have to go right out to a saucer. Only one can stay in the waiting room.

**Teacher:** Reporters?

**Children:** Four flying saucers and one astronaut.

**Teacher:** Again, I think there are more astronauts arriving. Yes, I see three more of them.

**Children:** Four flying saucers and four!

**Teacher:** Here comes the last one. She's really rushing.

**Children:** That makes five again. They've gotta go in a saucer.

**Children:** Oh, oh! That's five flying saucers.

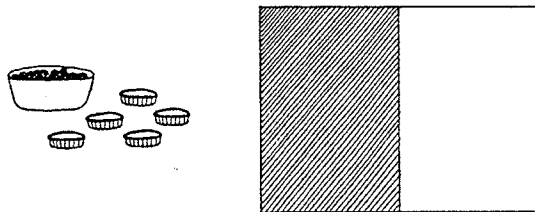
**Teacher:** Let's check the rules again.

**Children:** There it is.... Anytime there are five flying saucers on the launch pad, they must blast off and fly immediately to the space station.

**Teacher:** You sure know the rules. What would the reporter call this just before they take off?

**Children:** All five saucers are loaded and ready. 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.... Blast off!

**Teacher:** Good...ready? Have your flying saucers fly over to the space station. The astronauts will need to leave their saucers outside so help them into the space station.



**Teacher:** You can leave the empty saucers nearby for when they need to return to Mission Control. Can we report on the situation now?

**Children:** One space station, zero flying saucers and zero astronauts.

**Teacher:** The astronauts spend several days hard at work in space. They are study-

ing so many interesting things. Wait!...I think I hear Mission Control trying to reach them. Yes. They're telling them it's time to start back so they can study the predicted meteor showers.

**Teacher:** Let's check those Mission Control rules again. What is the rule about leaving?

**Children:** It says no more or no less than five flying saucers can be at a space station at a time. Does that mean they all have to leave together?

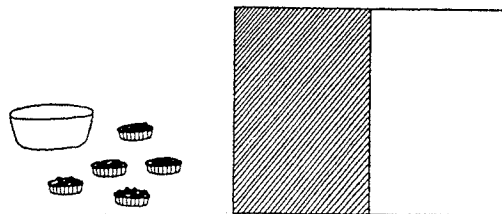
**Teacher:** Yes. Those rules are very strict. How many astronauts will go into each flying saucer?

**Children:** Five.

**Teacher:** Let's start loading up all our flying saucers.

**Teacher:** Are your saucers all set?

**Children:** Almost...there!



**Teacher:** Ready for launch? Start your engines. Off they go. I bet the reporters wish they were along.

**Child:** I wish I could go into space.

**Teacher:** Can you get all those saucers safely back to the launch pad?

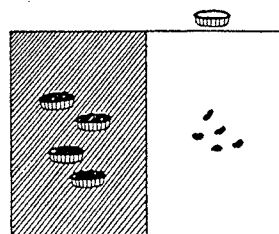
**Child:** Mine are ready.

**Child:** Me too.

**Teacher:** Good. Here we go.

**Teacher:** The saucer that landed first will be unloading first. Look...the door is opening now. I believe all the astronauts are getting out. Yes. They're walking back to the waiting room.

**Children:** That makes four flying saucers and five astronauts in the waiting room. We have to get rid of one astronaut.



**Teacher:** Let's have his family pick him up right away.

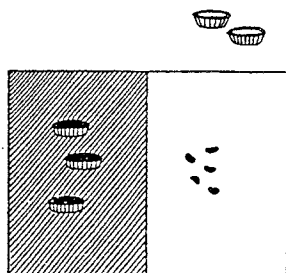
**Children:** OK. That makes four flying saucers and four.

**Teacher:** And there's the bus to pick up four more.

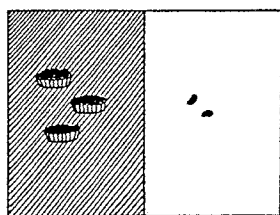
**Children:** Take four off...that leaves four flying saucers and zero.

**Teacher:** Another saucer is unloading now. There they go.

**Children:** That makes three flying saucers and five...how many go home?



**Teacher:** I think three of them have been called outside to meet with the T.V. reporters.



**Children:** That leaves three flying saucers and two.

**Teacher:** Oh dear. Another saucer's door has opened. Here come all five astronauts.

**Children:** We can't have seven in the waiting room. How many should leave?

**Teacher:** Let's have four go on out.

**Children:** That leaves two flying saucers and three in the waiting room.

**Teacher:** Here comes another crew. All five seem to be hurrying.

**Children:** Wow...too many in the waiting room. That's against the rules.

**Teacher:** Let's have four go on out to the parking lot.

**Children:** There. Now we have one flying saucer and four astronauts in the waiting room.

**Teacher:** Here come the husbands to pick up the two married women.

**Children:** Yep! One flying saucer and two.

**Teacher:** There's a friend to pick up one more.

**Children:** One flying saucer and one.

**Teacher:** There's a wife for another.

**Children:** One flying saucer and zero.

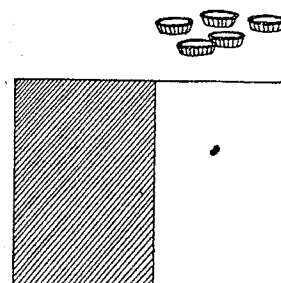
**Teacher:** At last, the final saucer is unloading.

All five astronauts look a bit tired.

**Children:** We can't have five in the waiting room.

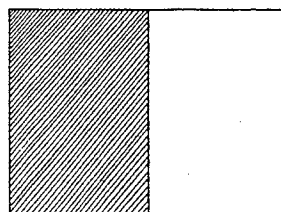
**Teacher:** Let's have four of them go into the offices to file reports.

**Children:** OK. Zero flying saucers and one.



**Teacher:** Finally, he gets to leave as well.

There's his son and daughter to pick him up.



**Children:** Zero flying saucers and zero astronauts. Mission Control is empty!

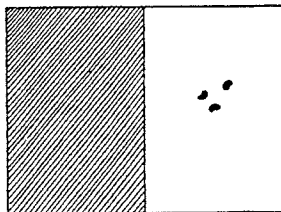
Children look to one another for lots of help the first time through these activities. Don't expect any kind of mastery in the beginning. You're setting regrouping and mathematical language foundations through story narrative. It helps to make the lessons memorable.

Put the materials away until another day and once you're cleaned up, the children probably will need time to work independently on familiar boxes.

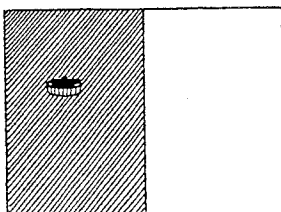
## MISSION CONTROL—Day 2

On this day you'll repeat the Mission Control game in problem solving form as you did with the cooky game. You can use beans and portion cups again. Here are some sample questions:

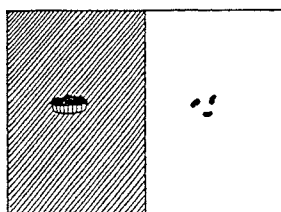
1. Three astronauts arrived at Mission Control. How did it look?



2. Two more arrived.

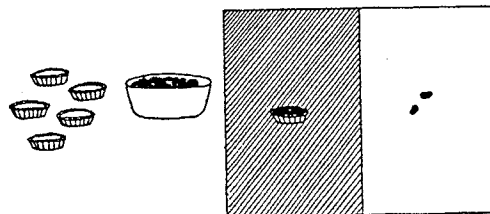


3. Three more came.

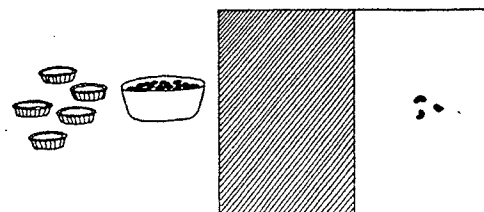


4. What will it look like when three more astronauts arrive?

Continue in this manner till you've moved the astronauts into the space station and perhaps even created another flying saucer or two.



Then reverse and remove the astronauts one, two and three at a time. Be sure to throw in a challenge occasionally. (Six astronauts are picked up by their families.)

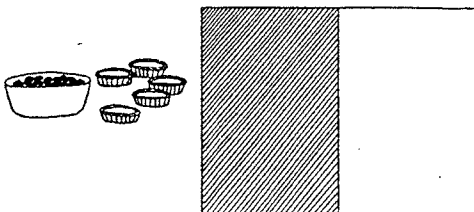


Work until you are again back to zero, zero.

## MISSION CONTROL—Day 3

Once again, use a giant place value strip while children work with beans and cups and add one astronaut at a time exploring and predicting, then looping patterns until you

reach one space station, zero flying saucers and zero astronauts. Then reverse and work your way back to zero.



0	0	2	0	4	0
0	1	2	1	4	1
0	2	2	2	4	2
0	3	2	3	4	3
0	4	2	4	4	4
1	0	3	0	1	0
1	1	3	1	1	0
1	2	3	2	4	4
1	3	3	3	4	3
1	4	3	4	4	2
				4	1

etc.

*You will probably need to do two or three more games for additional practice before moving to Base 10. These could include:*

### THE MARINELAND GAME (Base 4)

**You will need→** *for each child:*



a small cup of Pepperidge Farm fish crackers

3 portion cups for ice buckets



a place value board



#### Marineland Fishing Rules

1. Each fish caught must be placed in the storage pond to keep it cool.
2. As soon as four fish have been caught, they must be moved immediately to an ice bucket.

Marineland needs fish for their seals, dolphins and whales. They are hiring fisherman to catch fish but they have some very strict rules in order keep their fish *fresh*.

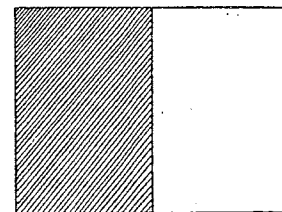
When three ice buckets and three fish have been caught, reverse the game by telling the children Marineland has offered to let them feed the hungry seal. (The children become the seal!) Feed him one, two and three crackers at a time as you reverse back to zero. Again this can be followed by the Day 2 and Day 3 activities described on previous pages.

### THE LUCKY STARS CANDY FACTORY (Base 5)

**You will need→** *for each child:*

24 unifix cubes

a place value board

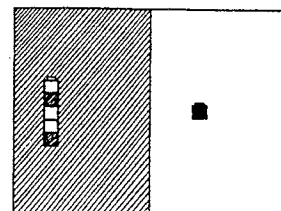


#### Lucky Stars Candy Factory Rules

1. Each time a new candy is formed, it is put onto the tray.
2. Whenever five candies are ready, they must be immediately stacked and moved to the wrapping room.

The children "manufacture" the candies in this game, and move them in stacks of five to the wrapping room. Once the wrapping room is full, four stacks and four, the store opens and begins to sell the candies. Each time the store tray is emptied, another stack is broken and moved onto the tray for immediate purchase.

wrapping  
room



tray

## THE DOUGHNUT SHOP (Base 5)

**You will need→**

*for each child:*

an individual chalkboard

a small cup of Cheerios or Fruit Loops

5 portion cups for "deep fat fryers"

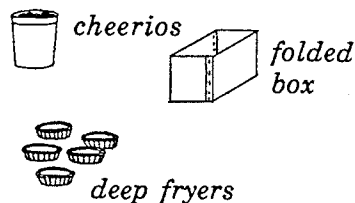
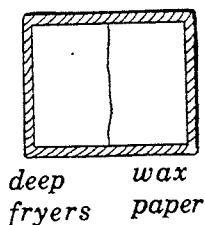
a small piece of wax paper

folded box (Children fold their own boxes from construction paper.)

### Doughnut Shop Rules

1. Be sure your doughnuts are the finest quality. As each doughnut is selected, place it on your wax paper.
2. As soon as you have five doughnuts, move them immediately to a deep fryer.
3. As soon as five deep fryers are ready, dump those doughnuts into your packing box.

The story would begin by asking all the doughnut shop workers to wash their hands and prepare their individual chalkboards by labeling them like yours. Ask them to set their cup of Cheerios and stack of portion cups close to their work area.



Include story details such as the workers searching for the very finest doughnuts one, two, and three at a time. They move the doughnuts to the deep fryers whenever five or more have been gathered on the wax paper (only five per deep fryer though). Once there are five deep fryers, the doughnuts are carefully dumped into the packing boxes to await orders from nearby markets. Work until you get to one box and two deep fryers.

The story could reverse by talking about the doughnut order that has arrived from a local market for a box and two styrofoam packages of doughnuts. Their portion cups now become the store containers which keep them fresh and the wax paper is the family table where each family's doughnuts are set out for eating. Take it back to zero and the children can eat them as the story dictates.

If you'd like the children to have some practice working on their own strips (see blacklines) at the lower bases, any of the above stories would work for that. They could do the activity as a group one day and the next day try recording it independently using all their manipulatives. Be sure they search for patterns and loop as they work.

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## Base 10

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### CHERRY PICKERS

**You will need→**     *for each child:*

“red” kidney beans                      12 portion cups  
2 brown construction paper packing boxes (page 221)  
a place value board (Materials Index)

When most of your class seem to have a fairly solid grasp of the regrouping idea forward and backward, it's time to move to Base 10.

Once again we begin with a story. We have a cherry packing factory and the rules are fairly simple. As the cherries are picked, they're laid on the ground. When there are ten cherries on the ground they are placed in the bucket and moved to

the packing shed. When there are ten buckets in the shed, they are dumped into a packing box and sent to the shipping room. Take this to at least 120.

The game reverses by delivering the buckets and loose cherries to the fruit stand where many customers are eager to have a taste of the first cherries of the season.

### EASTER BUNNIES

**You will need→**     *for each child:*

lima beans                                      12 portion cups  
1 or 2 colored envelopes                  a place value board

Today we are Easter Bunnies and we're going to the farm to gather eggs (beans). As we collect the eggs we lay them on the grass so they won't get broken. When we have ten we'll put them in our bucket (portion cup), so they won't get lost. When we have ten buckets, we'll carefully move them to

the Egg Factory (envelope) so they can be dyed. Have the eggs be found three to five at a time with the children doing the regrouping at appropriate times. Play to 120. Reverse by having the Bunnies deliver the Easter eggs.

### THE BASE 10 PROJECT

**You will need→**     envelopes                      several dispensers of scotch tape

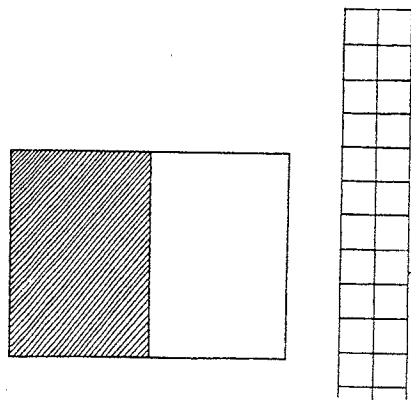
*for each child:*

place value strips (see blacklines)  
a brown lunch bag labeled with his or her name  
a clothespin labeled with his or her name  
10 portion cups with lids                  beans in a tub  
a place value board (Materials Index)

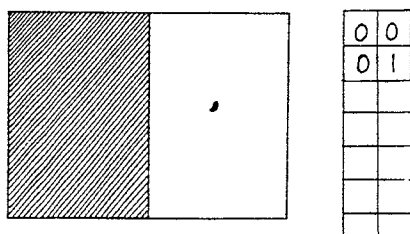


If the lessons above have gone well for most children, it is time to begin independent practice work.

To begin, have each child lay out a strip beside his or her place value board, set their portion cups and beans nearby and begin building with you.



Ask them to read their boards and record. Add a bean, read and record, etc.

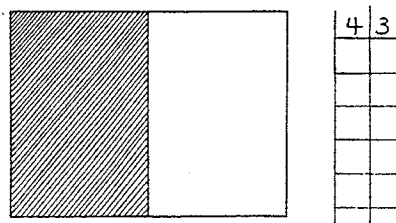


Work together until they get to one ten and nine. Help them search for patterns and loop them. Ask them to continue building and recording independently. They will ask you or the parent helper for new strips each time they reach the end of a strip but they *must* have looped their patterns before the adult tapes on a new strip. It's important for the teacher and a parent helper to circulate continuously offering support, taping on new strips and insisting that they build *before* they write.

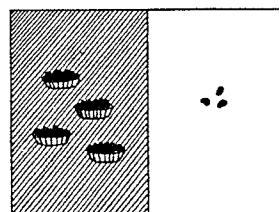
When the work time is over, the strip is rolled, clipped with the clothespin and put into the student's bag along with his or her beans and cups. The place value boards are returned to classroom supplies. You may want to provide an empty shelf or large box to hold their bags so things will not get lost.

On the second day of this project do a quick chalkboard group lesson before sending them off to work. Draw a place value board and strip on your chalkboard and ask them to read the

last number on the strip and tell you how it would be set up.



Count the tens and ones together, "10, 20, 30, 40, 41, 42, 43..."

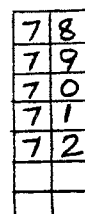


Do several examples like this so they will be aware of how to read their last number and set it up when they begin with their bags.

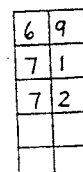
It's also helpful to do a quick chalkboard lesson on finding mistakes.



"No, you can't do that! You forgot to make a new cup; there's no such number as twenty ten."



"No, you're supposed to have eight cups, you went back to seven cups."



"You forgot to write zero—seven cups and zero."

Once again, you and a parent helper will need to circulate, checking to see that they are building, checking and looping patterns and helping them to count so they really can name the numbers they are writing.

**Teacher:** *Sammy, what number are you on?*

**Sammy:** *I'm on five cups and five.*

**Teacher:** *Let's count that together. How many beans are in each of your cups?*

**Sammy:** *Ten, we have to count by tens.*

**Teacher:** *Good! Let's count...*

**Sammy:** *10, 20, 30, 40, 50, 51, 52, 53, 54, 55.*

**Teacher:** *Let's read the last four numbers you wrote on your strip.*

**Sammy:** *51, 52, 53, 54, 55....*

**Teacher:** *Terrific job! Keep up the good work.*

When children reach ten cups, they pour their beans into an envelope labeled with their names and seal it up. What an occasion!

Each new work day, spend a few minutes modeling to help reduce the problems you saw the day before.

If you're feeling hassled, ask two or three confident students to help each day until things really smooth out. Also encourage all children to help one another. *So much* is learned in helping a friend.

When children reach 239, they draw the Stop and Turn Around Line, rewrite 239 and begin

subtracting one bean at a time until they get back to zero, zero. (You'll need to do some group modeling again because children will forget how to empty a cup to continue working and be very confused about when to open an envelope and how to reset their ten cups.)

It's exciting to have a Zero Zero Club chart hanging. As children finish the work, their names are added.

Children who finish quickly can be offered several options:

1. Be special helpers giving out strips and tape, etc.
2. Trying to add and subtract two at a time in Base 10 until they are sure of the pattern.
3. Try +3 and -3, +4 and -4, etc., until they are sure of the patterns.
4. They can use the current set of math boxes (Money and/or Arithmetic).
5. They could get out any previous math box they'd like to use.

## **THE ZERO ZERO CLUB CELEBRATION**

When everyone's name is on the Zero Zero Club chart, have a celebration. A doughnut party is especially fun since doughnuts are seen as big zeroes by kids.

## More Group Lessons

*When about two thirds of your class is finished with the Base 10 Project, begin the following lessons. They provide many more experiences with hundreds, tens and ones, and allow you to model some of the activities children will use during independent practice time.*

Concept Instruction	Base 4 and 5 • Cooky Factory • Mission Control • Marineland • Lucky Stars	Base 10 • Cherry Pickers • Easter Bunnies • Base 10 Project	More Group Lessons • Guess and Check • Counting Jars • Trading Games	Place Value Addition and Subtraction (Facts to 20 lessons for 2nd grade)
Independent Practice	Money and Arithmetic Boxes	No boxes (Make Money and Arithmetic Boxes available to children who finish Base 10 Project early)	Money and Arithmetic Boxes	Start phasing in Place Value Counting Boxes as you introduce them Place Value Counting Boxes

### GUESS AND CHECK

**You will need→** something to count— suggestions below  
 a place value board (Materials Index)  
 portion cups (Materials Index)  
 marking pen 3 x 5 index cards

This activity is one you can use throughout the year. You'll find it in Seasonal Math each month. It doesn't hurt to revisit it once or twice before children go on to some of the Place Value Counting Boxes, however.

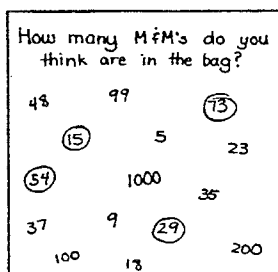
Teacher holds up items to be counted, a small bag of M&M's for instance, and asks children to estimate how many are in the bag. Children's guesses are recorded on the chalkboard or a piece of chart paper. Be sure to accept all guesses without comment—it's hard to risk being wrong—and our business is to encourage children to take risks. You'll find that children give increasingly accurate guesses as the

year progresses. Once all the guesses are recorded, take the opportunity to "play" with the numbers before you count the items.

**Teacher:** *Let's play a game with your guesses before we count. I'll ask you some riddles about your numbers. If anyone can guess the number I'm thinking of—even just one person—I'll put a ring around it. Ready? I'm looking at a number that's one more than fourteen.*

**Children:** *Fifteen!*

**Teacher:** *Right! I'm looking at a number that comes right before 30.*



**Children:** 31!

**Children:** No—29!

**Teacher:** OK. I see a number that's 70 plus 3.

**Children:** 73.

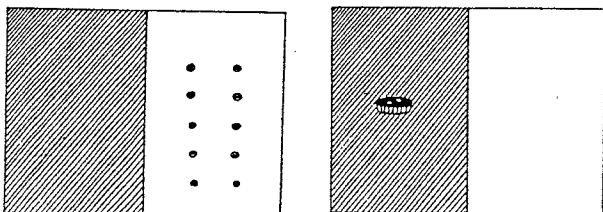
**Teacher:** I see a number that's 5 tens and 4 ones.

**Children:** 54.

Continue until the numbers are mostly circled or you're ready to move on. You'll vary the questions you ask depending on the grade level and abilities of your children.

Now it's time to count the M&M's with the children. Place the M&M's on the place value board—they watch and count with you.

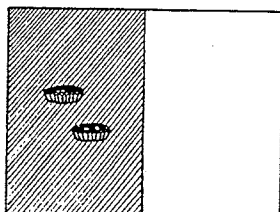
**Teacher:** OK! Here we go. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10...oh, oh! I've got ten. That means I have to gather the M&M's and put them in a portion cup, and move the cup over



to the lavender side. Let's keep going...11, 12, 13, 14, 15, 16, 17, 18, 19, 20. Oh no!

Another set of ten. What do I do now?

**Children:** Put them in a tens cup and move them over to the lavender side.



**Teacher:** OK. How many cups do we have on the lavender side now?

**Children:** Two!

**Teacher:** And how many M&M's does that mean we have so far?

**Children:** Ten, twenty.

**Teacher:** You know, I'm afraid we've just gone over some of the guesses we made. Does anyone see a number we need to erase because we have more?

**Children:** Fifteen. We have more than fifteen.

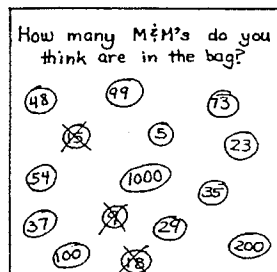
**Teacher:** Great! Jenny, can you come find the number fifteen and erase it? Any other numbers?

**Children:** Nine! We're way over nine.

**Teacher:** OK. Shane, come here and erase it.

**Children:** And what about eighteen?

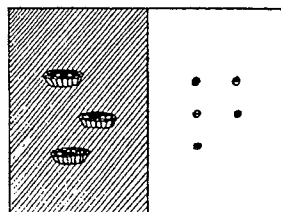
Have the children examine the numbers once or twice during the time they're counting, and again at the end, eliminating all the numbers they've gone past. It's fun, too, at the end, to have them find from the numbers remaining on the board the one that was closest to the actual total (although we never call attention to the child who named that particular number).



**Teacher:** That's all the M&M's in the bag. How many have we got?

**Children:** 35!

**Teacher:** Let's count by tens and ones.



**Children:** 10, 20, 30, 31, 32, 33, 34, 35.

Have children clap on the ones to remind them to "break" and stop counting by tens as you point.

**Teacher:** How many tens do we have on the lavender side of the board?

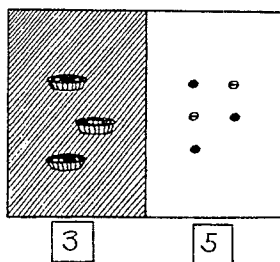
**Children:** Three!

**Teacher:** I'm going to write a three on a card and put it right under the lavender side. And how many ones—single M&M's—do we have on the white side?

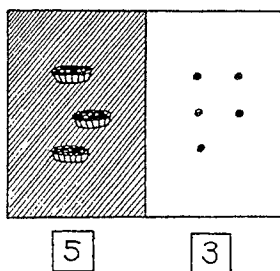
**Children:** Five.

**Teacher:** Right! I'll write five on another card and put it under the white side. Does anyone know the name of this number?

**Children:** Thirty-five?



**Teacher:** Sure. And do we really have 35 M&M's? Let's count them one more time to be sure. 10, 20, 30, 31, 32, 33, 34, 35. But then a big wind came and grabbed the cards like this and they flew into the air, and they came fluttering down, and they landed like this:



**Teacher:** Is that how many M&M's we have?

**Children:** No!

**Teacher:** But what's wrong? It's still the same numerals!

**Children:** But it's wrong! You have to change them around.

**Teacher:** OK. Tell me what to do.

**Children:** Easy. Put the three where the five is now, under the lavender side.

**Teacher:** Why?

**Children:** Because there are three cups.

**Teacher:** Oh, I see. And you want me to put the five on the white side...?

**Children:** Because you have five single M&M's there.

As the year progresses, you'll find the kids become more accurate at estimating quantity and they begin to understand the idea that the number on the left means tens, and the number on the right means ones; slowly you begin to convince children that 15 really is different than 51.

Other things that are fun to count include:

a tiny box of raisins



a box of animal crackers



a small bag of M&M's or Reese's Pieces

3 dozen doughnut holes in a box



a small bag of green grapes

a small bag of peanuts



a small box of cheese crackers



a jar of pennies

a small bag of sunflower seeds



There are lots of possibilities. We try to keep the quantities under 100 in the beginning but as understandings grow, counting larger numbers of things is very exciting.

## COUNTING JARS

### You will need→



something to count— a 2-pound bag of unsalted peanuts in the shell, a large jar of pennies, a bag of sunflower seeds, your special button collection from home (if it's something to eat, you'll want it to be wrapped or in a shell.)

place value boards

counting cups (1 oz. flat portion cups or 3 oz. dixie cups depending on the size of the objects you're counting)

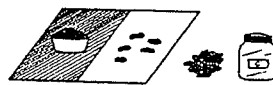
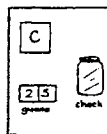
16 jars of different sizes or 16 quart-size ziplocks or other sturdy bags, each labeled with a different letter

several margarine tubs or other containers for holding hundreds

marking pen      3 x 5 index cards

record sheets (see blacklines)

Follow the first steps of Guess and Check exactly. When it comes time to count, open the bag or container, pour some of the items into a labeled jar or ziplock, call a child up to be your partner, and demonstrate as follows:



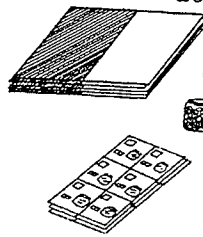
**Teacher:** *I know you'd fall asleep watching me count, so we'll all help today. I've poured some of the peanuts into this jar and I'm going to have my helper (an aide, parent, or responsible child) pour the rest into these other jars. Now Susan and I are just going to look at this jar. What's the letter on this jar? C? OK, I'll write "C" in the little box at the top of our record sheet.*

**Teacher:** *Now, Susan, how many peanuts do you think are in this jar? 20? I think there are about 30. How can we compromise and come up with a guess together? We only have one record sheet for the two of us. We could say 25? That's a great idea. I'll write 25 in the guess box. Now we'll count the peanuts onto our place value board. When we get ten, we'll put them in a cup and slide them over to the lavender side, just like we always do.*

The two of you count the peanuts from jar C out onto the board, grouping each set of ten. When you're finished, count the total by tens and ones and record the correct number on the 'check' side of the record sheet. Model a second time, using a different jar, and selecting a different child for a partner.

When the children understand, have them come up two by two to take a jar of peanuts (the peanuts have been poured into 16 jars or ziplocks by now), a place value board, 5 or 6 counting cups, and one record sheet. There are enough spaces for them to count six jars of peanuts.

place value boards



cups



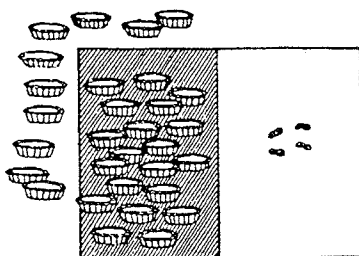
jars



record sheets

As soon as they're finished with the first jar, have them return it to the table or meeting area and select another one. Back and forth, back and forth, they select jars, guess the quantity, and record the correct number each time.

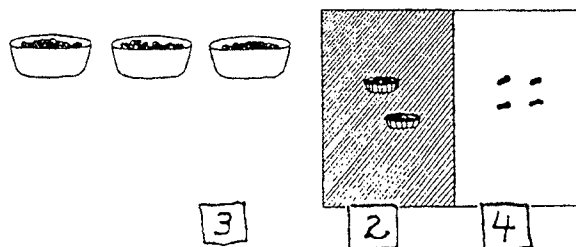
As the children are finishing their record sheets (or you're running out of time), ask them to count the jar (or ziplock) they're now working on into tens and ones and to bring the cups and singles up to your place value board. They put the tens on the lavender side, the ones on the white side, regrouping the ones into tens as more and more come in.



When all the tens and ones have been placed on the board, group them into hundreds by dumping each set of 10 tens into a margarine tub while the children watch and help you count. As you go along, call individuals up to eliminate the guesses that were too small from the chart.

How many peanuts in a 2-pound bag?	
2,000	<del>300</del>
<del>25</del> 1,000	<del>100</del>
2,400	430
<del>300</del>	550

Once you have the tens grouped into hundreds, you can go through the same last steps as in Guess and Check with the index cards and the 'big wind'.



*"Three hundred and twenty-four peanuts! Wow!"*

As children gain confidence with the procedures described in Guess and Check and Counting Jars, introduce the following Place Value Counting boxes for Independent Practice:

Counting Jars  
Fill and Count  
Junk Box Counting  
General Materials Counting  
Gift Wrap Counting  
Spin, Count, and Make a Book

Each time you introduce a new one, put a Money or Arithmetic Box away—you don't want more than 10-12 activities going at any one time.

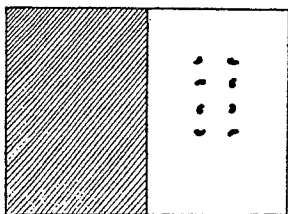
## TO 50 AND BACK—A Whole Group Trading Game

*The trading games provide a critical link between place value counting and adding/subtracting two and three digit numbers.*

**You will need→** a large 4-9 die and a large 1-6 die (Materials Index)  
for each child:  
a place value board (Materials Index)  
beans 5 portion cups

**Teacher:** Today we're going to play a trading game. It's called *To 50 and Back*. It will help you get ready to add and subtract big numbers. I have a large die marked 4, 5, 6, 7, 8, 9. It'll tell us how many beans to put on our boards each time.

**Teacher:** The first roll is eight. How many do we have on our boards?

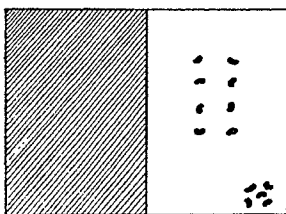


**Children:** Eight!

**Teacher:** The next roll is five. Do you think that'll give us enough to group a ten in a cup and move it over to the lavender side?

**Children:** Yes.

**Teacher:** Show me the five beans you're going to take. Let's put them on the white side. Oh, oh!

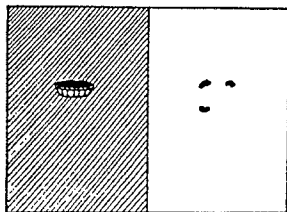


**Children:** What's wrong? Oh! We have more than ten on the white side. We'll have to put ten in a cup and move them over.

**Teacher:** How many ones do you have left on the white side?

**Children:** Three.

**Teacher:** What's your total now?

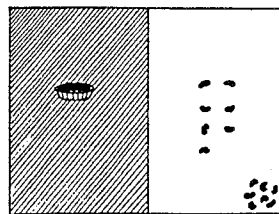


**Children:** Thirteen.

**Teacher:** The next roll is four. Do you think we'll be able to make a ten this time?

**Children:** No.

**Teacher:** The next roll is seven. Oh, oh! Looks like we'll have to make a ten and move it over again.

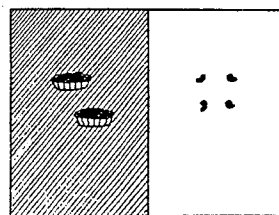


**Children:** OK.

**Teacher:** How many do you have left on the ones side?

**Children:** Four.

**Teacher:** What's your total?



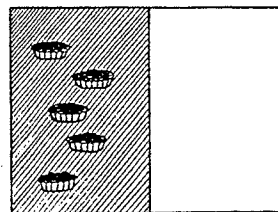
**Children:** Twenty-four.

**Teacher:** Do you think we'll have to group a ten and carry it over to the tens side on the next roll?

**Children:** Ummm...maybe. If you roll a six, seven, eight, or nine we will.

Continue in this fashion to 50. You may have to switch to a 1-6 die to hit it exactly. As soon as the group reaches 50, turn right around and head for zero, using the 4-9 die again to determine how many beans to take off each time.

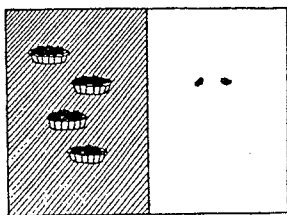
**Teacher:** OK. Here we go. The first roll is eight. Look at the white side of your board. Can you take eight off?



**Children:** No, it's impossible.

**Teacher:** So slide a ten-cup over to the white side, dump it out, and take off eight. What's your total now?

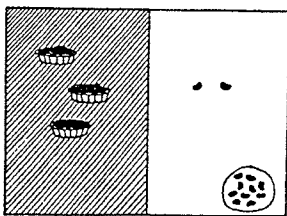




**Children:** Forty-two!

**Teacher:** The next roll is six. Look at your white side. Can you take six off?

**Children:** No! We've only got two! We have to slide another cup over!



**Teacher:** Right. Slide that cup over and dump it out very carefully so the ten stays in a lump.

**Teacher:** Now look at your white side. How many beans do you have there?

**Children:** Twelve.

**Teacher:** Right. You can see your lump of ten, and two more, so you count 10, 11, 12. Now take six out of the lump of ten and slide the remaining beans up to join the other two. What's your score now?



**Children:** Thirty-six!

Continue this procedure until they're down to zero. Again, you'll probably need to use a 1-6 die at the end to go out evenly.

## TO 50 AND BACK—TEAM OR PARTNER TRADING GAME

**You will need→** large 4-9 and 1-6 dice if the class is playing in two teams. Each pair of children will need one 4-9 die and one 1-6 die if playing in partners.

for each child:

a place value board (Materials Index)

5 portion cups      beans

This is played exactly like the game just described, with a slight twist. Divide your class in half. Roll to see which team starts first. Teams take turns rolling and adding beans to their boards. Each child on the team builds on his or her own board. As soon as the first team reaches or goes over 50, both teams turn around and race back to zero. If Team A was behind, with only 32 beans, suddenly all those children are ahead, because 32 is much closer to zero than 50 is! The first team back to zero wins.

Once the children understand, have them play To 50 and Back in partners and model the

boxed trading games from the Place Value Counting Packet.

The beauty of these games is that sometimes the children have to regroup and sometimes they don't. Making a distinction between the two operations is built in from the start and will hopefully prevent confusion later.

This is a perfect time to make a few of the boxed trading games available during Independent Practice Time—Beachcomber Trading, Easter Baskets and Give It Away are good starters.

## CRAZY MIXED UP NUMBERS

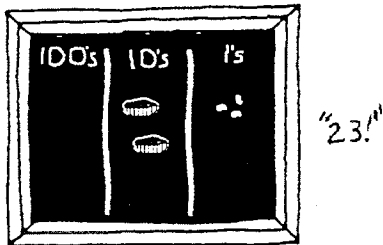
**You will need→** *for each child:*

beans ("ones")      portion cups ("tens")  
an envelope ("hundreds")  
chalkboard, chalk and eraser

This game is fun played in the following versions.

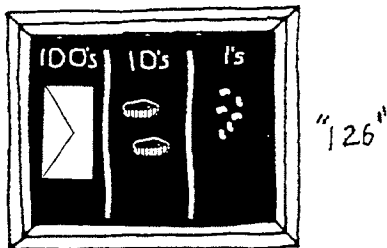
Teacher calls numbers:

1. Children count out ten beans into each of six cups.
2. Children take a small handful of beans.
3. They split their chalkboard in three parts and write "hundreds" on the left, "tens" in the middle and "ones" on the right.
4. The teacher briskly calls out numbers and the children work rapidly to keep up, setting out their filled cups and beans.



Teacher shows number cards:

1. Teacher holds up a numeral card.
2. Children read the number aloud and build. It can either be set out with filled cups and beans or with empty envelopes, empty cups and beans when the numbers become larger and/or they are more sure of themselves.



In either game, play continues for about five or six minutes. End the activities by discussing and illustrating how different numbers looked (sort of a chalkboard wrap-up).

**The Number Is:**

53

35

142

Etc.

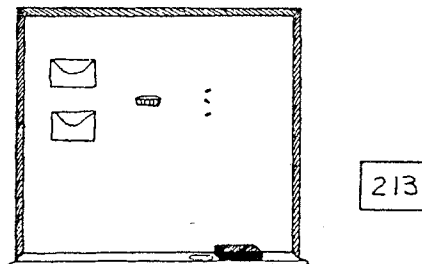
**We set out:**

five cups and three beans

three cups and five beans

one envelope, four cups and two beans

Draw envelopes, cups and beans on your chalkboard and ask them to write the numeral on their chalkboards.



Use every opportunity to focus children on large numbers through page numbers, the Calendar Numberline Strip and Pattern Grid, tallying, sums of money, newspaper and catalog ads, house numbers, speedometers, thermometers, etc.

As you're leaving the Counting and Trading Game boxes behind, review and extend these skills with the Working with Larger Number Boxes, Place Value Addition and Subtraction activities and boxes, and appropriate Seasonal Math lessons.

# Moving to the Boxes

*If you've done lots of Seasonal Math along with the activities described so far in this chapter, you've set some wonderful foundations. Children will need two to four more weeks of experience to pull some understandings together. Now's the time to complete your shift from Money and Arithmetic to Place Value Counting Practice and Enrichment Boxes. You may already have phased in Counting Jars, Fill and Count, Junk Box Counting, Beachcomber Trading, Easter Factory and Give It Away. Introduce the rest of your Place Value Counting activities over the next several days, modeling each thoroughly. Aim for eight to twelve boxes at varying levels of difficulty. If you have more to offer, that's wonderful!*

## **Here's a list of the activities in the Place Value Counting Practice and Enrichment Boxes.**

Be sure to choose a mixture of counting games, trading games, and activities that involve working with larger numbers.

### **Box Name**

### **Skills Explored**

Counting Jars

Fill and Count

Junk Box Counting

General Materials Counting

Gift Wrap Counting

Spin, Count and Make a Book

Beachcomber Trading

Easter Egg Factory

Spaceship Factory

Go for Broke

Give It Away

200

Unifix Stacks

### ***Counting Games***

All of these Boxes deal with estimating quantity and counting by tens and ones or hundreds, tens and ones.

### ***Trading Games***

All of these games set foundations for adding and subtracting with and without regrouping.

**Box Name****Skills Explored**

Matrix Madness

Roll, Roll, Roll for Beans

Rags or Riches?

Grand Prix

***Working with Larger Numbers***

Reading, writing, and understanding  
double and triple digit numbers.

## Chapter 18

# PLACE VALUE ADDITION AND SUBTRACTION

*By the time you are ready to introduce addition and subtraction of two and three digit numbers, your children will have experienced estimating and counting with place value activities every month through Seasonal Mathematics. They will have worked with counting and discovering patterns in your group lessons for base four, base five and base ten. They will be currently working on the counting and trading activities from the Place Value Counting Practice and Enrichment Boxes. Once those boxes begin to go smoothly, you can devote a portion of your Concept Instruction time to the following lessons.*

We are often asked if we really introduce these concepts to first graders. The answer is “yes” *but* only because we all work in school systems that include two and three digit addition and subtraction (without regrouping) in their curriculum expectations and use standardized testing which includes those skills for first graders.

We believe that if children are to eventually have solid understandings of adding and subtracting numbers above twenty, they need to experience that working with larger numbers often involves regrouping. We want them to ponder reasonable answers and question answers that seem unreasonable. We know that children as young as six, seven and even eight shouldn’t be expected to reach mastery of these big ideas. We hope to provide enough exciting and meaningful opportunities for exploring

these ideas so that our children can begin constructing understandings upon which to build.

Our goals for these lessons include:

- thinking of large numbers in hundreds, tens and ones
- solving two and three digit addition and subtraction problems with and without regrouping using various models.
- pondering reasonable outcomes

When you begin, trust that varied exposures to these complex ideas will help many of your children begin to construct meaning out of their initial confusion.

# Group Lessons

## Introduction To Place Value Addition and Subtraction

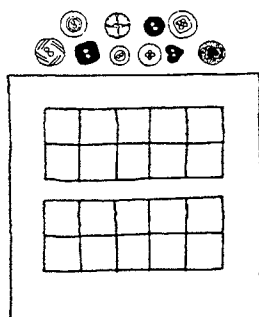
*The following lessons help children feel more comfortable with quantities in relation to tens and fives. If you have taught the Doubles, Neighbors, Fast Tens and Fast Nines activities from Arithmetic, many will have gained comfort with such strategies and patterns, therefore, these lessons will seem easier.*

### JUNK BOX ABRACADABRA

**You will need→** a set of numeral cards from 1-9  
for each child:  
1 copy of the ten frame board (see blacklines)  
a junk box to share with 2 or 3 friends

Tell the children you're going to work together to look at fives and tens so they can become more comfortable as you begin adding and subtracting larger numbers.

**Teacher:** *Would each of you take a small handful of junk box counters from the box you're sharing. Please set them above your ten frame board.*

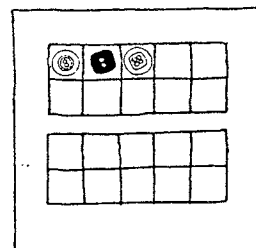


**Teacher:** *I'll begin by holding up a numeral...*

3

**Children:** *Three! Should we set out three?*

**Teacher:** *Yes, that's exactly what you should do. Please put them all on your top row.*

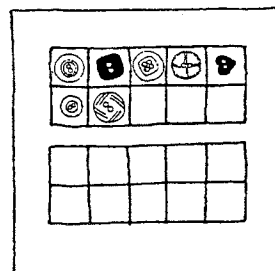


**Teacher:** *Here's another card.*

**Children:** *Seven? Now what?*

7

**Teacher:** *Don't clear off your three counters. This game is called Abacadabra because I want you to quickly change your three to seven.*



**Children:** That's easy...four, five, six, seven.  
**Teacher:** That works. Did anyone think of it another way?

**Children:** Yeah! I just know that three and four make seven.

**Teacher:** Take a look at your boards. How many are on the top row?

**Children:** Five.

**Teacher:** How about the second row?

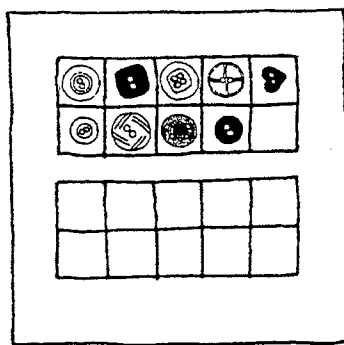
**Children:** Two.

**Teacher:** Seven is how many more than five?

**Children:** Two more...I'd have to have three more frogs to have ten.

**Teacher:** Here's another card...Abracadabra!

**Children:** Nine! Seven, eight, nine. We need two more.



**Teacher:** Nine is how many less than ten?

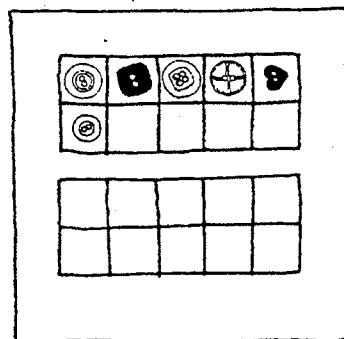
**Children:** One less.

**Teacher:** And how many more than five?

**Children:** Four more. Four and five make nine too.

**Teacher:** Abracadabra, turn nine into six.

**Children:** We have to take off three. That's one more than five. Yeah, five and one make six.



**Teacher:** How many less than ten?

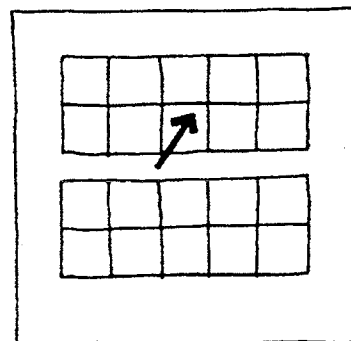
**Children:** Four...six and four make ten.

The activity continues in this manner focusing the children on the fives and/or tens at each turn. When you're nearly finished, have children put their counters away. Ask them to try to visualize how the numbers would look on their boards.

**Teacher:** Let's put our counters away but check to see whether we're beginning to see some of the numbers in our heads. You'll want to keep your ten frames in front of you.

**Teacher:** Here's our first card...it's an eight. How would it look?

**Children:** (pointing to ten frame) That's three more than five...yeah, it would end right here. Two more would get to ten.



**Teacher:** Is eight closer to ten or closer to five?

**Children:** It's closer to ten...only two more, five is three back.

If most of your children seem fairly comfortable, spend a few minutes trying other cards in the deck to build awareness and confidence.

## JUNK BOX ADDITION

**You will need→** a set of cards with numerals 10-20  
for each child:  
a junk box to share with partner  
a ten frame board

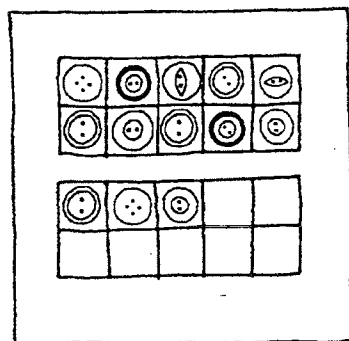
**Teacher:** I need everyone to work with a partner. I'll use my feely box to help us find partners.

**Teacher:** Once you have a partner, please join me on the rug with the junk box you'll share. Can you sit so you can see me easily?

**Teacher:** Here's our first card.

**Children:** It's a thirteen!

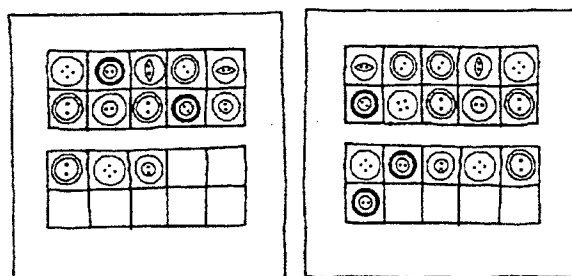
**Teacher:** Please work together to set out thirteen counters on one of your ten frames boards.



**Children:** That's easy—it's like Fast Tens. We need ten and three more.

**Teacher:** Good. Everyone seems to have finished that easily. Let's set up the second board. Here's a card for that one.

**Children:** Sixteen! We need ten and six.



**Teacher:** Good. Now comes the tricky part. I want you to think in tens. Let's look at the board with thirteen. Is thirteen closer to ten or closer to twenty?

**Children:** It's closer to ten. It's only three more than ten.

**Teacher:** How much less than twenty?

**Children:** Five, six, seven...seven!

**Teacher:** What about the sixteen? Is it closer to ten or closer to two tens.

**Children:** It's closer to twenty. You only need four more to be twenty. Yeah, but you'd have to take off a lot to get back to ten.

**Teacher:** I'm looking at Junichiro's and Michael's boards. They're using the shells. Can anyone think of a story that would put the shells altogether?

**Child:** How about this? Michael found thirteen shells. Then his sister gave him sixteen more shells. How many does he have now?

**Teacher:** Great story! Is there any way we could make a quick but good guess about how many that will be when they're put together?

**Children:** Do you mean like add ten and twenty?

**Teacher:** That's one good way. Can you think of any other ways?

**Child:** When I look at our boards, I see that we have two tens already. Yeah...and the six and three is almost another ten.

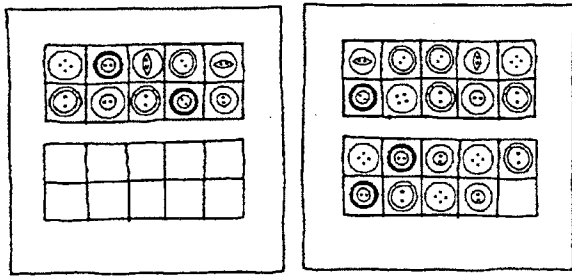
**Teacher:** So you think a good guess might be thirty?

**Children:** That sounds right.

**Teacher:** Let's put it together and check it.

Why don't you push your three over by your six so it will be easier to see how many there are all together.





**Children:** Twenty-nine! Just one less than thirty.

Continue using the ten frame boards and asking children to make up stories for their junk boxes after the numeral cards have been read and quantities set out each time. Think in tens and nearest fives to figure reasonable totals.

## BY GUESS AND BY GOLLY

**You will need→** 3 bowls of unifix cubes      6 ten frame boards  
a feely box with children's names inside  
numeral cards 10-20  
for each child:  
chalkboard, chalk and eraser

**Teacher:** Let's begin by choosing six people to work in partners. (Pull six names from box and give each set of partners a bowl of unifix cubes and two ten frame boards.)

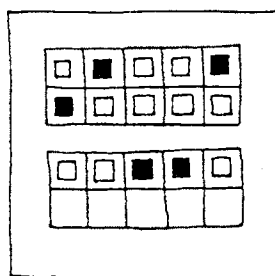
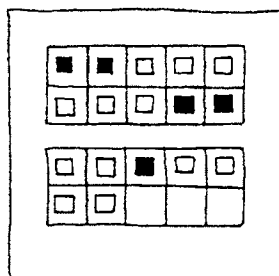
**Teacher:** Put your chalkboards on "hold" for a few minutes and pay attention to these couples in front of you.

**Children:** Like on that TV program!

**Teacher:** Couple number one, quickly set out counters for these two numeral cards.

17

15



**Teacher:** Couple number two...here are your cards to set up.

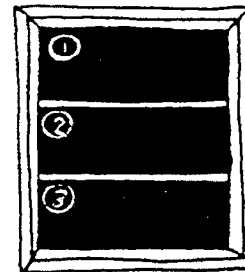
19

16

**Teacher:** Couple number three...

12 14

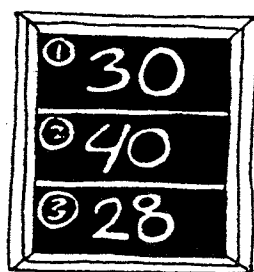
**Teacher:** While they're setting those up, you need to write on your chalkboards just like this.



**Teacher:** Back to our couples. Look at couple number one. Quickly, look at their boards and write down a guess for how much that will be when we put the unifix cubes together.

**Teacher:** Now, look at couple number two. Write your guess in your second space.

**Teacher:** And couple number three.



**Teacher:** Try hard to trust your guesses. We're working on this so we can learn to puzzle about our answers when we're figuring out adding and subtracting problems. We see many older children get answers that don't make any sense but most of those children don't seem to ever wonder about it. We hope you'll learn to guess how much it should be before you stop and figure it out. As your guesses improve, you'll be able to ask yourself if the answers you're getting make sense.

**Teacher:** Take a look at couple number one.

What were some of your guesses?

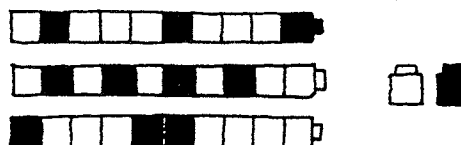
**Child:** I said "thirty" because they had two tens and I think those other cubes could make another ten.

**Child:** I said "thirty-two" because I went five, ten, fifteen, twenty, twenty-five, thirty and a little bit more.

**Child:** I said "twenty" but maybe I forgot to think about the cubes on the bottom.

**Teacher:** That's OK. You looked at the tens. You were on the right track. It takes a lot of practice to notice everything. There were lots of good guesses on this one.

Continue in this manner for couples two and three. Finally, go back to couple number one and ask them to stack their cubes in tens until they can't make any more tens. Read the total together.



Do the same with the other ten frames, stacking and reading the totals.

Try another round with new partners if interest holds or do this another day or two until most of your children begin to gain ballpark accuracy in their guessing.

## SO SMART

**You will need** → for each child:

a copy of Addition Board (see blacklines)

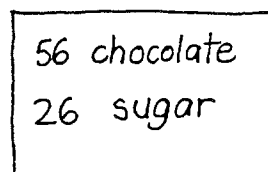
beans to share

9 portion cups

Note: This activity is an extension of By Guess and By Golly and wouldn't be used for children having lots of difficulty estimating.

**Teacher:** Ray arrived at the doughnut shop early. He made fifty-six chocolate doughnuts and twenty-six sugar doughnuts. How could we quickly set this up so we could make a guess as to how many doughnuts Ray has ready to sell?

**Children:** Could you tell that one more time and maybe write the numbers down for us?  
(The story is retold and numbers are written.)



**Children:** That means five tens for the fifty-six. Is it OK just to pretend we have ten beans in each cup?

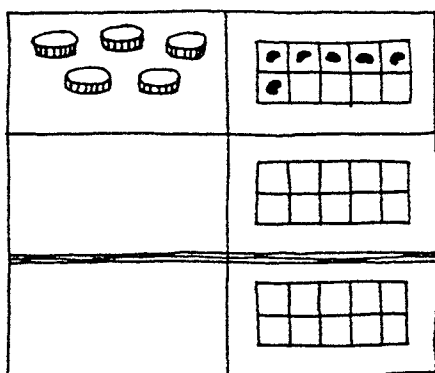
**Teacher:** Do you feel you could do that and not get confused?

**Children:** Let's try!

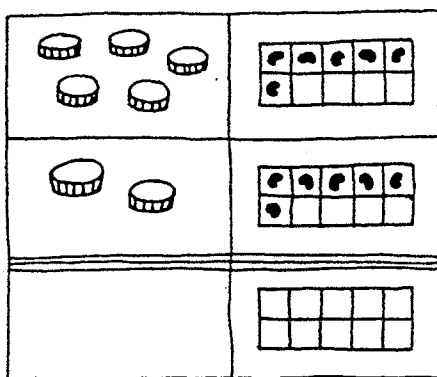
**Teacher:** Set those cups on the upper part of your addition boards on the tens side.

**Teacher:** How about the six?

**Children:** We better set out six beans on the ones side.



**Teacher:** Can you set up the twenty-six?



**Children:** Sure...pretend these two cups are filled and six more beans.

**Teacher:** Good job. Now let's try to make a guess at the total before we really figure it out. How do you think we could do it quickly?

**Children:** How about looking at the cups? Five cups and two cups make seven.

**Children:** And six and six make twelve. That's seventy and about ten more.

**Children:** Eighty!

**Children:** No, it's a little bit more than eighty ...'cause twelve is more than ten.

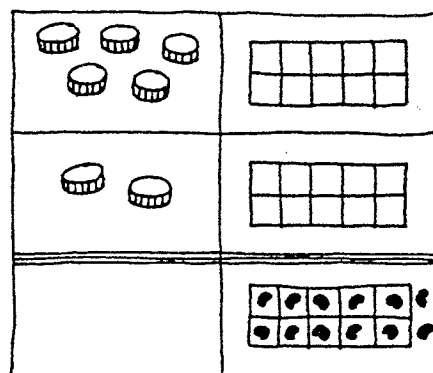
**Teacher:** You are quite good at figuring out reasonable answers. Let me show you how that gets put together so we can find out how many doughnuts Ray really made and see if our guesses were close.

**Teacher:** Remember when we were doing the Place Value stories earlier and putting the fish in the bucket and sending the astronauts into flying saucers?

**Children:** Then we did the cherry buckets and Easter egg factories too.

**Teacher:** Many of you have been using our Boxes of trading games to practice making new groups. When we tried to figure out how many doughnuts Ray had made, we set up the addition boards. Let's take a look at our cups and beans. We looked at the tens first when we were trying to make an educated guess. Now that we want to check our guess and find out how much it really is, let's figure out first if we need to make any new cups with the "doughnuts" on our ones side.

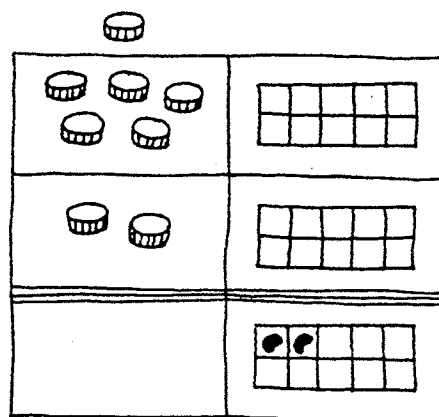
**Children:** We know six and six make twelve. That's more than ten so we will need another cup.



**Teacher:** How about pulling your "doughnuts" down to the bottom of your board. Take an empty cup and count ten of your beans into the cup.

**Children:** That's easy...

**Teacher:** Move that new cup up to the top of your addition board on the tens side.



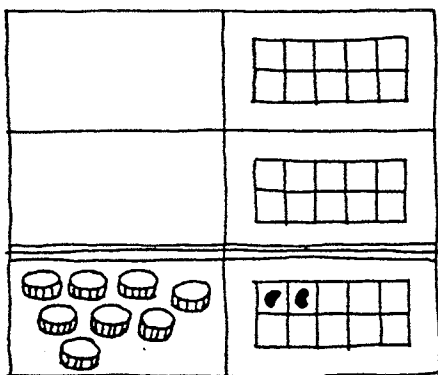
**Children:** Now we have one and five and two.

**Children:** That's eight cups.

**Teacher:** Good. How about moving all those cups to the bottom of your addition

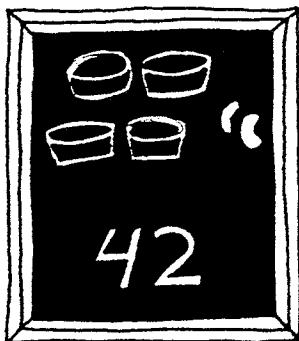
board? How many "doughnuts" do you have altogether?

**Children:** Eighty-two!



After you've tried several stories, consider doing this activity another day with children working in partners on chalkboards to write down their guesses. (Working with a partner is usually less threatening than taking risks alone.)

Many children find it easier to draw the containers they believe they'll end up with than to write the number when they're guessing. They have better understandings of quantities in groups than they have of how to name and write those numbers. Encourage them to draw



it part of the time so it becomes easier to think of the numbers by looking at their drawings.

When many children have reached a comfort level with these procedures, you might want to introduce the algorithm.

**Teacher:** Let's take a look at the last story problem we solved. John made seventeen filled doughnuts and twenty-five sugar doughnuts.

**Child:** Yum! I wish I had a doughnut right now!

**Teacher:** Let's solve it one more time with our beans and cups. I'll show you how to write this down. How did we start?

**Children:** We had one ten and seven in the top row for seventeen filled doughnuts.

**Teacher:** And...

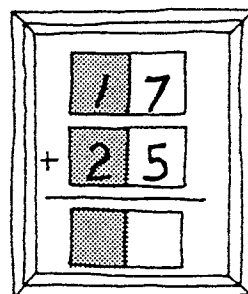
**Children:** We had twenty-five in the second row—two tens and five.

**Teacher:** And we're trying to find out...

**Children:** How many doughnuts John baked altogether.

**Michael:** I can already see what's going to happen! It'll be a little over forty altogether, 'cause of the three tens and then twelve more.

**Teacher:** Let's work it out and see what happens. Let me record the problem first. Now what?



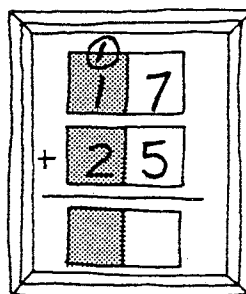
**Children:** Pull down the beans on the ones side and see if we have enough to make a new ten cup.

**Emilia:** We will! We're going to have twelve!

**Teacher:** Right. What are you going to do with that new cup of ten?

**Children:** Move it up to the top of the tens side, with the other cups.

**Teacher:** Let me make a record of what you just did. You moved a cup up? I'll record that by writing a one in a circle at the top of my tens side. Does that one mean just one?

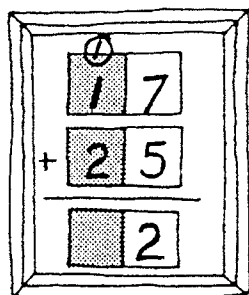


**Children:** No! It means one cup—ten beans!

**Teacher:** And how many beans do you have left on the ones side?

**Children:** Two—we had twelve—ten and two left over.

**Teacher:** Here's how I'll record what happened:

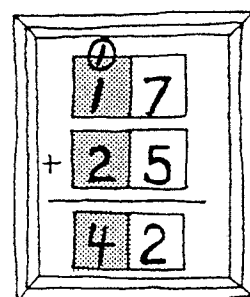


**Teacher:** What shall we do next?

**Children:** Pull down all the cups Now we have four.

**Teacher:** I'll record that too. Let's read the whole number sentence now.

**Children:** Seventeen plus twenty-five makes forty-two. So Michael was right.



If children seem to understand, repeat the lesson several times and then have them record with you on individual chalkboards as they manipulate their cups and beans. The algorithm may be confusing for some children, especially if you move into it too quickly. If many seem bewildered, plan to back off, return to this lesson a bit later and repeat it on several different days at least, using a new story line each time. The Place Value Addition and Subtraction Boxes themselves offer children additional opportunities to gain understanding.

## BIG BUCKS

**You will need→** set of large paper dimes and pennies (You probably made up some of these when you were teaching Money Concept lessons.)

pocket chart fake dollars (see blacklines)

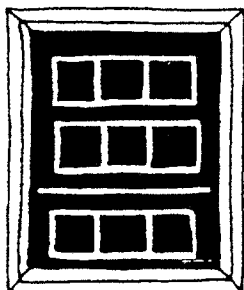
Big Bucks spinner (blackline supplement)

for each child:

a chalkboard, chalk and eraser

This lesson is based on the Big Bucks activity from the Place Value Addition and Subtraction Boxes.

**Teacher:** Could you draw boxes just like mine on your chalkboards?



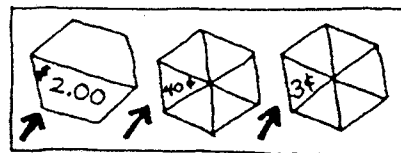
**Teacher:** Let's see if we can learn to work with Big Bucks.

**Child:** That's what my uncle says when he talks about that car he wants...it costs big bucks!

**Teacher:** Joey, would you spin this spinner.

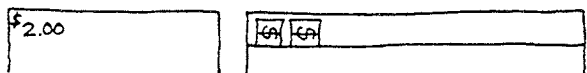
**Joey:** Can I spin all three wheels?

**Teacher:** Please do and then read each wheel to us starting with the dollars.



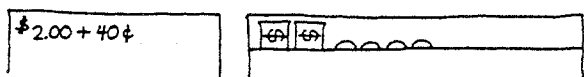
**Joey:** OK...two dollars.

**Teacher:** Hold on and I'll write that on my board and then put two fake dollars in our pocket chart.



**Joey:** 40¢...get some dimes.

**Teacher:** Let me write that. Here are my dimes. How many do I need to make 40¢?

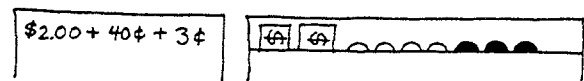


**Children:** Four—ten, twenty...thirty, forty.

**Teacher:** Joey, what about the last spinner wheel?

**Joey:** It says three cents. Get three pennies.

**Teacher:** I'll write that down and here are the three pennies. Let's count the money so far. Where should I start?

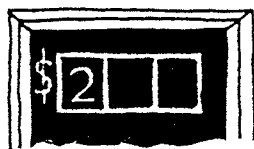


**Children:** Start with the dollars. Two dollars...ten, twenty, thirty, forty, forty-one, forty-two, forty-three cents!

**Teacher:** Great! I want to show you a short way to write that and then I'll have you try it on your chalkboards. How many dollars do we have?

**Children:** Two dollars!

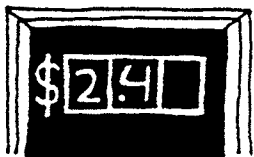
**Teacher:** I'll write the two in my dollar space and draw a dollar sign just to the left of it.



**Teacher:** How many dimes?

**Children:** Four dimes—that makes forty cents.

**Teacher:** I'll write that in the middle box. That's where people write the dimes. I have put a decimal point before the four so you'll know we've changed to coins.



**Children:** It's like hundreds, tens, and ones again.

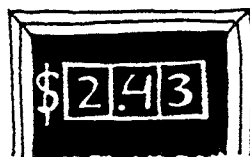
**Teacher:** That's correct. How many pennies are in a dollar?

**Children:** One hundred...and there are ten pennies in a dime and a penny is just one cent!

**Teacher:** So it really is hundreds, tens and ones in money.

**Teacher:** Where shall we write the three pennies.

**Children:** In the ones box. It's on the right. Make a cents sign too.

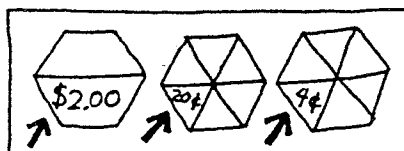


**Teacher:** When people use a dollar sign and a decimal point, they don't use a cent sign too. It's rather hard to get all this figured out when you're just beginning. I'll read it to you and you listen for me to say "and" when I touch the decimal point. Two dollars and forty-three cents.

**Children:** Yeah, but you said cents. It sounds like you should write it.

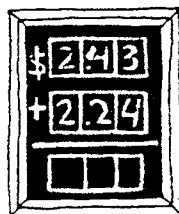
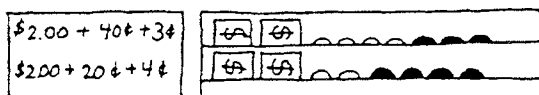
**Teacher:** It is confusing. Try to think of it as a shortcut way of writing dollars and cents.

**Teacher:** Joey, could you spin another turn for us?



**Joey:** OK. I got two dollars, twenty cents...and four cents.

Write that as before and set it up on the pocket chart. Count it again with the children and then help them write it on their chalkboards as before. They'll probably question why the dollar sign isn't written again. It won't hurt for them to write it but we always explain it as just another time saver or shortcut.

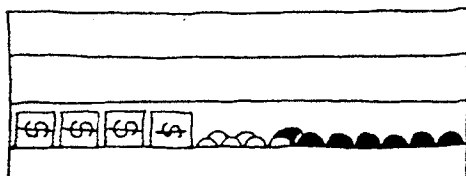


**Teacher:** Before we count up all our money, let's take a quick guess at how much it will be.

**Children:** It's easy...it's four dollars.

**Children:** Yeah, and sixty cents and seven pennies!

**Teacher:** You're so smart! Let's check it to be sure. We'll move all the money down to another row and put it together.



**Children:** See...four dollars and sixty-seven cents.

## TRIANGLE TOSS

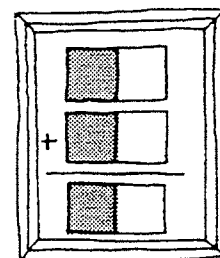
**You will need→** triangle dice (blackline supplement)  
for each child:  
a copy of the Addition Board (see blacklines)  
8 portion cups      beans to share

This lesson is based on the Triangle Toss activity from the Place Value Addition and Subtraction Boxes.

**Teacher:** Here's another job to help you learn to understand how to add tens and ones. Do you all have your addition boards, cups and beans to share?

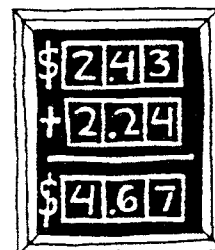
**Children:** Just about!

**Teacher:** Please take a look at my chalkboard. I need you to draw boxes on your chalkboard just like I'm drawing.



**Teacher:** Very good! Can we write it down?

**Children:** We did it!



**Teacher:** Terrific! Let's read it from the beginning to remember what we did.

**Children:** Two dollars and forty-three cents plus two dollars and twenty-four cents makes four dollars and sixty-seven cents.

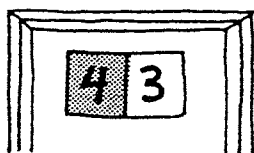
**Teacher:** You sure figured that one out. Let's try again to be sure you really understand it.

When you feel most children are catching on, add the Big Bucks Box to your Independent Practice Time collection. (You may want to remove a Place Value Counting Box at this time.)

**Heather:** Forty and three!



**Teacher:** How can we write forty and three?



**Heather:** It's just the same as four tens and three. You write four in the tens box and three in the ones box.

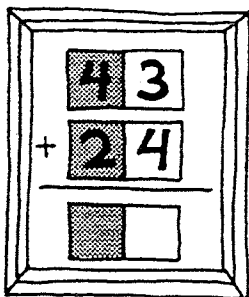
**Teacher:** Fantastic! Heather, could you toss those triangles again?

**Heather:** I got twenty and four! That makes twenty-four.



**Teacher:** How do we write it?

**Heather:** You put a two in the tens box for the twenty and a four in the ones place.



**Teacher:** Can anybody think of a story for this problem? Jim?

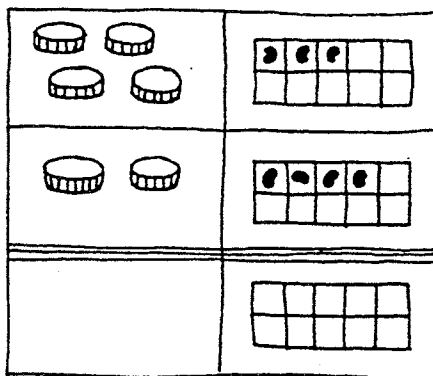
**Jim:** I've got a good one! There were forty-three white ducks swimming around on this lake, see. They were diving under the water and looking for things to eat...lots of quacking, too. Twenty-four brown ducks heard the noise and they came and joined the quacking!

**Teacher:** You're right, that was a good story. What are we trying to find out?

**Children:** We need to find out how many ducks were swimming and quacking on the lake.

**Teacher:** Let's set it up with cups and beans quickly. How will it look?

**Children:** We need four cups of ten beans on the top and two cups of ten on the second row.

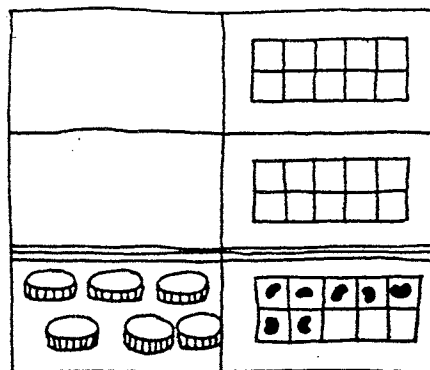


**Children:** Don't forget the ones...put three beans on the top row and four in the second row.

**Teacher:** Take a quick look and whisper to a friend about how many ducks we'll have altogether. Cheryl, what did you whisper?

**Cheryl:** I think it might be sixty-five.

**Teacher:** That sounds pretty close to me. Let's push all our beans together at the bottom of our addition boards and check.



**Children:** Just like all the ducks getting together at the lake!

**Children:** Yep! It's sixty-seven. Good guess, Cheryl.

**Teacher:** Great job everyone. Let's try it a couple more times to be sure everyone is catching on and then we'll add it to our Independent Practice Time boxes so you can practice adding two digit numbers by yourself or with a friend.



## TRIPLE SPIN TAKE AWAY

You will need Triple Spin Take Away spinner (blackline supplement)  
for each child:

a place value board beans to share 4 portion cups

This lesson is based on the Triple Spin Take Away activity from the Place Value Addition and Subtraction Box.

**Teacher:** Today, we're going to do a game that makes us think hard as we add and subtract large numbers. Do you have your materials ready?

**Children:** I'm ready. Me too!

**Teacher:** I'm going to spin all three of the spinners and then I'll write the numbers on the board so you can all see.

$$(30 + 1) - 4$$

**Teacher:** Can anyone read it for me?

**Child:** Thirty plus one take away four?

**Teacher:** You're on the right track. Is there any other way to read it?

**Child:** Thirty-one take away four. Thirty-one is the same as thirty plus one.

$$\begin{array}{r} 31 \\ - 4 \\ \hline \end{array}$$

**Teacher:** Good! Can anyone think of a story that could go with thirty-one minus four?

**Child:** Yeah! My Mom says she wants to lose thirty-one pounds but so far she's only lost four.

**Teacher:** Good story! It's often very hard to go on a diet. Do you think we can figure out how many pounds she still wants to lose? Will someone take a guess?

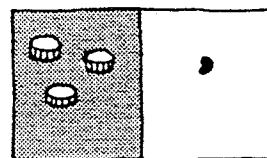
**Child:** If you took five away from thirty, you'd have twenty-five.

**Teacher:** Good guess. You must have been thinking in tens and fives.

**Child:** Yeah...those are easy counting patterns for me now.

**Teacher:** Let's set it up and solve it. What do we need for the thirty-one?

**Children:** Three tens and one. Yeah...three cups, count ten into each cup and then one more bean for the ones side.



**Teacher:** Margie says her Mom has lost four pounds already. What do we do about that four?

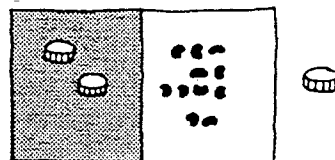
**Children:** If we set out four more beans, then we'll have more than thirty-one.

**Teacher:** That would make it seem like Margie's Mom is gaining weight instead of losing it. We're going to have to take away some beans from the thirty-one.

**Children:** But we only have one bean that's not in a cup...

**Teacher:** True, but what do you do when you're playing some of the Trading games like Give It Away or Go For Broke?

**Children:** You break up a ten or trade your dime for ten pennies. We could move a cup over to the ones side and pour out those beans.



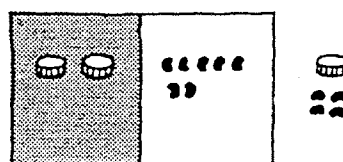
**Teacher:** Would that give us enough to take away four?

**Children:** We have eleven...that's plenty!

**Teacher:** Then remove four beans just like Margie's mom got rid of four pounds.

**Children:** That leaves seven.

**Teacher:** What do you get when you count all your beans now?



**Children:** Ten...twenty...twenty-seven!

**Children:** Thirty-one take away four leaves twenty-seven. She's gotta be on the diet a long time!

Many children need to play this game several days as above: reading the number sentences, telling stories, constructing the problem with beans and cups, pondering reasonable results and solving the problem. When many children have reached a comfort level in these procedures, you might want to introduce the algorithm.

**Teacher:** Let's take a look at this last story problem we solved. Kari said she had twenty-three valentines to give away but her little brother colored on seven.

**Children:** Now she only has sixteen valentines to give her friends.

**Teacher:** Right...baby brothers can be a pain sometimes!

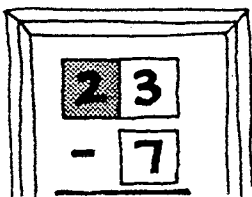
**Children:** All the time!

**Teacher:** Let's solve it one more time with our beans and cups. I'll show you how you'd write this down. How did we start?

**Children:** We had two tens and three...twenty-three.

**Teacher:** Then...

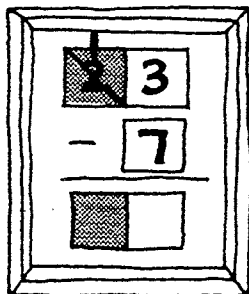
**Children:** We had to take away seven but there weren't enough so we dumped a cup.



**Teacher:** Let's see...we had  $23 - 7$ ...two cups and three beans. We dumped a cup. How many cups were still on our boards?

**Children:** Only one cup!

**Teacher:** Watch how I show that. Since we only have one cup left, I'm showing that the two cups have been changed to one cup.



**Children:** Why don't you just erase the two?

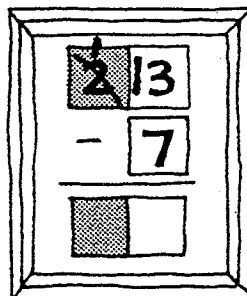
**Teacher:** If I erased the two, I might forget Kari started out with twenty-three valentines and think she only had thirteen at the beginning. This way, I can tell I've made a change. Have we changed anything else?

**Children:** Yes, the three.

**Children:** I've got the ten I dumped and the other three.

**Children:** That's thirteen now.

**Teacher:** True. Here's how I'll show that change on my chalkboard.



**Teacher:** I added a cup of ten beans to my three and that turned it into thirteen.

**Children:** Uh huh...one ten and three.

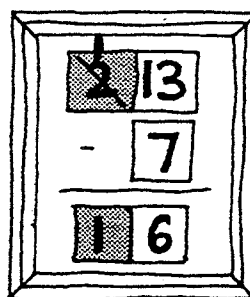
**Teacher:** How many valentines did Kari's little brother damage?

**Children:** Seven...we took away seven.

**Teacher:** How many could Kari still give away?

**Children:** Sixteen.

**Teacher:** Here's how we write that.



Note: Often algorithms thoroughly confuse children when introduced too early. Do not push this for children who aren't ready to understand. For too long, well-meaning teachers have only taught the algorithms and so many children never understood regrouping at all. Even if many of your children don't seem ready for the algorithms, they'll be gaining valuable experience as they continue constructing and solving the story problems with their models. They have plenty

of formal schooling ahead to refine their skills.  
(Many educators believe children shouldn't be

asked to deal with these algorithms before eight or  
nine years of age.)

## ON SALE

**You will need→** play food items and a clothespin  
feely box of "cents off" cards (blackline supplement)  
large paper fake dollars, dimes and pennies to use on  
your pocket chart (see blacklines)  
for each child:  
a chalkboard, chalk and eraser

(Based on the On Sale activity from the Place  
Value Addition and Subtraction Boxes.)

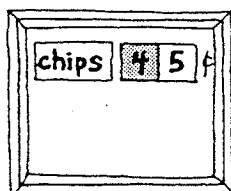
*Let me pull out these "bargain  
cards" for you to see. Let's read one.*

**Teacher:** Today we're going to work on  
subtracting with large numbers.  
We'll pretend we're at the  
neighborhood market which is  
having a sale.

**Teacher:** Damon, here are some packages  
of food. Can you choose one to buy?

**Damon:** I like potato chips. Let's buy that  
bag.

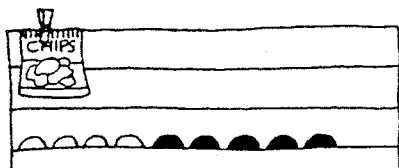
**Teacher:** I'll write the item you chose and  
its price here on my chalkboard.  
Boys and girls, please write it just  
like I did, on your chalkboards.



**Teacher:** Today we only took dollars,  
dimes and pennies to the store.  
How can we pay for our chips?

**Children:** We need four dimes and five  
pennies.

**Teacher:** I'll set that up on our pocket  
chart.



**Teacher:** This store has a special bargain  
bucket when you get ready to pay.

**12¢ off**

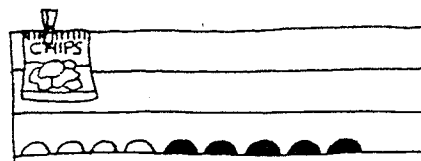
**Children:** That one says twelve cents off.

**Teacher:** I'll put the "bargain cards" back  
and have Eric reach in to find out  
what kind of a bargain we'll get  
today.

**Eric:** I got sixteen cents off!

**Teacher:** That sounds like a pretty good  
deal for potato chips.

**Teacher:** Look at our pocket chart. We  
have four dimes and five pennies.  
Can you make an educated guess  
about how much these chips will  
cost after they take off sixteen cents?



**Elizabeth:** I think it'll be about thirty  
cents.

**Teacher:** How did you choose that  
number?

**Elizabeth:** I just took away a dime first  
and then I guessed about thirty—I  
don't know why.

**Teacher:** Can anybody think of why  
Elizabeth might have chosen thirty  
instead of thirty-five?

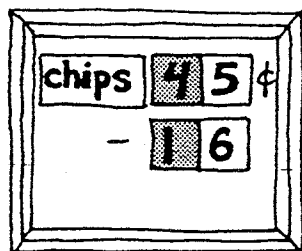
**Child:** Maybe she thought about sixteen  
being like fifteen and if you count  
by fives, you'd get thirty.

**Teacher:** Were you counting backwards?

**Elizabeth:** Kind of, I guess.

**Teacher:** Let's see if we can solve this problem.

First, I'll write down the cents off amount so we don't forget.



**Teacher:** Here's our forty-five cents. How do we take off the sixteen cents?

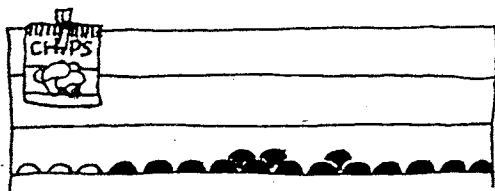
**Children:** Sixteen is one dime and six pennies. We could just take away a dime and... oops! There are only five pennies.

**Teacher:** This looks like one where we're going to need to trade first. Do you know how?

**Children:** Yeah...you can't take six pennies away from five. We could get a dime and trade it in for ten pennies. Do you have ten pennies?

**Teacher:** Yes I do. Let's try that. Janey, will you take out a dime and put in ten pennies instead.

**Janey:** I'll put them on the pennies side.



**Janey:** Now we have three dimes and fifteen pennies.

**Teacher:** Can we take off sixteen cents now?

**Janey:** Not from just the pennies.

**Teacher:** Is there any other way?

**Janey:** What if we took six pennies away and then took one dime away?

**Teacher:** How did you think of that?

**Janey:** Well, when I looked at the chalkboard, I thought the sixteen really meant one dime and six pennies.

**Teacher:** That's very sophisticated thinking. Class, will that work?

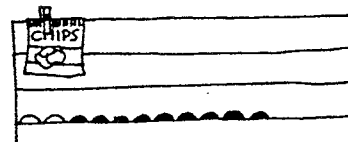
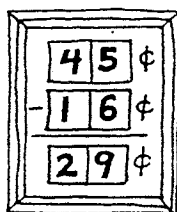
**Children:** Let's try it.

**Teacher:** If I take off six pennies, how many are left?

**Children:** Nine pennies.

**Teacher:** If I take off one dime, how many dimes are left?

**Elizabeth:** Two dimes. Ten, twenty, twenty-nine!



**Teacher:** That was surely a good guess, Elizabeth.

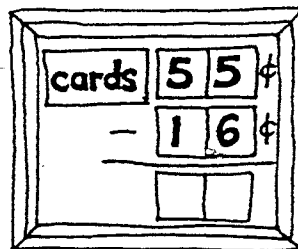
Do a few more problems together. The cents off cards won't always involve regrouping. Children need practice at questioning whether regrouping will be needed each time.

When most of your children are comfortable reading the prices, setting up the money and taking away the indicated amount, show them again how to do the algorithm. Those who are ready to understand will find it exciting to do the notation of the needed trades.

**Teacher:** Let's take a look at this last transaction. David picked out the deck of cards for fifty-five cents.

**Children:** Yeah, that one was such a good deal!

**Teacher:** I'll write it again from the beginning and ask you to watch as we set up our dimes and pennies to pay for it.



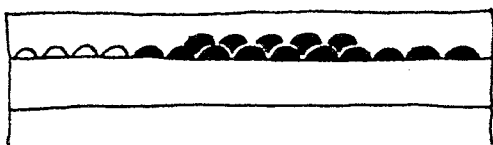
**Teacher:** Then what happened?

**Children:** David got a "bargain card" that said sixteen cents off!

**Teacher:** How did we take away sixteen cents from the fifty-five cents?

**Children:** Well, five pennies weren't enough to get six pennies. We had to change one of our dimes into ten pennies.

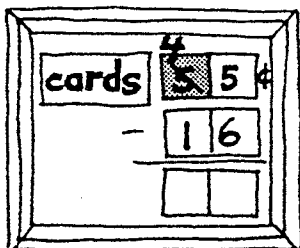
**Teacher:** Let's stop and do that now. I take a dime to the banker and she gives me ten pennies...now my money looks like this.



**Teacher:** Now what kinds of money do we have in our pocket chart?

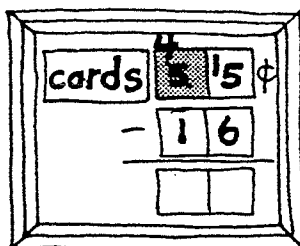
**Children:** We have four dimes and fifteen pennies.

**Teacher:** Here's how I'll show that on my problem....we started with five dimes but took one to the banker for ten pennies. Now we only have four dimes. How about the pennies?



**Children:** We put those ten with our five and now we have fifteen pennies.

**Teacher:** Here's how we need to note that on our problem.

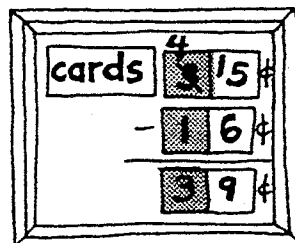


**Teacher:** Then what did we do?

**Children:** We took away the six pennies from our fifteen pennies. That left nine pennies.

**Teacher:** What else did we do?

**Children:** We took away one dime from our four dimes. Yeah....those cards only cost thirty-nine cents.



**Children:** That's almost the same as Triple Spin Take Away.

**Teacher:** True, the only difference is we're using dimes and pennies so we need to remember the cents sign as we write the numbers in our problem.

**Teacher:** Let's try another one or two. Please write with me as we work them out so you'll feel more comfortable at this.

Add the Box to your Independent Practice collection once many of your children understand how to use it.

## Moving to the Boxes

We follow the same teaching strategies for nearly every lesson as we continue introducing the Boxes from Place Value Addition and Subtraction. We usually put away some Place Value Counting Boxes as we add new Boxes. In first grade, two and three digit addition and subtraction is often quite difficult for some children. It's very important, therefore, to keep a sampling of Place Value Counting Boxes available and even bring back a few Arithmetic Boxes too. You may even want to add a few of your more complex Pattern Boxes for children to try again.

*In second grade, we gradually phase out Place Value Counting but provide some lessons and Boxes from the Arithmetic chapter on Facts to Eighteen along with these Place Value Addition and Subtraction lessons and Practice and Enrichment Boxes.*

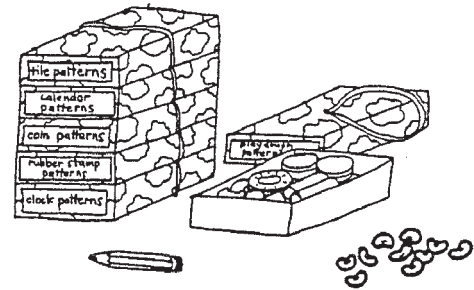
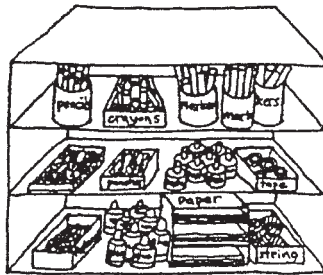
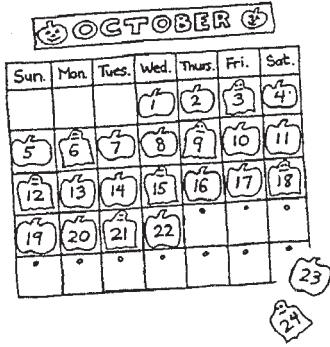
*There doesn't seem to be a magic timeline for any of these lessons and Boxes. We try to start with our easier Boxes and add the more complex Boxes as children gain confidence. Children learn at such different rates. Keep providing many pieces of the mathematics puzzle and maintain an optimistic, expectant, opportunity-filled environment. Trust each child to continue growing in mathematics as the weeks, months and years go by.*

**Here is a list of the activities in the Place Value Addition and Subtraction Practice and Enrichment Boxes.**

Nearly all of them could be made up with numbers that wouldn't involve regrouping but we feel that would be a disservice to children since they need to be aware that adding and subtracting larger numbers often involves regrouping.

Add Tens	Big Bucks
Triangle Toss	Subtract Tens
Subtract Hundreds	Feely Box Addition
Spin and Spin Again	Eating Out
The Store	The Toy Shop
Book Order Addition	Tens Minus Less
Triple Spin Take Away	Trade to Subtract
On Sale	Add, Tell, Spin and Win
Subtract, Tell, Spin and Win	Race to 100
Grand Prix	Catalog Addition

# Planning







# PLANNING

*The Box It or Bag It Mathematics Teachers Resource Guide covers standard math objectives for first and second grades: pattern, arithmetic (addition and subtraction to ten, to eighteen), beginning measuring, money, place value counting (understanding hundreds, tens and ones), place value addition and subtraction (adding and subtracting two and three digit numbers with and without regrouping), and beginning multiplication and division. It also includes sorting, graphing, estimating, and geometry.*

*This part of the Teachers Guide will help you think about using these resources to plan an appropriate program for your children.*

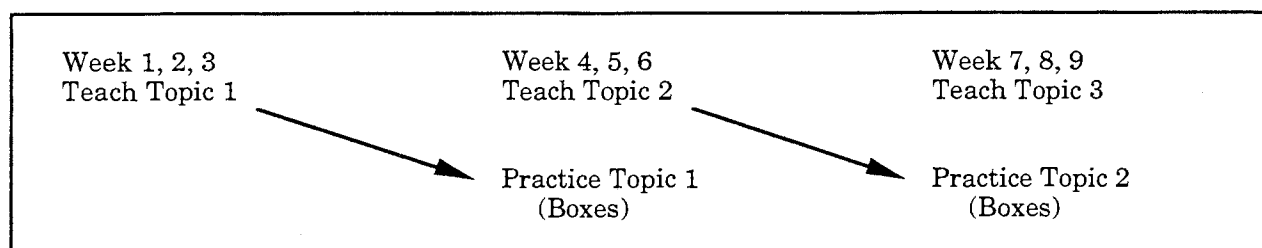
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## How do I plan instruction for each topic?

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In many math programs, it's standard practice to provide a bit of direct instruction on a given topic followed by a short period of written practice on the same material. Instruction is programmed to become slightly more difficult each day until the topic is "covered". Children are then tested for mastery. When we introduce a new topic, we prefer to offer children many whole group teacher-guided

lessons over a relatively long period of time—several weeks or more. These experiences set the stage for more extensive exploration of the topic during Independent Practice Time. As children work with Boxed activities, we assess their understandings by observing and questioning. (Topic concept packets for creating Boxed activities include Observation sheets.)



Use the ideas and activities in Chapters 13-18 to plan Concept Instruction for each topic. Utilize the corresponding packets of blacklines, cardstock items and instructions (Box It or Bag It Practice and Enrichment Boxes) to create your Boxed activities for Independent Practice Time.

Many teachers find the Concept Planning Sheet pictured here helpful as they plan for their children. (See blacklines for a larger copy.)

Box It or Bag It Mathematics Concept Planning Guide	
Concept Instruction—Group Lessons How are you going to introduce this concept?	
Independent Practice Time—What do you already have?	
What Boxes will you try to make?	
Easy	Challenging
What could you ask your class parents to make?	
Is there anything you will include for additional practice (workbook pages, copied sheets, computer programs)?	

## How do I sequence my instruction?

## How long do I teach each topic?

Take the timelines below as rough approximations. Ultimately, the needs of the children in your class each year should determine your pacing and sequencing. As you become more familiar with the ideas in this book and more comfortable with the activities, you'll be increasingly able to balance their needs against your resources.

### First Grade:

Discovery Time (2-5 weeks)

Pattern (3-6 weeks)

Arithmetic—Facts to Ten (3-6 weeks)

\*Measuring (2-4 weeks)

\*Money (3-4 weeks)

\*Place Value Counting (5-9 weeks)

Place Value Addition and Subtraction  
(3-7 weeks)

\*Make a few Arithmetic—Facts to Ten Boxes available during Independent Practice Time as you cover these topics. First graders need opportunities

to revisit addition and subtraction combinations all year.

### Second Grade:

Discovery Time (2-3 weeks)

Pattern (2-3 weeks)

Arithmetic—Facts to Ten (3-4 weeks)

\*Measuring (2-3 weeks)

\*Money (3-4 weeks)

\*Place Value Counting (5-7 weeks)

Arithmetic—Facts to Eighteen (3-4 weeks)

\*Place Value Addition and Subtraction  
(5-9 weeks)

\*Make a few Arithmetic Boxes available during Independent Practice Time as you cover these topics.

Because it takes so many weeks for primary children to begin to develop solid understandings, we provide an hour long "double-layered" math period each day. The first half of the period is often

whole group instruction; the second half is independent practice on the topic previously taught. (We squeeze out another time block during our day

for The Calendar.) The following year plans reflect such instruction (see next page).

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## The year plans look workable, but how do I build in the review my class needs?

---

*I can't teach skills like money, measuring, or story problems for a month and drop them; my children will forget! And what about sorting, graphing, estimating, geometry and beginning multiplication and division? They're not mentioned anywhere in your plan.*

That's where Seasonal Math, Chapters 1-9 meets your needs. Seasonal Math allows us to cover a number of very important math skills every month, all year long. Some of them, such as graphing, sorting, estimating and geometry, don't lend themselves to being taught as units. Without expecting mastery, we want to offer exposure to these skills as often as possible—once a month or more. Other skills—patterning, story problems, beginning measuring, money, place value counting are so central to primary mathematics that we want to set foundations long before they're the main focus of instruction and provide review/extension opportunities long after that major focus.

Seasonal Mathematics addresses the following skills nearly every month:

- sorting
- graphing
- patterning
- geometry/spatial problem solving
- measuring
- money
- story problems (addition, subtraction, multiplication and division)
- estimating/place value counting
- number patterns (beginning multiplication and division)

You can incorporate Seasonal Mathematics by spreading the activities described in each chapter (Chapters 1-9) over a month's time, doing a few each week. Your schedule for a week might look like this:

	Monday	Tuesday	Wednesday	Thursday	Friday
30 minutes	Concept Instruction	Concept Instruction	Seasonal Mathematics	Seasonal Mathematics	Concept Instruction
30 minutes	Practice and Enrichment Boxes	Practice and Enrichment Boxes	Practice and Enrichment Boxes	Seasonal Mathematics	Practice and Enrichment Boxes

### First Grade Year Plan

	SEPTEMBER → JUNE						
Concept Instruction (Whole Group Lessons)	Pattern (Ch. 13) Arithmetic-Learning the Processes (Ch. 14)	Arithmetic-Learning the Processes and Facts to 10 (Ch. 14)	Arithmetic-Facts to 10 (Ch. 14)	Money (Ch. 16)	Place Value Counting-Bases 4 and 5 (Ch. 17)	Place Value Counting-Base 10 (Ch. 17)	Place Value Addition and Subtraction (Ch. 18)
Independent Practice Time (Boxes)	Discovery Materials (Ch. 12)	Pattern Boxes	Arithmetic-Facts to 10 Boxes	Measuring Boxes A few Arithmetic-Facts to 10 Boxes	Money Boxes A few Arithmetic-Facts to 10 Boxes	No Boxes (Make Money and Arithmetic Boxes available to children as they finish Base 10 project)	Place Value Counting Boxes A few Arithmetic-Facts to 10 Boxes Place Value Counting and Place Value Addition and Subtraction Boxes (Ch. 18)

### Second Grade Year Plan

	SEPTEMBER—OCTOBER → JUNE							
Concept Instruction (Whole Group Lessons)	Pattern (Ch. 13) Arithmetic-Learning the Processes (Ch. 14)	Arithmetic-Facts to 10 (Ch. 14)	Arithmetic-Facts to 10 (Ch. 14)	Money (Ch. 16)	Place Value Counting-Bases 4 and 5 (Ch. 17)	Place Value Counting-Base 10 (Ch. 17)	Arithmetic Facts to 18 (Ch. 14)	Place Value Addition and Subtraction (Ch. 18)
Independent Practice Time (Boxes)	Discovery Materials (Ch. 12)	Pattern Boxes	Arithmetic-Facts to 10 Boxes	Measuring Boxes	Money Boxes	No Boxes (Make Money and Arithmetic Boxes available to children as they finish Base 10 project)	Place Value Counting Boxes Arithmetic Facts to 18 Boxes	Place Value Addition and Subtraction Boxes

# It seems complicated to juggle Concept Instruction, Independent Practice Time and Seasonal Mathematics. How can I keep track of it?

Running an activity based Math program is a juggling act at times and it can be hard to keep track of where you're going. Many teachers find the planning guide pictured below helpful. (See blacklines

for a larger copy.) They fill one out at the beginning of each month and use it like a "menu" from which to pull activities as they write weekly lesson plans.

**Box It or Bag It Planning Guide for \_\_\_\_\_**  
(month)

	Monday	Tuesday	Wednesday	Thursday	Friday
30 minutes	Concept Instruction	Concept Instruction	Seasonal Math	Seasonal Math	Concept Instruction
30 minutes	Practice and Enrichment Boxes	Practice and Enrichment Boxes	Practice and Enrichment Boxes	Seasonal Math	Seasonal Math or Boxes

CONCEPT INSTRUCTION, Chapters 13-18, provides specific, direct teaching to each concept.

- Concept(s) I'm introducing this month \_\_\_\_\_
- Key concept instruction lessons:

INDEPENDENT PRACTICE TIME: Box It or Bag It Box activities provide individual practice and enrichment.

- Concept(s) my class is practicing \_\_\_\_\_
- Practice and Enrichment Boxes:

SEASONAL MATHEMATICS, chapters 1-9, provides consistent exposure and review each month.

- Seasonal unit I'm doing this month \_\_\_\_\_
- Here are one or more activities I'm planning to draw from my seasonal unit in each area:

Graphing/Sorting	Story Problems
Estimation/Place Value Counting	Measuring
Patterning	Extended Number Patterns
Money	Geometry/Spatial Prob. Solving

**Box It or Bag It Planning Guide for** October  
(month)

**Sample**

	Monday	Tuesday	Wednesday	Thursday	Friday
30 minutes	Concept Instruction	Concept Instruction	Seasonal Math	Seasonal Math	Concept Instruction
30 minutes	Practice and Enrichment Boxes	Practice and Enrichment Boxes	Practice and Enrichment Boxes	Seasonal Math	Seasonal Math or Boxes

CONCEPT INSTRUCTION, Chapters 13-18, provides specific, direct teaching to each concept.

•Concept(s) I'm introducing this month Arithmetic-Facts to Ten

•Key concept instruction lessons:

- |                                           |                                |
|-------------------------------------------|--------------------------------|
| ✓ <i>People Problems</i>                  | <i>Shake Those Beans</i>       |
| ✓ <i>Story Mats Stories</i>               | <i>Story Mats Addition</i>     |
| ✓ <i>Story Mats and Unifix Cubes—</i>     | <i>Alligator Subtraction</i>   |
| <i>Number Charts</i>                      | ✓ <i>Piggybank Subtraction</i> |
| <i>Dice Toss (Make large chart to</i>     | <i>Mountain Subtraction</i>    |
| <i>hang like children's record sheet)</i> |                                |

**Concept Lessons to Extend Patterns**

- ✓ *Pattern Story Problems*      ✓ *Prediction Patterns*      *Magazine Picture Patterns*

INDEPENDENT PRACTICE TIME: Box It or Bag It Box activities provide individual practice and enrichment.

•Concept(s) my class is practicing Pattern

•Practice and Enrichment Boxes:

**Easy**

- ✓ 1. *Playdough Patterns*
- ✓ 2. *Unifix Cube Patterns*
- ✓ 3. *Alphabet Stamps*
- ✓ 4. *Pattern Blocks*
- ✓ 5. *Tile Patterns*
- ✓ 6. *Rubber Stamp Patterns*

**Challenging**

- ✓ 7. *Calendar Patterns*
- ✓ 8. *Quilt Patterns*
- ✓ 9. *Template Patterns*
- ✓ 10. *Pattern Blocks and Mirrors*
- ✓ 11. *Geoboards, Nuts and Washers*
- ✓ 12. *Pattern Shapes Race*
- ✓ 13. *Coin Patterns*

## Sample

SEASONAL MATHEMATICS, chapters 1-9, provides consistent exposure and review each month.

•Seasonal unit I'm doing this month October

•Here are one or more activities I'm planning to draw from my seasonal unit in each area:

### Graphing/Sorting

1. *Sorting pumpkins*
2. *Mystery Box Sorting*
3. *How do you want our pumpkins carved?*

### Story Problems

- ✓ 1. *Counting stories with ghost masks (counting by ones, fives and ones, tens and ones)*
- ✓ 2. *Addition and Subtraction Stories (masks)*
3. *Fact Family Charts*
  - a) *Generate charts-*
  - b) *Generate Big Books*

### Estimation/Place Value Counting

1. *The Popcorn Ghost*
- ✓ 2. *Halloween Jelly Beans*
3. *Pumpkin Seeds*
  - a) *Spoonfuls*
  - b) *How many seeds*

### Measuring

- |                                                                                                                                                                                                                                                               |                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <i>Pumpkin Circumference</i> <ol style="list-style-type: none"> <li>a) <i>Measure and sort</i></li> <li>b) <i>graph</i></li> </ol> <i>Pumpkin Weights</i> <ol style="list-style-type: none"> <li>a) <i>Weigh and sort</i></li> <li>b) <i>graph</i></li> </ol> | <i>Pumpkin Height</i> <ol style="list-style-type: none"> <li>a) <i>Measure</i></li> <li>b) <i>Make an experience chart</i></li> </ol> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|

### Patterning

- ✓ 1. *Theater Patterns*
  - ✓ a) *Have class make starter cards*
  - ✓ b) *Acting out theater patterns with cards*
  - c) *Inventing theater patterns*
2. *Party Placemats (patterns around border)*

### Extended Number Patterns

*Pumpkin Eyes*

### Money

*How Much for that Pumpkin in the Window?*

### Geometry/Spatial Prob. Solving

#### Science

*Save Halloween seeds for spring science project. Discuss patterns of growth cycle.*

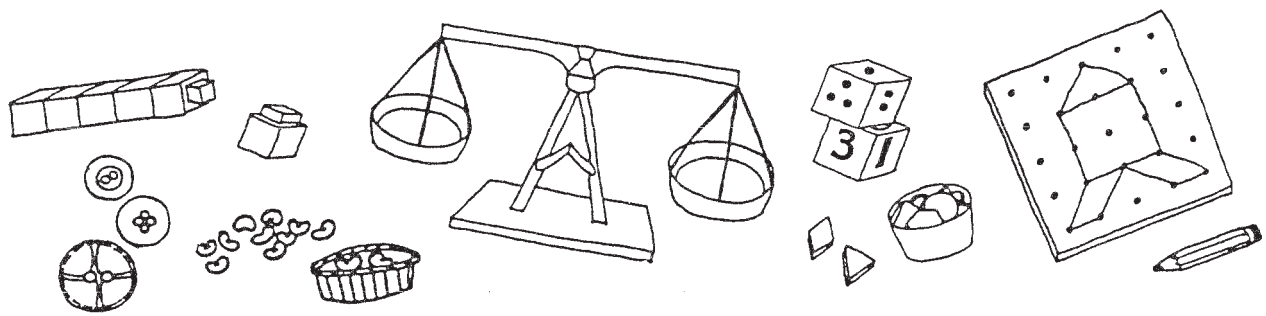
**Part 5: Weekly Planning Sheet**
**Sample**

Monday	Tuesday	Wednesday	Thursday	Friday
<b>Group Lessons</b>				
<b>Arithmetic</b> <b>People Problems</b> 1. write out story/quick chart 2. Demonstrate "short cut" number sentence	<b>Arithmetic</b> (small group) <b>Story Mat Stories</b> (Addition and Subtraction) ----- (Repeat lessons with 8 more children)	<b>Patterns</b> <b>Pattern Story Problems</b> 1. Tell and act out a few samples 2. Brainstorm word bank 3. Have kids begin a Big Book page	<b>Seasonal Math</b> <b>Story Problems with masks-</b> (counting variety-ghost masks from last week's art)	<b>Seasonal Math</b> <b>Story Problems with masks-</b> Addition and Subtraction
<b>Independent Practice Time</b>				
<b>Boxes Easy</b> 1. Playdough Patterns 2. Unifix Cube Patterns 3. Storybox Patterns 4. Pattern Blocks 5. Alphabet Stamps	<b>Challenging</b> 6. Calendar Patterns 7. Quilt Patterns 8. Template Patterns 9. Pattern Blocks and Mirrors 10. Geoboards	<b>Finish:</b> Small group Story Mat Addition and Subtraction (as on Tuesday)	<b>Boxes as on Monday/ Tuesday</b> ----- Kids may also continue work on Pattern Story Problem Big Book	<b>Boxes as on Monday/ Tuesday</b> ----- Some children may need to finish Pattern Story Problem
Monday	Tuesday	Wednesday	Thursday	Friday
<b>Group Lessons</b>				
<b>Story Mats and Unifix Cubes—Number Charts</b>	<b>Prediction Patterns</b> (Use Halloween books—favorite pages of pictures for this activity)	<b>Seasonal Math</b> Make starter cards for Halloween Theater Patterns	<b>Seasonal Math</b> Use starter cards to act out Halloween Theater Patterns	<b>Piggybank Subtraction</b> (Play as a group—tell stories—use record sheets Remind kids to bring tiny pumpkins for next week's Pumpkin Math
<b>Independent Practice Time</b>				
<b>Easy</b> 1. Tile Patterns 2. Unifix Cubes Patterns 3. Pattern Blocks/Dice 4. Rubber Stamps	<b>Challenging</b> 5. Calendar 6. Quilt 7. Giftwrap 8. Coin Patterns 9. Pattern Blocks and Mirrors 10. Geoboards		Remove: Unifix Cubes Patterns Add: Story Mat Addition	<b>Seasonal Math</b> ----- Halloween Jellybeans Estimating and counting

Calendar—12:50-1:05 daily



# Materials Index



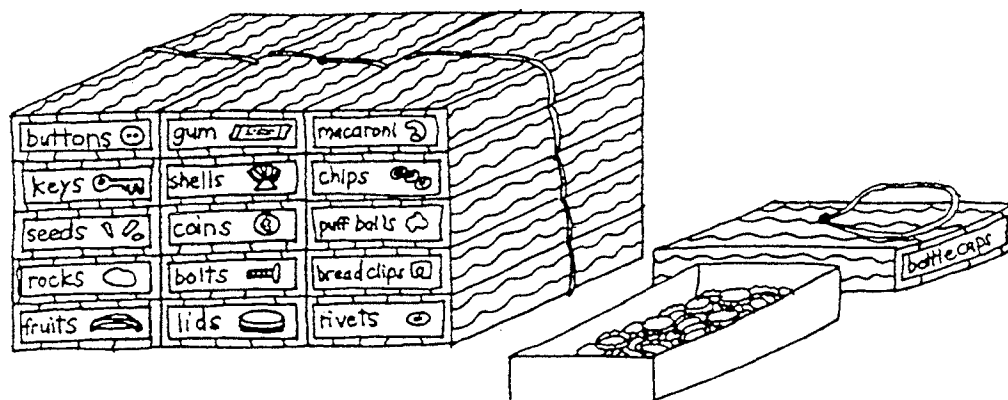


# MATERIALS INDEX

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## Junk Boxes

---



### HOW MANY?

10-20 boxes

### WHERE DO I GET IT?

#### Empty Junk boxes

"Junk Boxes" can be ordered from MLC.

#### Junk Children can bring

Each box needs 50-100 items. Send a note home to your students' families asking them to save the following:

old keys

tiny rocks

gum wrappers

dried seeds

nuts and bolts

tiny plastic lids

buttons

seashells

bottle caps

foreign coins

plastic bread fasteners

### Junk you might want to purchase

small plastic fruits and vegetables

carnival supply items (Be careful not to purchase items which are too tempting for play or theft.)

plastic gourmet toothpicks

colored plastic game markers (MLC)

## Other Junk

You might save lost barrettes and wash them in soapy water.

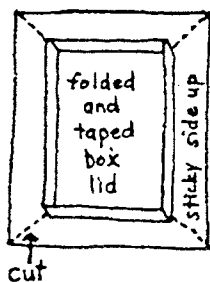
You might color assorted shapes of macaroni (see directions below).

## HOW DO I PREPARE IT?

### Junk Boxes

Tape the corners together with filament tape.

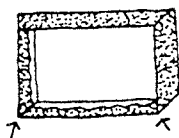
Cover all lids with colored contact paper (the same pattern for all).



Contact paper will be cut to size and laid on table, sticky side up.

Cut mitered corners into contact paper.

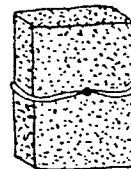
Fold up sides and ends wrapping mitered portion around corners.



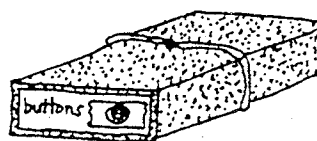
Slit contact paper at corners down to edge of box so you can fold about 1/2" of contact paper into lid.

Cut a length of 1/4" elastic to go comfortably around the narrow portion of your box. Tie the ends together to make a knot.

Poke a hole in the center of your lid. Slip the elastic through from the inside so the knot stays inside the lid. Anchor the knot by slipping a paper clip through it. Tape the clip to the lid with your filament tape.



Label *both* ends of each box with the name of the junk that will be inside using a permanent Sanford Sharpie marking pen. It's also very effective to use clear contact paper to fasten an example of the item to either end by the written label so every child can easily know what is inside.



### Coloring Macaroni

Purchase three or more varieties of small, sturdy macaroni. Mix 1/3 cup of each into a bowl. Divide this mix into four portions. Pour 1/2 teaspoon of rubbing alcohol into a jar or sealable ziplock bag. Add 15 to 20 drops of food coloring.

Add one of your portions of macaroni mix. Seal with a lid and shake until thoroughly colored. Pour out on newspaper to dry. Continue in this manner until you've used four colors.

---

## Big Books

---



### HOW MANY?

Once you start having your class make some, you can judge how many by your energy and their enthusiasm.

### WHERE DO I GET IT?

These will be assembled throughout the year.

For each Big Book you will need:

12" X 18" sheets of construction paper

water-based marking pens for lettering

Poster board or matte board for covers

scotch tape      filament tape

a hole punch      yarn or brass fasteners

### HOW DO I PREPARE IT?

If you want your books to easily open out flat, cut your covers 12" X 18" and then cut all pages and

your covers to 12" X 17", saving the 1" X 12" piece to tape on the left hand side of each page and each cover. Scotch tape works fine on the pages but it's best to use filament tape on the covers.

If your children are writing in their Best Guess spelling, it's fun to use a glue stick to glue their rough copy to the back of each finished page.

If you have lamination services available, laminate each page and cover.

Assemble your book by punching holes in the covers and pages and securing with yarn or brass fasteners.

---

## Feely Boxes

---

### HOW MANY?

One or two

### WHERE DO I GET IT?

For each box you will need:

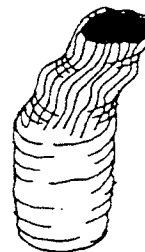
a stretchy adult sock

a plastic pint or quart yogurt or cottage cheese container

### HOW DO I PREPARE IT?

Push plastic container down into the toe of the sock.

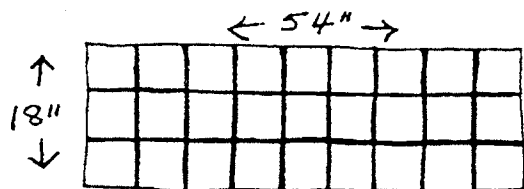
Cut strips of paper on which to write each student's name. (See Seasonal Math, Money, and Pattern for other uses of Feely Boxes.)



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## Graphing Mat

---



### HOW MANY?

One

### WHERE DO I GET IT?

Buy 1/2 yard of 54" vinyl at your local hardware or dime store. You can also use shower curtains, solid color plastic tablecloths, or old window shades.

### HOW DO I PREPARE IT?

Use a permanent marking pen to mark off three 6" rows and nine 6" columns.

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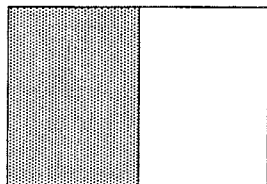
## Place Value Board—Teacher Board

(for group instruction)

---

### HOW MANY?

One



a 12" X 18" piece of white poster board

a 9" X 12" piece of lavender construction paper

### HOW DO I PREPARE IT?

Use a glue stick to glue the lavender paper to the left side of your poster board. Laminate or cover with clear contact paper.

### WHERE DO I GET IT?

You will prepare it. You will need:

---

## Place Value Board—Student Board

---

### HOW MANY?

One per student

a 9" X 12" piece of white poster board

a 6" X 9" piece of lavender construction paper

### HOW DO I PREPARE IT?

Use a glue stick to glue the lavender paper to the left side of your poster board. Laminate or cover with clear contact paper.

### WHERE DO I GET IT?

You or a parent will prepare them. You will need for each board:

---

## Large Milk Carton Dice or Foam Dice

---

### HOW MANY?

Two or more



### WHERE DO I GET IT?

You or a parent will prepare milk carton dice.

Cut the fourth side so it is twice the height of the bottom measurement. Fold the fourth side down to close the box and tape it securely with filament tape. Cover with contact paper or spray with a dark, fast-drying paint.

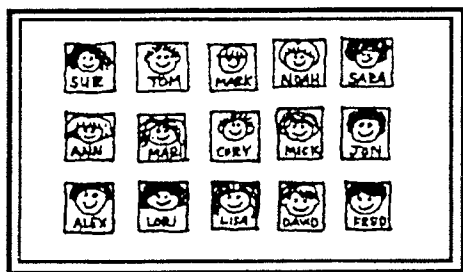
Write numerals and dots as appropriate to your needs. (You will probably want one labeled 1-6 with large dots and one labeled 0-5 with numerals.)

### HOW DO I PREPARE IT?

There are two ways to make these. Cut down a half gallon milk carton so three sides are the same height as the measurement of the bottom of the milk carton.

**Or**—Cut two half gallon milk cartons down so all sides are the same as the bottom measurement. Shove one inside the other and tape securely. Continue as above.

## Xeroxed Copies of School Pictures



### HOW MANY?

You will want to run about ten copies each time.

### WHERE DO I GET IT?

You will prepare these in the late fall by using the individual "cum" pictures you get from the photographer.

### HOW DO I PREPARE IT?

Mount a small photograph of each child on an 8 1/2" X 14" piece of paper. Label each photo with the child's name. Run copies on the best copy machine you have available. (As new students arrive, ask them for a wallet size copy of their school picture. If they don't have one, pull the one from the cum when it arrives.)

## Hundreds Matrix

### HOW MANY?

You will want at least one kind.

### WHERE DO I GET IT?

Purchase from teacher supply stores or make your own. A wonderful Hundreds Chart with removable numeral cards (25" X 26" nylon fabric sewn with clear plastic pockets) is available from MLC.

### HOW DO I PREPARE IT?

To make your own matrix, use a 30" square of manila tag. Divide it into 3" rows and columns. Write the numerals 1-100.

Color the fives column and tens column in light colors to make those counting patterns easy to see.

Laminate.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

## Story Mats

### HOW MANY?

8 sets

- Ladybugs (8 mats, 80 red Unifix cubes)
- Polar Bears (8 mats, 80 white Unifix cubes)
- Cooky Jars (8 mats, 80 brown Unifix cubes)

- Hungry Caterpillars (8 mats; 80 green and 80 yellow Unifix cubes)
- Frog Ponds (8 mats, 80 green Unifix cubes)
- Halloween (8 mats; 80 white, 80 green and 80 orange Unifix cubes)
- Butterflies (8 mats; 80 blue and 80 orange Unifix cubes)
- Penguins (8 mats and 80 black Unifix cubes)

## WHERE DO I GET IT?

These sets of working mats are used for a few of the lessons in Chapter 14 and are easy to prepare. Just run the mats as described below and you're in business.

## HOW DO I PREPARE IT?

Locate the Story Mats in the blacklines. run four copies of each mat and cut them apart to create a set of eight per theme. Store each set in a ziplock bag, manila envelope, or tagboard folder. Store Unifix cubes separately, selecting the colors needed for the current story. To do the activities described in Chapter 14, you'll need story mats and Unifix cubes in the colors listed above.

---

## Unifix Cubes

---



### HOW MANY?

1,000

### WHERE DO I GET IT?

These can be ordered from MLC.

### HOW DO I PREPARE IT?

Pour cubes into a tub or box.

---

## Pattern Blocks

---

### HOW MANY?

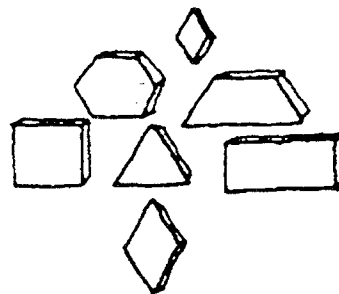
2 or 3 sets

### WHERE DO I GET IT?

These can be ordered from MLC.

### HOW DO I PREPARE IT?

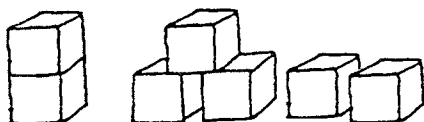
Keep pattern blocks in a tub or box.



---

## Wooden Cubes (3/4" or 1")

---



### HOW MANY?

200-300

### WHERE DO I GET IT?

These can be ordered from MLC.

### HOW DO I PREPARE IT?

Pour cubes into a tub or box.



---

## Tiles (1" square)

---

### HOW MANY?

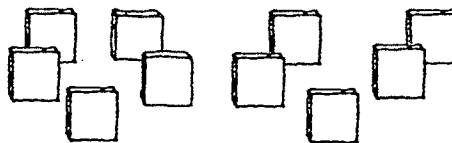
300-400, all the same color.

### WHERE DO I GET IT?

Ready to use tiles, either ceramic or plastic, can be purchased from MLC or they can be purchased at your local tile store. They come on sheets.

### HOW DO I PREPARE IT?

If your tiles are on string mesh sheets, soak them awhile in your sink and then peel. Put tiles in tub or box.



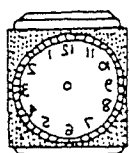
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## Clock Stamps

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### HOW MANY?

1-2



### WHERE DO I GET IT?

You may be able to custom order these from a stamp or stationery company, or make them from blank rubber stamps. (They are no longer available from MLC.)

---

## Coin and Dollar Stamps

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### HOW MANY?

2-4 sets of coin stamps. It's nice to have one each of \$1, \$5, and \$10 stamps.

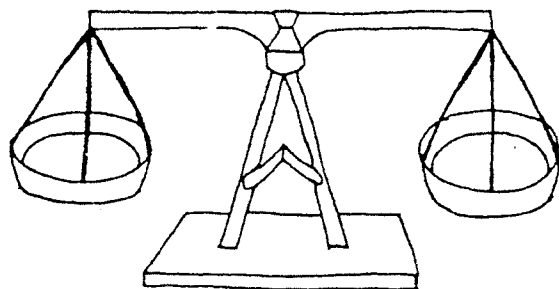
### WHERE DO I GET IT?

You may be able to custom order these from a stamp or stationery company, or make them from blank rubber stamps. (They are no longer available from MLC.)

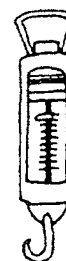
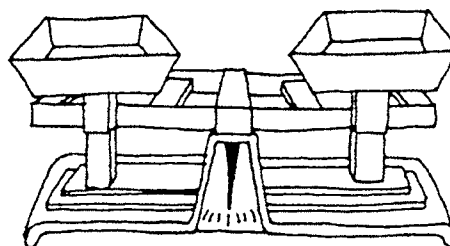
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## Scales

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- Balance
- Pan Balance
- Spring Scale (If you have a generous budget, add this.)



### HOW MANY?

One, two or more

## WHERE DO I GET IT?

Available from MLC. (Check your school closets first. Many scales are hiding in supply room or teacher closets.)

Try to have a scale with very large pans and another with a balance needle and buckets or pans to either side.

Spring scales are another way to weigh and give children a different experience. You can hook a milk box scale to them. These are used mainly in large group lessons.

You may also want to ask parents if anyone has a Weight Watchers scale they no longer need.

---

## Milk Box Scales

---

### HOW MANY?

A pair and one more

### WHERE DO I GET IT?

You will make them yourself or ask a parent to make them.

You will need:

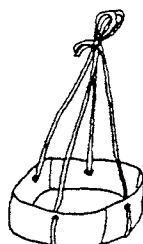
string

scissors

rubber bands

a hole punch

plastic or cardboard milk containers



Punch a hole in the center of each of the four sides about 1/3" down from the top edge.

Cut two 25" lengths of string. Thread the string through one hole, under the container and up through the opposite side's hole. Repeat for the other pair of holes.

Hold the scale up and balance it on the strings. Tie a slip knot at the top of the strings. Use filament tape to tape the strings in place on the bottom of the box.

Slip a school rubber band (not heavy duty) under the knot at the top and loop one end through the other to secure it.

Do the same for your other box trying to get the strings the same length as your first scale. Be sure to use the same size and thickness of rubber band.

Extend rulers out from top of table or desk and anchor the ruler with books. Suspend the scales from the rulers by their rubber band loops. Don't worry about rubber band breakage—the bands can easily be replaced and bear more weight than you might think.

### HOW DO I PREPARE IT?

Use your scissors to trim your containers down to about a 2" height.

---

## Rice, Jars and Funnels

---

### HOW MANY?

5 pounds of rice (not instant) Or use aquarium gravel or salt if mice are a problem.

6-10 bottles and jars of varying sizes

2 funnels

### WHERE DO I GET IT?

**Rice:** most grocery stores

**Bottles:** You save or have children bring

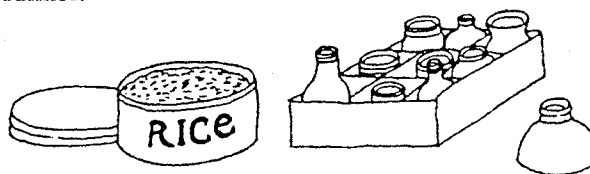
**Funnels:** Save large plastic pop bottles

## HOW DO I PREPARE IT?

**Rice:** Pour rice into a plastic tub or a large cookie tin saved from the holidays. (Mice aren't so tempted if you can seal the rice.)

**Bottles:** Save salad dressing bottles, jelly jars, instant coffee jars, pickle jars, etc. Place jars in a divided cardboard box. Label each jar with an alphabet letter.

**Funnels:** Cut the top from a large plastic pop bottle with scissors, leaving about 4"-5". This is a great funnel!



---

## Individual Student Chalkboards

---

### HOW MANY?

One per student

### WHERE DO I GET IT?

These can be purchased from MLC or you can search out black Nat-Mat and cut it on a very large paper cutter.



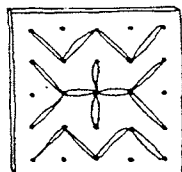
### HOW DO I PREPARE IT?

Have children thoroughly rub these down in both directions with chalk, erase and you're ready to have them write.

---

## Geoboards and Rubber Bands

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### HOW MANY?

4-6 boards and 1 package of rubber bands

### WHERE DO I GET IT?

These can be purchased from MLC.

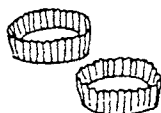
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## Portion Cups

---

### HOW MANY?

2 boxes



### WHERE DO I GET IT?

These can be purchased from MLC. We like the shallow 1-oz. portion cups.

---

## Filament Tape

---



### HOW MANY?

One roll, 3/4" wide (not on a dispenser)

### WHERE DO I GET IT?

Hardware stores, stationery stores, grocery stores (we prefer better brands).

---

## Tacky Glue

---

### WHERE DO I GET IT?

Any craft store, many fabric stores

(A hot glue gun is often nice if you own one and feel safe using it.)

---

## Ten Frame Boards

---

### HOW MANY?

One per child

### WHERE DO I GET IT?

See Resource Guide blacklines for ten frame blackline.

### HOW DO I PREPARE IT?

Run copies and ask a parent to mount these on tagboard for lamination. Or, if your ditto machine or copier will take tag or construction paper, run them directly on one or the other. Laminate for long term use.

---

## Discussion Cards—

## Doubles, Neighbors, Fast Nines and Fast Tens

---

### HOW MANY?

One set of each.

### WHERE DO I GET IT?

Ask a parent to help make these.

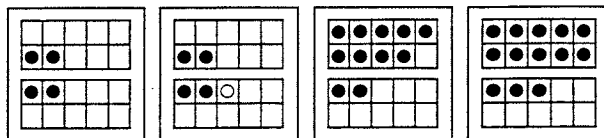
### HOW DO I PREPARE IT?

You will need:

copies of the Discussion Cards (see blacklines)

Manila tag on which to glue copies of Discussion Card blacklines

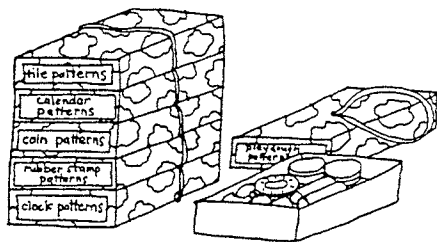
You can simply mount the Discussion Cards on tag and laminate. If you want the dots to show up better, before you laminate, color every white dot. Use the same color throughout.



---

## Practice and Enrichment Boxes

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### HOW MANY?

There are nine Practice and Enrichment Box packets available. Topics are:

- Pattern (K-2)
- Shapes (K)
- Reading, Writing, and Understanding Numerals 0-10 (K)
- Money (K-2)
- Arithmetic (1-2)
- Place Value Counting (1-2)
- Place Value Addition and Subtraction (2)
- Introduction to Measuring (K)
- Understanding Measuring (1-2)

Each Practice and Enrichment Box packet contains nine to eighteen Independent Practice Time activities that are appropriate for the grade levels indicated. An activity includes, blacklines, game-

boards and cards, making and playing instructions. Materials needed for an activity (such as dice) but not included in the Practice and Enrichment Box packet are listed in the instructions.

### WHERE DO I GET IT?

Order from MLC. For storing your Boxed activities, order half and standard boxes.

### HOW DO I PREPARE IT?

Packets include instructions for completing each Boxed activity. See Junk boxes in this Materials Index for how to construct and cover your activity storage boxes. Cover same topic activity boxes with a matching color or pattern to make identification of sets easy. For example, you might cover all Pattern Boxes in red-checked paper, Money Boxes in yellow-flowered paper, Shapes Boxes in solid blue, etc.).

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## Problem-Solving Books

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*Invitations to Problem Solving with Story Boxes Kindergarten*

*Posing and Solving Problems with Story Boxes 1st & 2nd Grade*

Story problem guides filled with activities designed to develop number and operation sense in the context of familiar themes. Theme-based activities move children from solving teacher-posed problems to inventing counting strategies as they solve adding, subtracting, grouping, and partitioning problems.

### HOW MANY?

One copy per classroom. Each copy includes lesson plans, instructions for preparing story boxes and other materials, and a separate volume of blacklines. Kindergarten contains six story problem themes: The Spooky House, The Cat Cottage, Penguins, Frogs & Toads, The Burger Hut, and Rainbow Bears. 1st & 2nd Grade contains five story problem themes: School Bus Kids, Pumpkins, Goblins & Ghosts or Night Critters, Christmas Presents or Presents for Special Occasions, The Teddy Bear Store, and The Cookie Store.

### WHERE DO I GET IT?

May be ordered from The Math Learning Center.

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## Notes

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1st and 2nd Grade  
Blackline Masters

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**BOX IT  
OR  
BAG IT  
MATHEMATICS**

---



Written by—  
Primary Classroom Teachers

**Donna Burk**  
San Jose, California; a graduate  
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Published by—  
The Math Learning Center  
Salem Oregon

## **Box It or Bag It Mathematics, Blackline Masters—1st and 2nd Grade**

Box It or Bag It Mathematics consists of:

Teachers Resource Guide and Blackline Masters, Kindergarten

Teachers Resource Guide and Blackline Masters, 1st and 2nd Grade

Practice & Enrichment Boxes:

Shapes

Introduction to Measuring

Understanding Measuring

Reading, Writing & Understanding Numerals 0–10

Pattern

Arithmetic

Money

Place Value Counting

Place Value Addition & Subtraction

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No Blacklines

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---------	--------------------------------	------

**\*Note** These blacklines from Practice & Enrichment Boxes are supplemental to the original blackline packet. They are needed to conduct the whole group lessons in the Teachers Resource Guide.

**Key to Abbreviations:** TRG – designates page in Teachers Resource Guide on which the blackline is listed. BL – designates page number in Blackline Masters.

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## Organizing Information

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No Blacklines

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TRG 135	Day Bear September and February hats, Daily Number Cards for bear shirts	BL 26
TRG 135	Day Bear November, December and April hats	BL 27
TRG 135	Day Bear May & June hats	BL 28

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## Concept Instruction

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### Chapter 12 Discovery Time

TRG 151      Pattern Block Shapes      BL 29–33  
TRG 152      Geoboard Dot Paper      BL 34

### Chapter 13 Pattern

No Blacklines

### Chapter 14 Arithmetic

TRG 166	Story Mats (making instructions in Materials Index)	BL 48–56
TRG 167	Story Mats (making instructions in Materials Index)	BL 48–56
TRG 168	Story Mats (making instructions in Materials Index)	BL 48–56
TRG 169	Shake Those Beans (Fives) record sheet*	BL 104
TRG 170	Dice Toss record sheet*	BL 105–106
TRG 170	Piggybank Subtraction record sheet*	BL 107
TRG 170	Piggybank cards (use record sheet)*	BL 107
TRG 171	Large Monster Face*	BL 108
TRG 171	Small Monster Faces*	BL 109
TRG 181	Fast 9's and 10's record sheet*	BL 110
TRG 182	Doubles, Neighbors, 9's, 10's and Leftovers record sheet*	BL 111
TRG 183	21 cards*	BL 112
TRG 184	Tic Tac Toe record sheet*	BL 113

**\*Note** These blacklines from Practice & Enrichment Boxes are supplemental to the original black-line packet. They are needed to conduct the whole group lessons in the Teachers Resource Guide.

**Key to Abbreviations:** TRG – designates page in Teachers Resource Guide on which the black-line is listed. BL – designates page number in Blackline Masters.

## Chapter 15 Understanding Measuring

TRG 187	Measuring Length sheets*	BL 114–115
TRG 189	The Balance Scale record sheet*	BL 116

## Chapter 16 Money

TRG 193	Coin Graph spinner*	BL 117
TRG 193	Coin Graph record sheet*	BL 118
TRG 194	Spin A Half Dollar spinner	BL 35
TRG 194	Spin A Half Dollar gameboard	BL 36
TRG 194	Money March spinner	BL 35
TRG 194	Money March gameboard	BL 37
TRG 195	Spin 25 Cents trading boards	BL 38
TRG 203	Park and Shop gameboard	BL 39–40
TRG 203	Making Change spinner*	BL 117

## Chapter 17 Place Value Counting

TRG 222	Place Value Strips	BL 41
TRG 228	Counting Jars record sheet	BL 42

## Chapter 18 Place Value Addition and Subtraction

TRG 240	Addition Board	BL 43
TRG 243	Big Bucks (Fake Dollar Bills)	BL 5
TRG 243	Big Bucks spinner*	BL 119
TRG 245	Triangle Dice*	BL 120
TRG 245	Addition Board	BL 43
TRG 247	Triple Spin Take Away spinner*	BL 119
TRG 249	Cents Off cards (for feely box)*	BL 120

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## Planning

TRG 254	Concept Planning Sheet	BL 44
TRG 257	Planning Guide	BL 45
TRG 257	Seasonal Mathematics Planning Sheet	BL 46
TRG 260	Weekly Planning Sheet	BL 47

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## Materials Index

### Story Mats

TRG 265	Cooky Jars Story Mat	BL 48
TRG 265	Butterflies Story Mat	BL 49
TRG 265	Halloween Story Mat	BL 50
TRG 265	Polar Bears Story Mat	BL 51
TRG 265	Ladybugs Story Mat	BL 52
TRG 265	Hungry Caterpillars Story Mat	BL 53
TRG 265	Frog Ponds Story Mat	BL 54
TRG 265	Penguins Story Mat	BL 55

**\*Note** These blacklines from Practice & Enrichment Boxes are supplemental to the original blackline packet. They are needed to conduct the whole group lessons in the Teachers Resource Guide.

**Key to Abbreviations:** TRG – designates page in Teachers Resource Guide on which the blackline is listed. BL – designates page number in Blackline Masters.

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## Materials Index (cont.)

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### Ten Frame Boards

TRG 270	Student Ten Frame Board	BL 56
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### Discussion Cards

TRG 270	Doubles Discussion Cards	BL 57–66
TRG 270	Neighbors Discussion Cards	BL 67–75
TRG 270	Tens Discussion Cards	BL 76–85
TRG 270	Nines Discussion Cards	BL 86–94

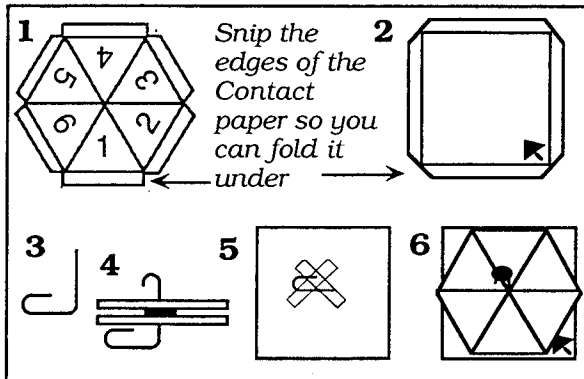
## BLACKLINE SUPPLEMENT FOR GRADES 1 AND 2

Included in the Supplement (which starts with Blackline 95) are adoptions of blacklines from Practice and Enrichment Boxes needed to conduct the whole group lessons in the Teachers Resource Guide.

### SPINNERS (MAKING INSTRUCTIONS)

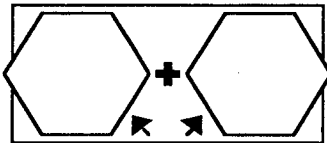
#### Single spinner

1. Glue spinner tops to sturdy cardboard. Cut them out and cover tops with clear Contact paper overlapping edges to the underside.
2. For the base, cut a square or rectangle from sturdy cardboard or bristol board. Check spinner top to determine needed size. Cover with clear Contact paper.
3. Straighten out one side of paper clip.
4. Cut two 1-1/2" washers from your cardboard. Assemble as shown. Bend top of paper clip.
5. Tape underside of base to secure paper clip.
6. Use a permanent pen to draw arrow on base at corner. Tape top part of paper clip for safety.



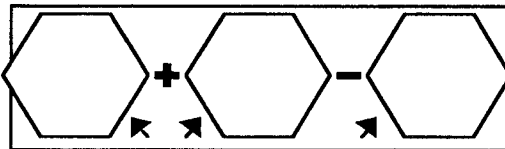
#### Double spinner

The base needs to look like this:

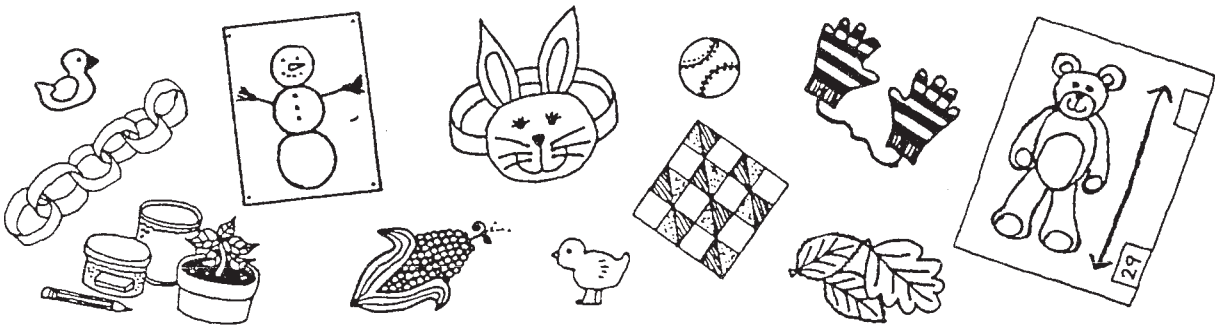


Be sure to label each spinner with the name of the game to which it belongs.

#### Triple spinner

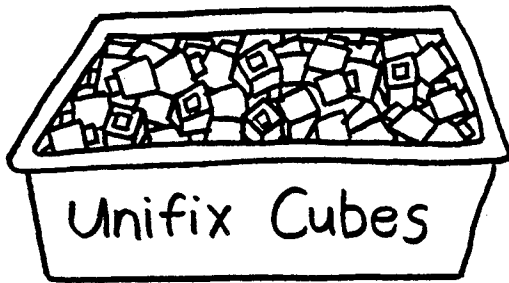


# Seasonal Mathematics



# Measuring Length with Unifix Cubes

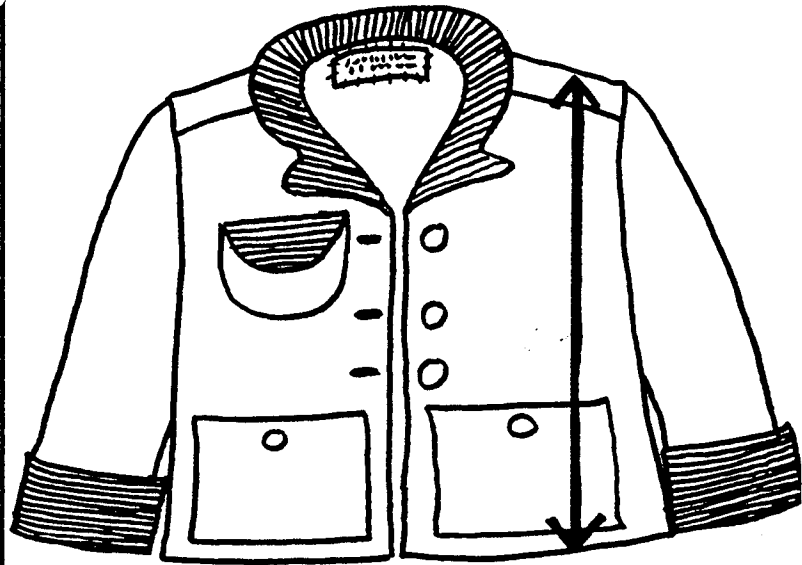
by \_\_\_\_\_




guess

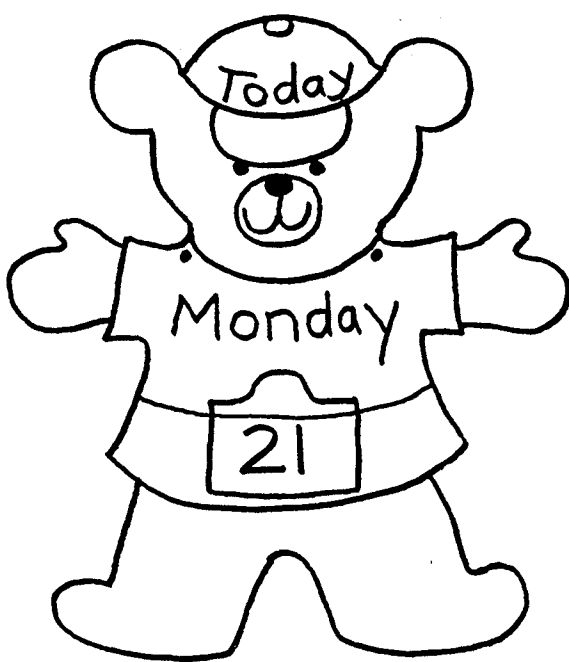
check

# sweater, jacket, or coat



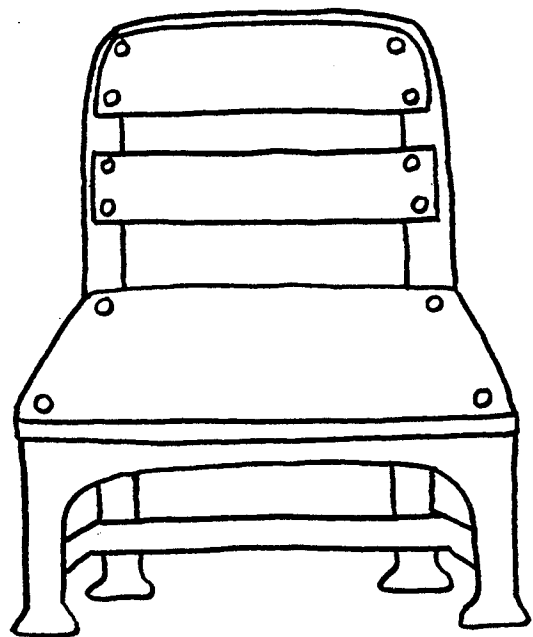

guess

check




guess

check

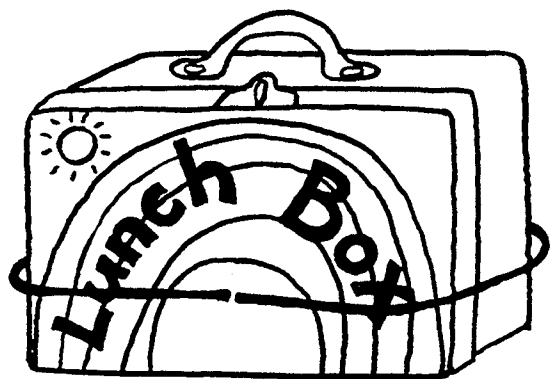



guess

check

# Measuring Circumference with string and cubes

by \_\_\_\_\_



guess

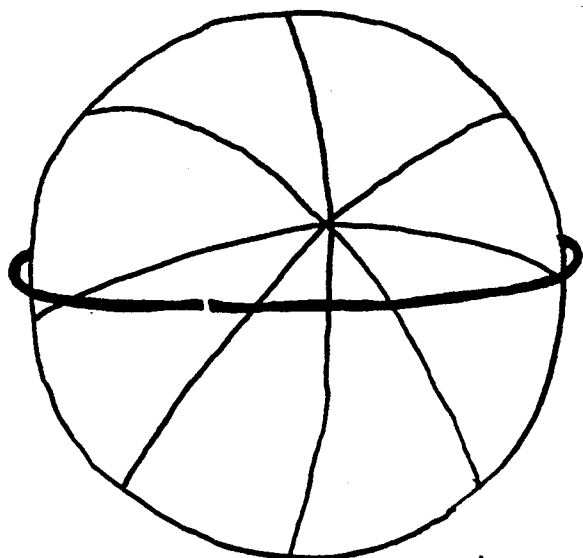
check



mug

guess

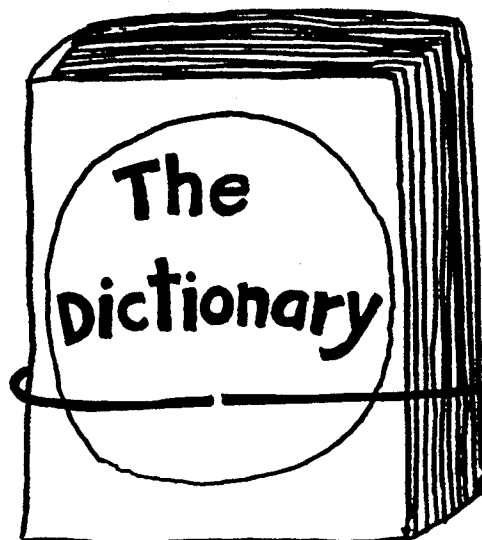
check



The class ball

guess

check



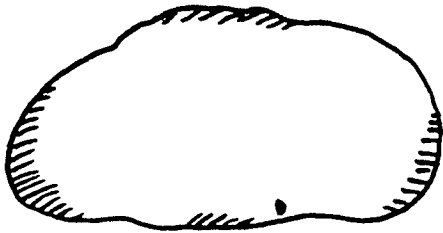
guess

check



# Weighing with Balance Scales and Tiles

by \_\_\_\_\_



rock

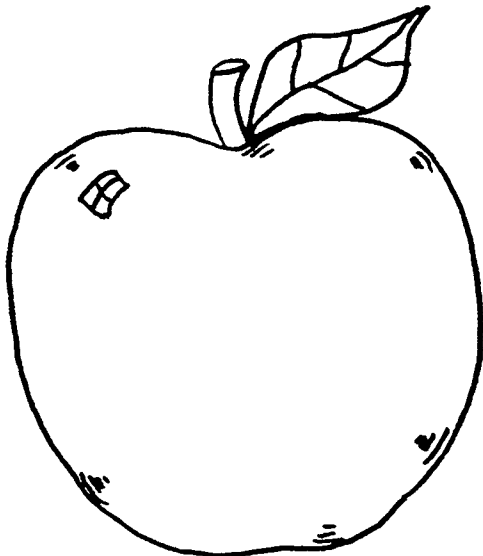
guess

check



guess

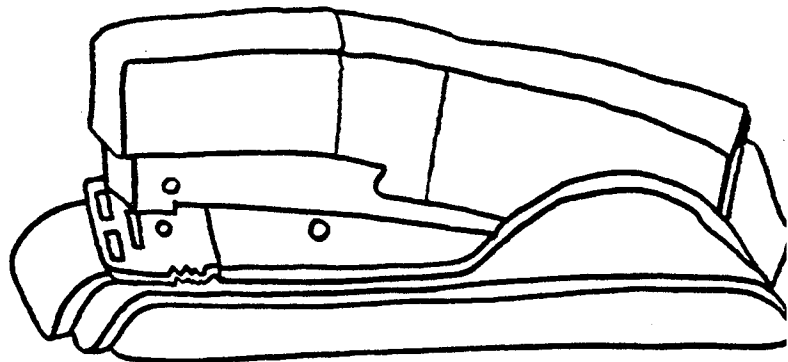
check



apple

guess

check



stapler

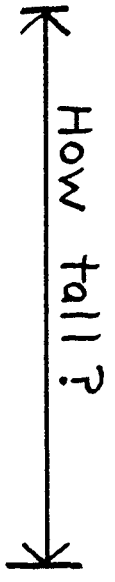
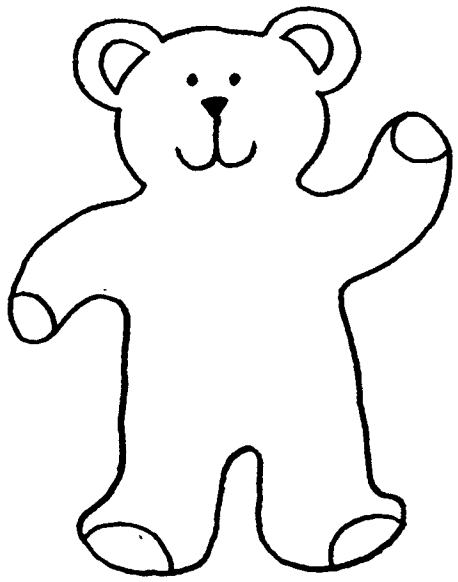
guess

check



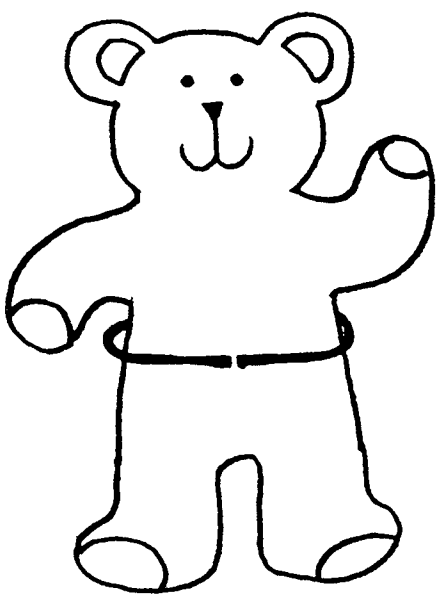
\_\_\_\_\_

name



guess

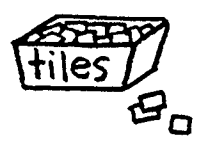
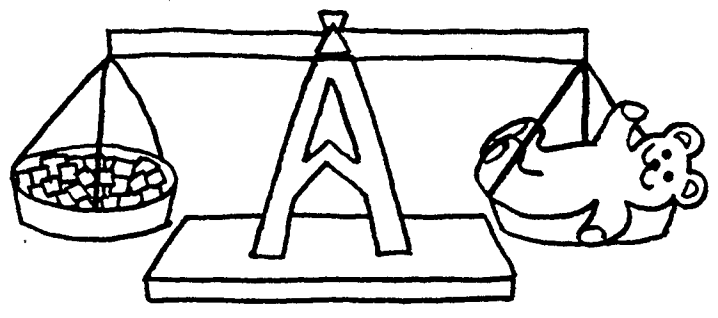
check



How big around ?

guess

check



How heavy ?

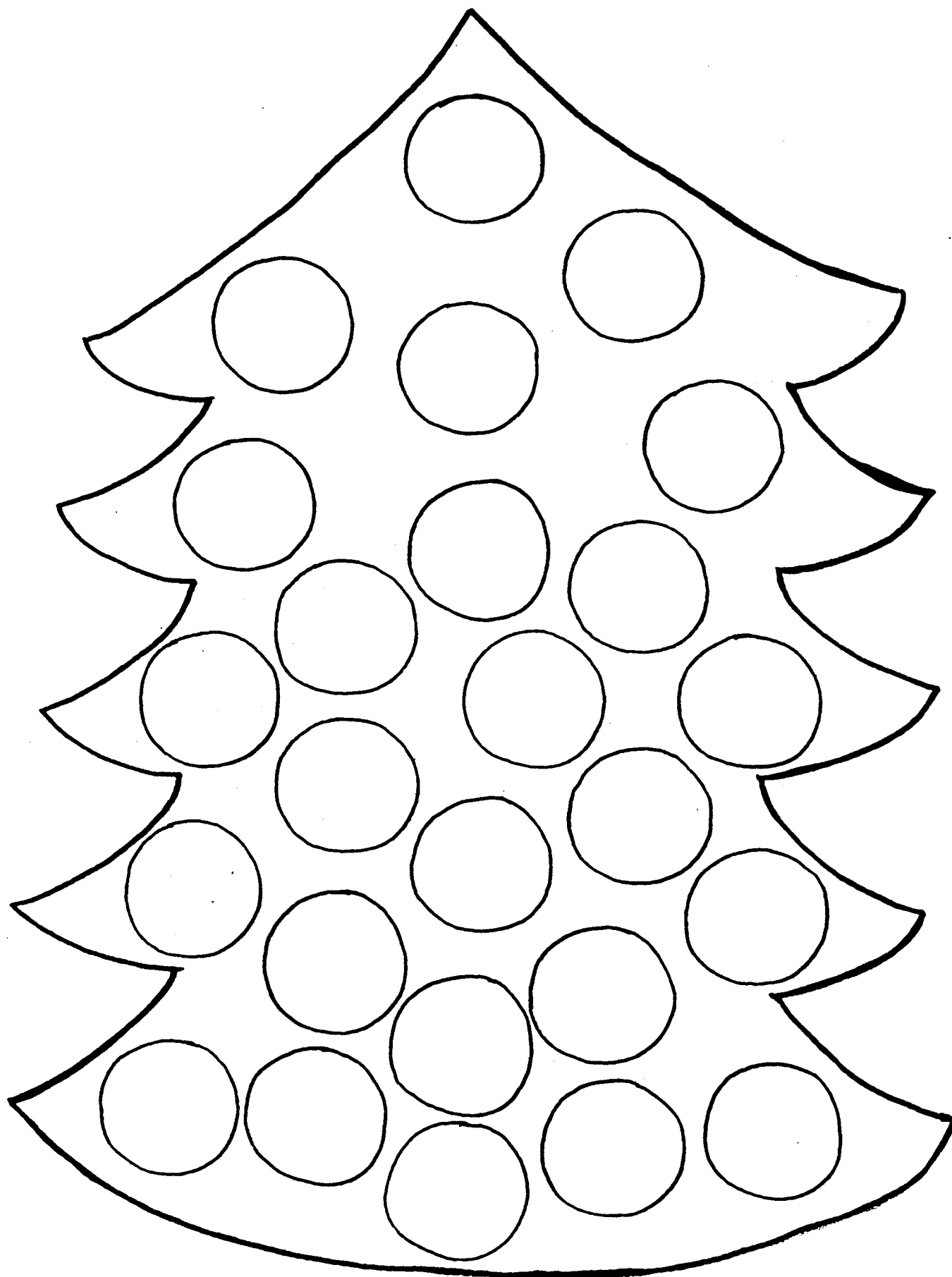
guess

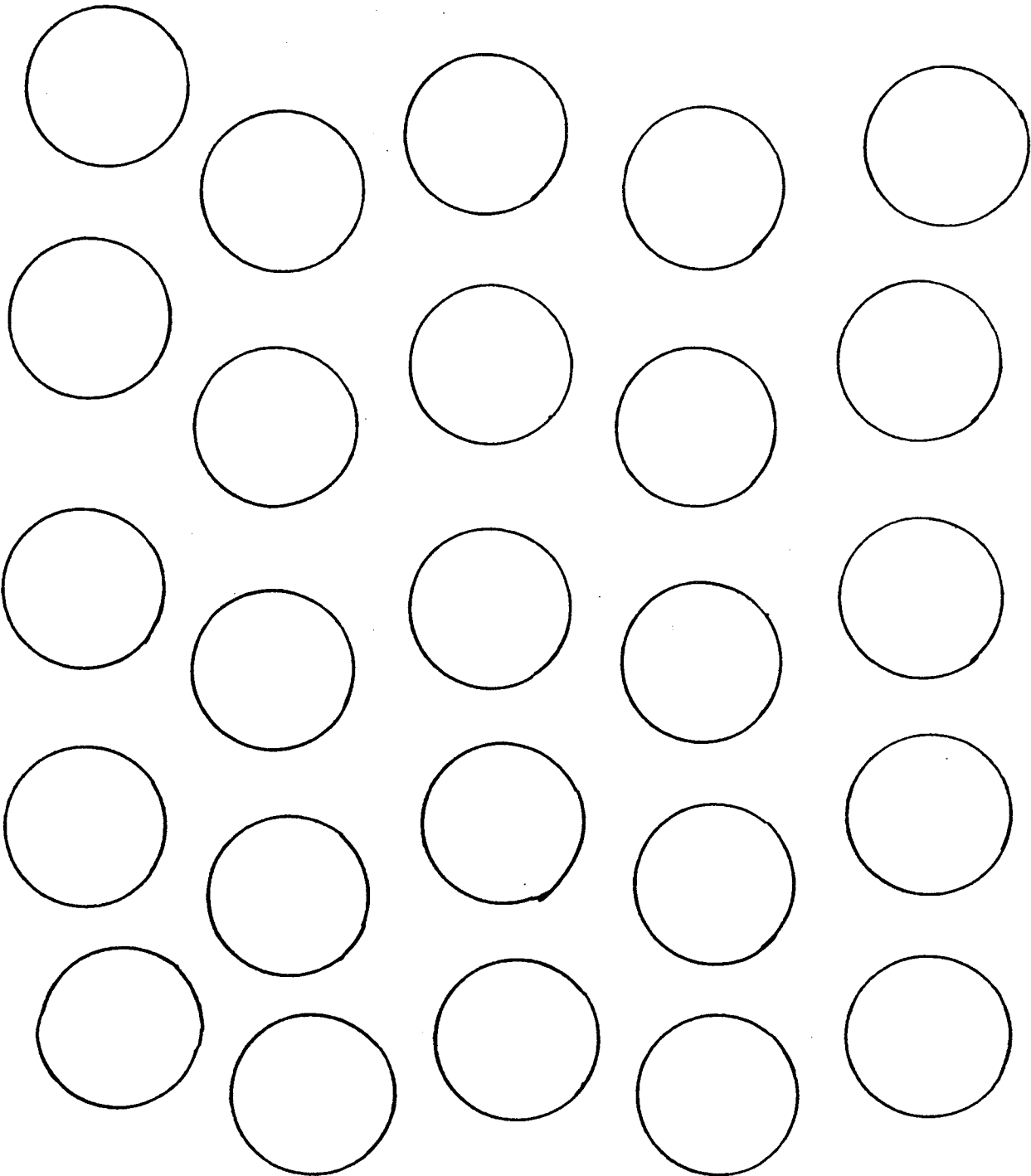
check



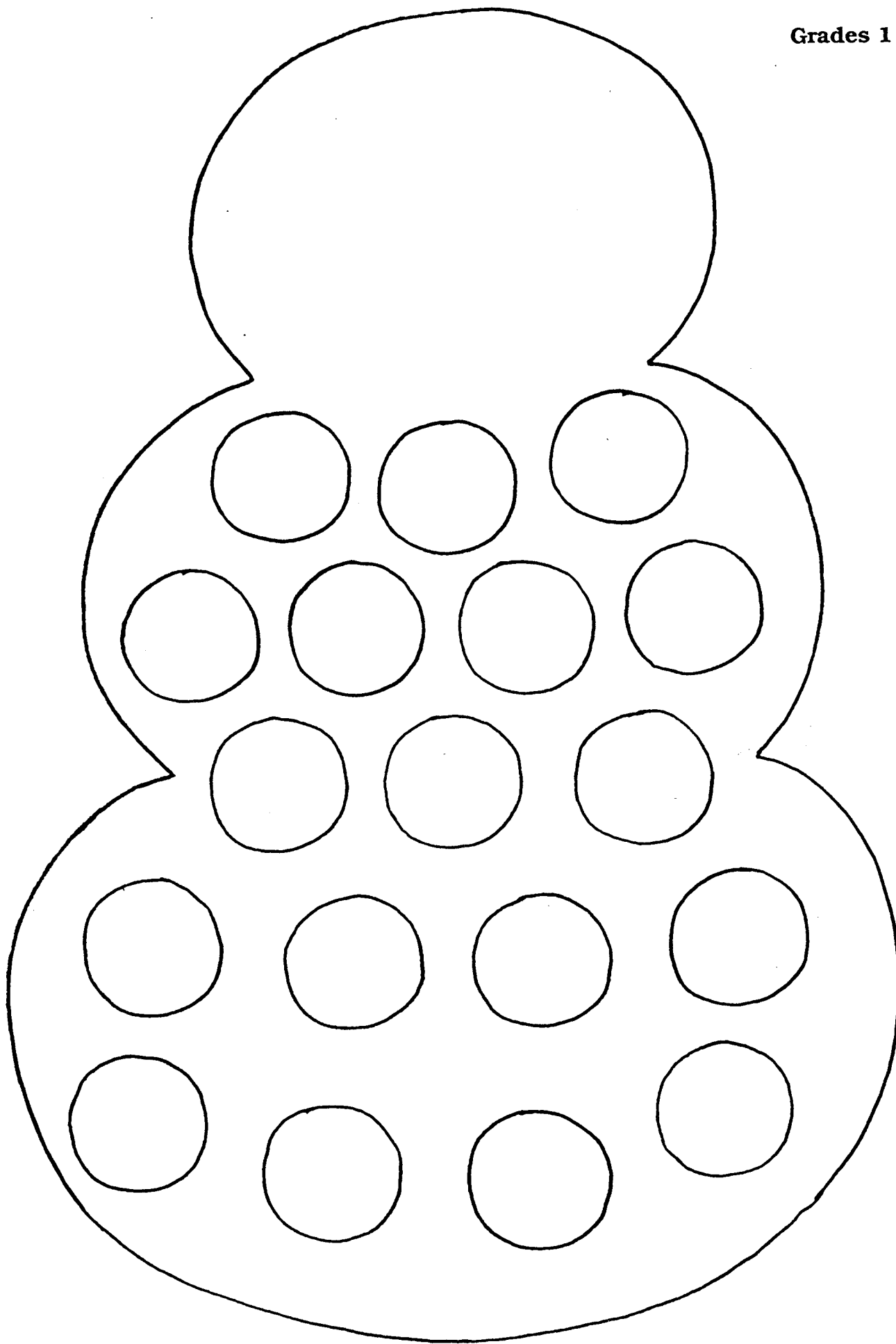
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>
<b>31</b>	<b>32</b>	<b>33</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>
<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>	<b>45</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>50</b>
<b>51</b>	<b>52</b>	<b>53</b>	<b>54</b>	<b>55</b>	<b>56</b>	<b>57</b>	<b>58</b>	<b>59</b>	<b>60</b>
<b>61</b>	<b>62</b>	<b>63</b>	<b>64</b>	<b>65</b>	<b>66</b>	<b>67</b>	<b>68</b>	<b>69</b>	<b>70</b>
<b>71</b>	<b>72</b>	<b>73</b>	<b>74</b>	<b>75</b>	<b>76</b>	<b>77</b>	<b>78</b>	<b>79</b>	<b>80</b>
<b>81</b>	<b>82</b>	<b>83</b>	<b>84</b>	<b>85</b>	<b>86</b>	<b>87</b>	<b>88</b>	<b>89</b>	<b>90</b>
<b>91</b>	<b>92</b>	<b>93</b>	<b>94</b>	<b>95</b>	<b>96</b>	<b>97</b>	<b>98</b>	<b>99</b>	<b>100</b>

Name \_\_\_\_\_



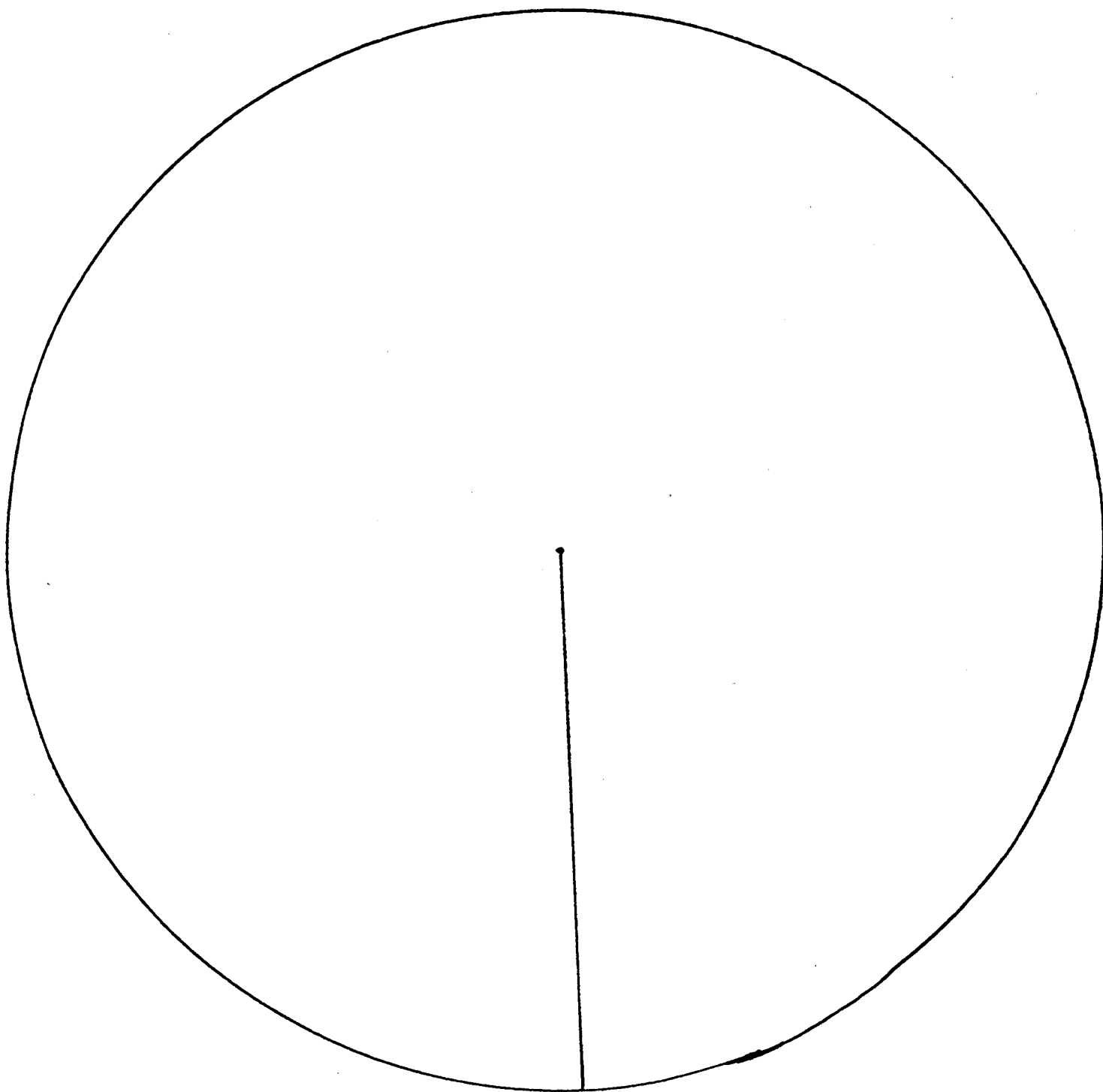


Chapter 4: Snowman Calendar—  
Countdown to Winter Vacation  
run on white construction paper—children number circles from 1-18



**Chapter 4: Rudolph Cone Pattern**  
run on brown construction paper

**Grades 1 & 2 — 10**





\_\_\_\_\_ came to school today.

\_\_\_\_\_ is only \_\_\_\_\_ months old.  
(He She)

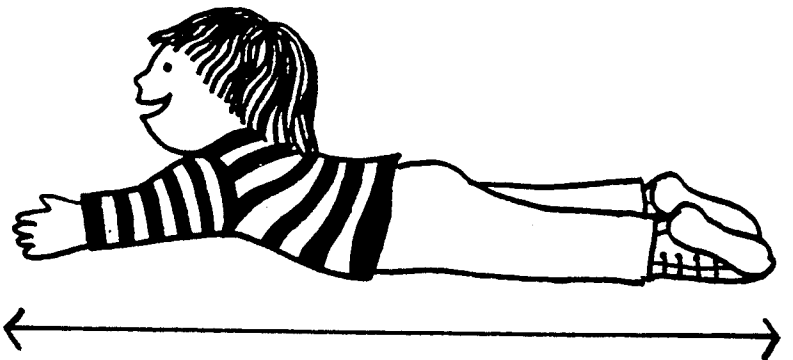
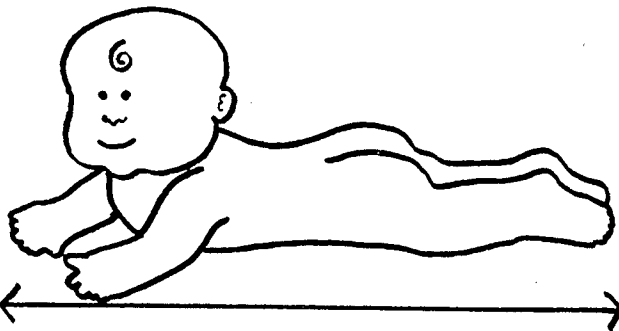
\_\_\_\_\_ is \_\_\_\_\_'s \_\_\_\_\_  
(He She) (brother sister friend  
cousin)

\_\_\_\_\_ came with \_\_\_\_\_'s \_\_\_\_\_  
(He She) (mom dad aunt  
uncle grandma  
grandpa friend)

Here is a book about \_\_\_\_\_ and me.

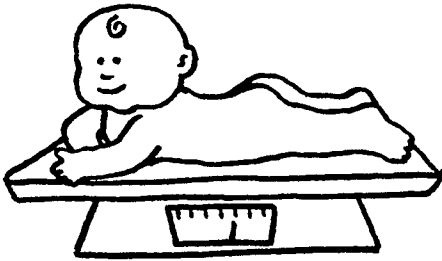
\_\_\_\_\_ is small.

I am large.



\_\_\_\_\_ is   cubes long. I am   cubes long.

\_\_\_\_\_ is light.



\_\_\_\_\_ weighs 

--	--

 pounds.

I am heavy.



I weigh 

--	--

 pounds.

---

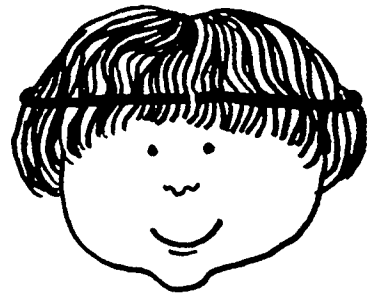
We measured with string and unifix cubes to find the circumference of our heads.



\_\_\_\_\_ 's head string  
is 

--	--

 cubes long.

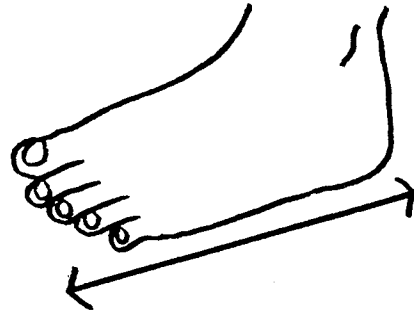


My head string is  

--	--

 cubes long.

\_\_\_\_\_ has small feet. I have large feet.



\_\_\_\_\_ 's foot is  

 cubes long.

My foot is 



 cubes  
long.

---

Here is a picture of \_\_\_\_\_ and me.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Code (75) 4 N 2 W 3 N 7 E 9 S									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Code (44) 2 W 5 S 1 E 6 N									
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51	52	53	54	55	56	57	58	59	60
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81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Code (53) 2 N 5 E 3 S 4 W 1 N									
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41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
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81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Code (1) 5 E 9 S 4 E 6 N									
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21	22	23	24	25	26	27	28	29	30
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51	52	53	54	55	56	57	58	59	60
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81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Code <span>36</span> 1 N 2 W 2 N 3 W									
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31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
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Code <span>29</span> 2 N 5 W 5 S 3 W 4 S 7 E									
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31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Name \_\_\_\_\_

Code <span>3</span> 4 S 2 W 5 S 1 E 3 N									
1	2	3	4	5	6	7	8	9	10
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21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Code <span>66</span> 1 E 3 N 4 W 3 N									
1	2	3	4	5	6	7	8	9	10
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21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Code

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Code

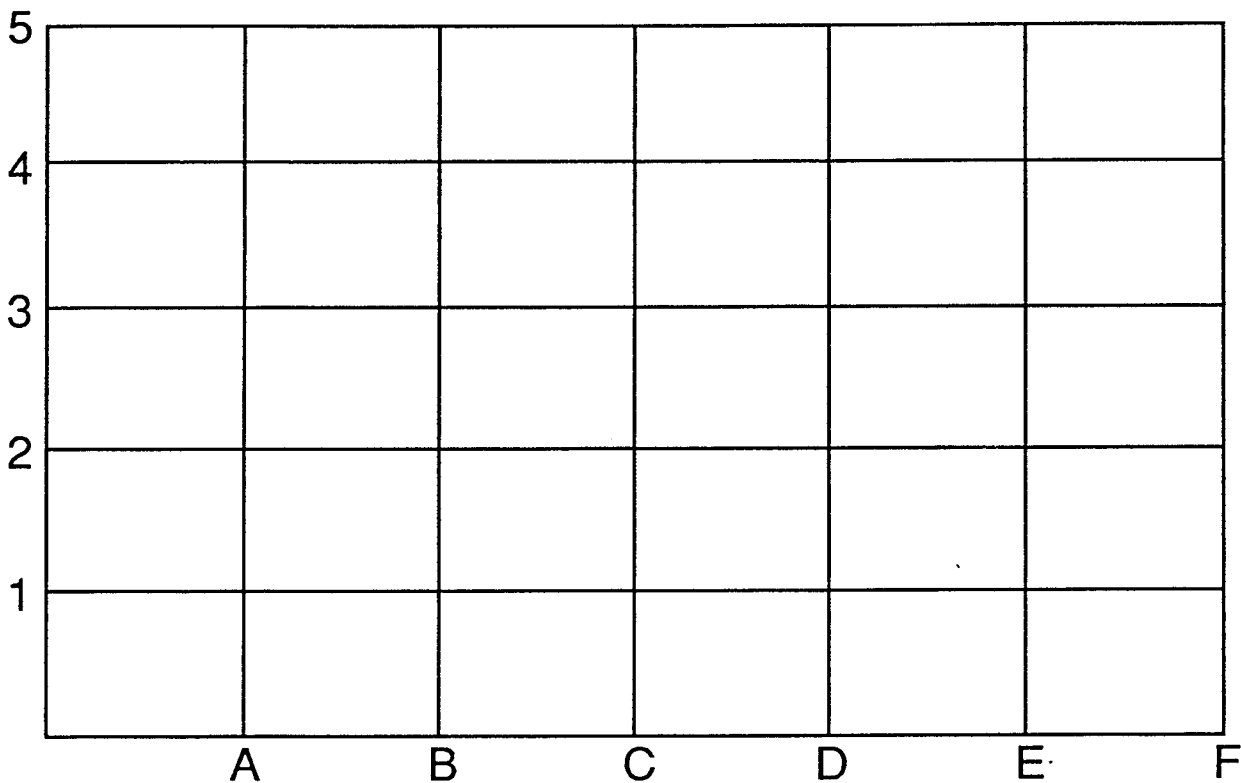
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Code

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

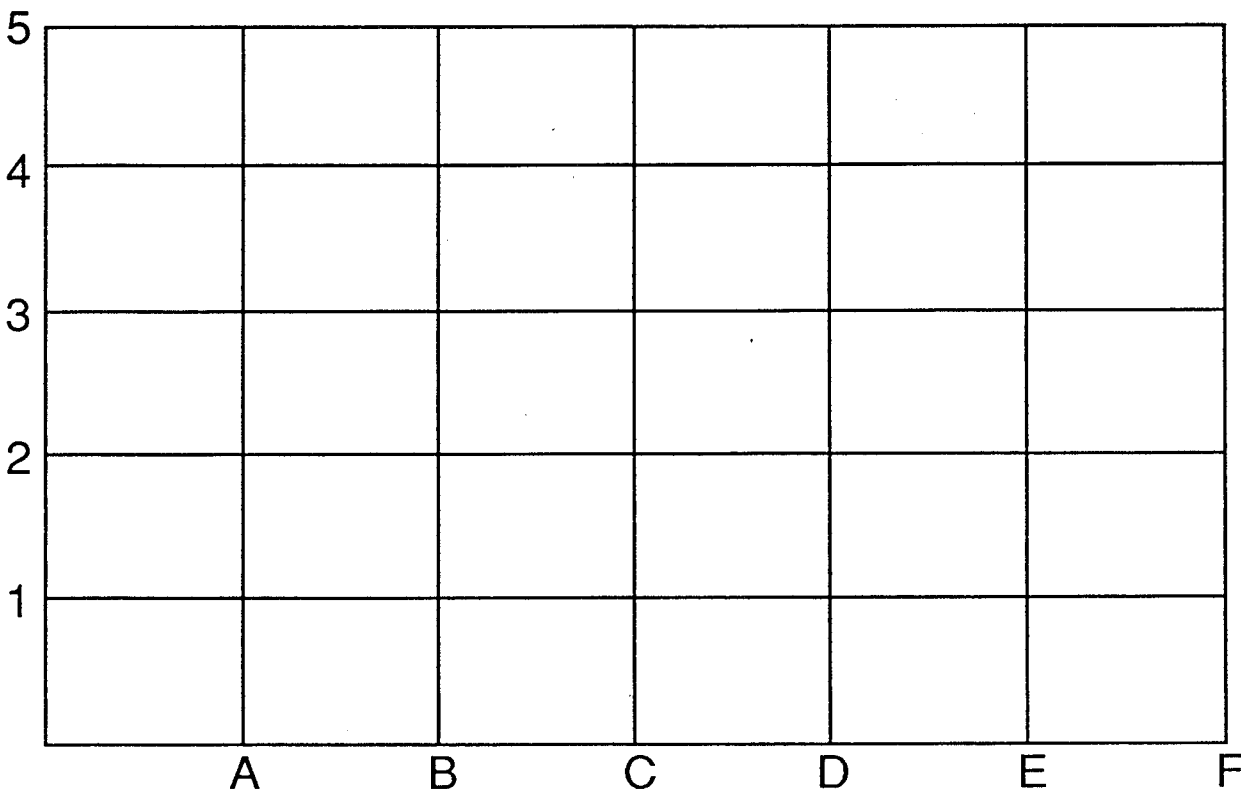
Code

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



- A,2 (1)
- B,1 (2)
- C,1 (3)
- D,2 (4)
- C,2 (5)
- C,5 (6)
- D,3 (7)
- B,3 (8)
- C,5 (9)
- C,2 (10)
- A,2 (11)

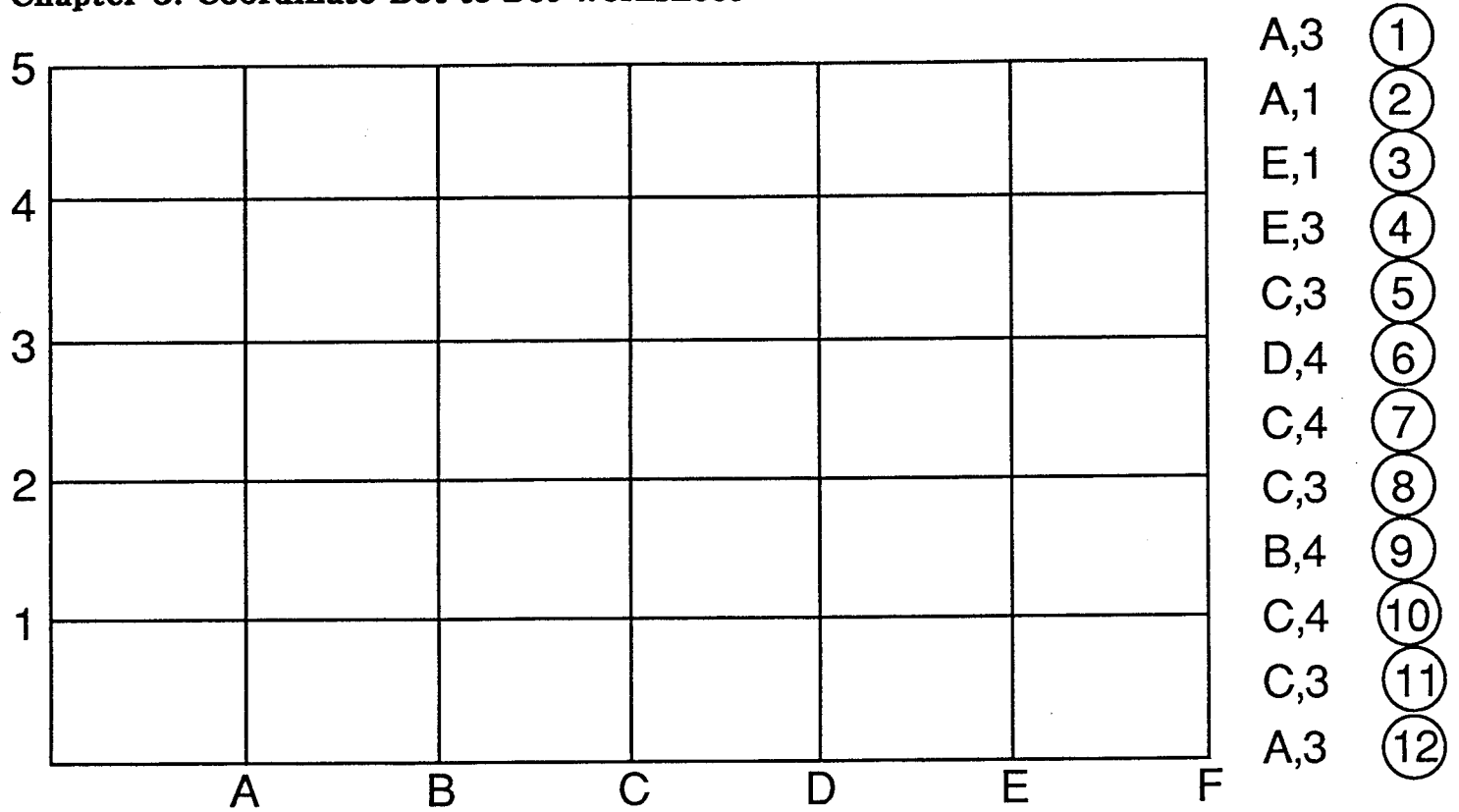
This is a \_\_\_\_\_



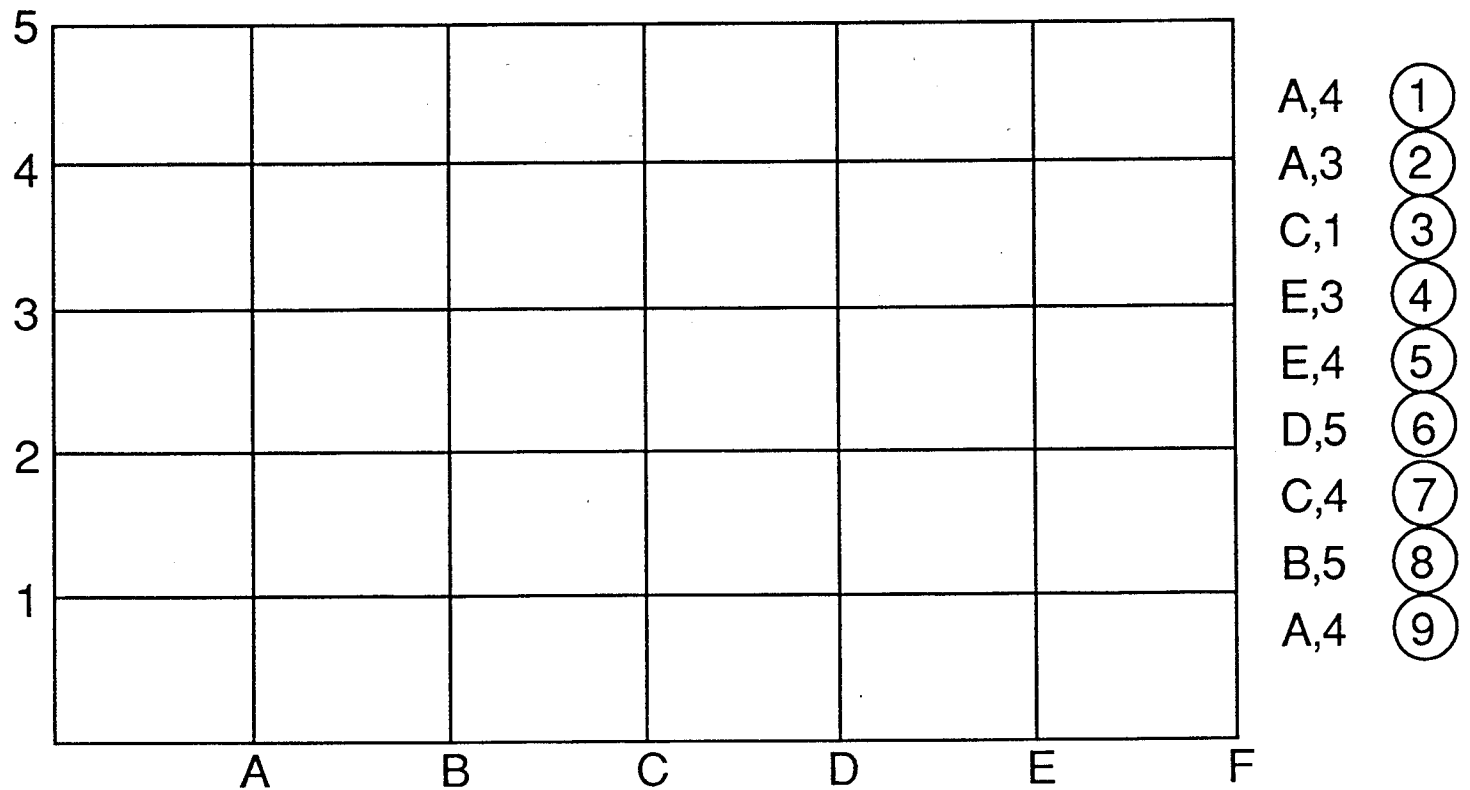
- A,5 (1)
- A,1 (2)
- E,1 (3)
- E,2 (4)
- D,2 (5)
- D,3 (6)
- C,3 (7)
- C,4 (8)
- B,4 (9)
- B,5 (10)
- A,5 (11)

This is a \_\_\_\_\_





This is a \_\_\_\_\_



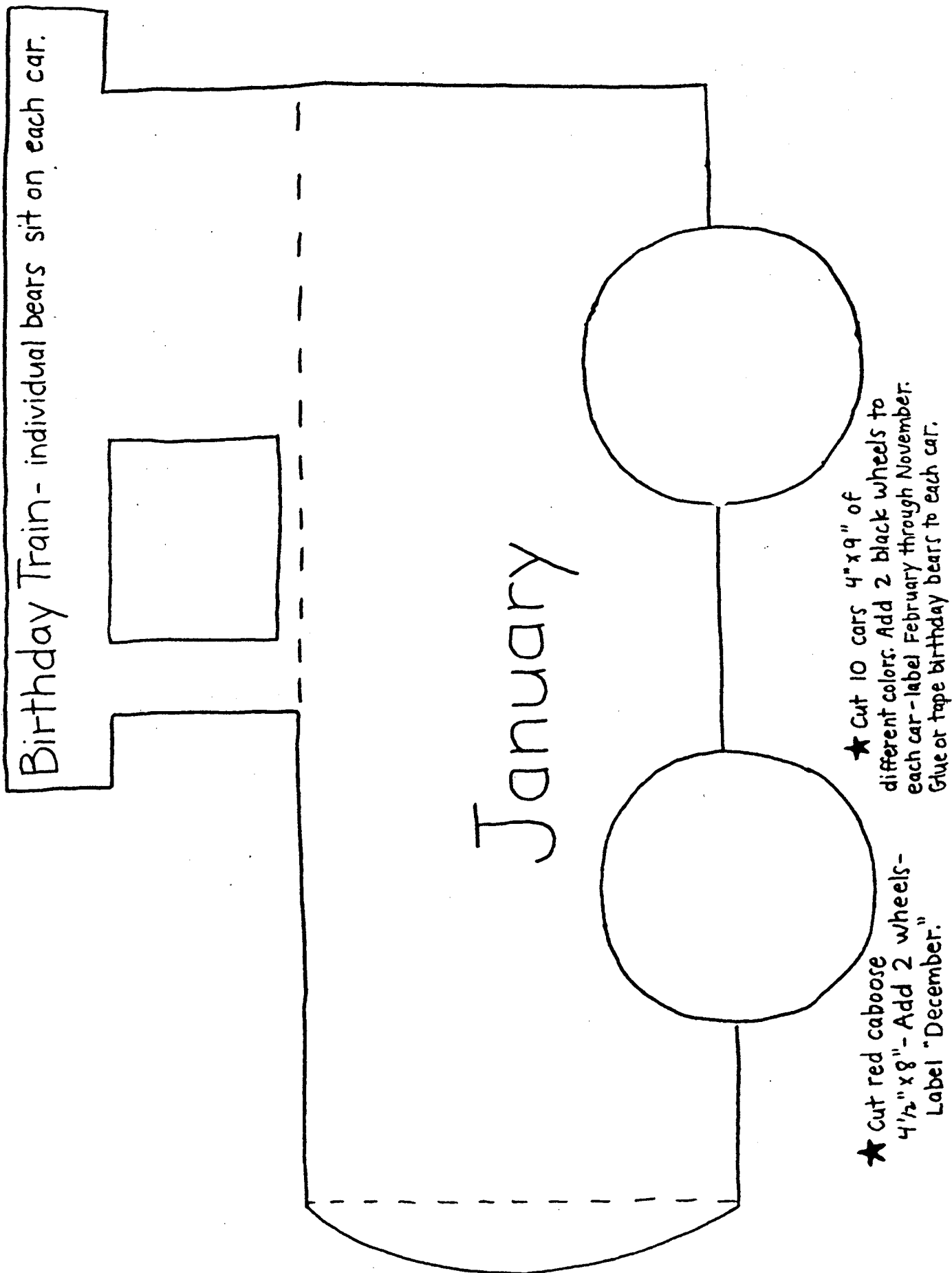
This is a \_\_\_\_\_

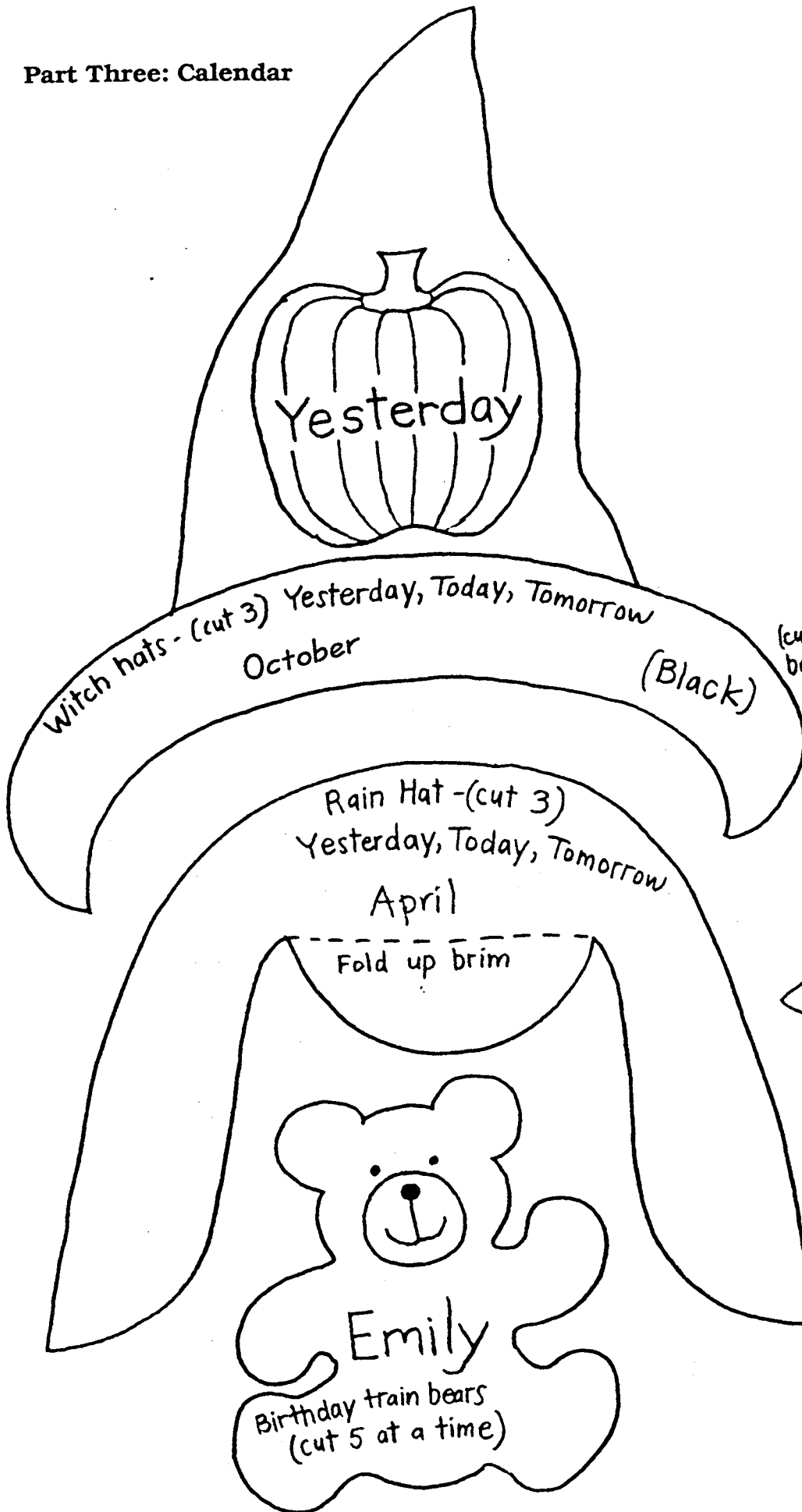
## Coordinates

							A
							B
							C
							D
							E
6	5	4	3	2	1		

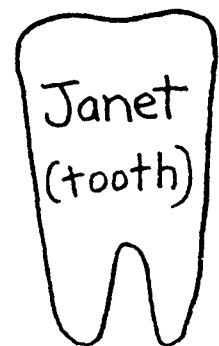
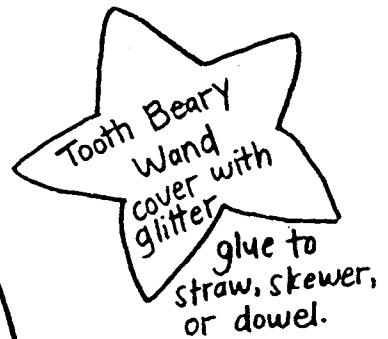
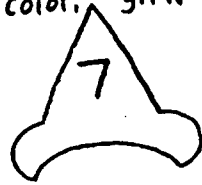
# The Calendar

[illegible]

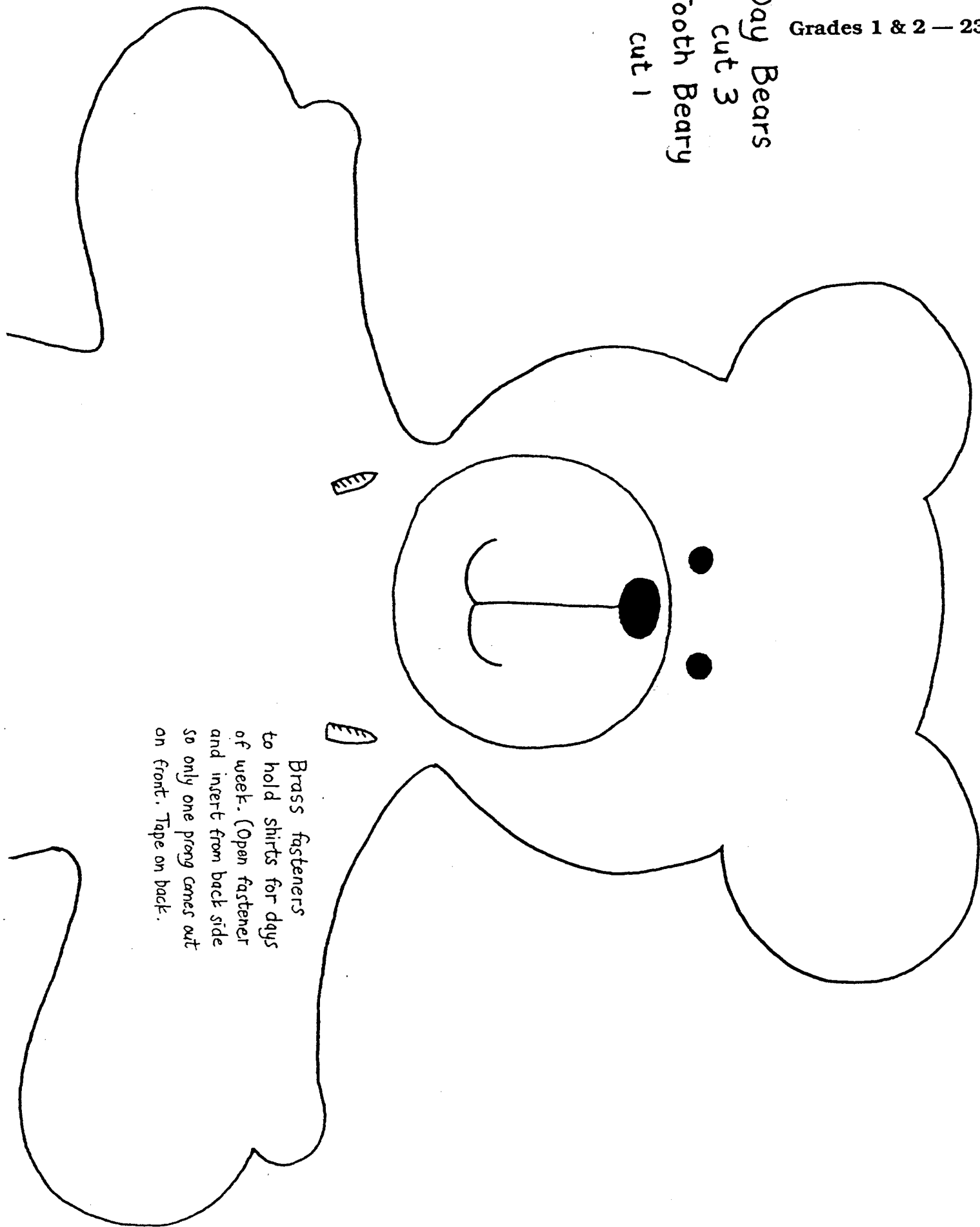




Birthday bear hats  
(cut 5 at a time) boys could  
be one color, girls another.

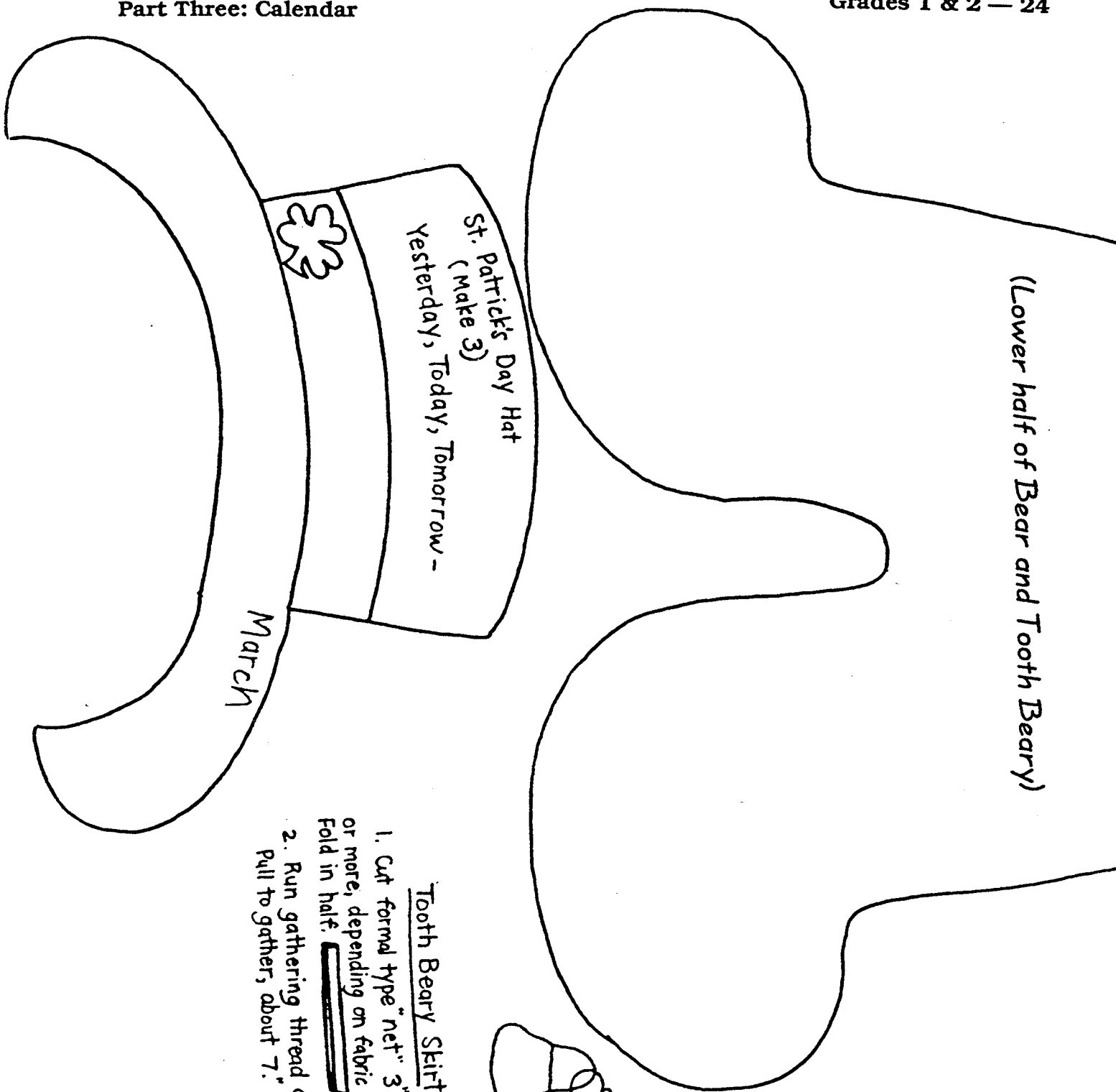


Day Bears  
cut 3  
Tooth Beary  
cut 1



Brass fasteners  
to hold shirts for days  
of week. (Open fastener  
and insert from back side  
so only one prong comes out  
on front. Tape on back.

(Lower half of Bear and Tooth Beary)



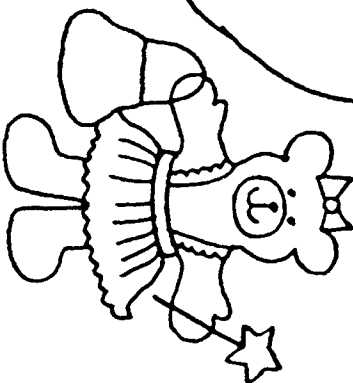
St. Patrick's Day Hat  
(make 3)  
Yesterday, Today, Tomorrow -

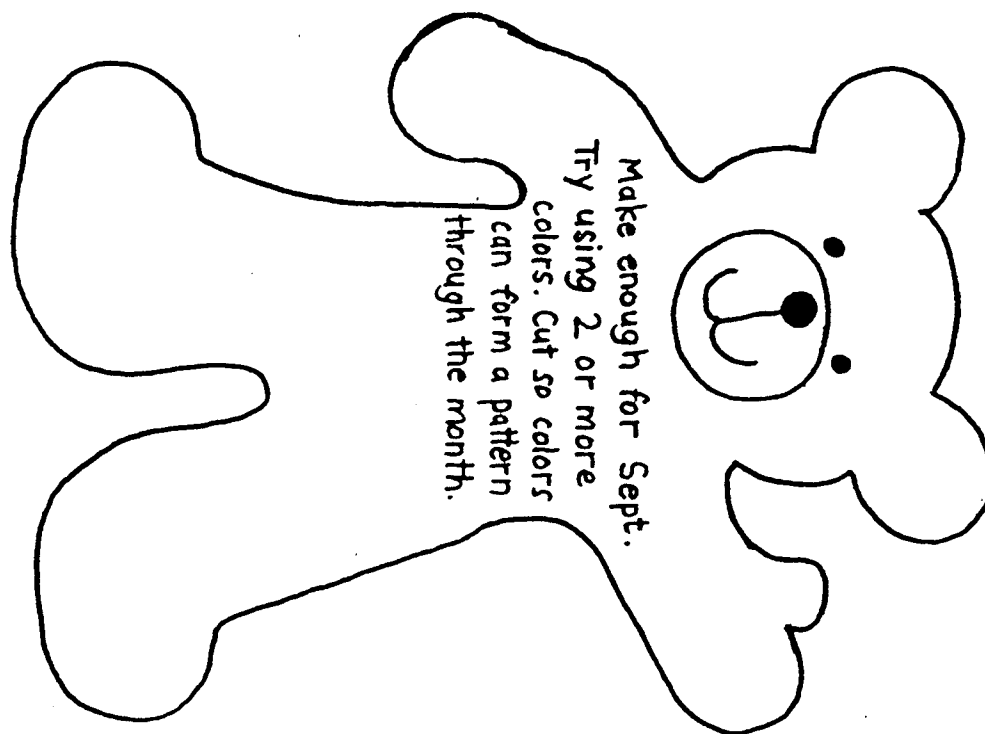


March

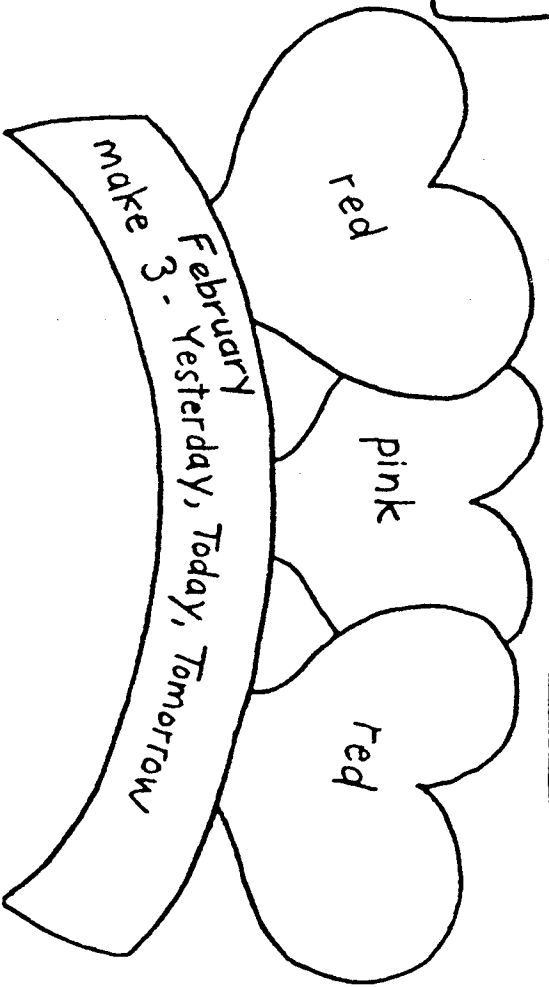
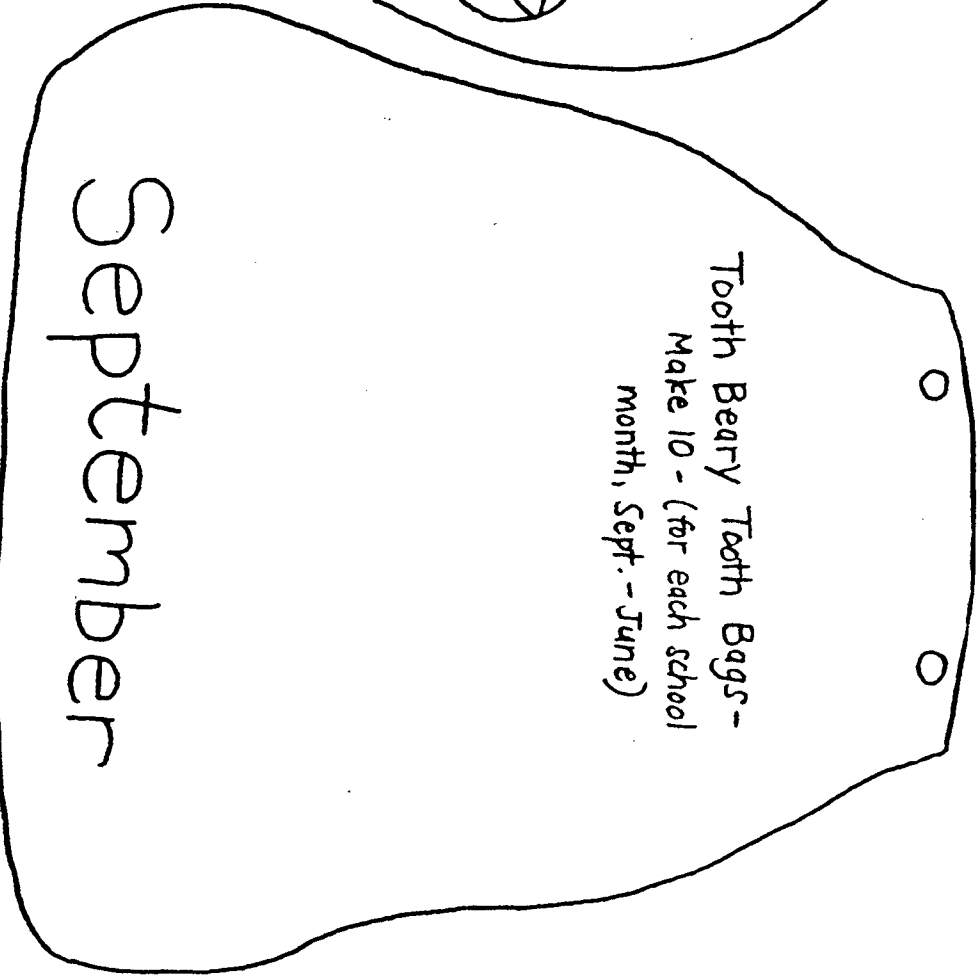
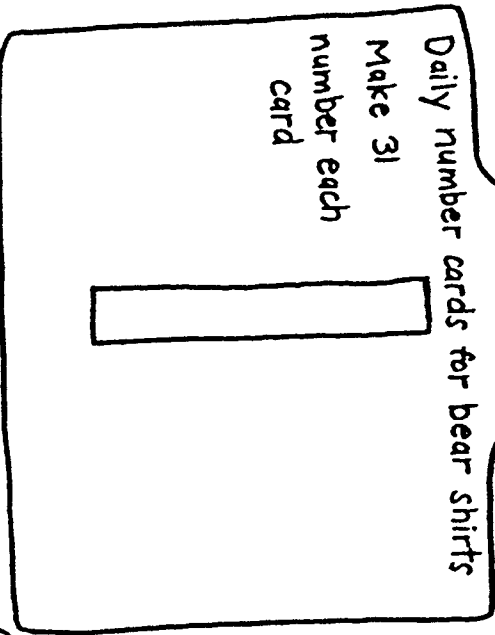
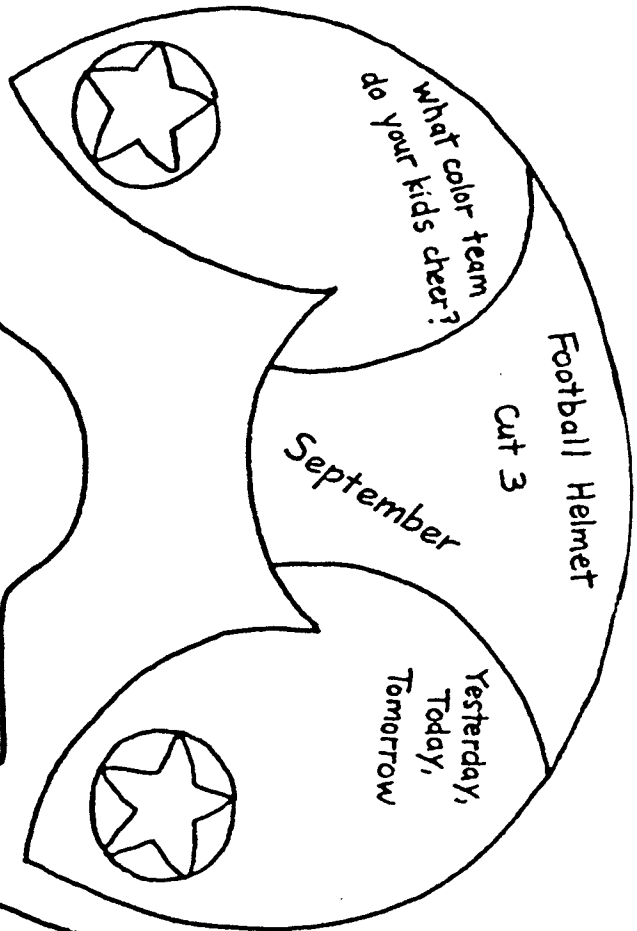
### Tooth Beary Skirt

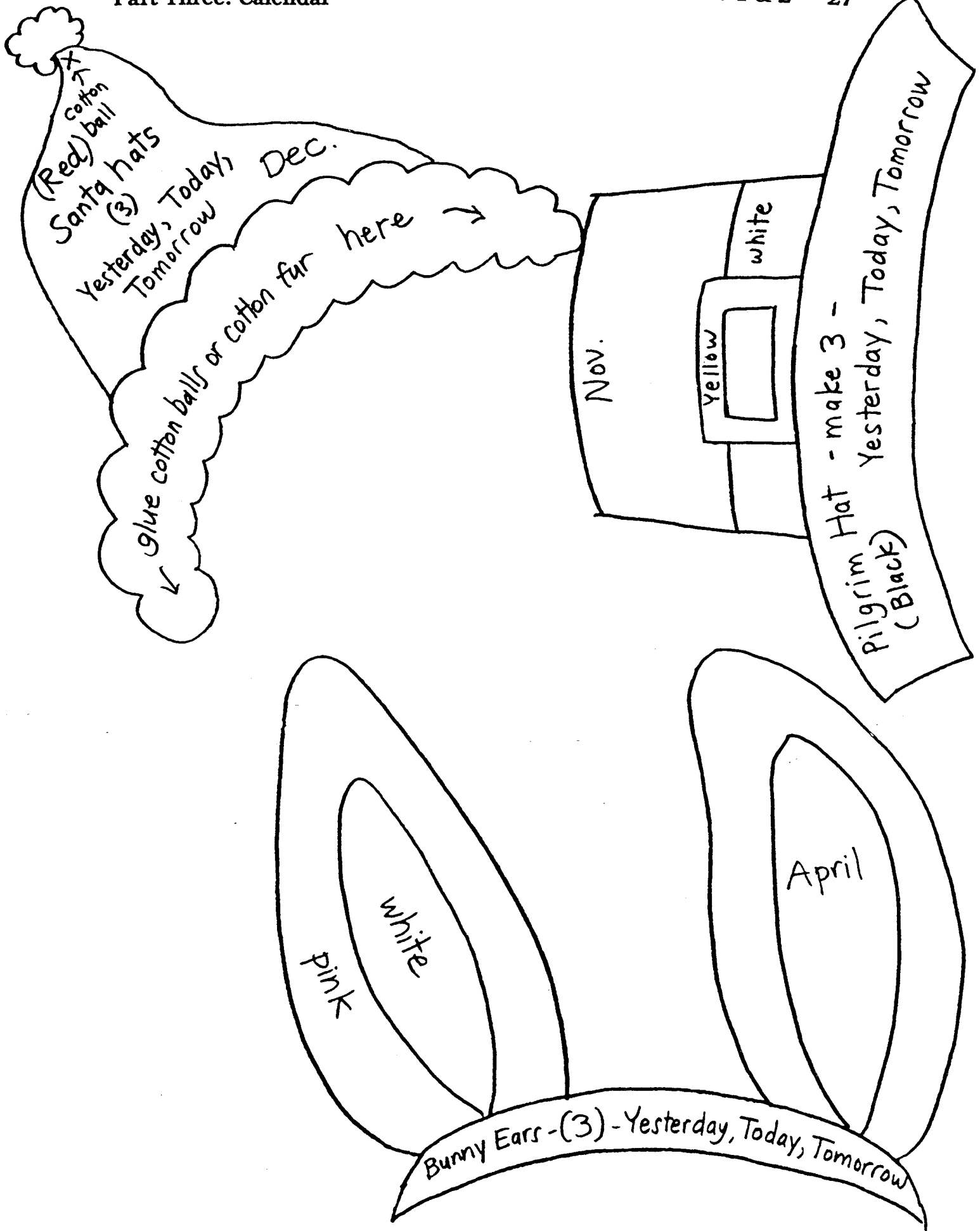
1. Cut formal type "net" 3'x5'4" or more, depending on fabric width. Fold in half.
2. Run gathering thread at top. Pull to gather, about 7".

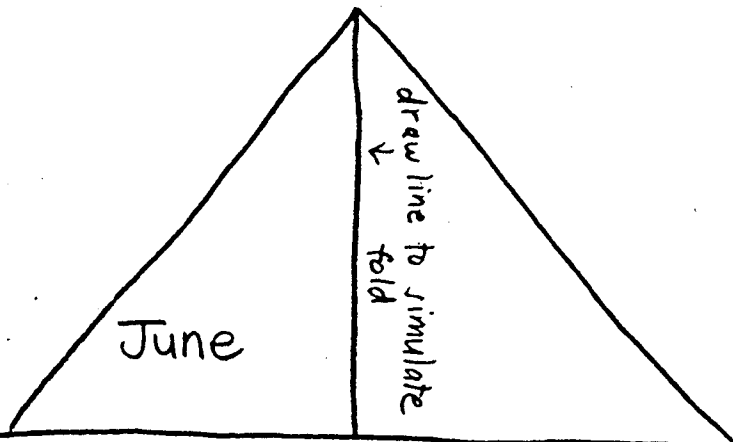
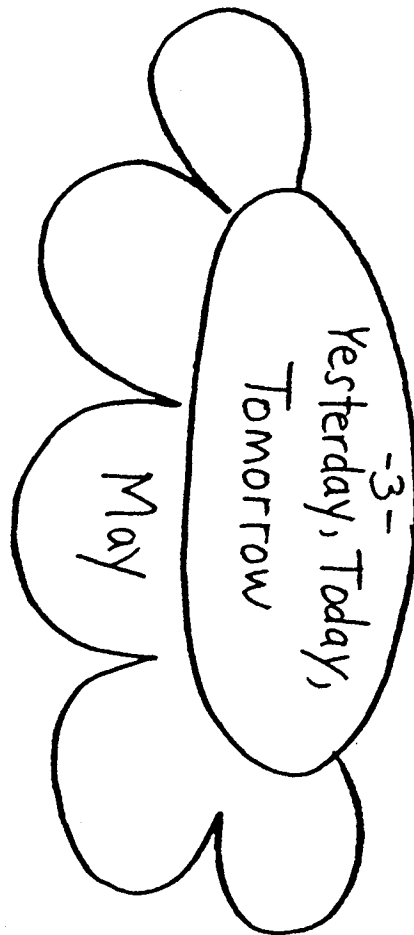
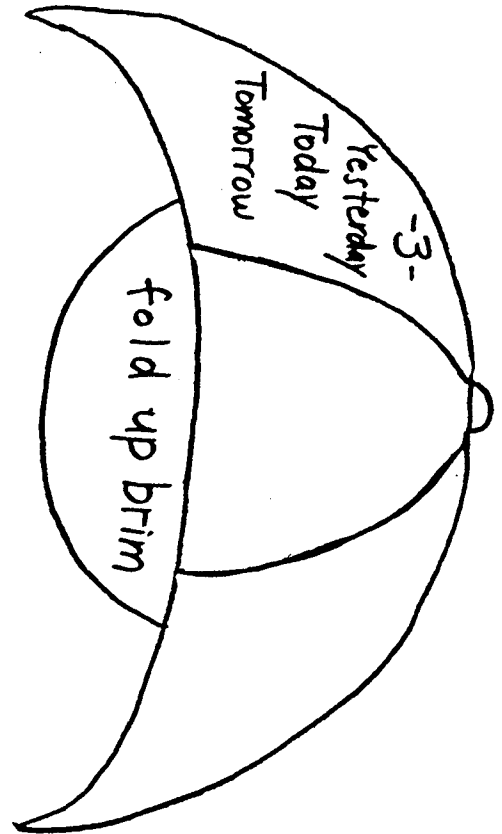






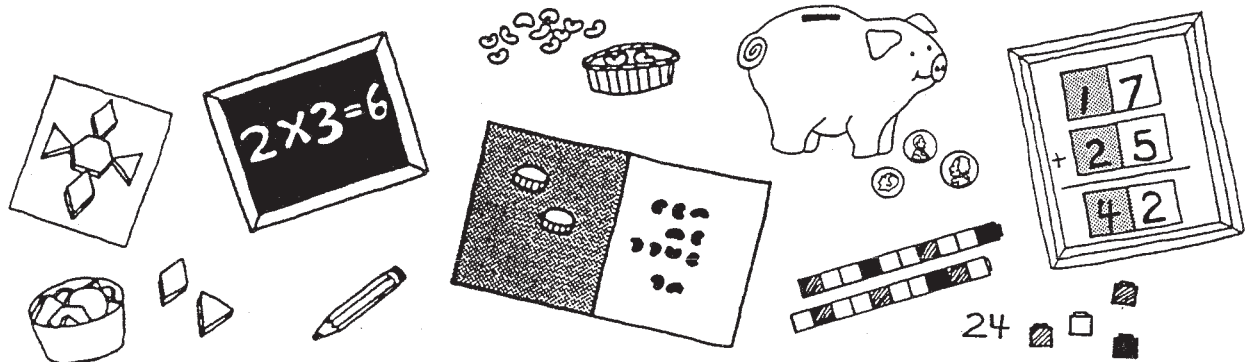




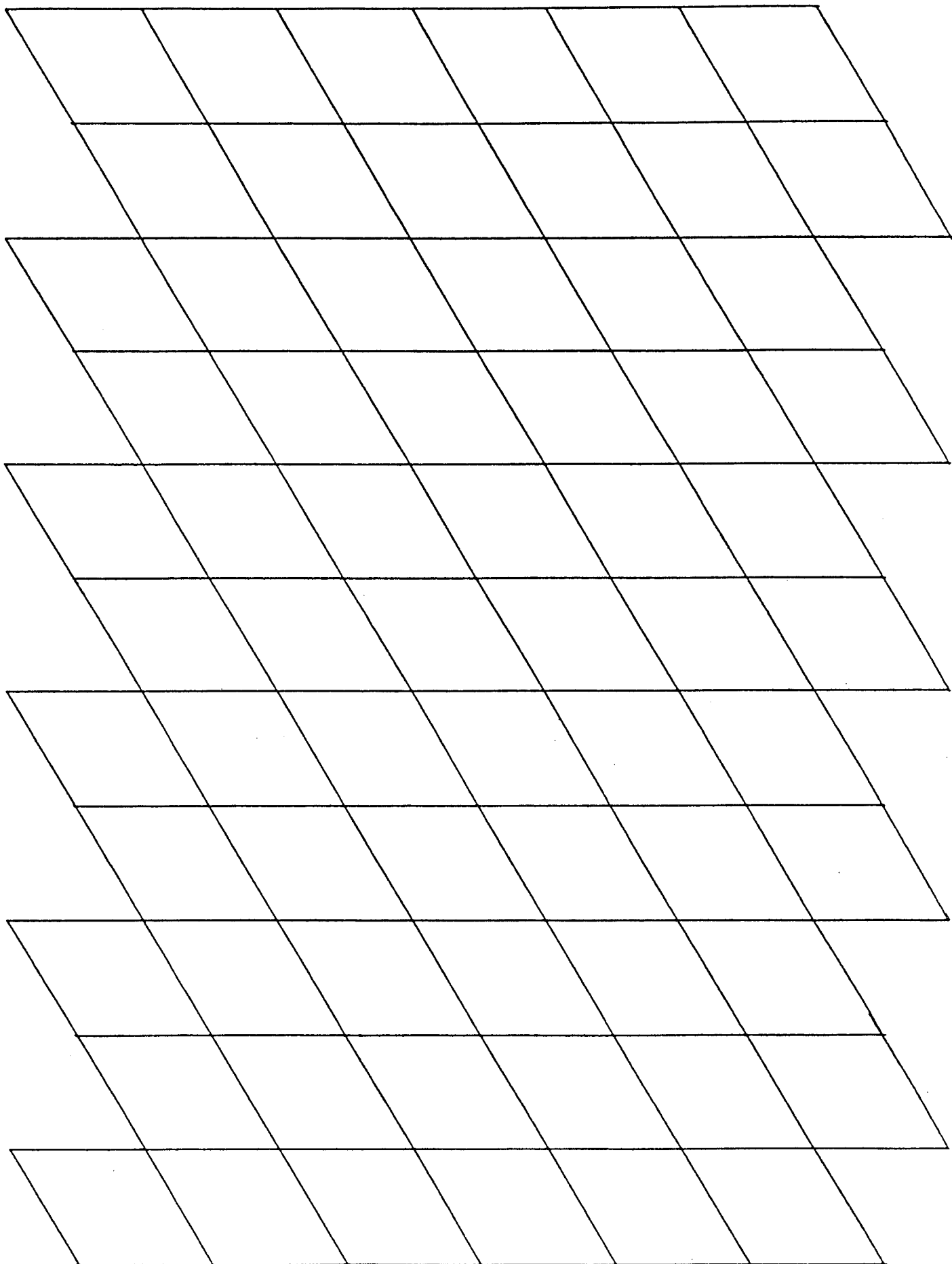


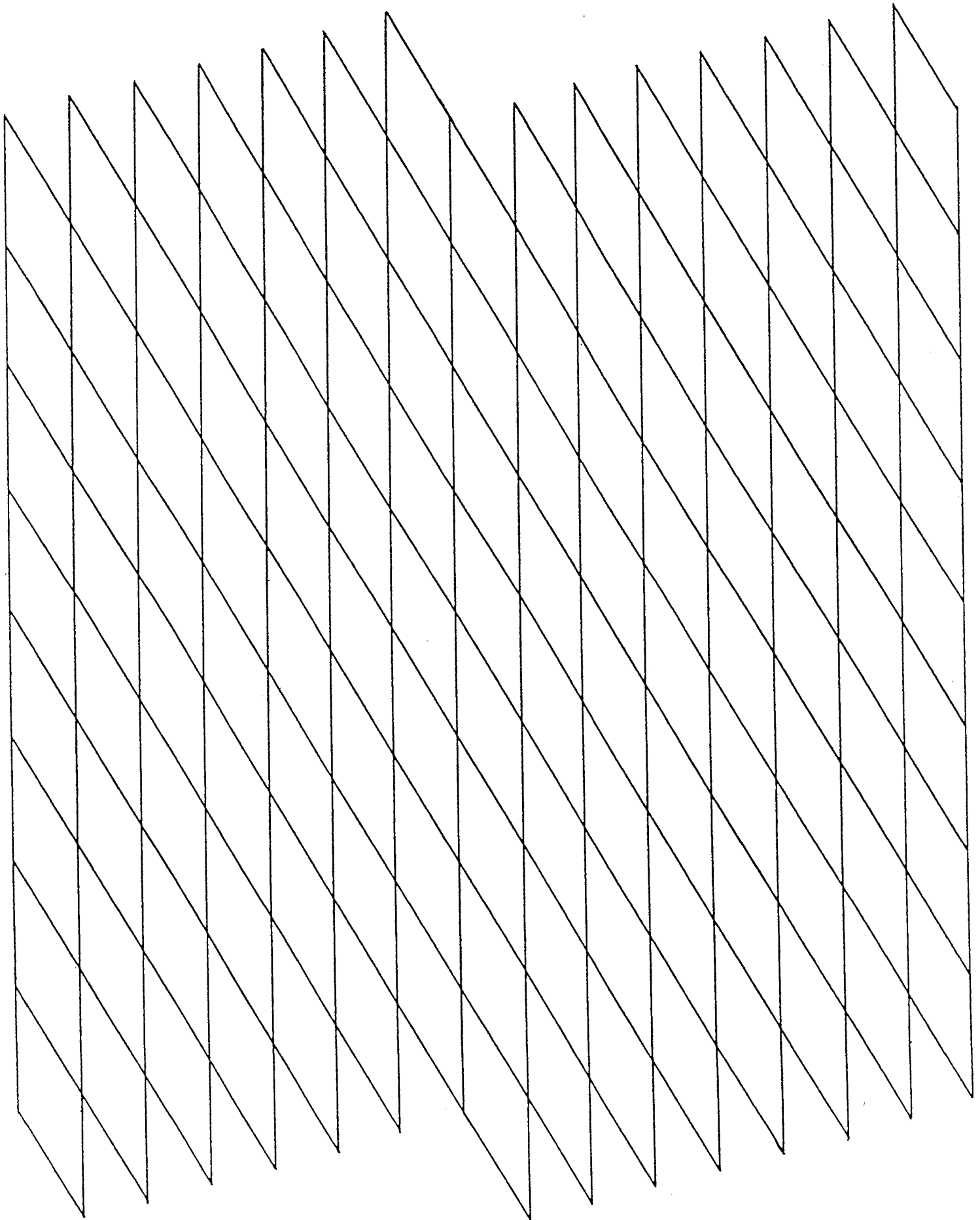
Make 3 out of newspaper or construction paper  
Yesterday, Today, Tomorrow

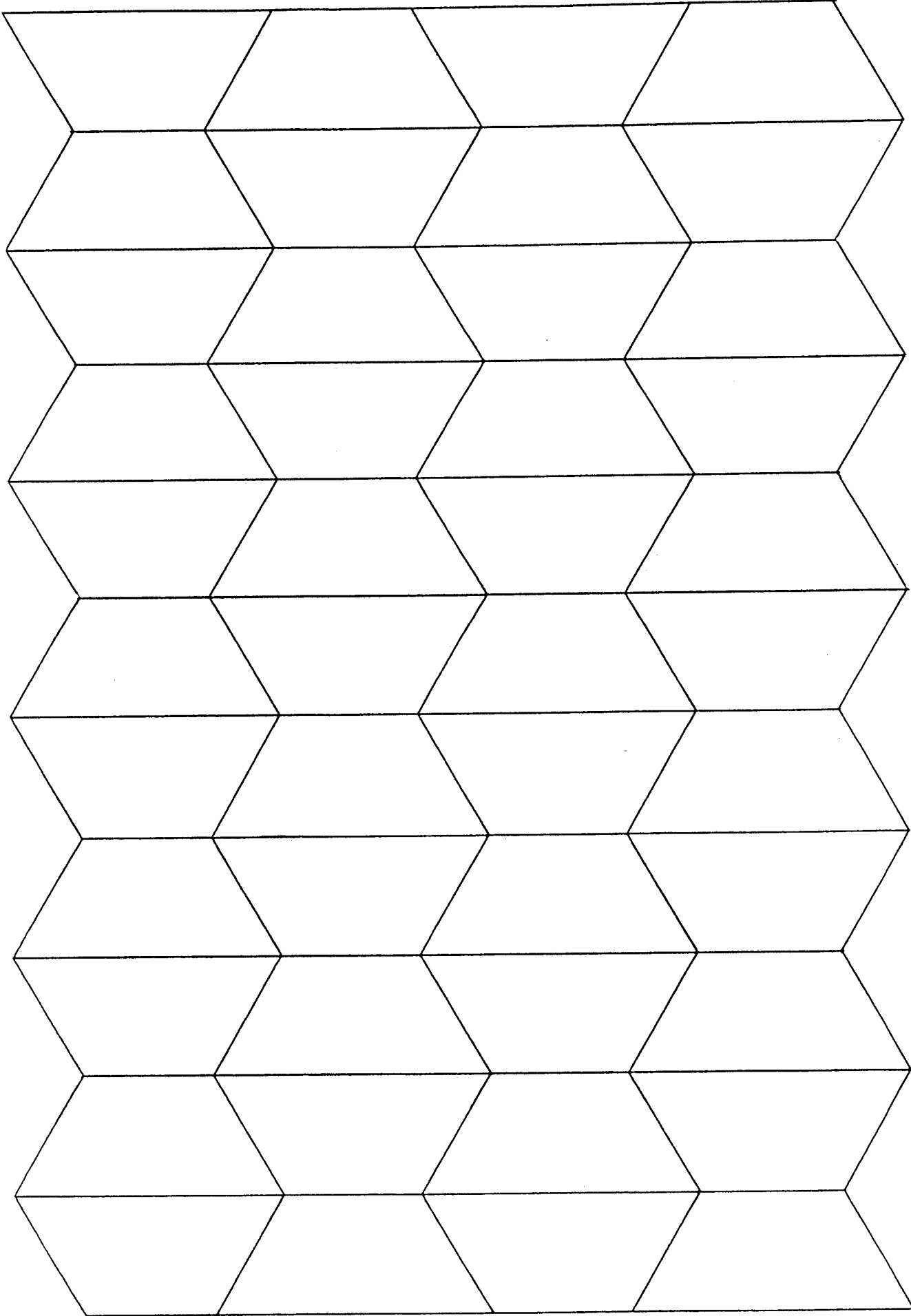
# Concept Instruction

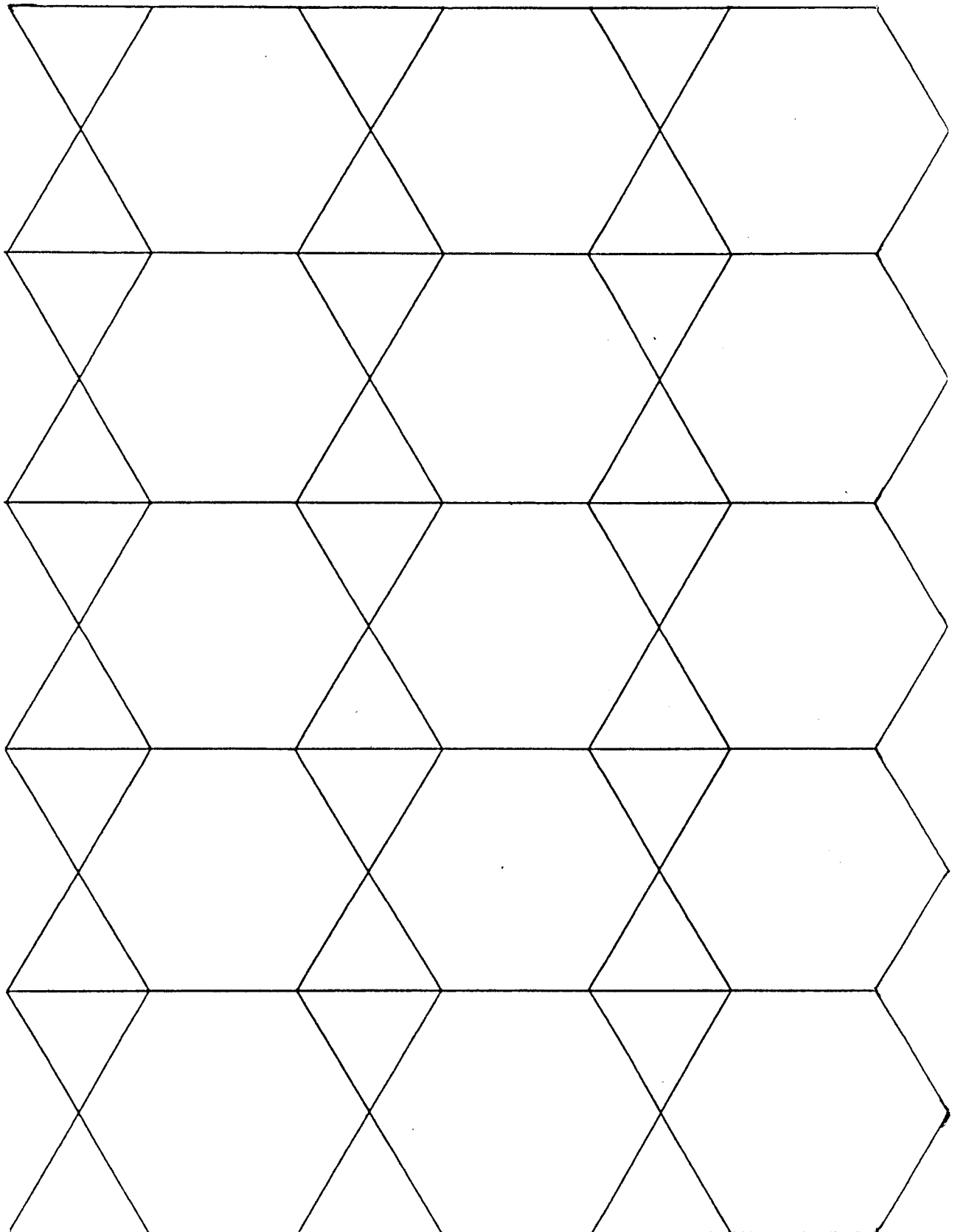


**Chapter 12: Pattern Block Shapes**  
run on blue construction paper

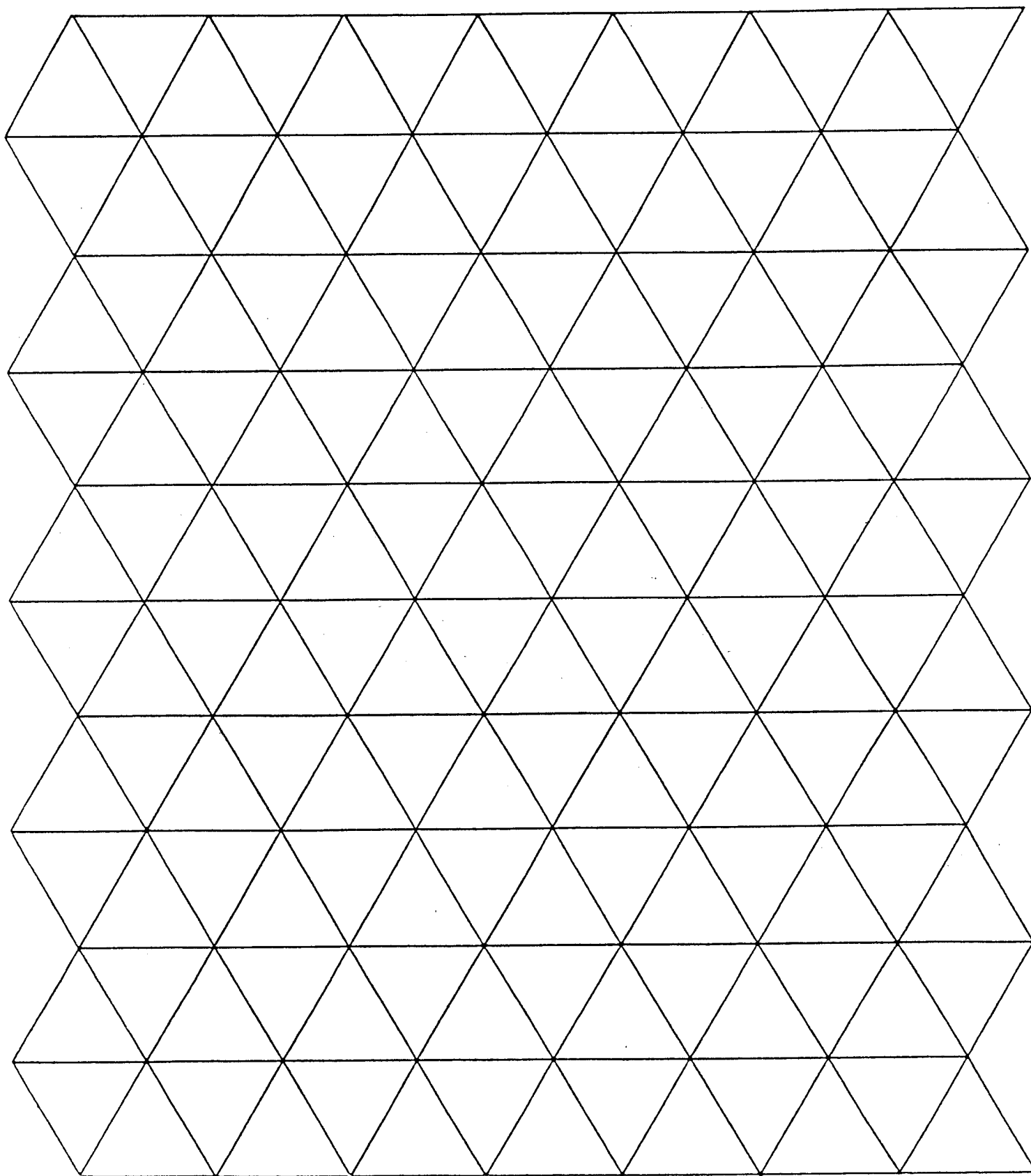




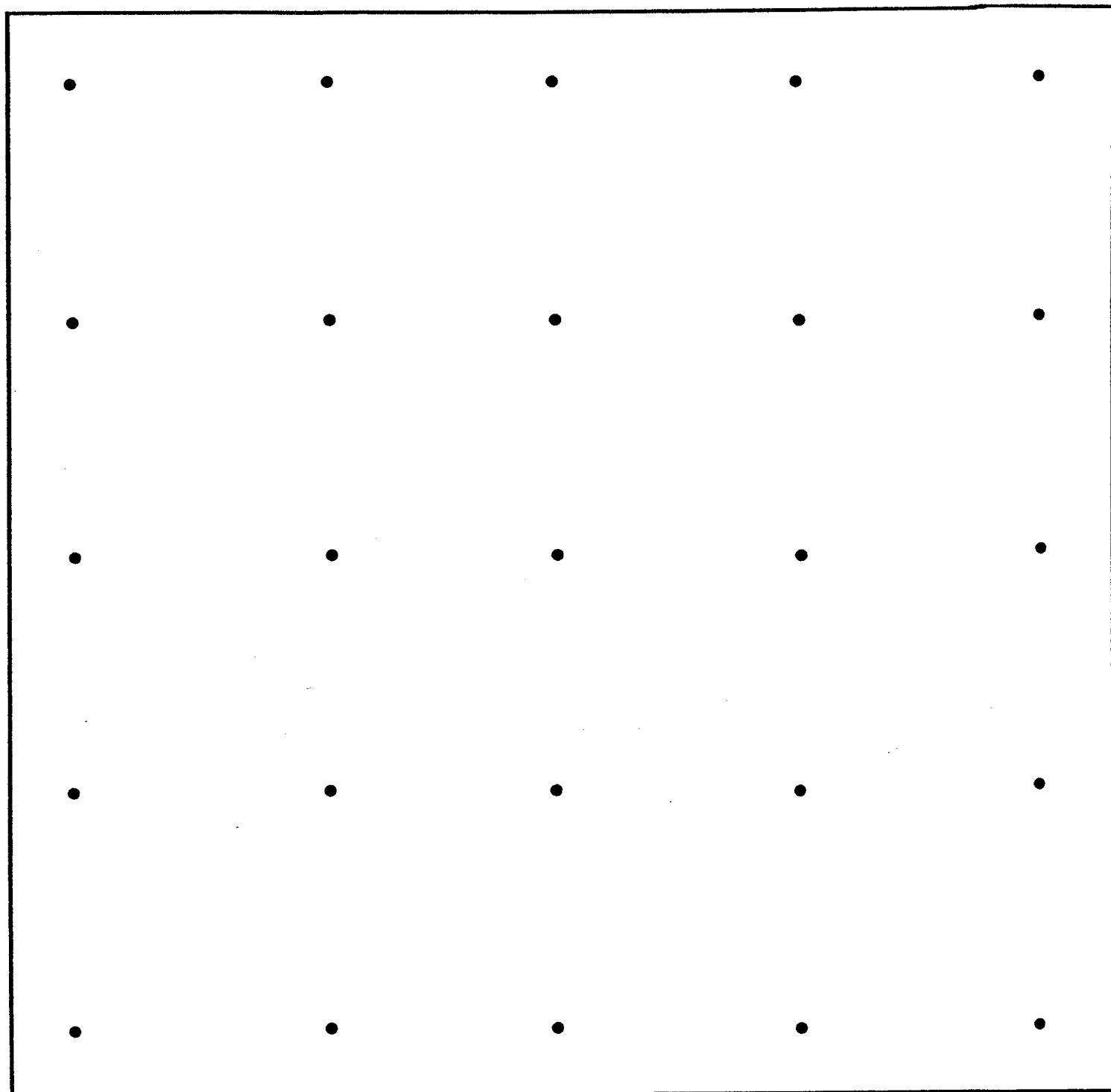


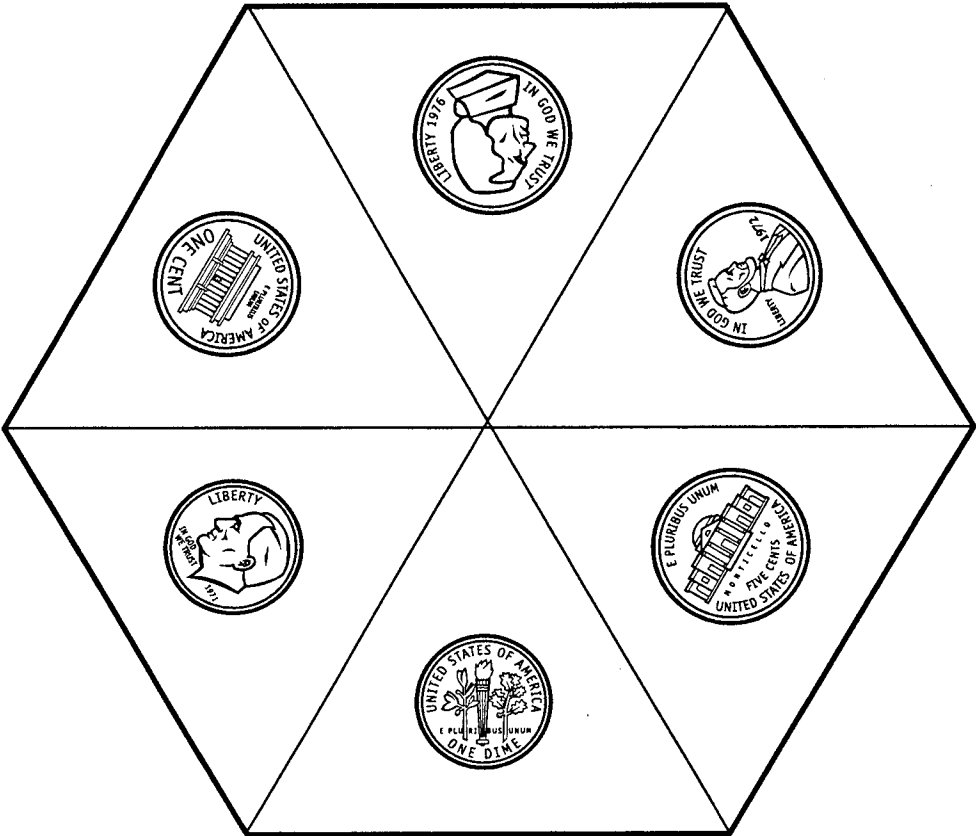




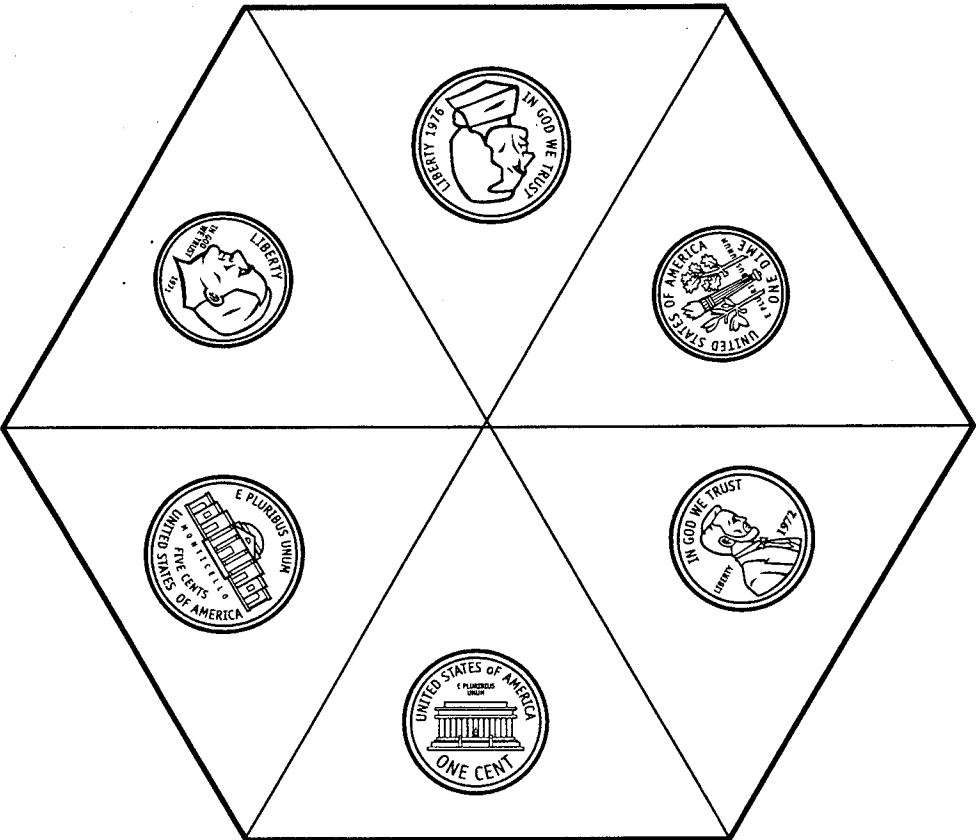


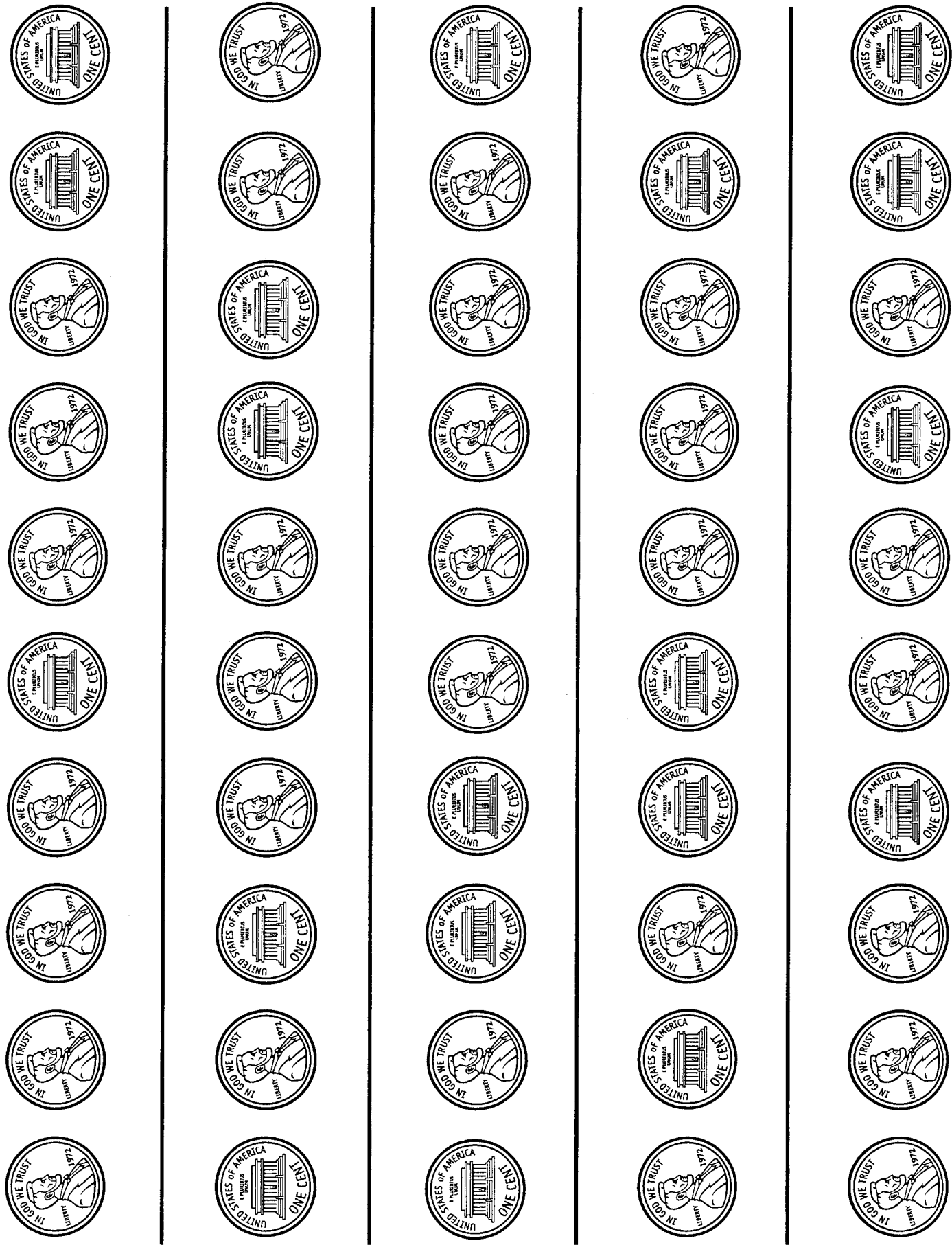
Chapter 12: Geoboard Dot Paper





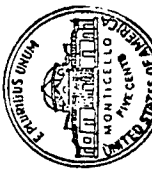
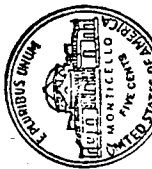
Chapter 16: Money March Spinner





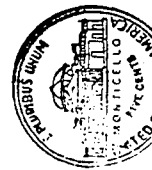
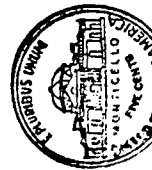
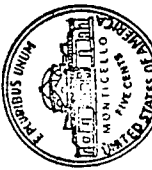
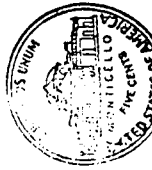
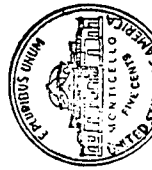


Chapter 16: Spln 25 Cents Trading Boards



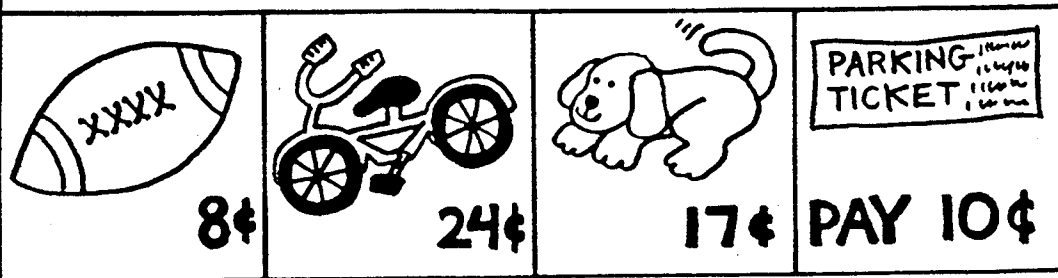
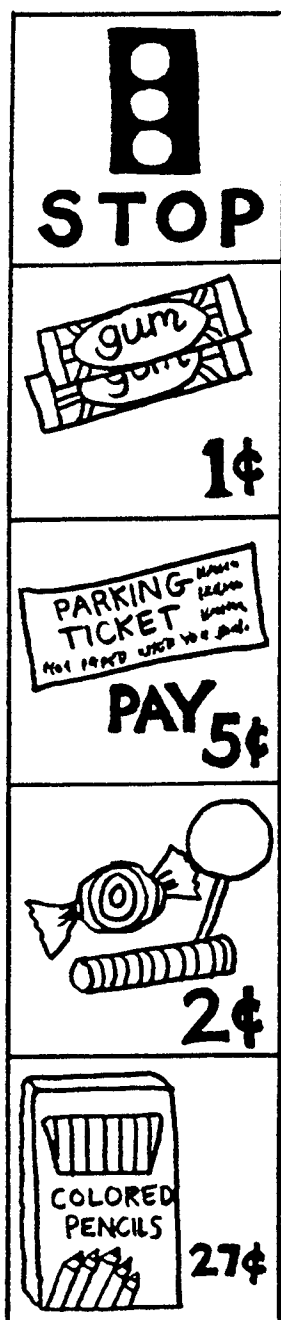
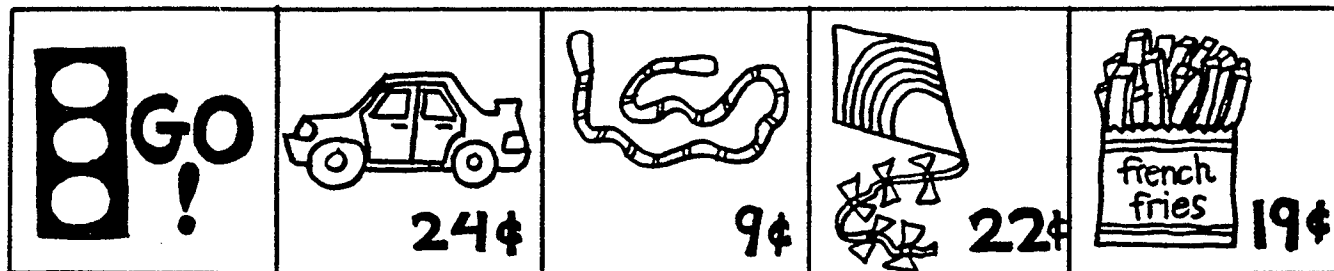
pennies

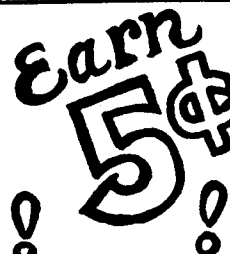
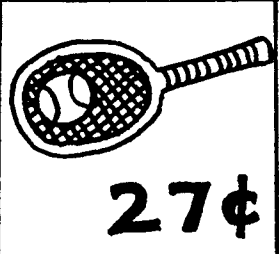



nickels



pennies

nickels




				
	27¢	32¢	8¢	16¢

you need  
**GAS**  
Pay 5¢




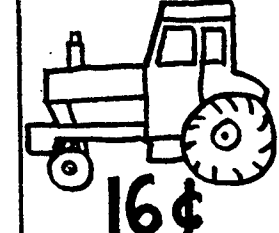
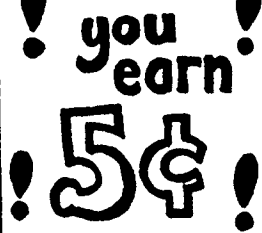
	
	

	18¢
-------------------------------------------------------------------------------------	-----

	5¢
--------------------------------------------------------------------------------------	----

	15¢
---------------------------------------------------------------------------------------	-----

	33¢
---------------------------------------------------------------------------------------	-----

				
41¢	26¢	5¢	16¢	

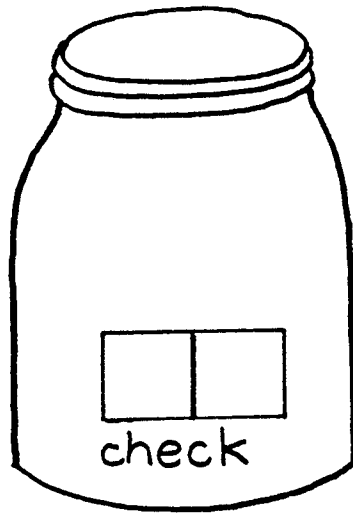


[illegible][illegible][illegible][illegible]

# Counting Jars

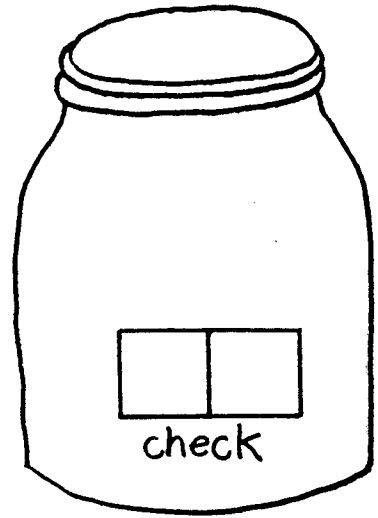
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guess



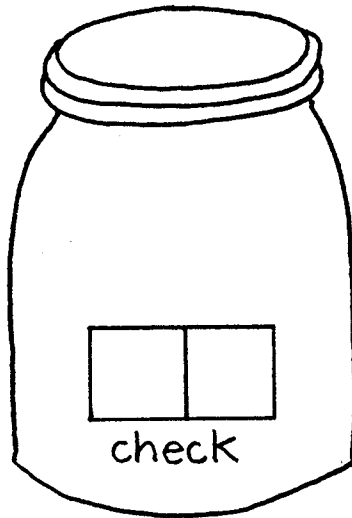
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guess



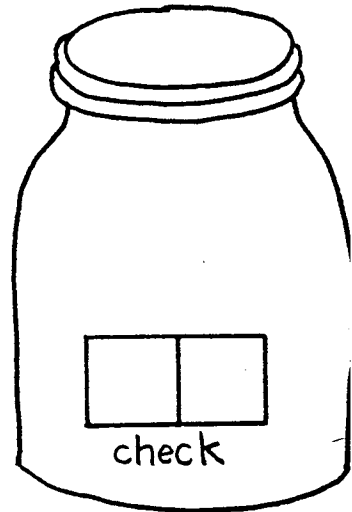
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guess



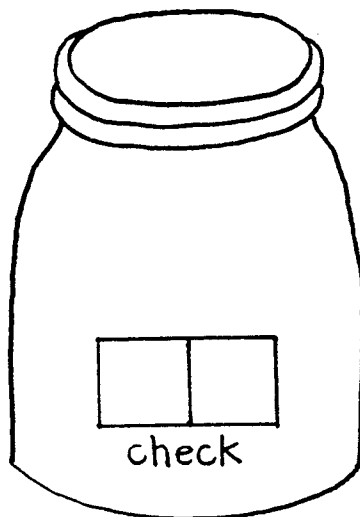
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guess



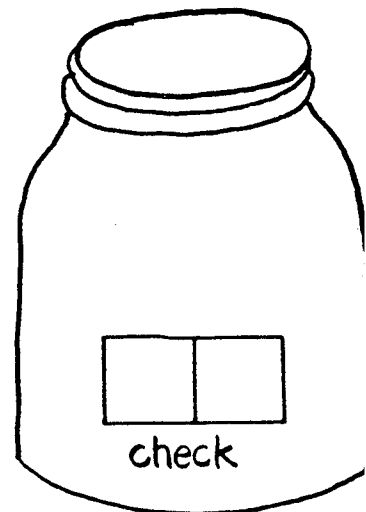
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guess



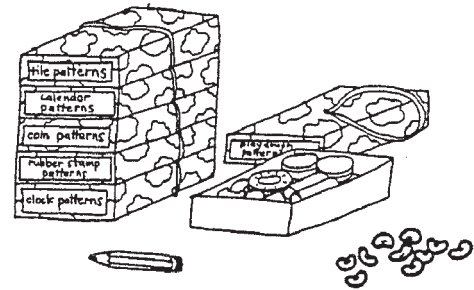
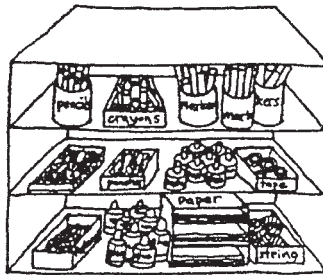
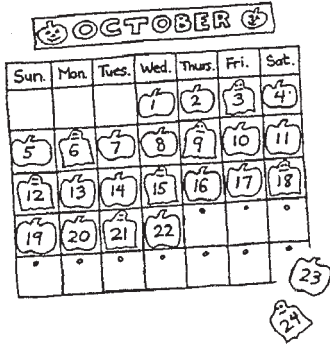
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guess






# Planning



**Box It or Bag It Mathematics  
Concept Planning Sheet**

Concept Instruction—Group Lessons  
How are you going to introduce this concept?

Independent Practice Time—What do you already have?

What boxes will you try to make?

Easy

Challenging

What could you ask your class parents to make for you?

Is there anything you will include for additional practice  
(workbook pages, ditto sheets, computer programs)?

## Box It or Bag It Planning Guide for \_\_\_\_\_ (month)

	Monday	Tuesday	Wednesday	Thursday	Friday
30 minutes	Concept Instruction	Concept Instruction	Seasonal Math	Seasonal Math	Concept Instruction
30 minutes	Practice and Enrichment Boxes	Practice and Enrichment Boxes	Practice and Enrichment Boxes	Seasonal Math	Seasonal Math or Boxes

CONCEPT INSTRUCTION, Chapters 13-18, provides specific, direct teaching to each concept.

- Concept(s) I'm introducing this month\_\_\_\_\_
- Key concept instruction lessons:

INDEPENDENT PRACTICE TIME: Box It or Bag It Box activities provide individual practice and enrichment.

- Concept(s) my class is practicing\_\_\_\_\_
- Practice and Enrichment Boxes:

SEASONAL MATHEMATICS, chapters 1-9, provides consistent exposure and review each month.

- Seasonal unit I'm doing this month\_\_\_\_\_
- Here are one or more activities I'm planning to draw from my seasonal unit in each area:

Graphing/Sorting

Story Problems

Estimation/Place Value Counting

Measuring

Patterning

Extended Number Patterns

Money

Geometry/Spatial Prob. Solving

**Part V: Weekly Planning Sheet****Grades 1 & 2 — 47**

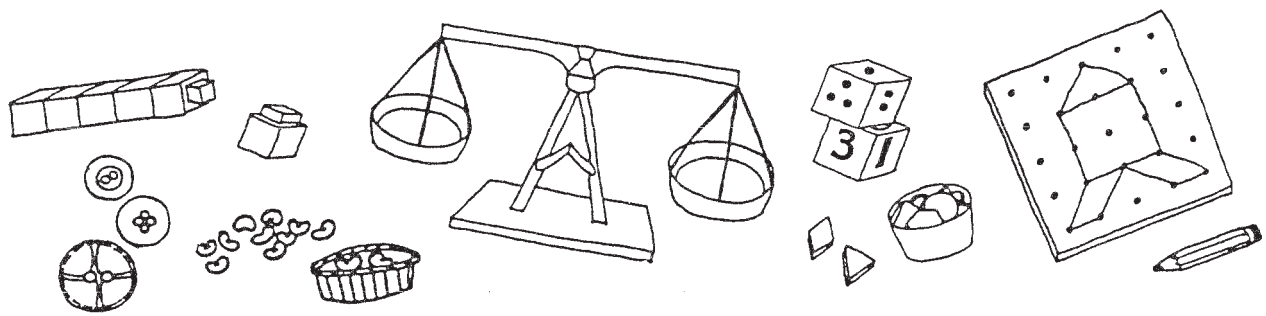
Monday	Tuesday	Wednesday	Thursday	Friday
<b>Group Lessons</b>				
<b>Independent Practice Time</b>				

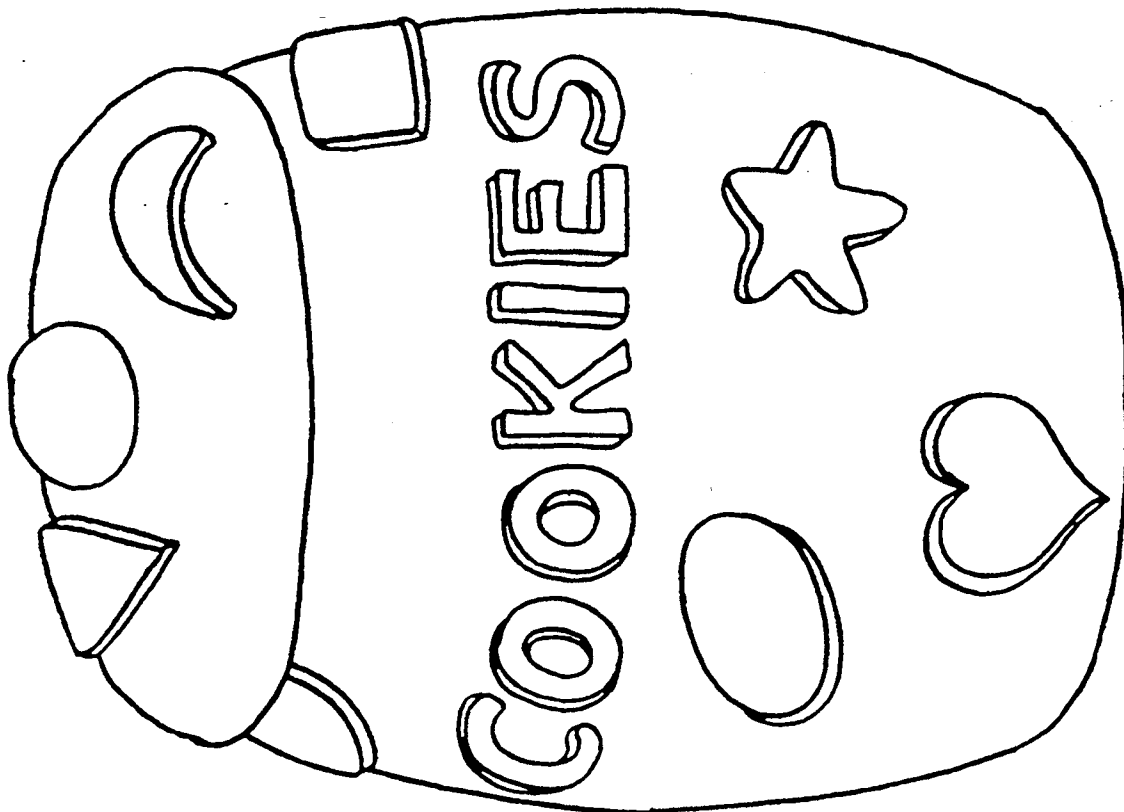
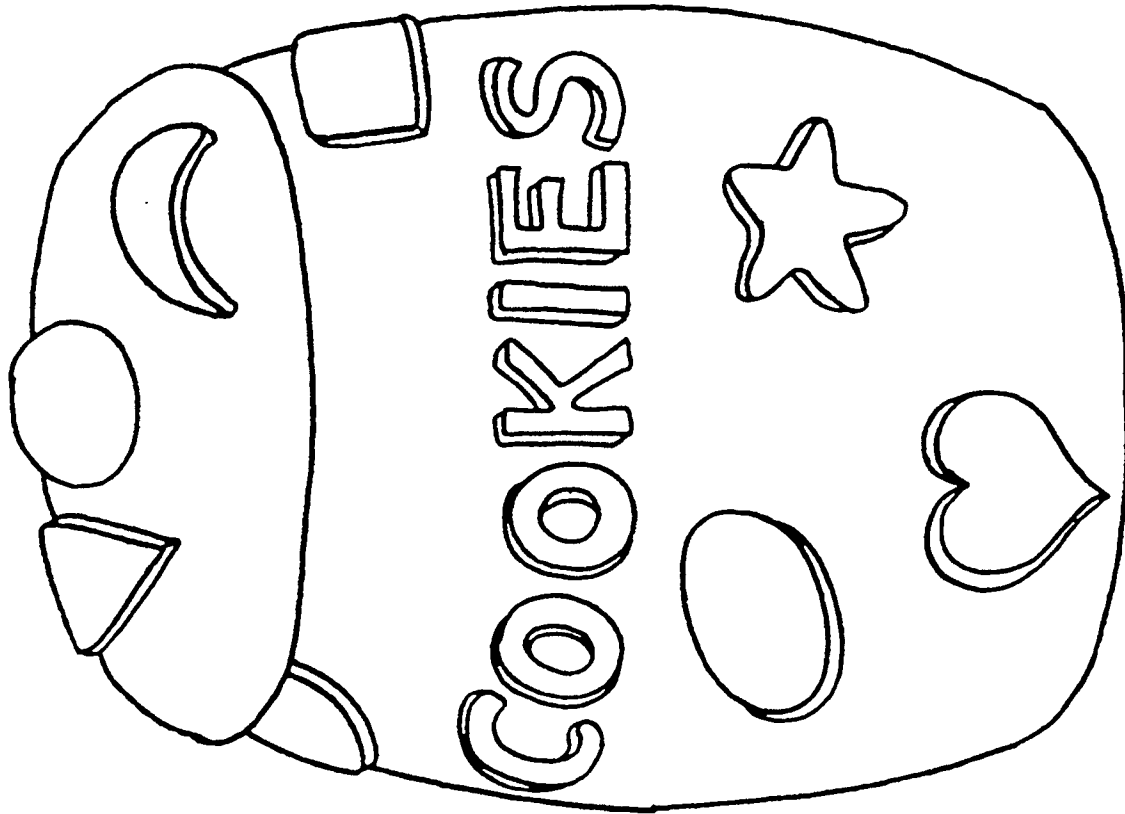
  

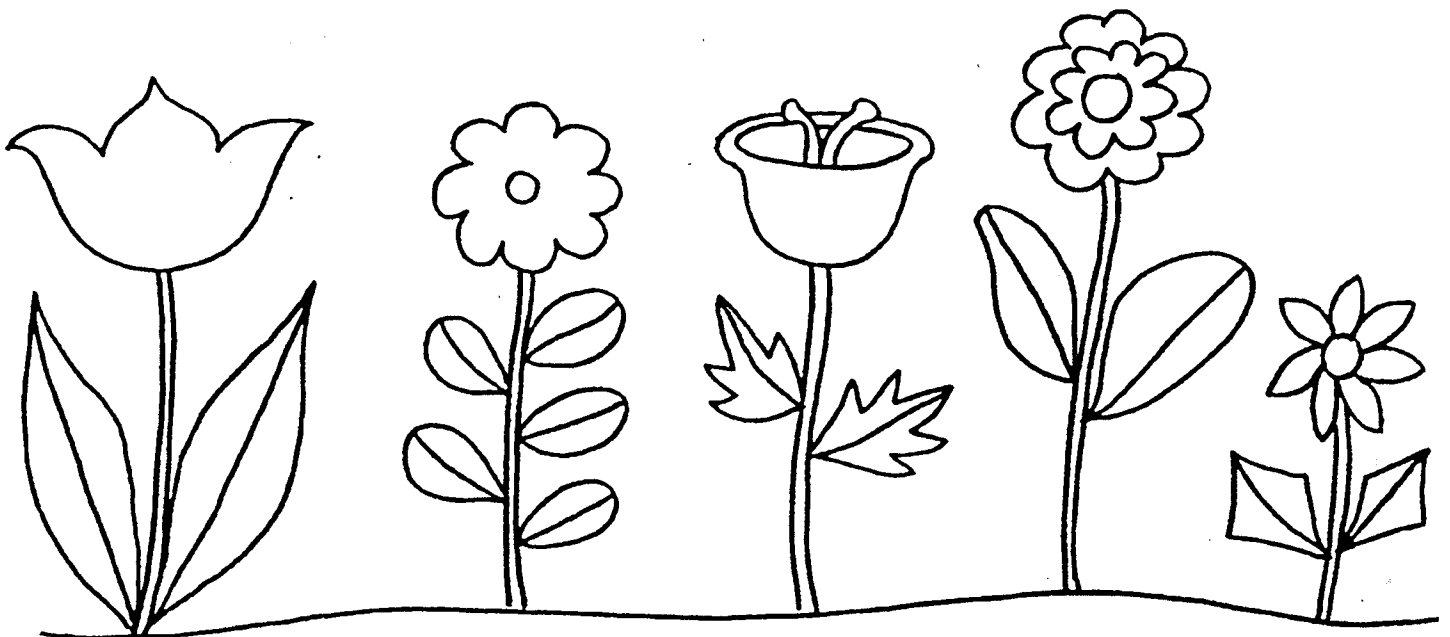
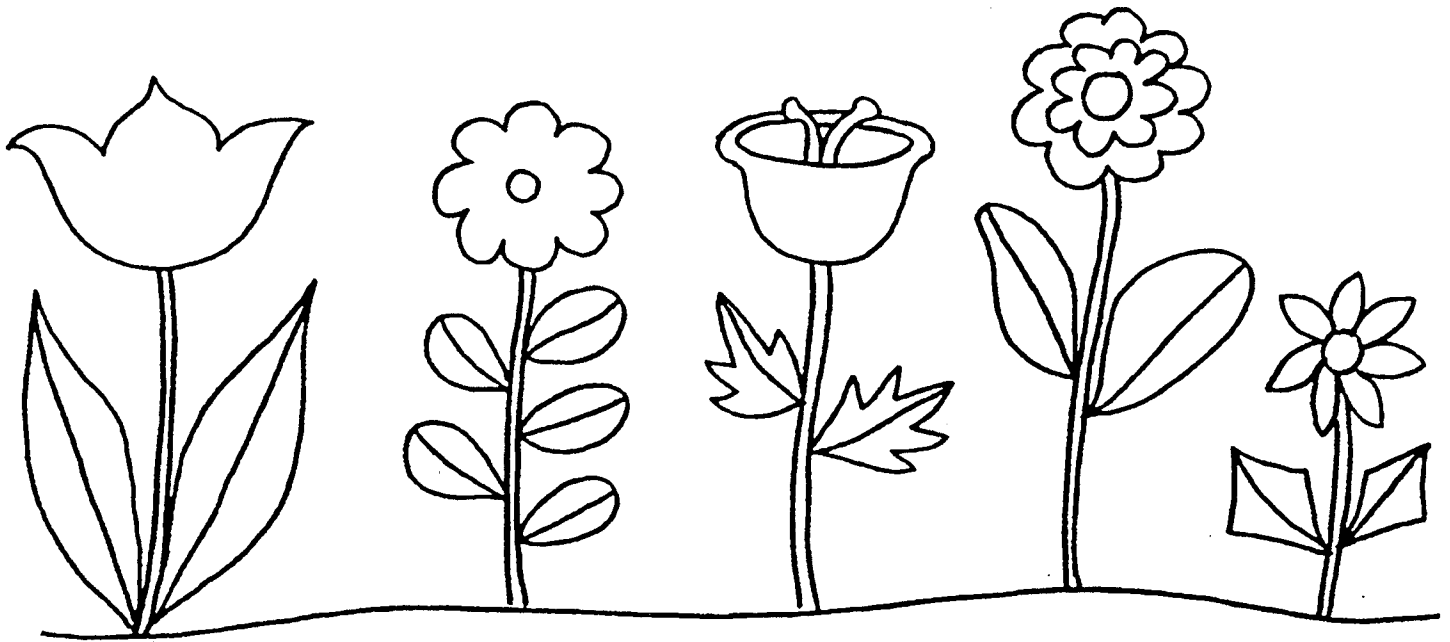
Monday	Tuesday	Wednesday	Thursday	Friday
<b>Group Lessons</b>				
<b>Independent Practice Time</b>				



# Materials Index

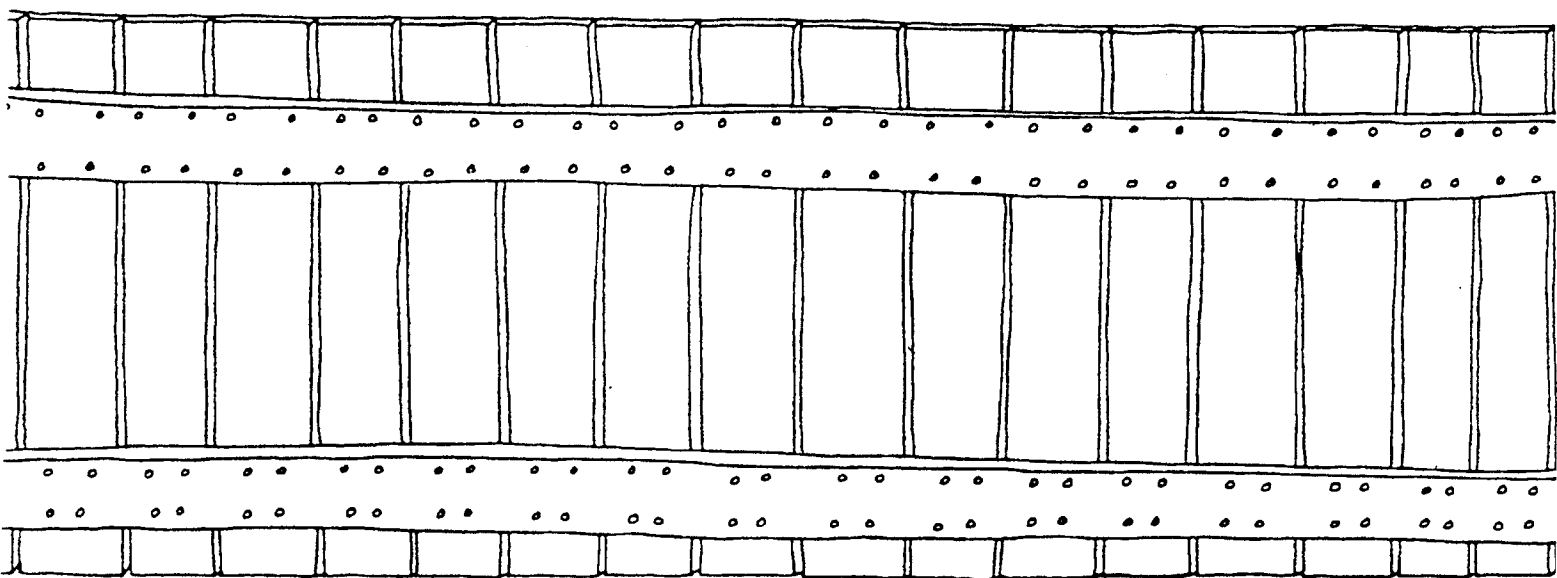
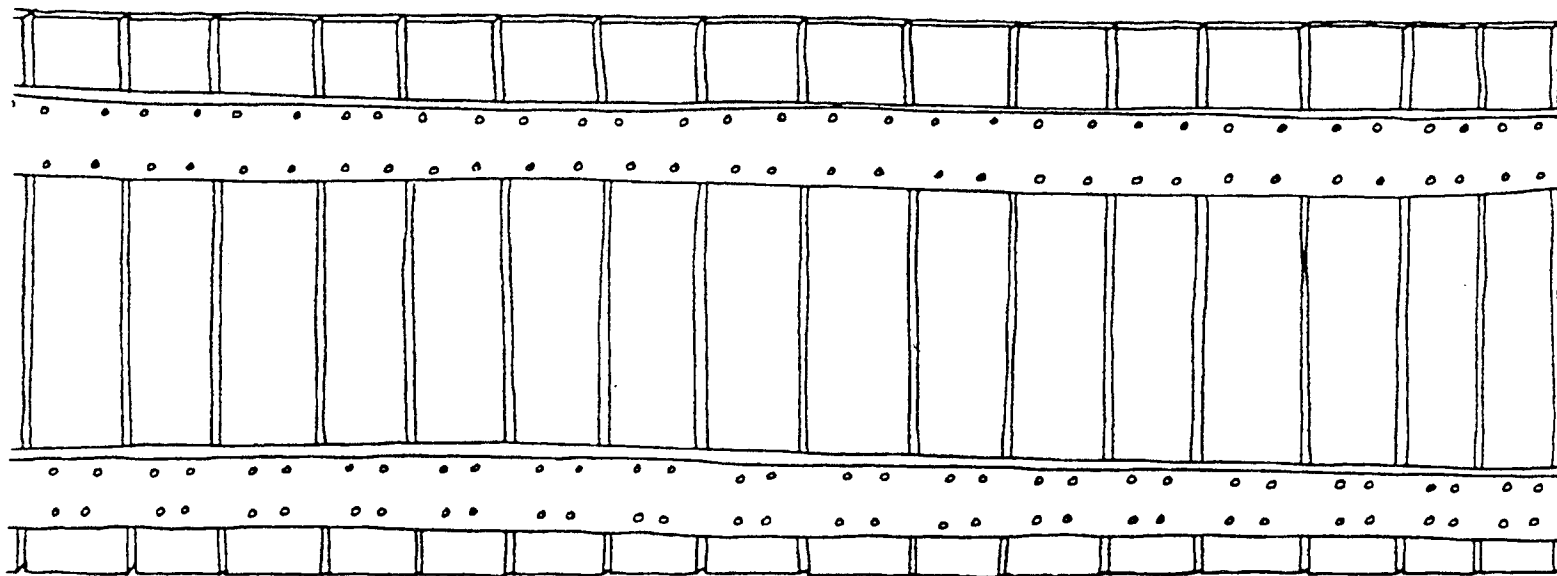


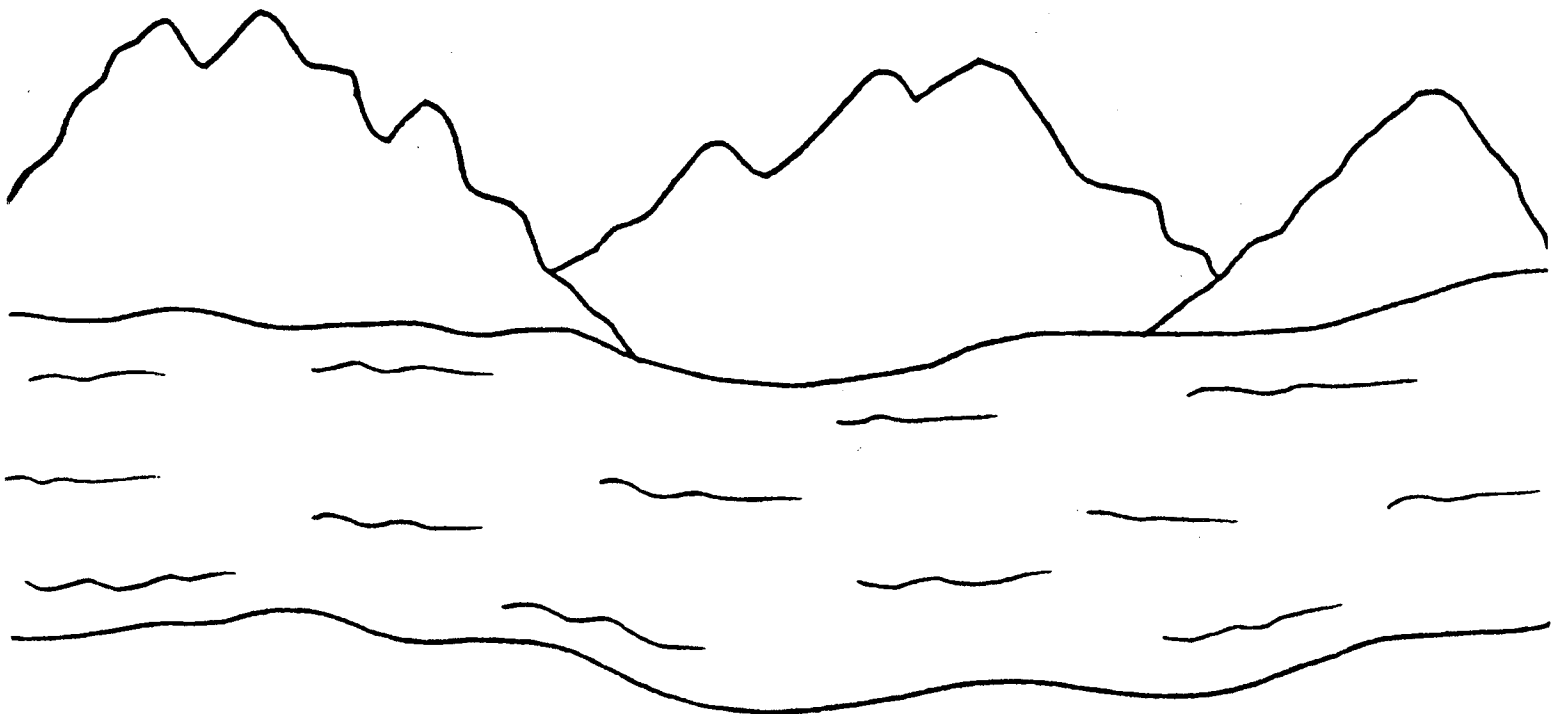
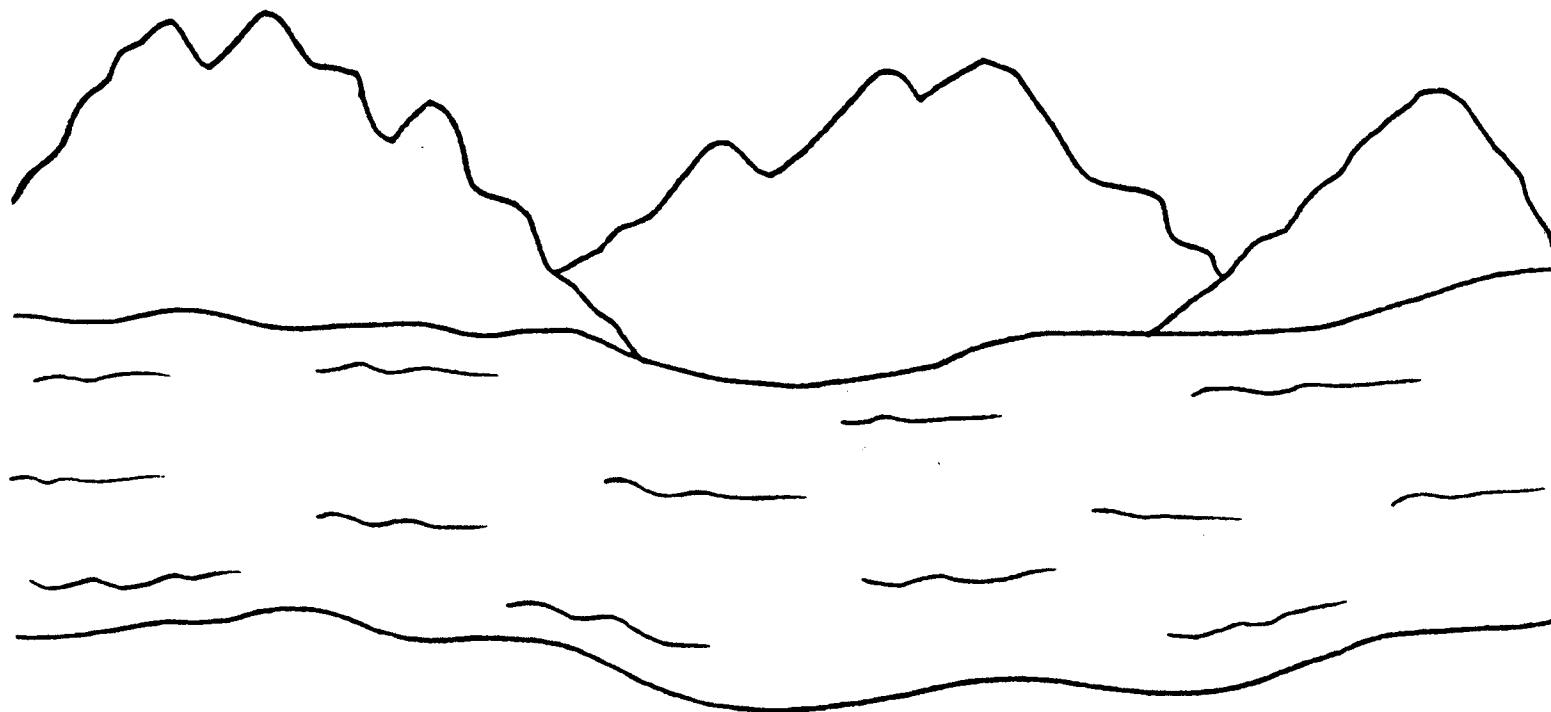




**Part Six: Story Mats—Halloween**  
run 4 copies, cut apart to make 8 mats

**Grades 1 & 2 — 50**

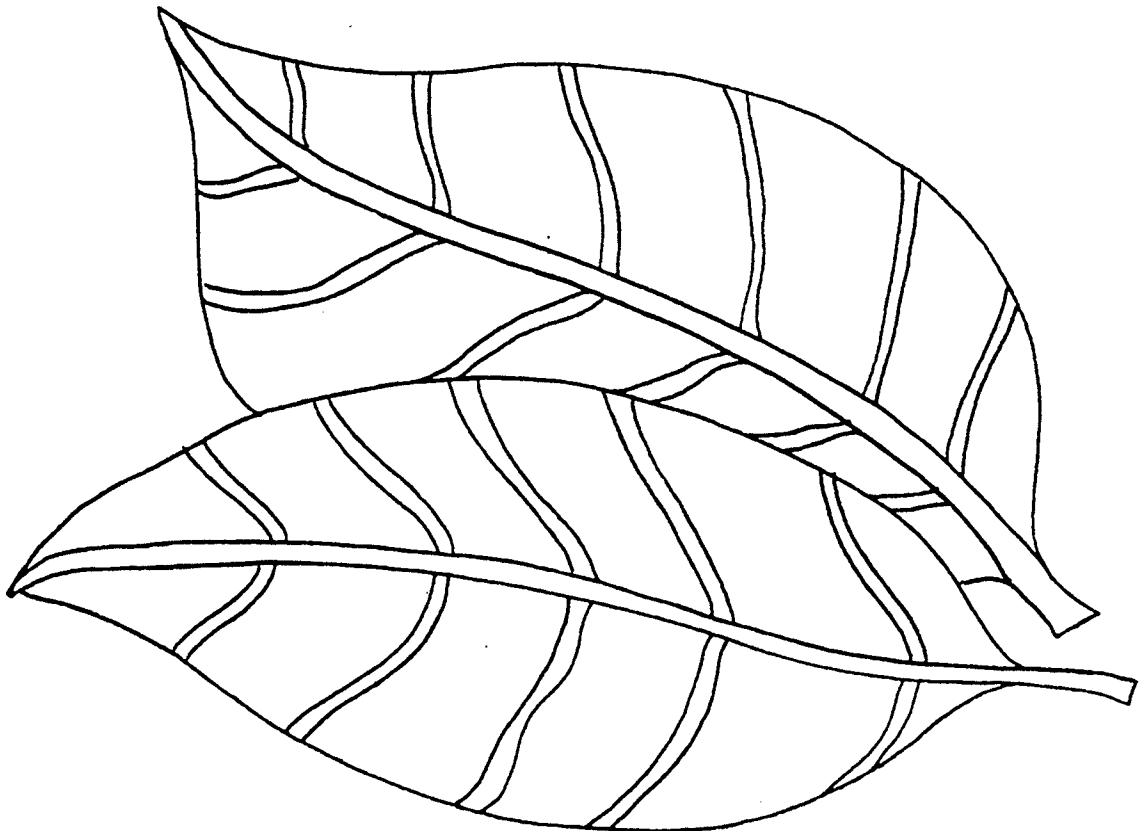
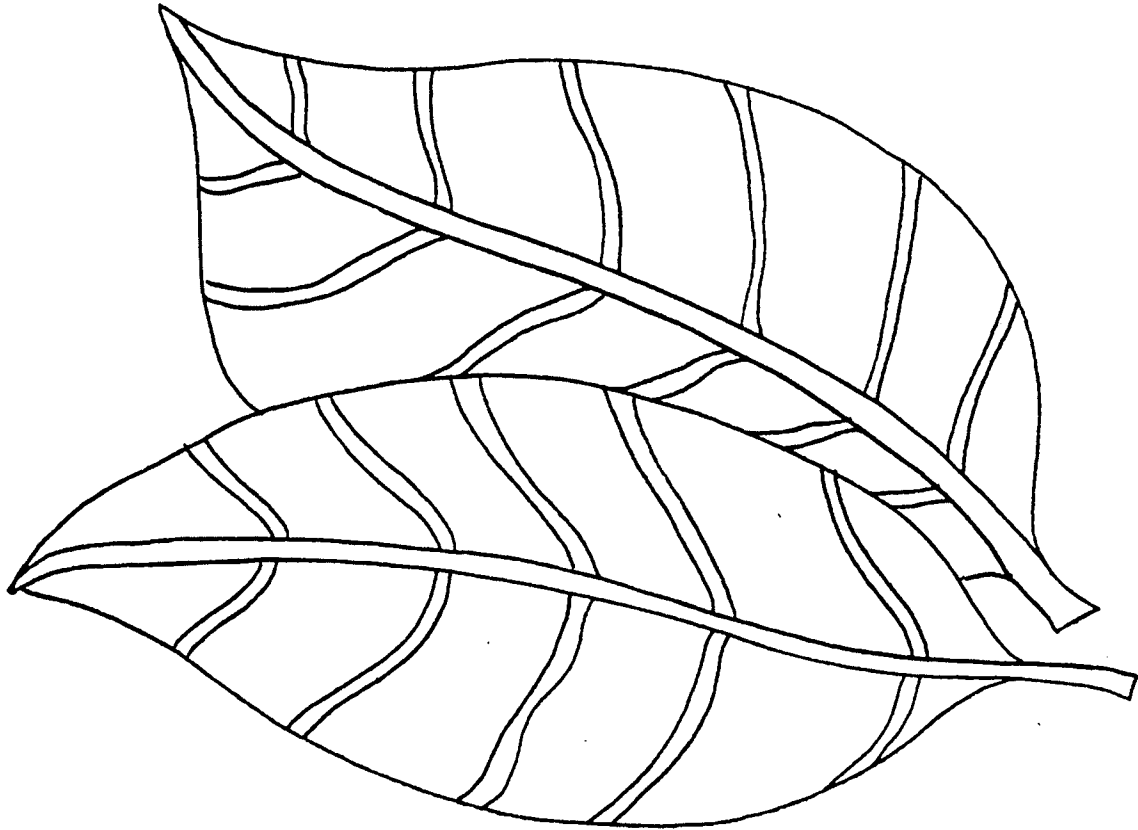






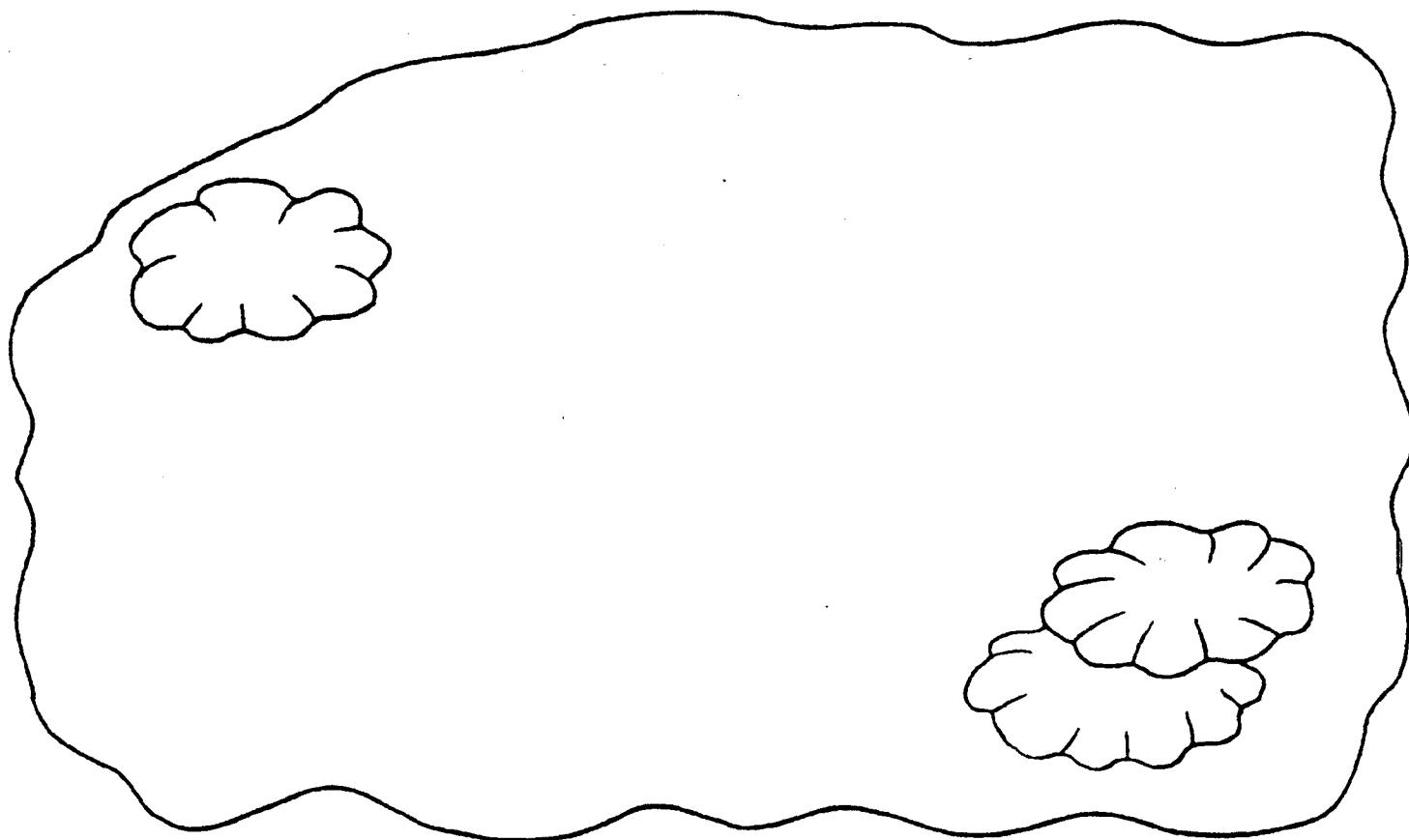
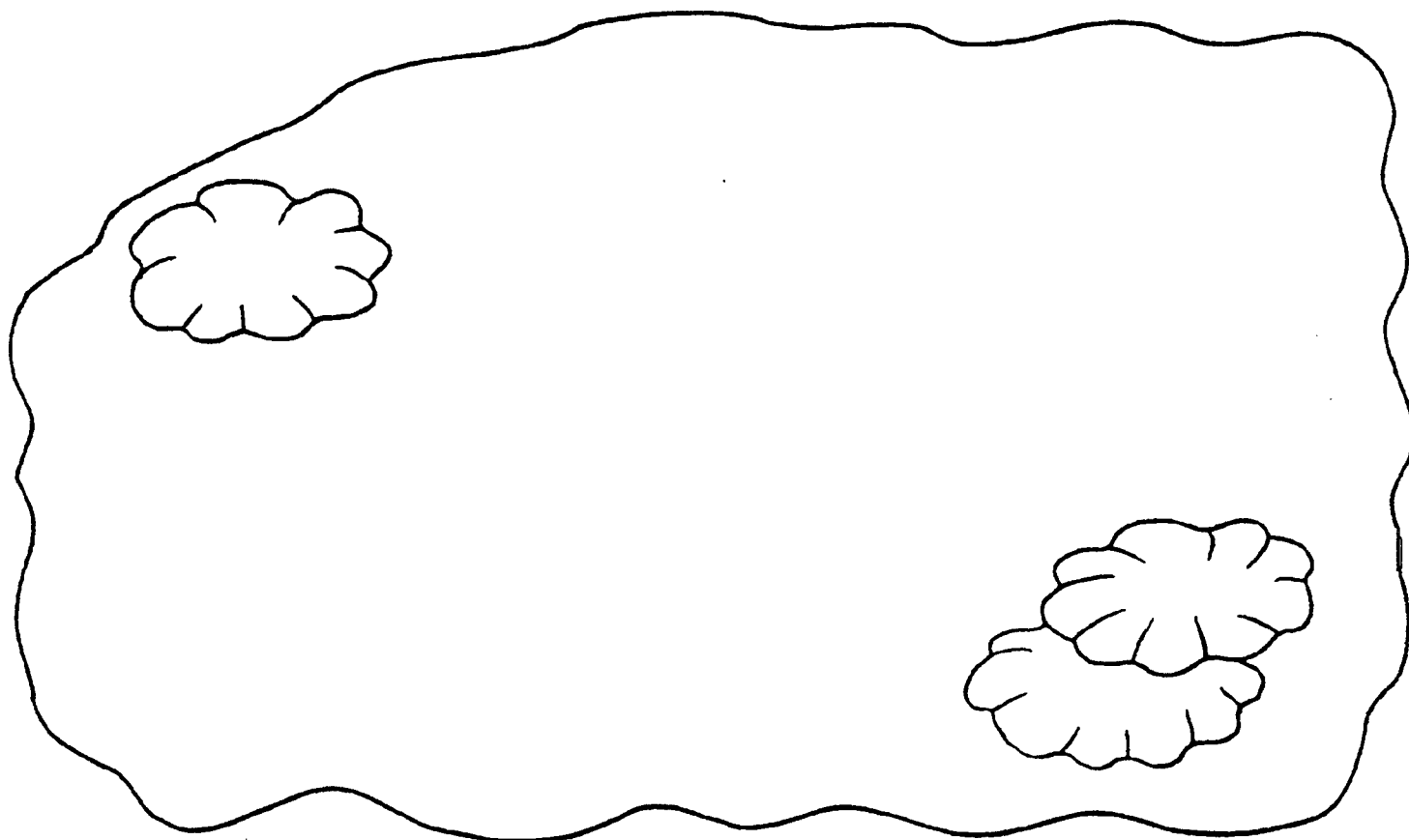
**Part Six: Story Mats—Hungry Caterpillars**  
run 4 copies, cut apart to make 8 mats

**Grades 1 & 2 — 53**

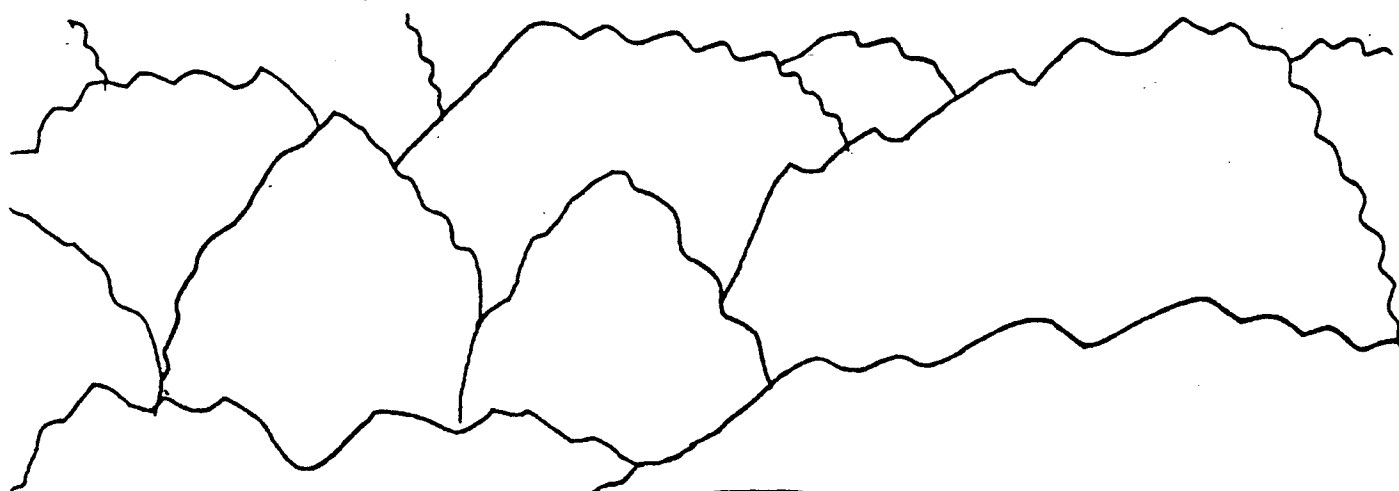
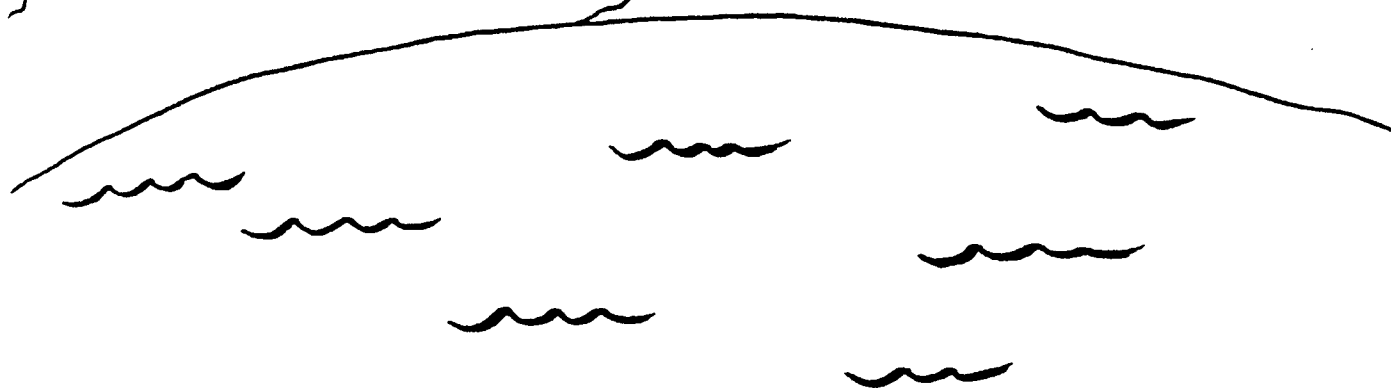
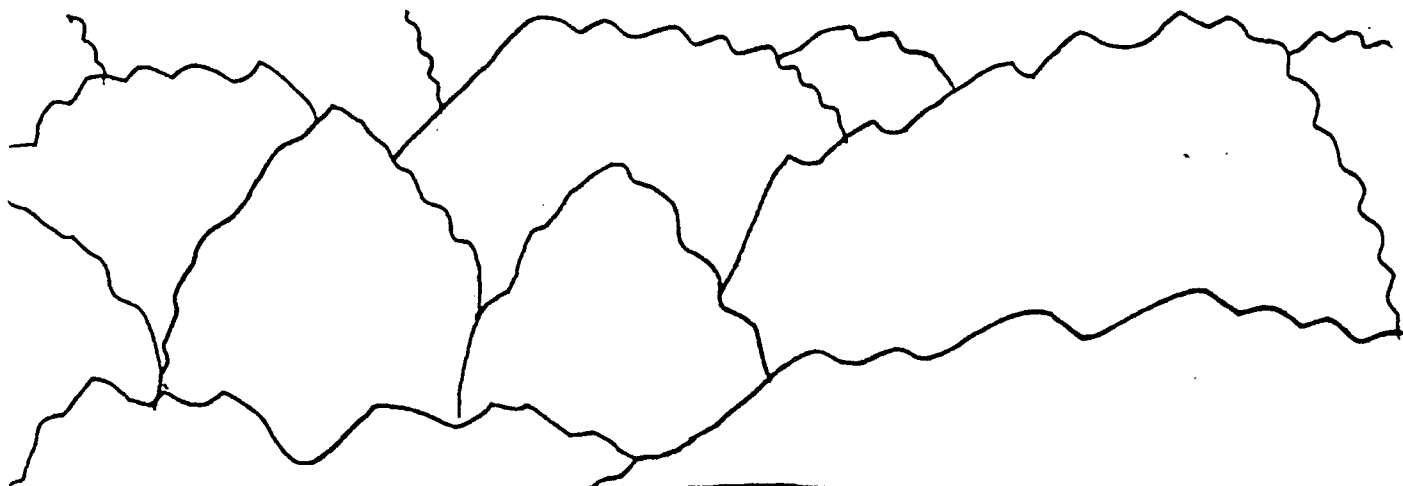


**Part Six: Story Mats—Frog Ponds**  
run 4 copies, cut apart to make 8 mats


**Grades 1 & 2 — 54**












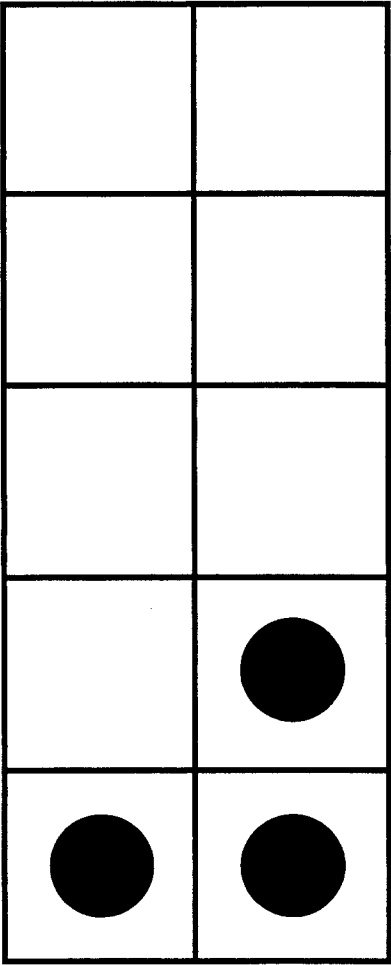
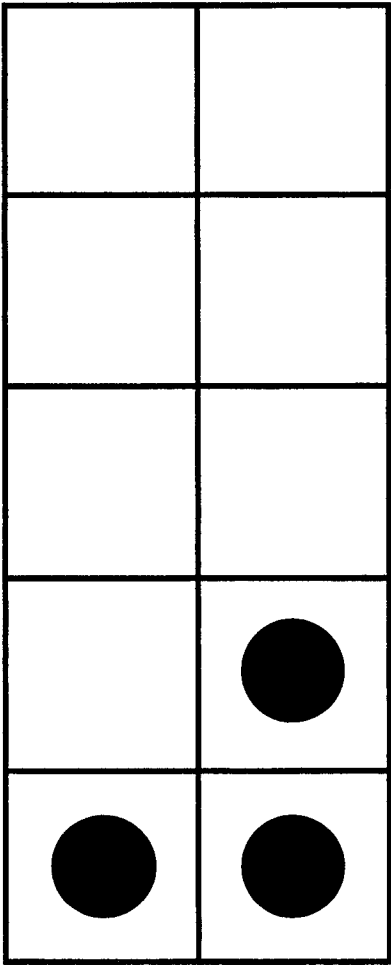




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●	●

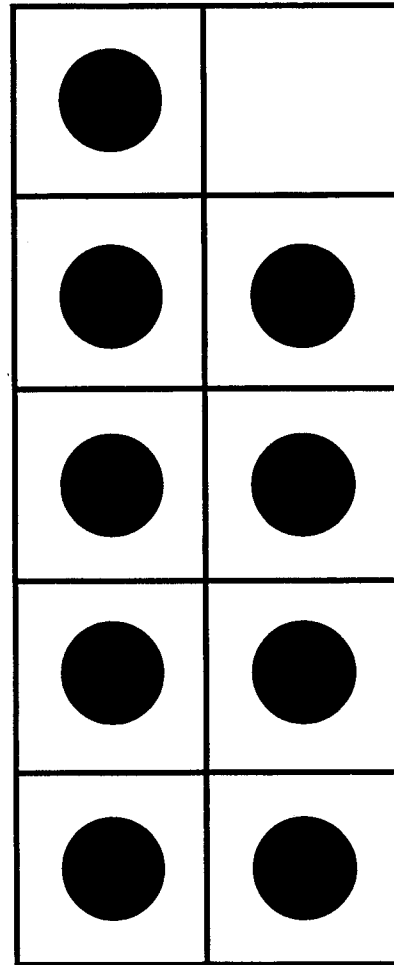
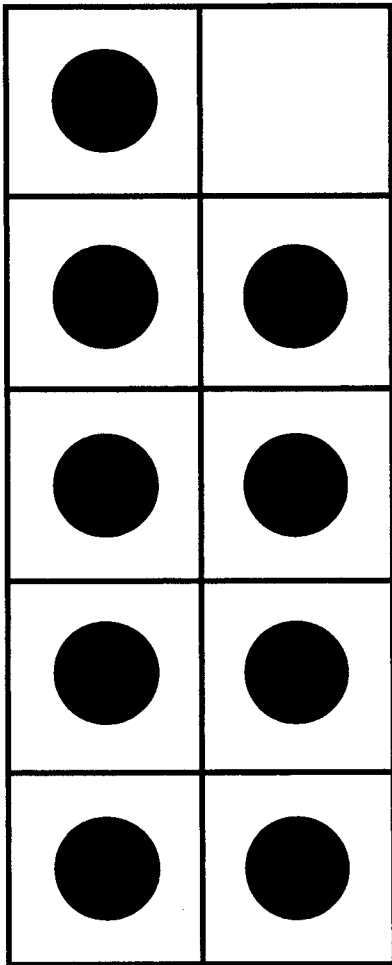


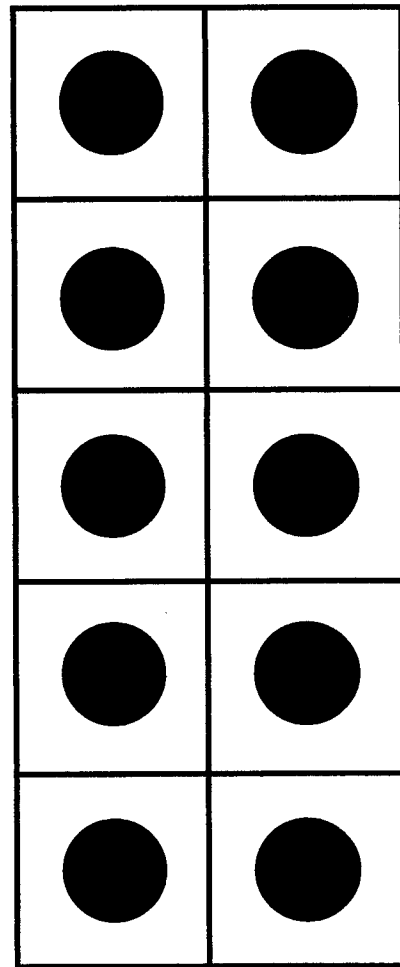
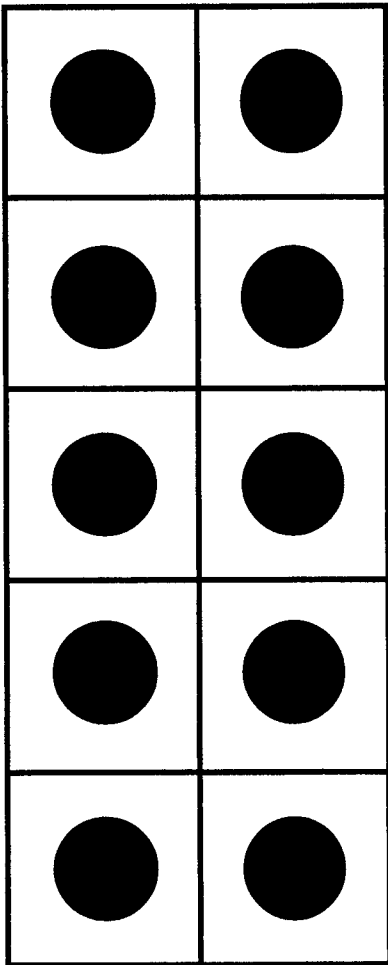
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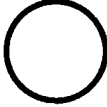
	
	
	
	

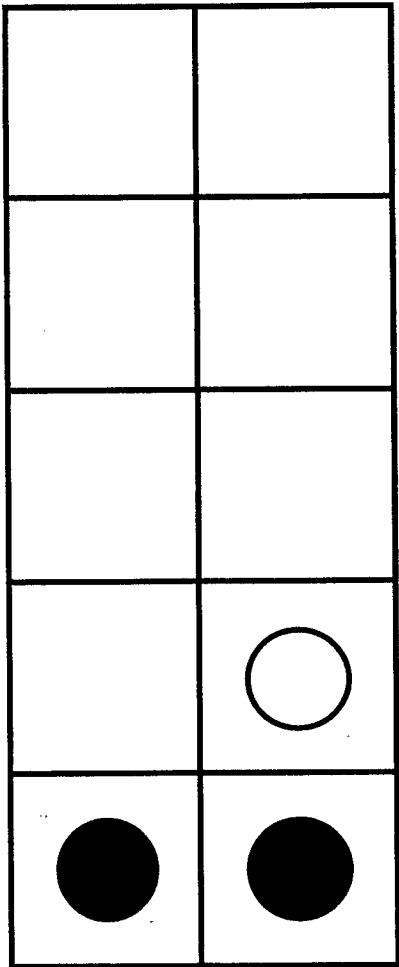
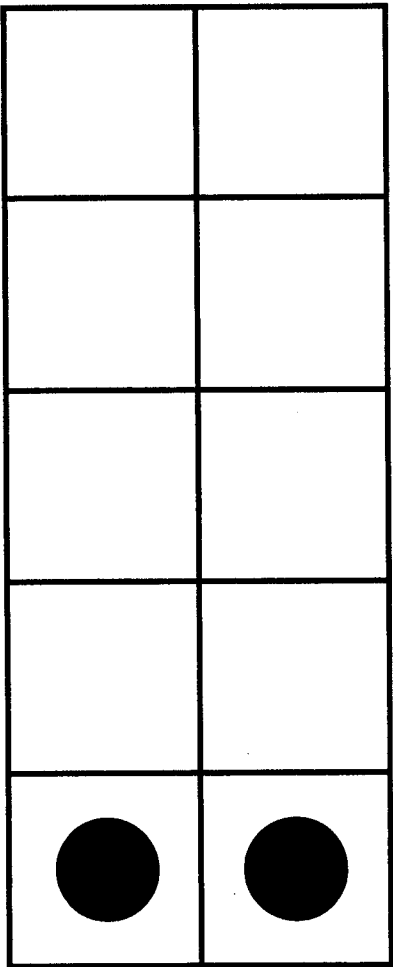
	
	
	
	

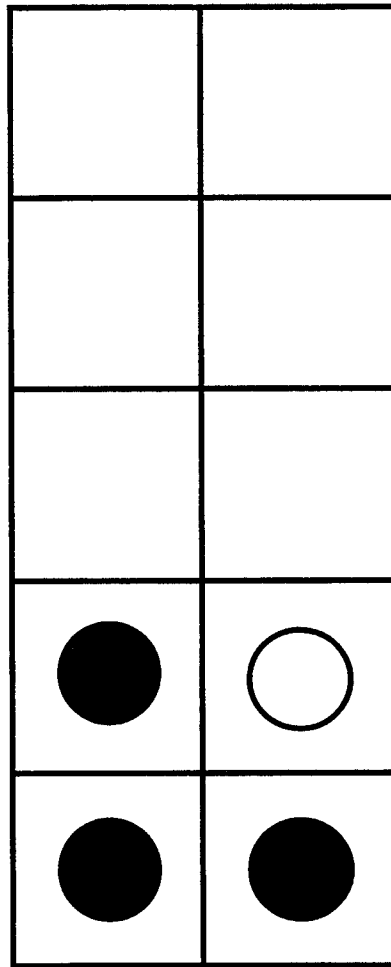
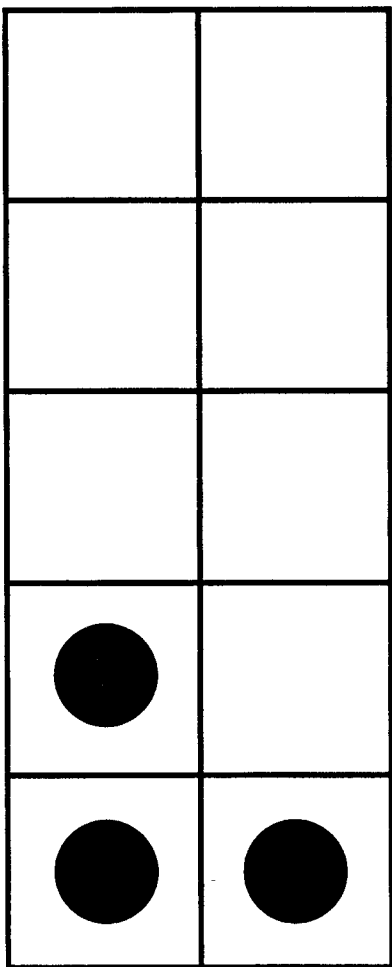


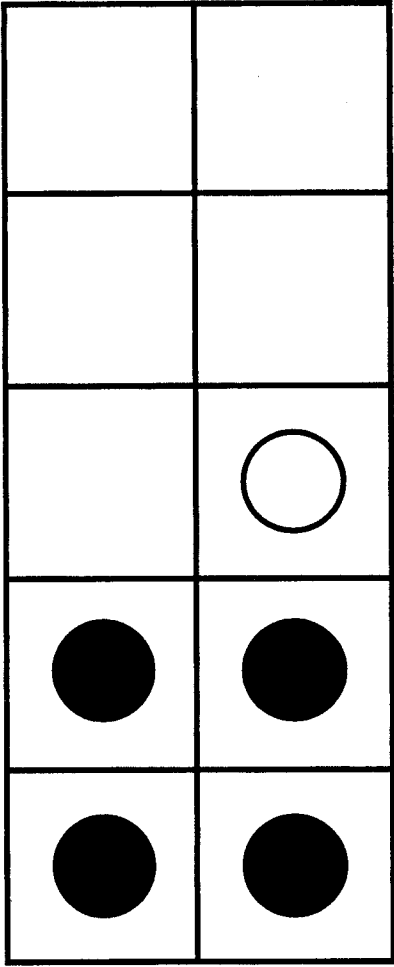
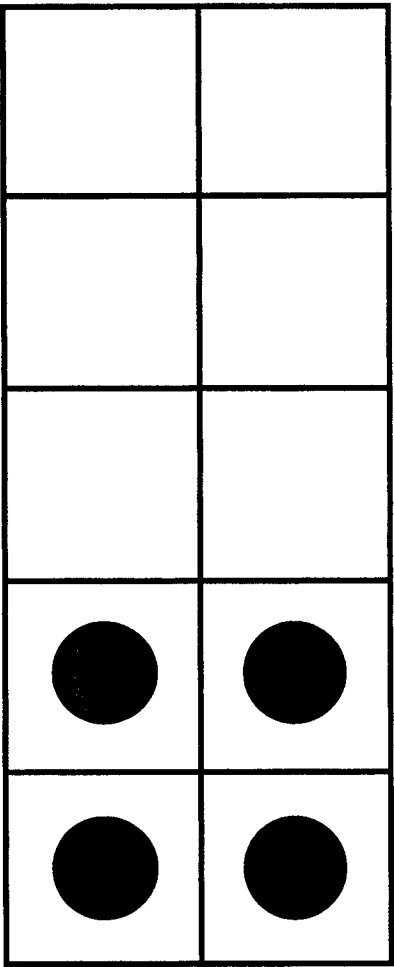


















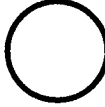






●	
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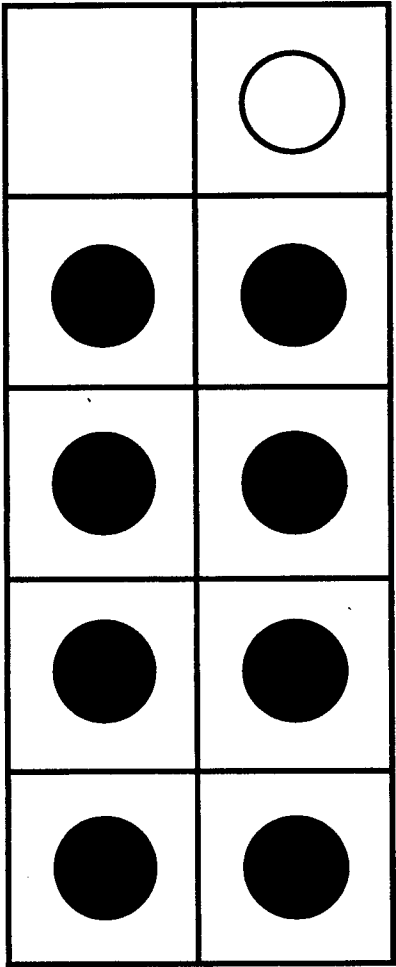
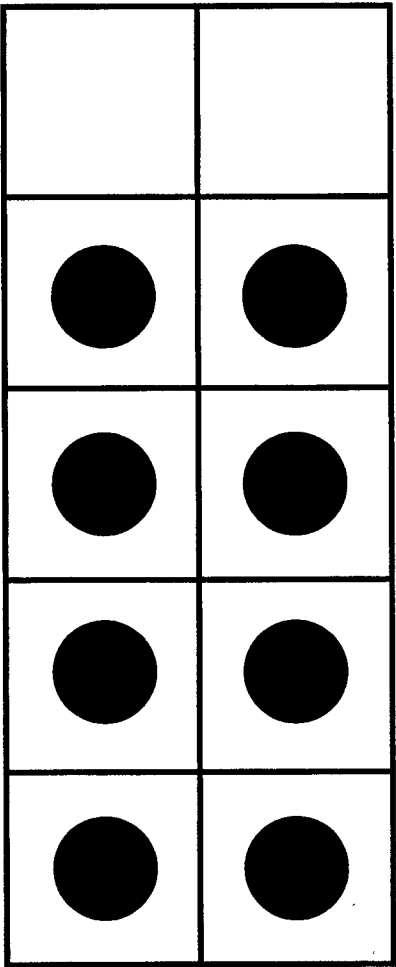
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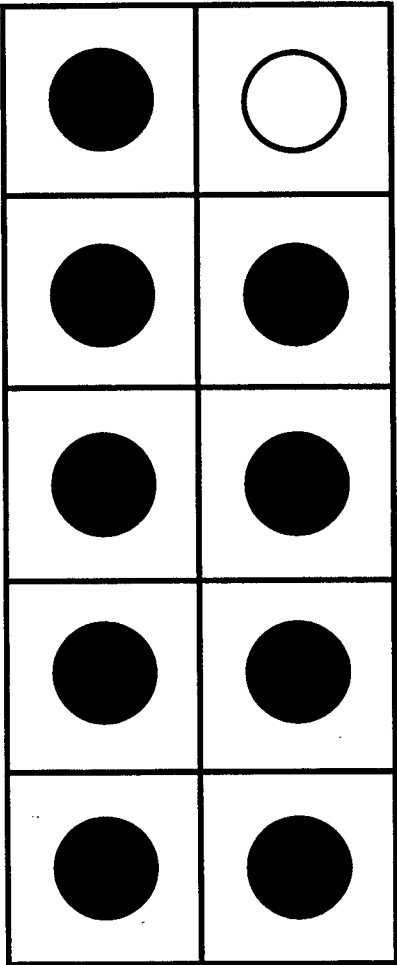
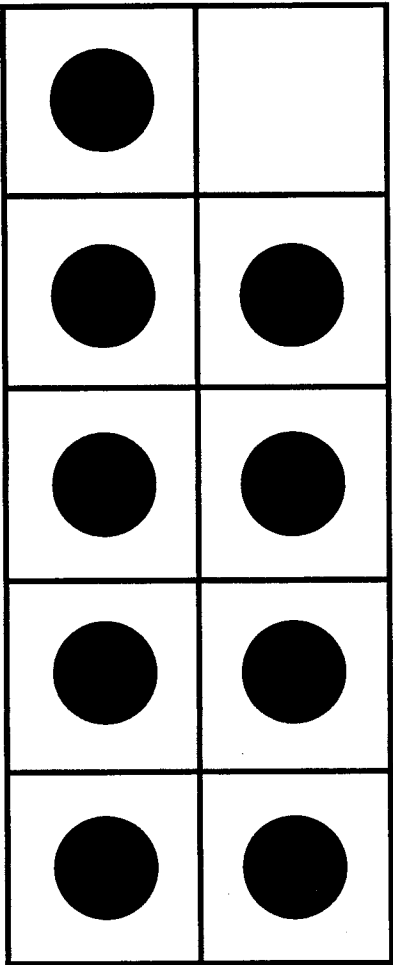
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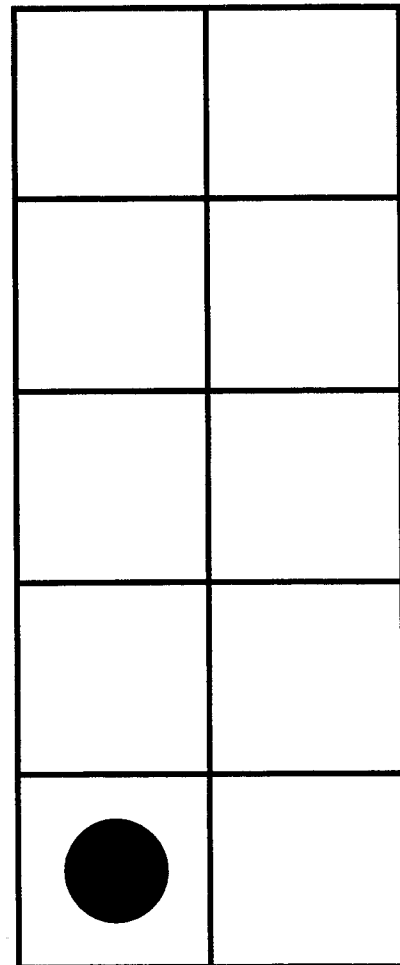
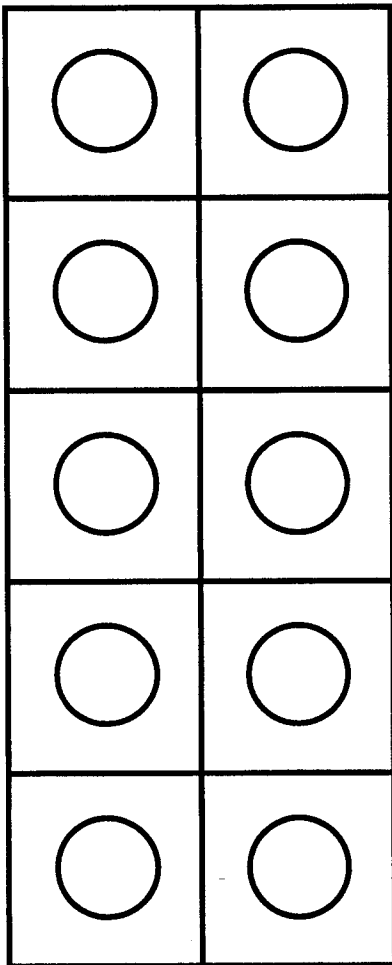
	○
●	●
●	●
●	●

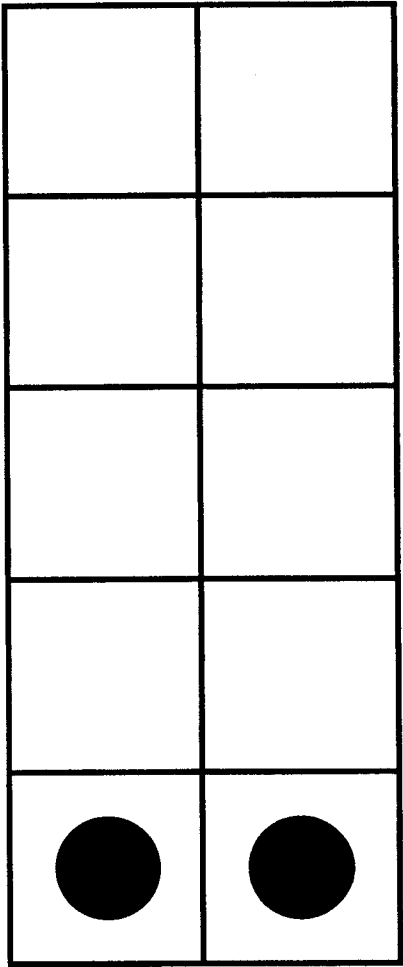
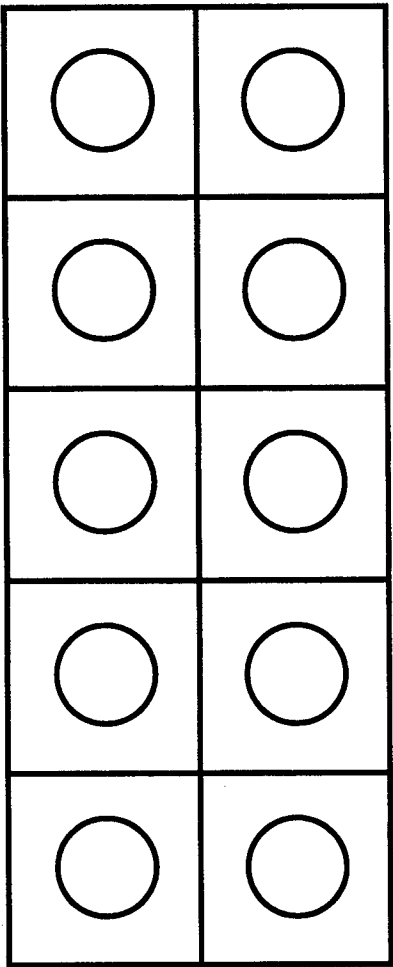
	
	
	
	

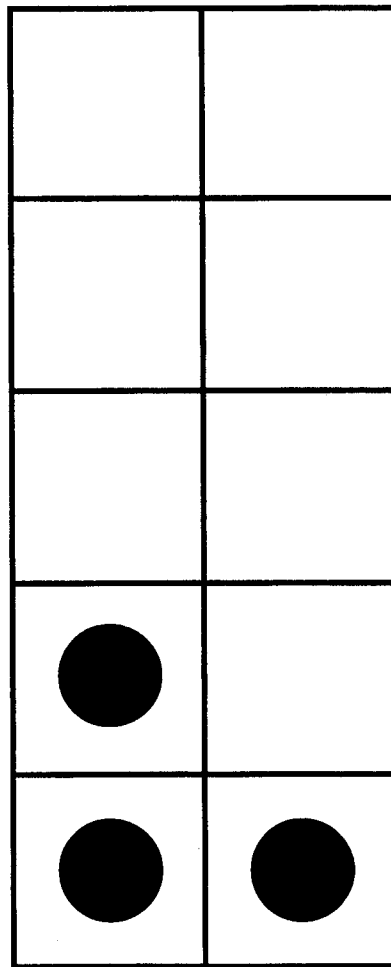
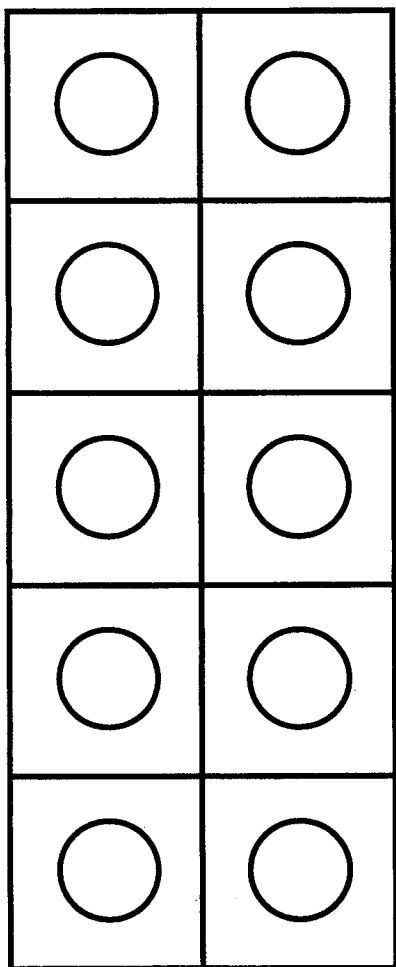
	
	
	
	



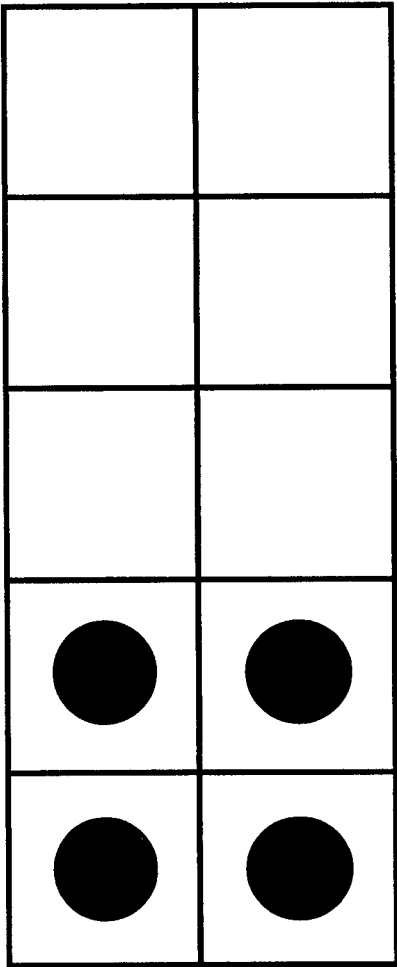
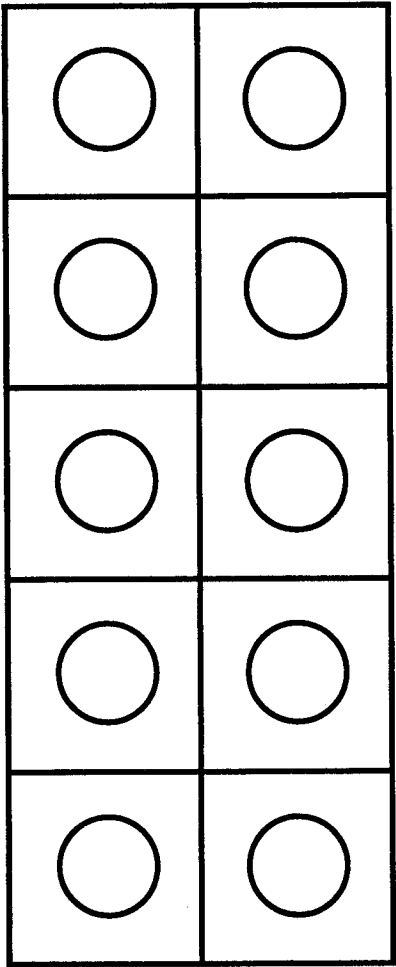


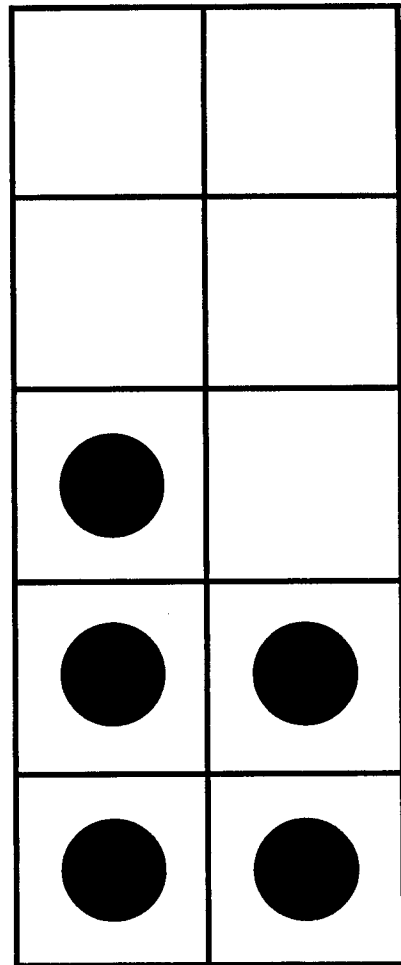
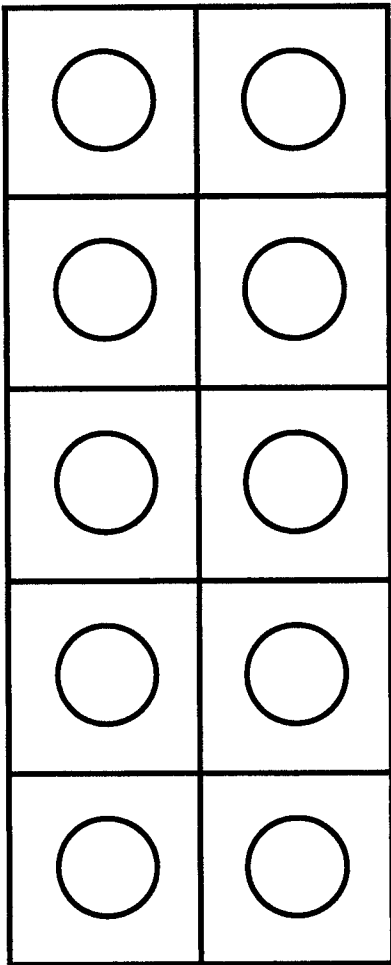


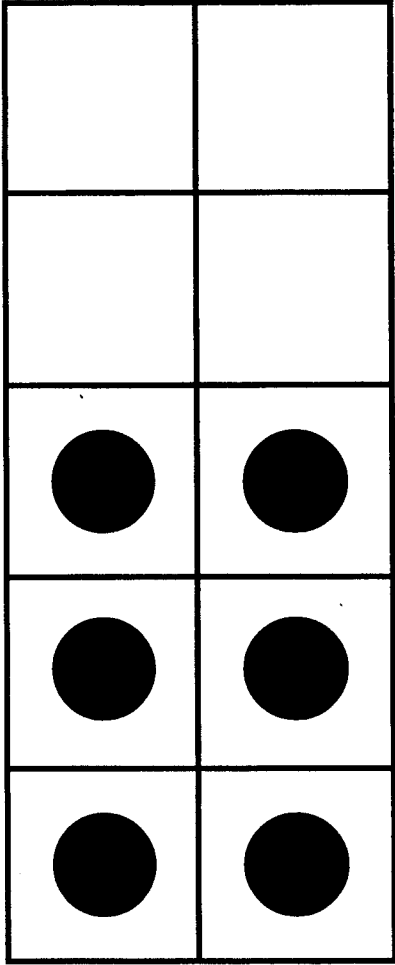
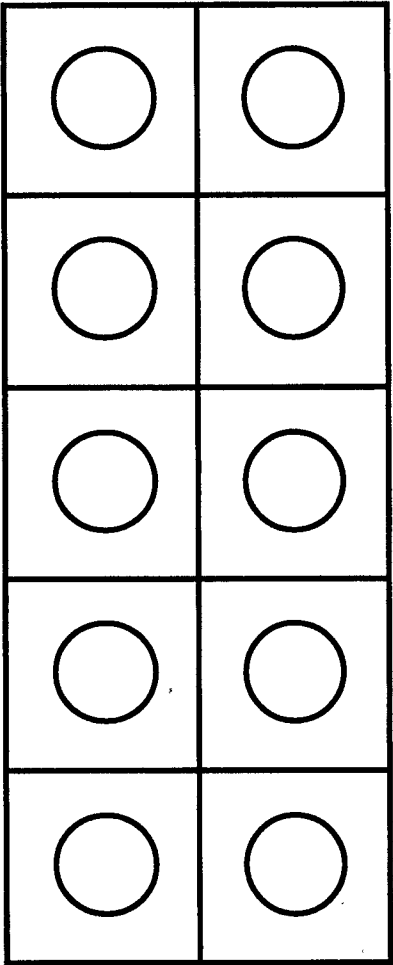


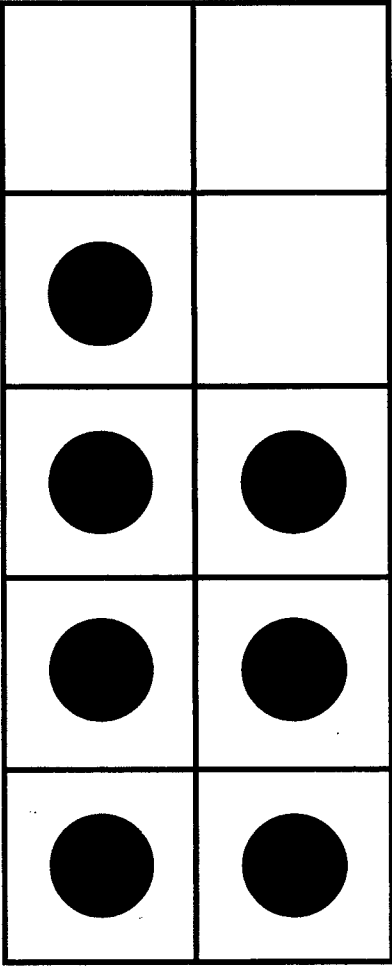
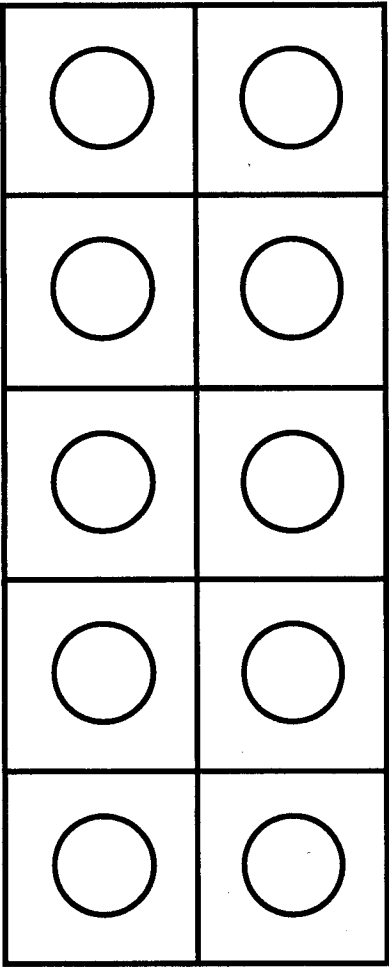


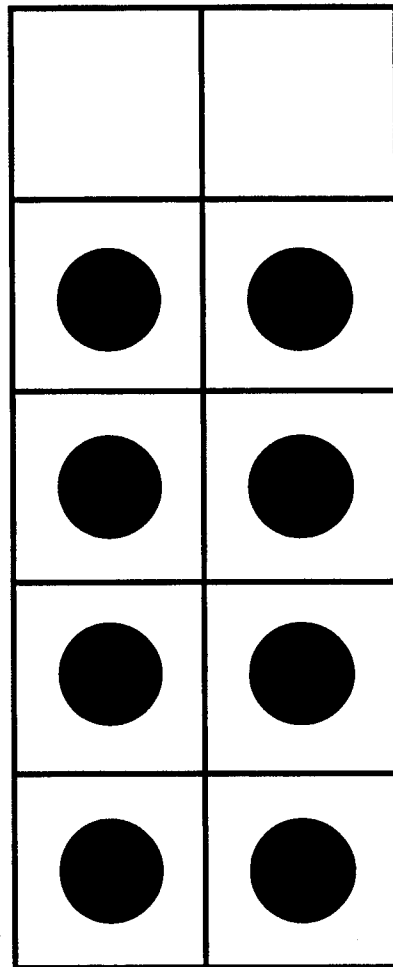
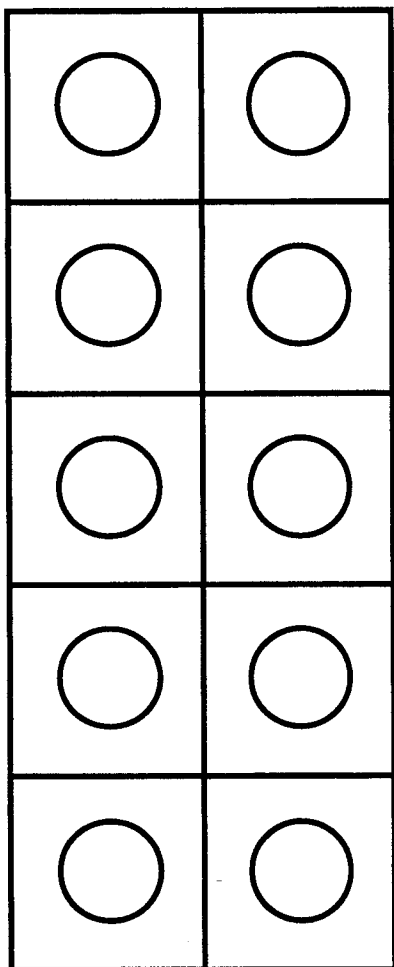


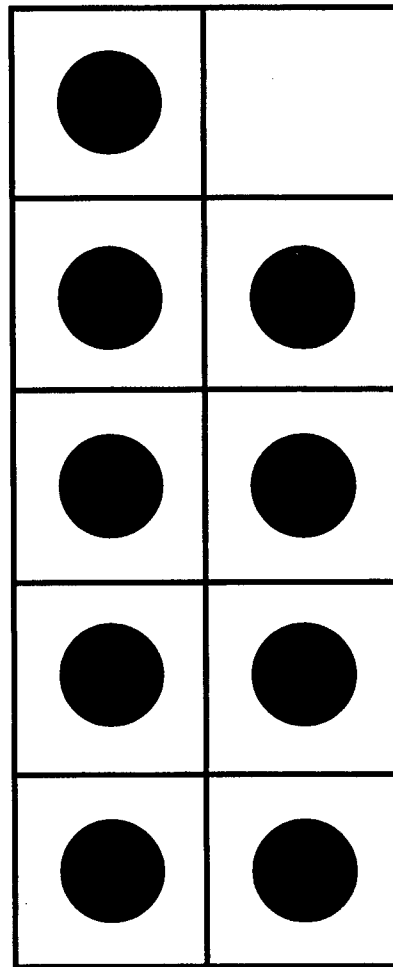
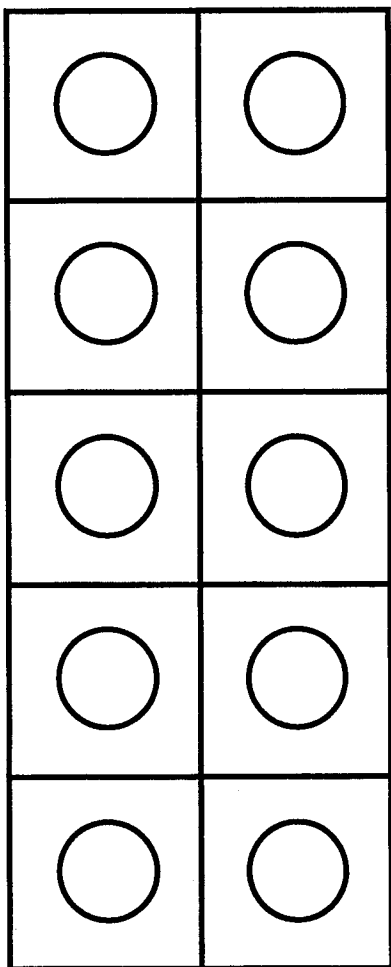


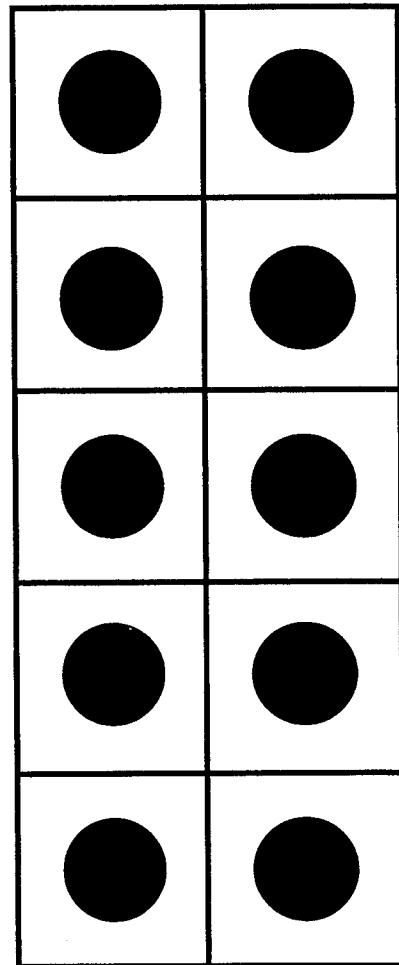
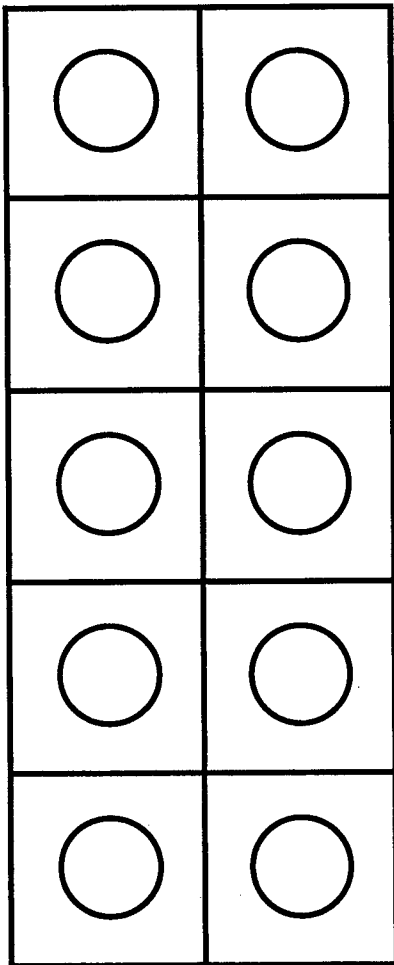


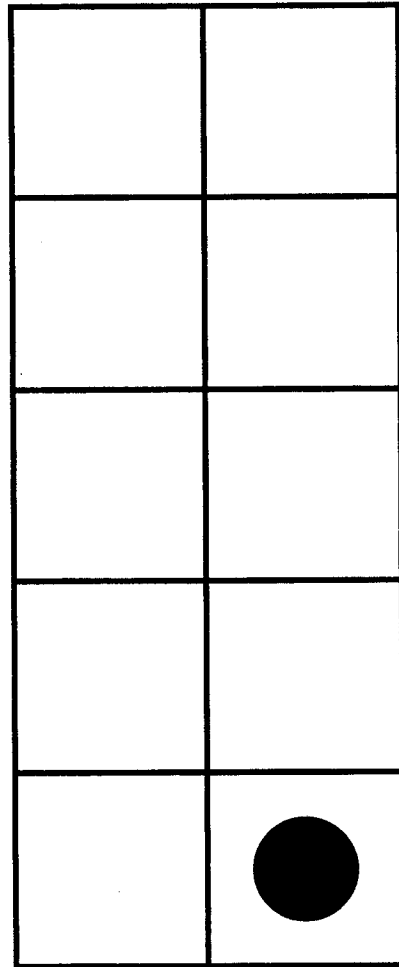
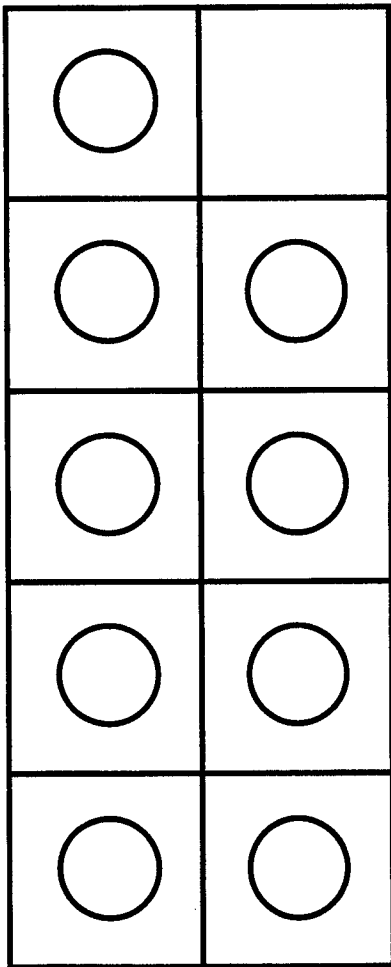




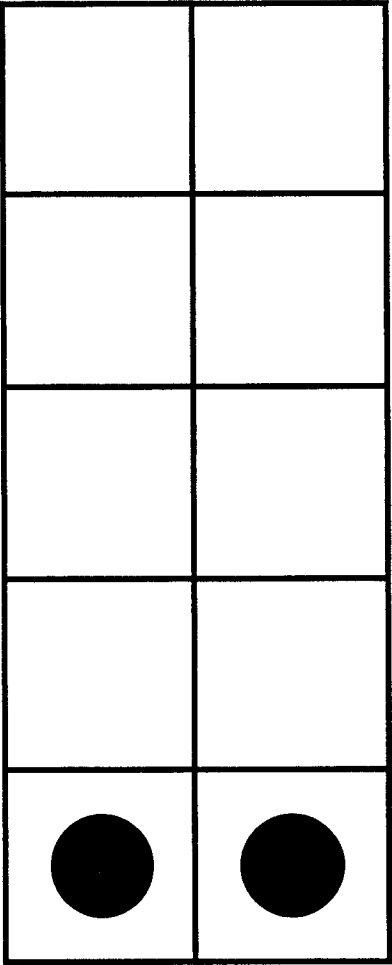
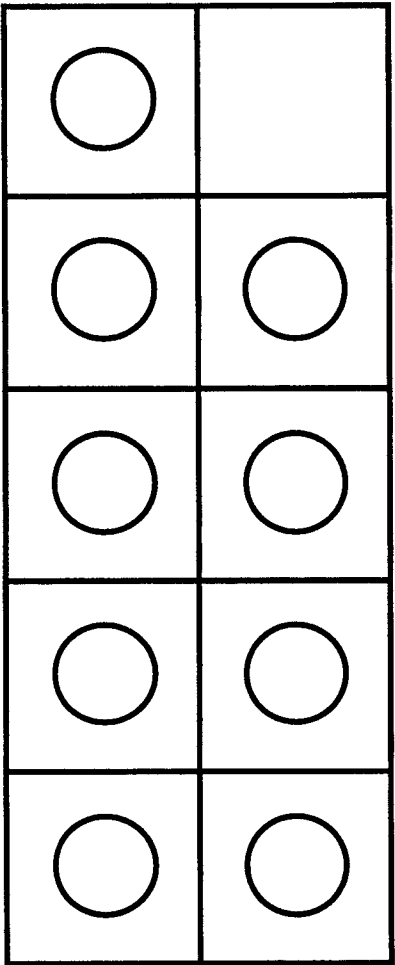


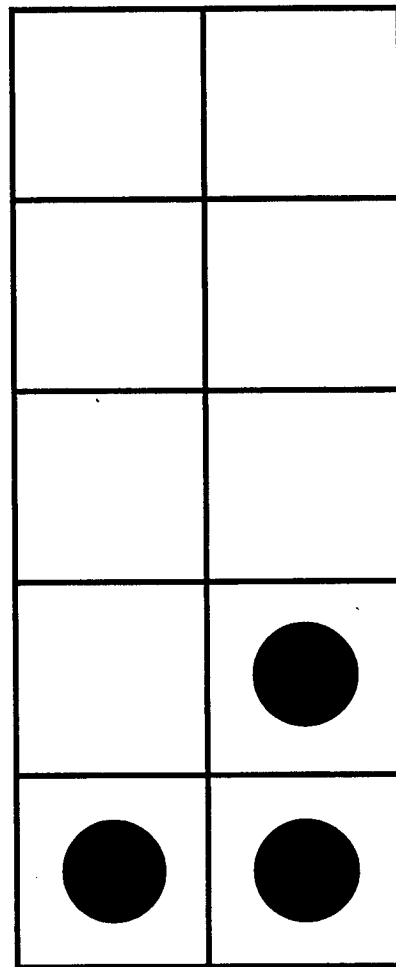
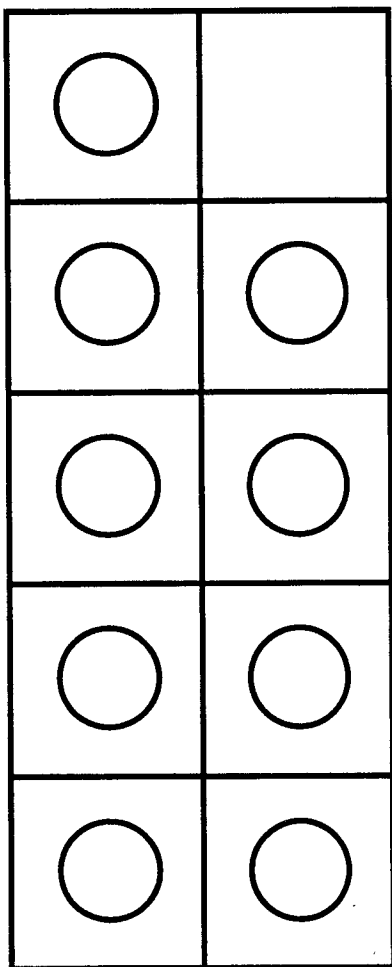


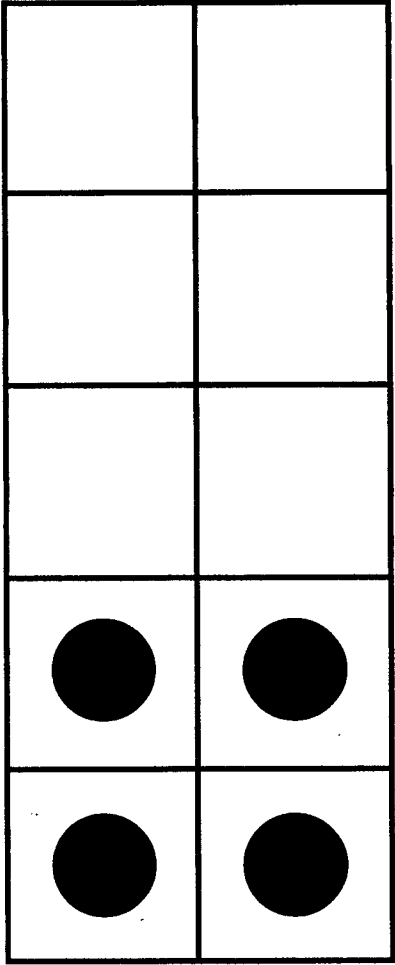
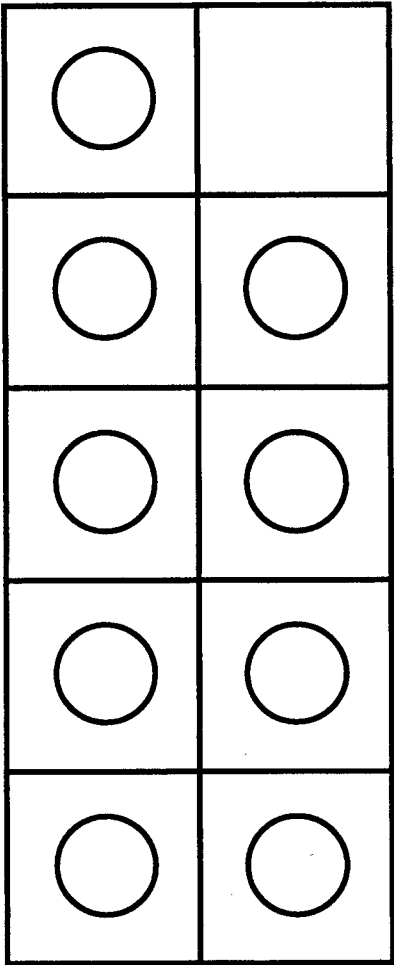


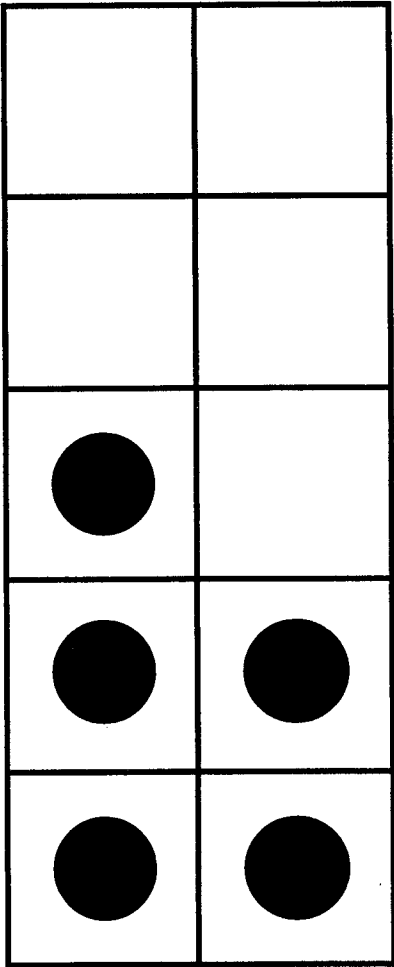
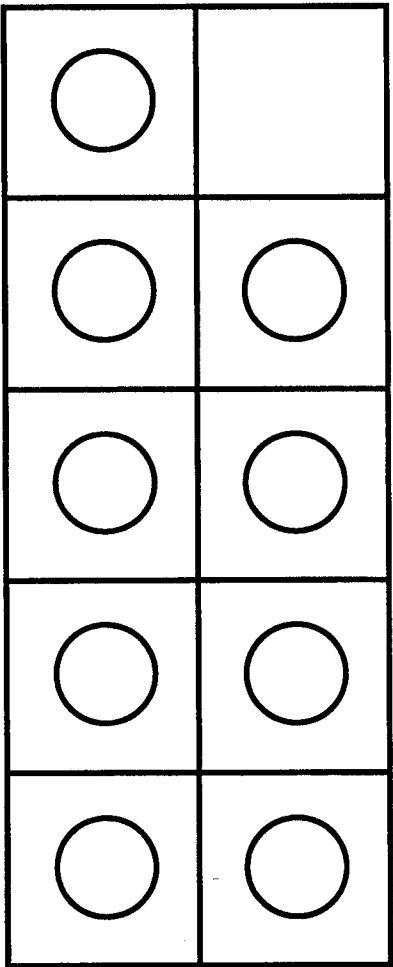


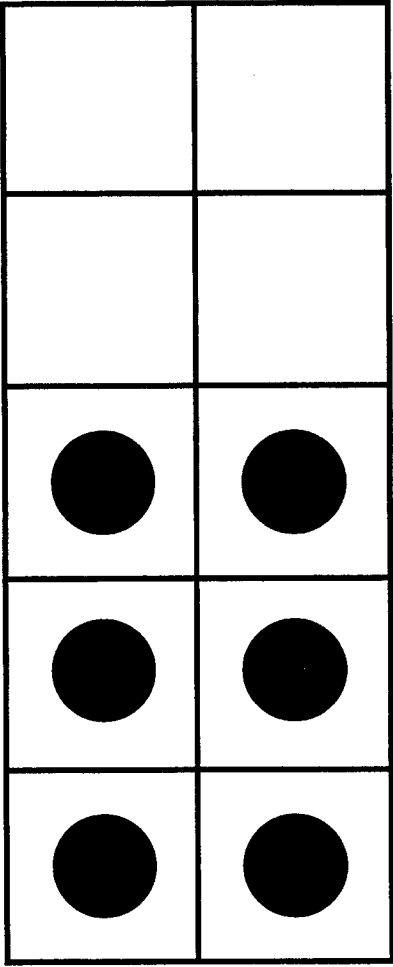
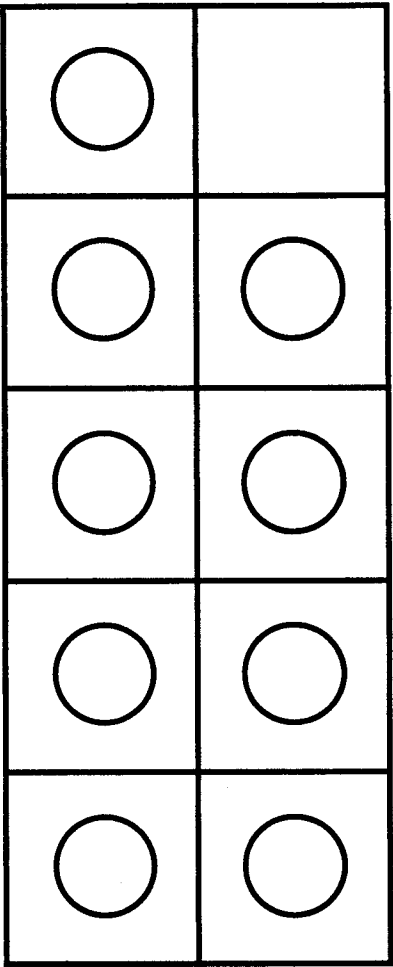


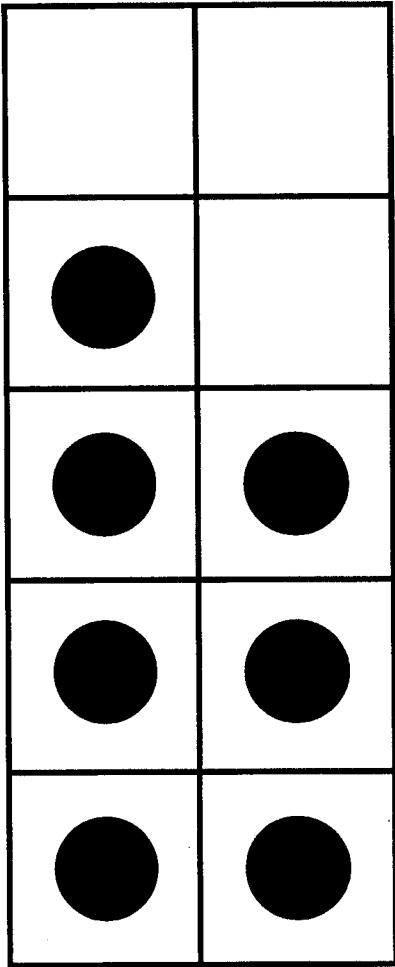
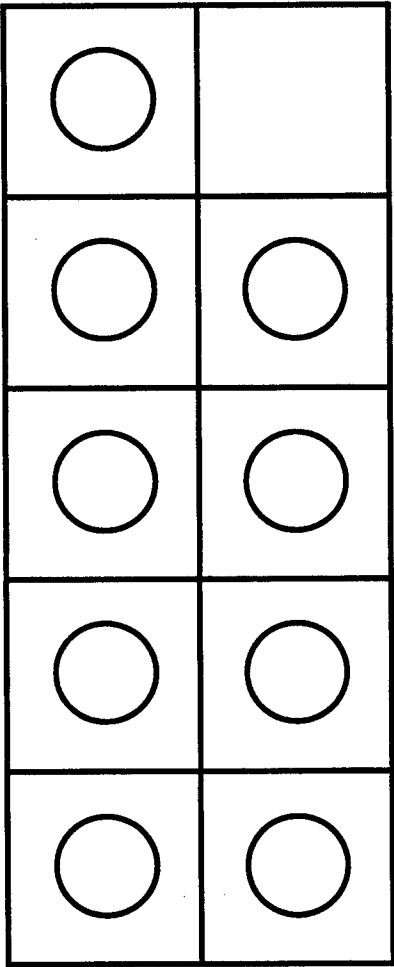


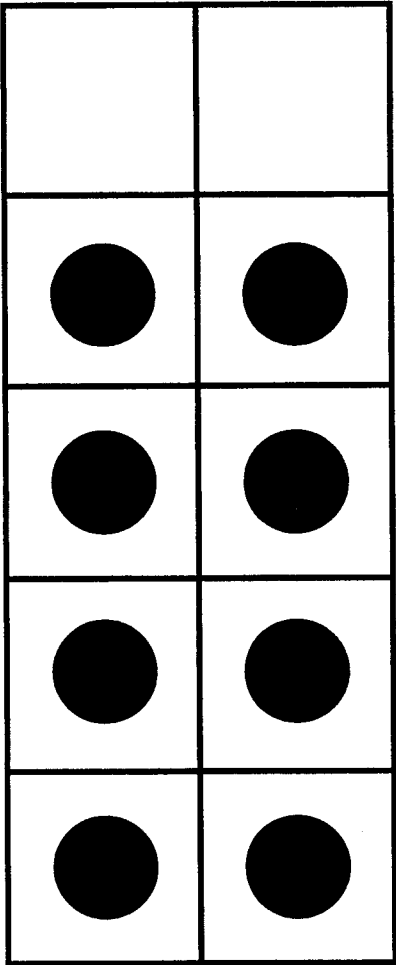
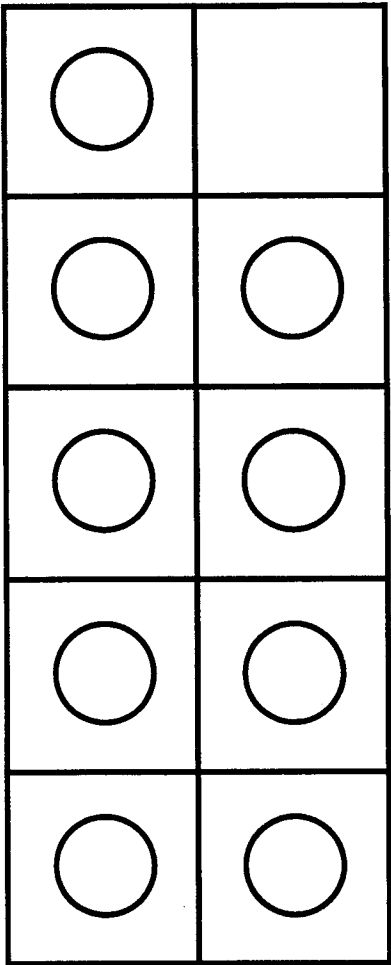


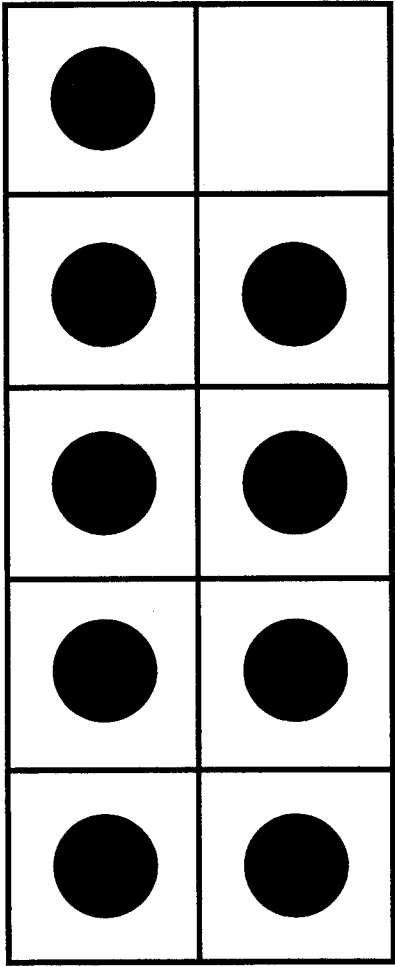
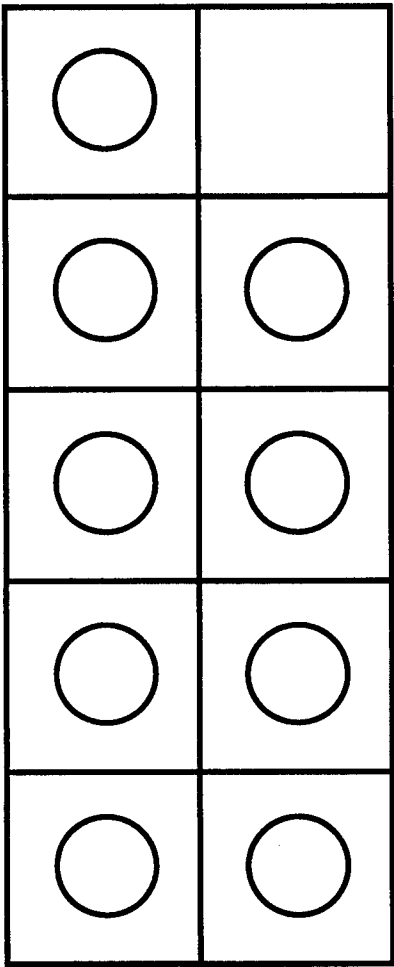










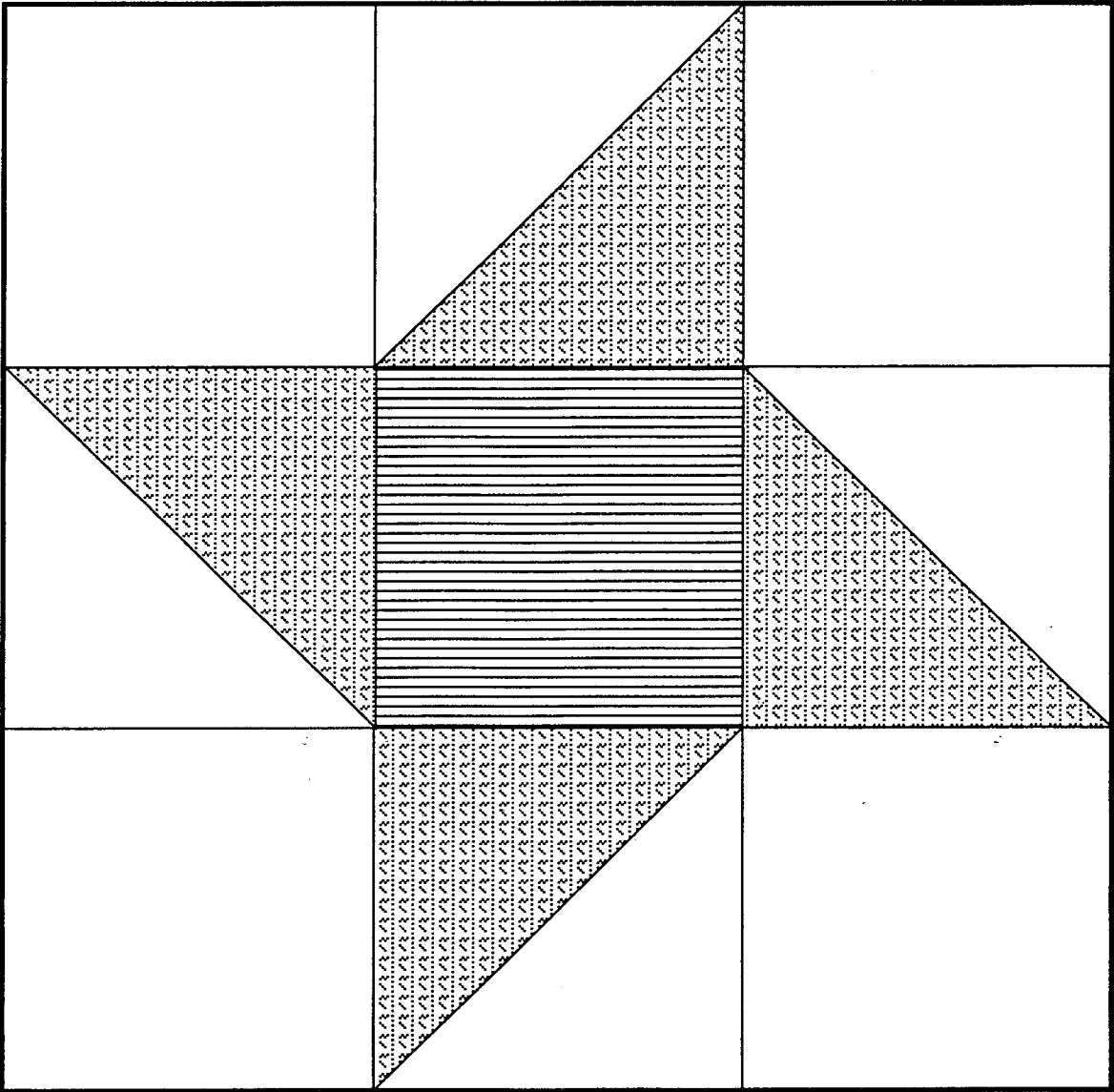




# **Blackline Supplement**

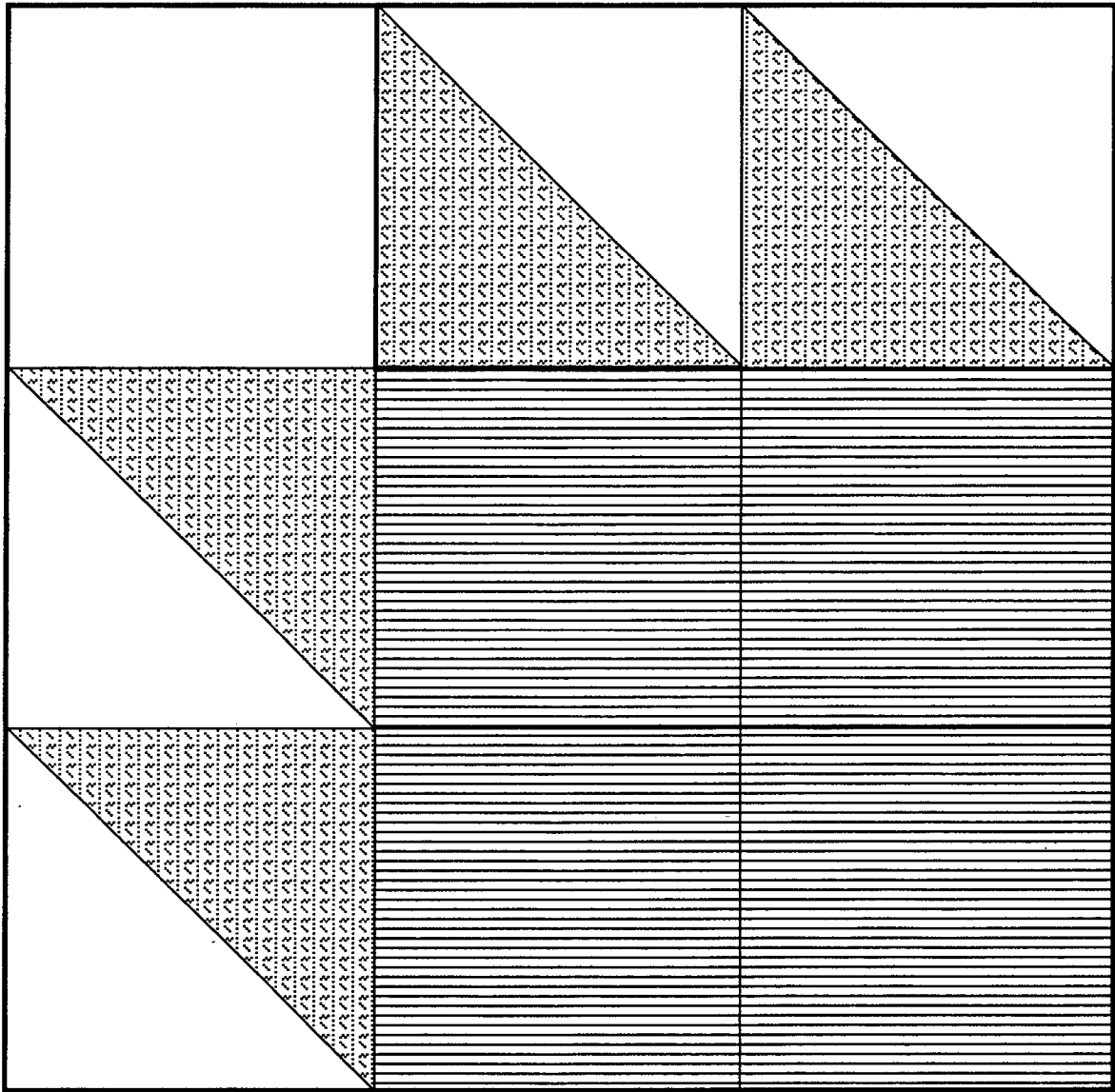
The materials in this collection are also found in the Practice & Enrichment Boxes.

[illegible]



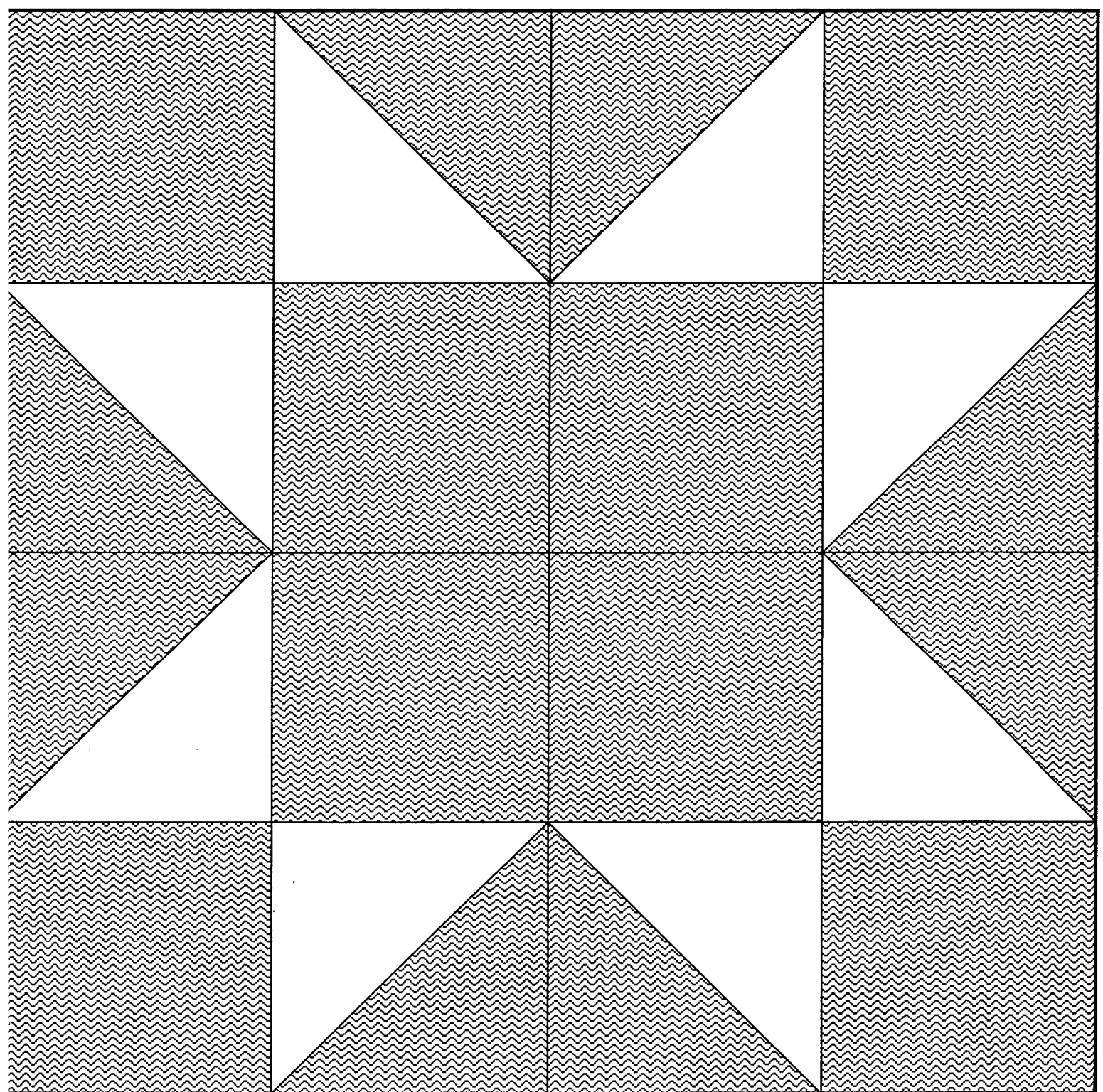
**Shooting Star**

name \_\_\_\_\_



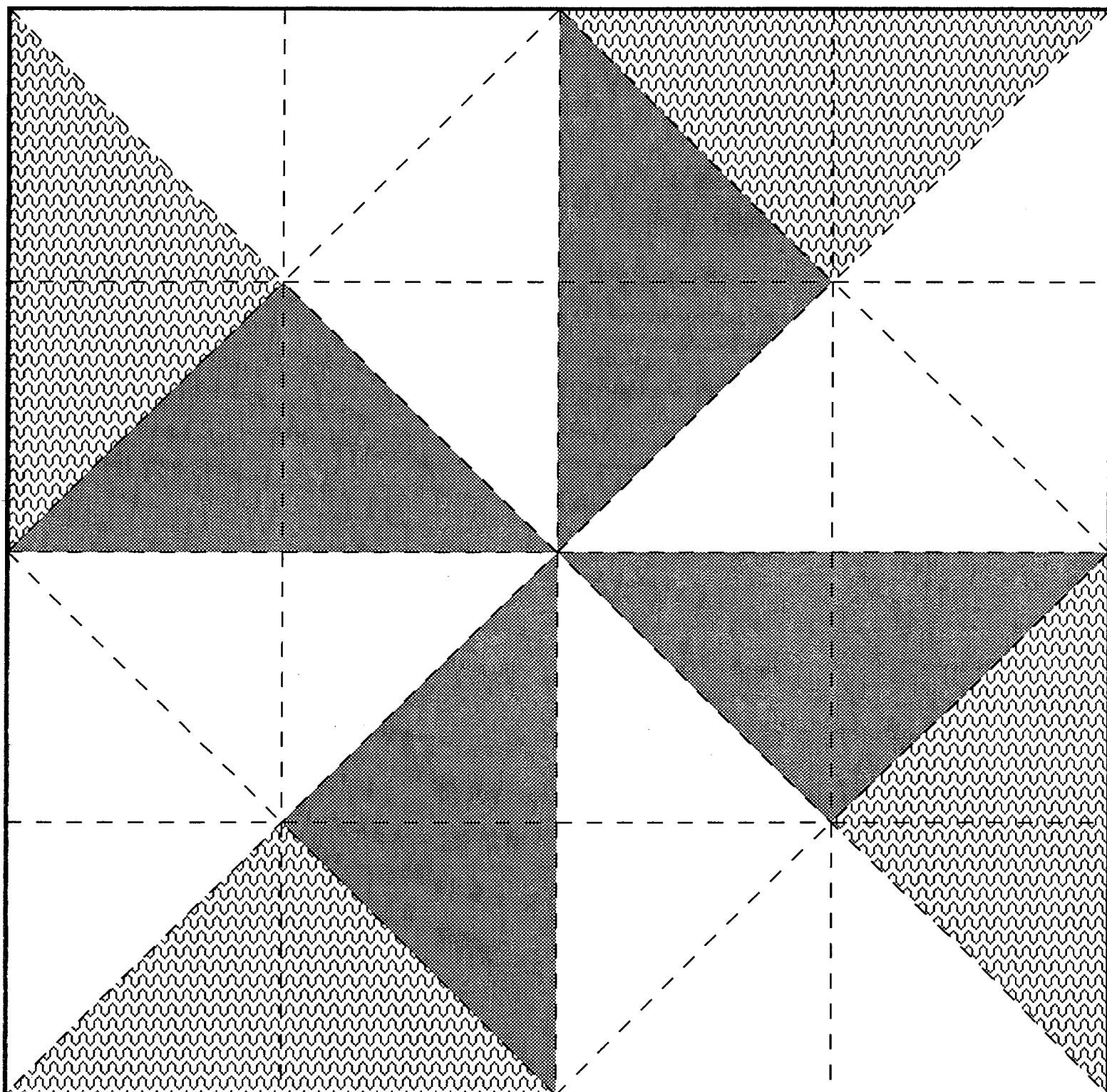
**Bear Paw**

name \_\_\_\_\_



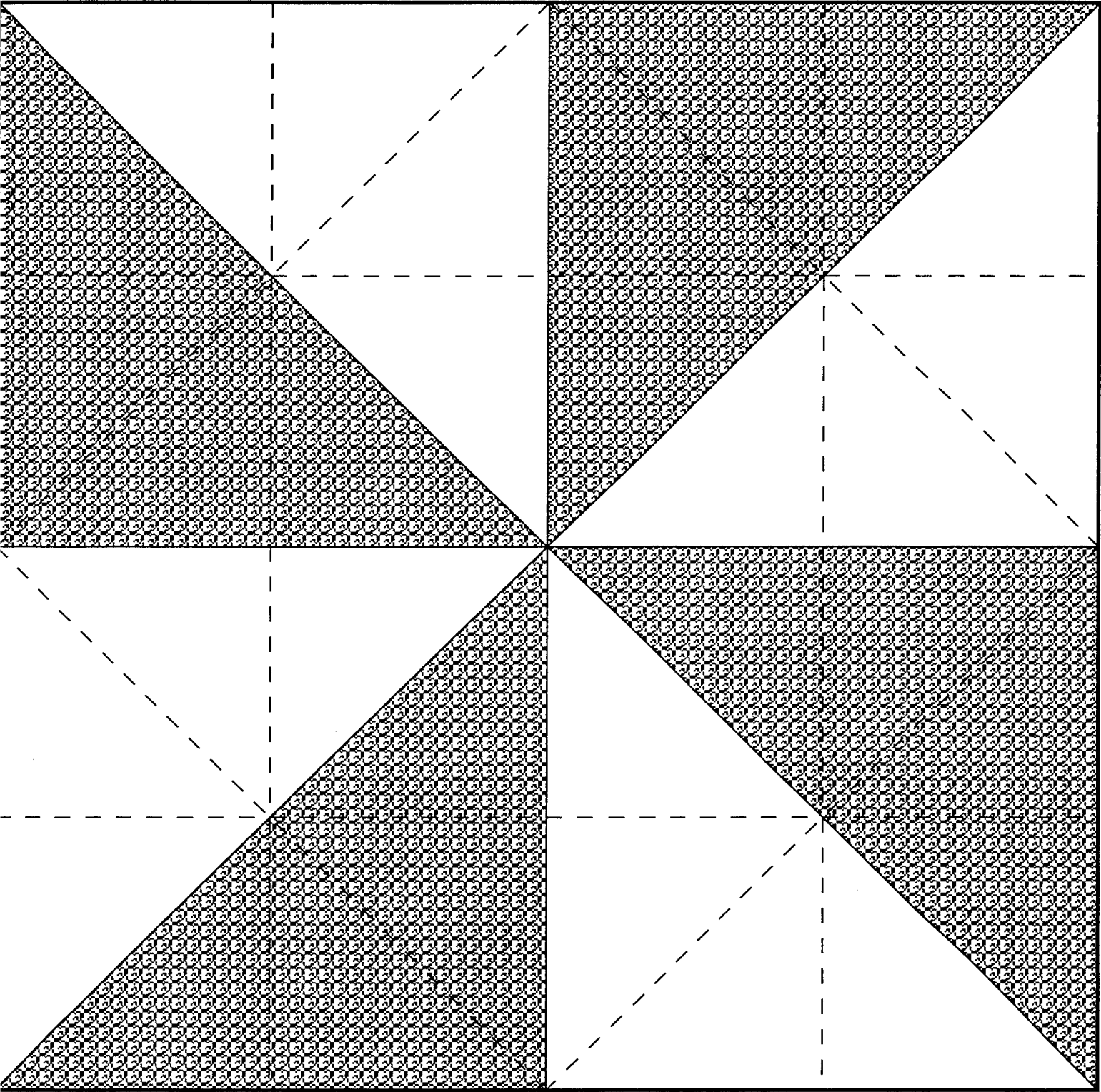
**Sawtooth Star**

name \_\_\_\_\_



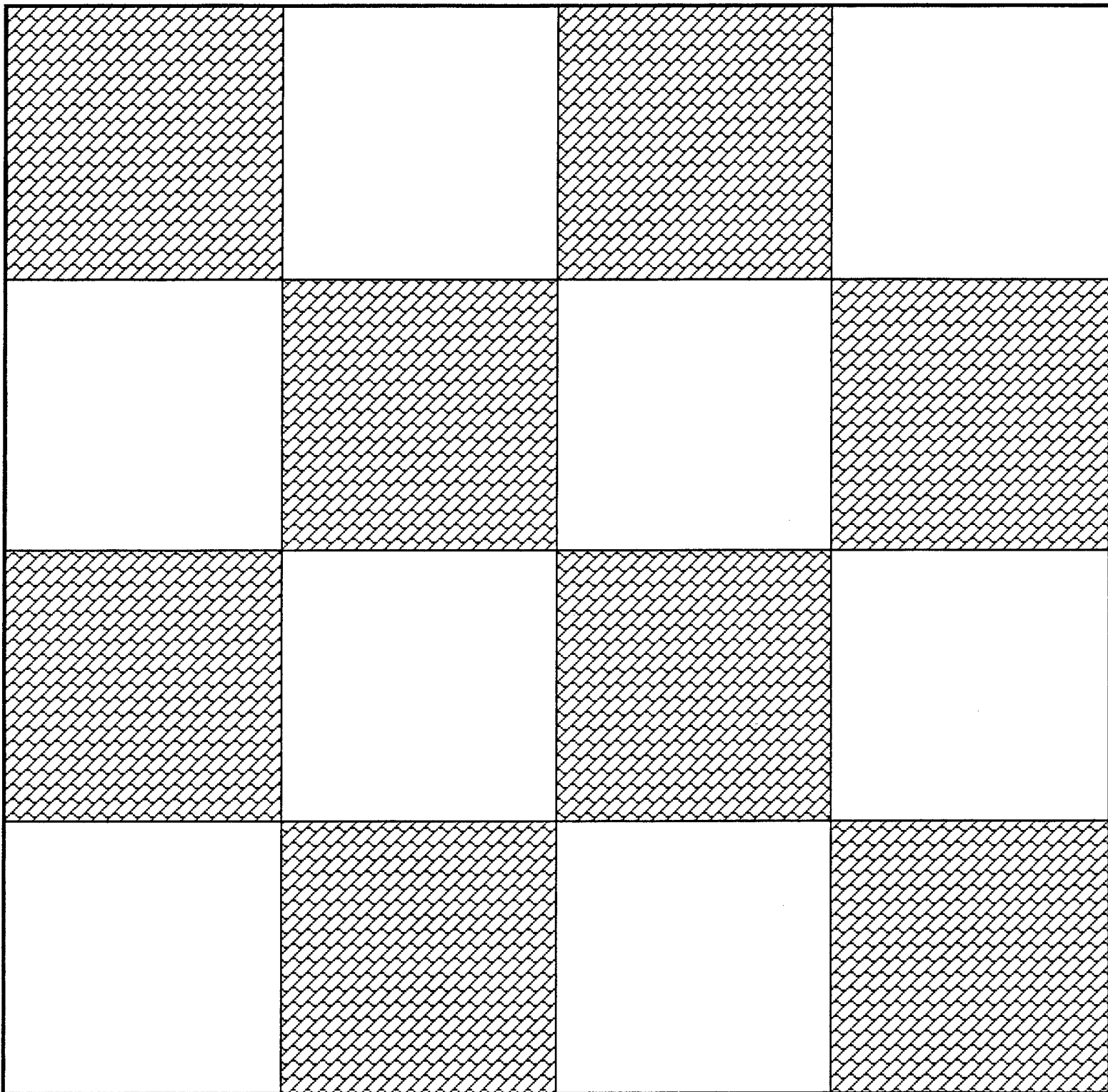
**Whirligig**

name \_\_\_\_\_



Windmill

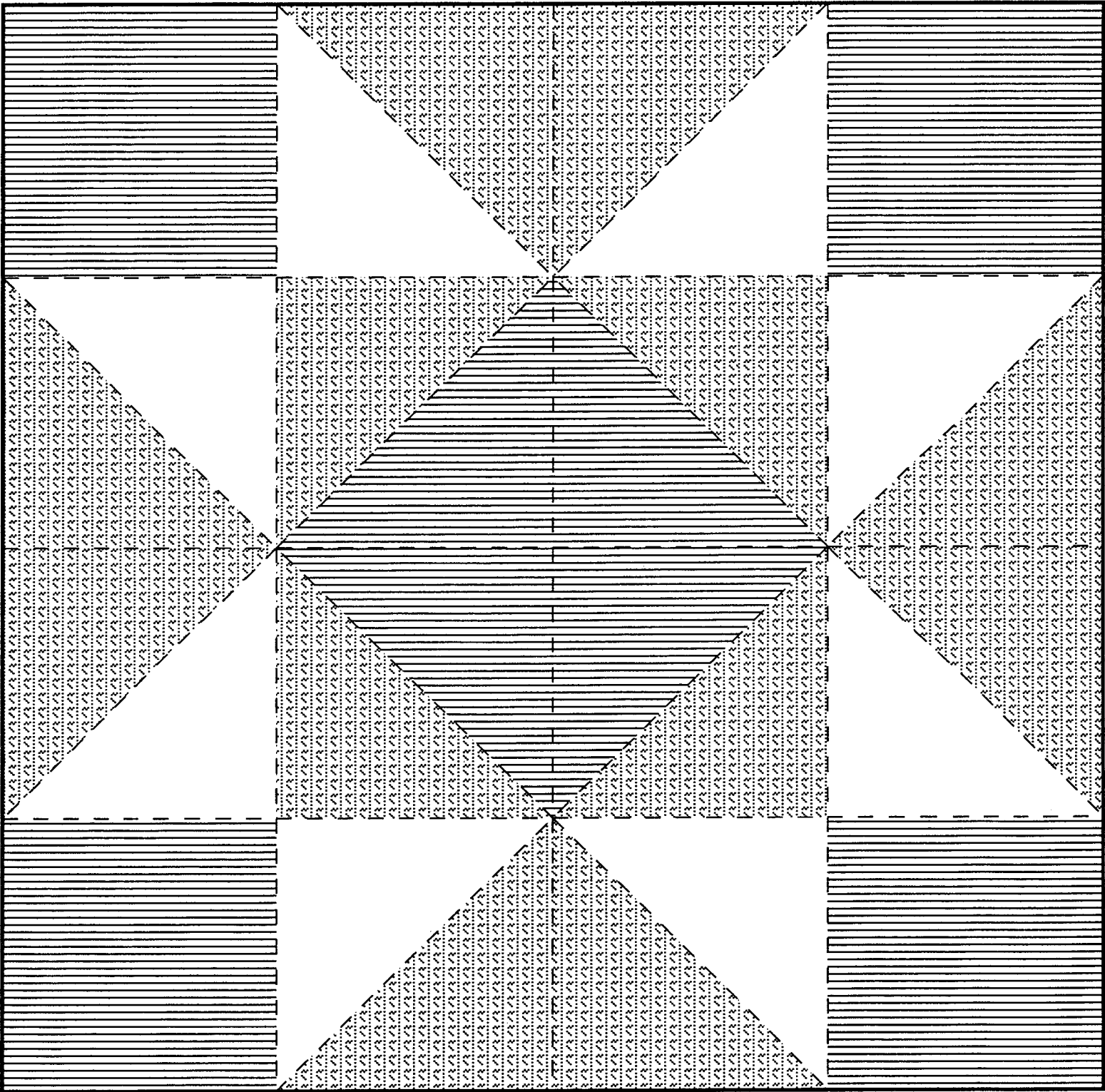
name \_\_\_\_\_



**Checkerboard**

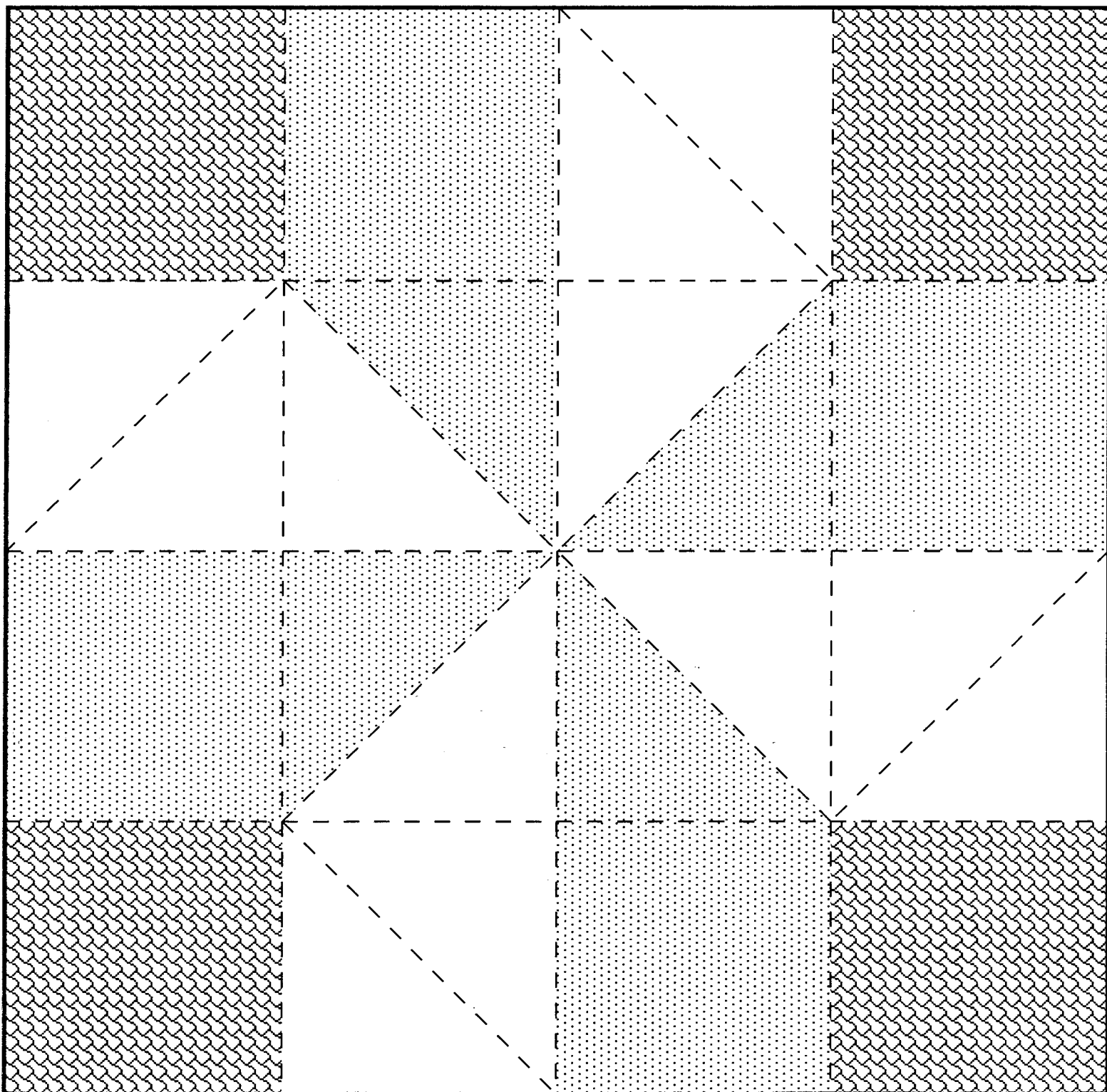
name \_\_\_\_\_





**Evening Star**

name \_\_\_\_\_



**Nelson's Victory**

name \_\_\_\_\_

# Shake those



beans!

name

						<b>0 + 5</b>
						<b>1 + 4</b>
						<b>2 + 3</b>
						<b>3 + 2</b>
						<b>4 + 2</b>
						<b>5 + 0</b>

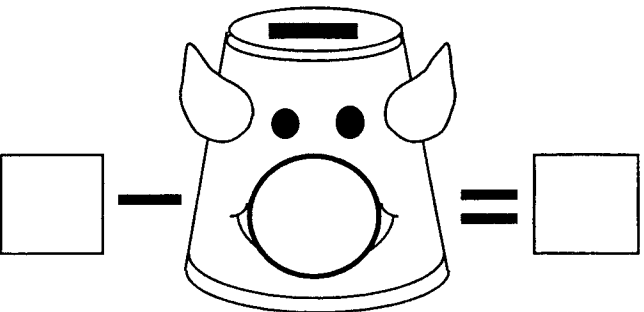
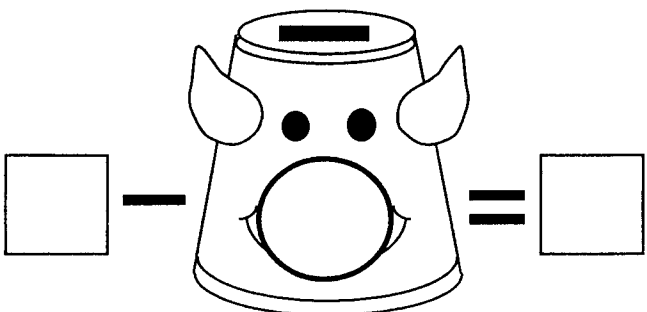
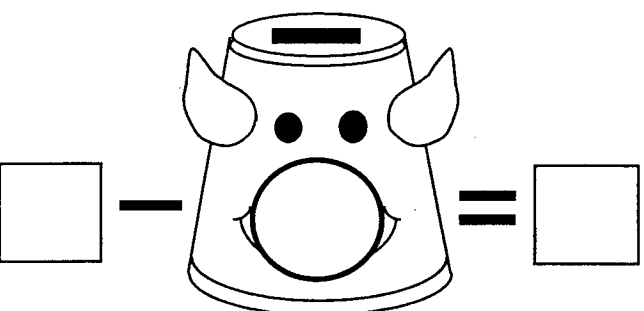
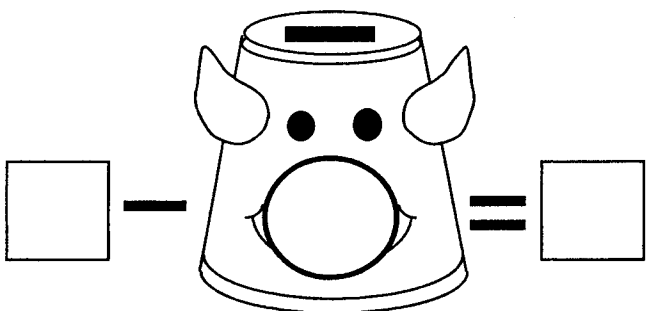
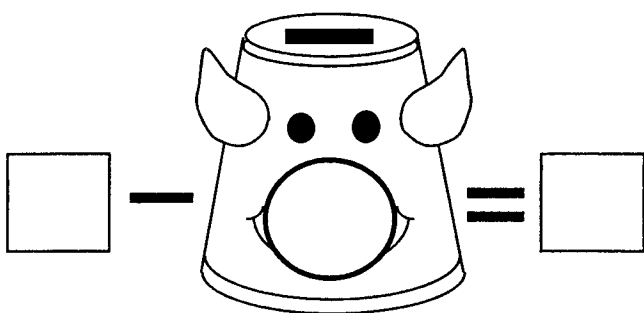
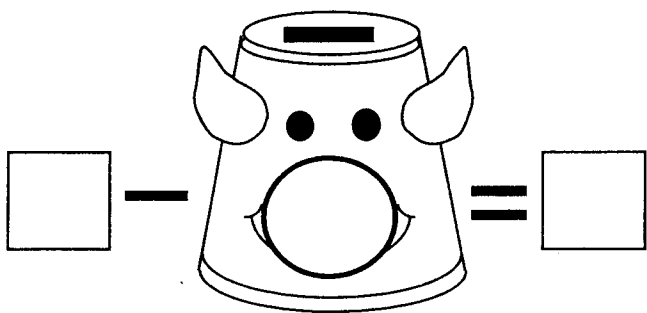
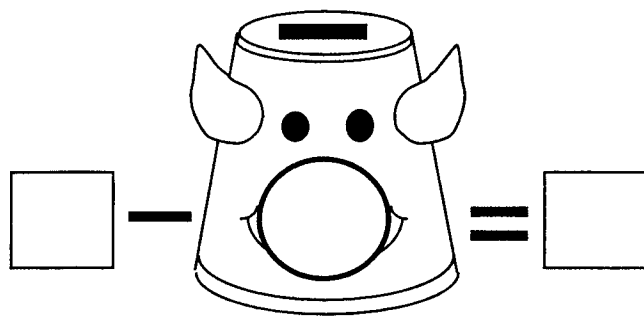
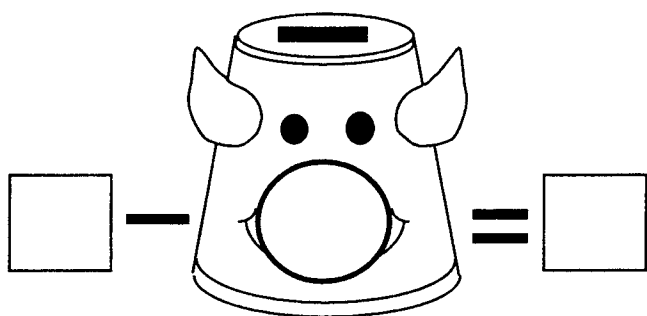
name \_\_\_\_\_

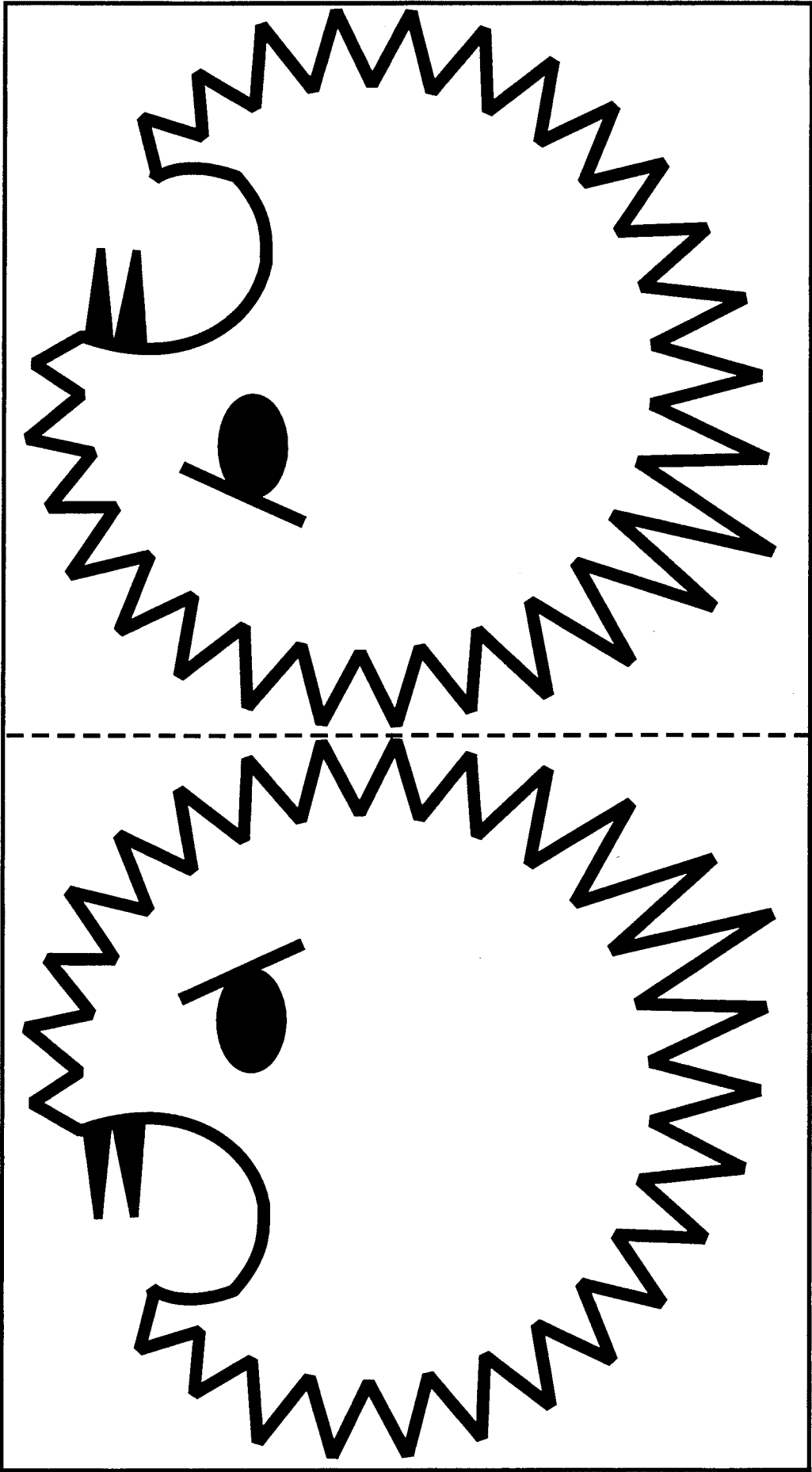
						2
						3
						4
						5
						6

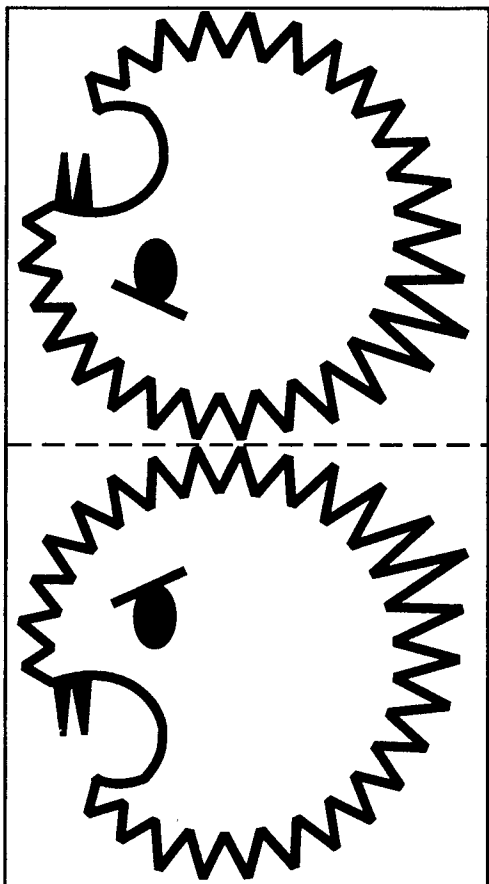
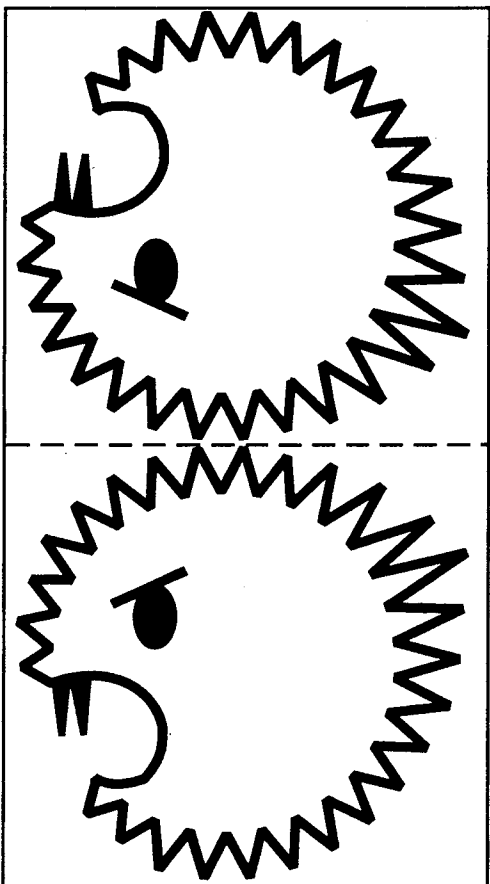
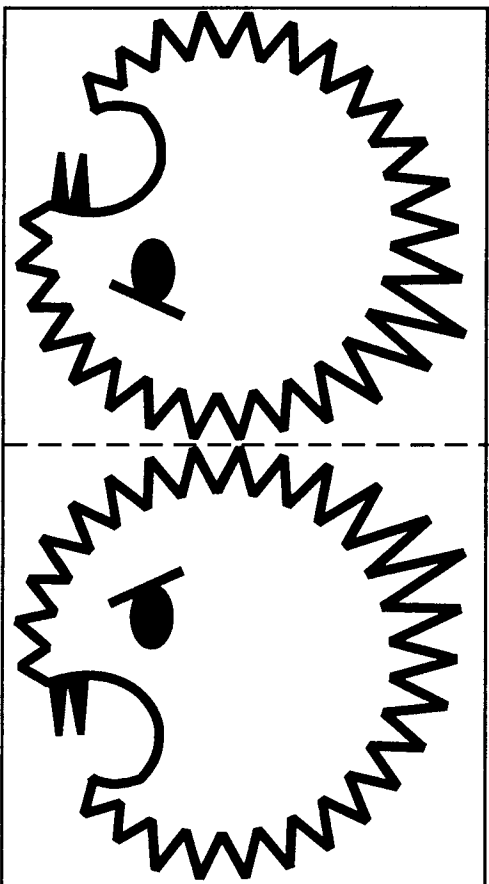
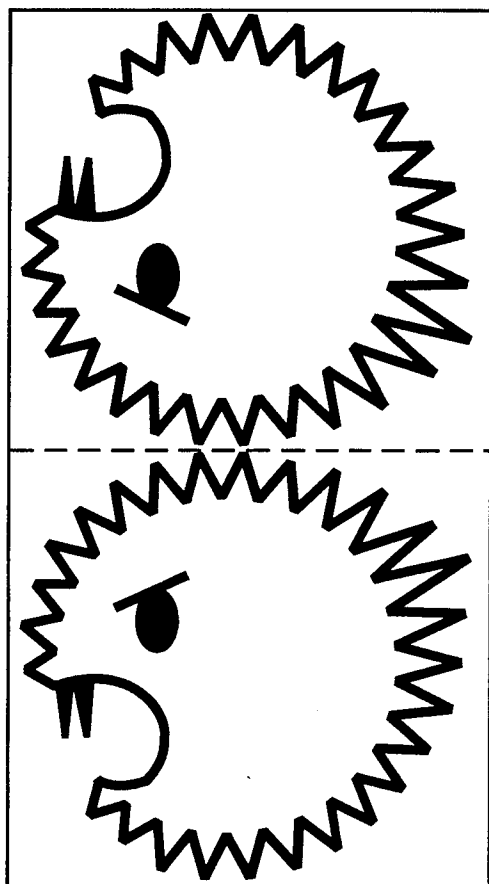
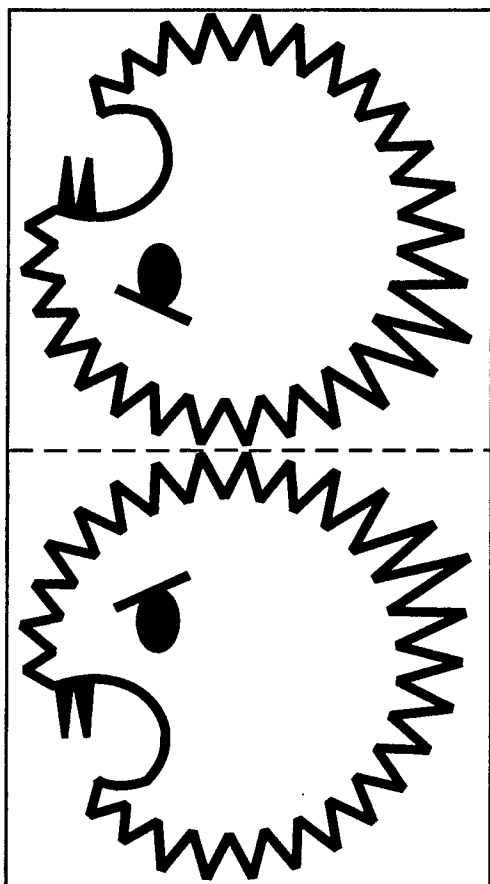
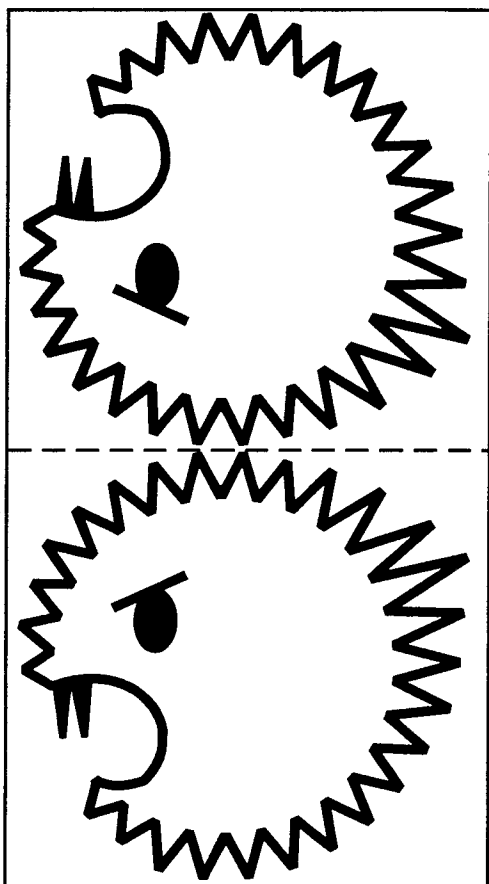
name \_\_\_\_\_

						7
						8
						9
						10
						11

name \_\_\_\_\_









***Fast 9's and Fast 10's***

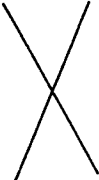
\_\_\_\_\_ name

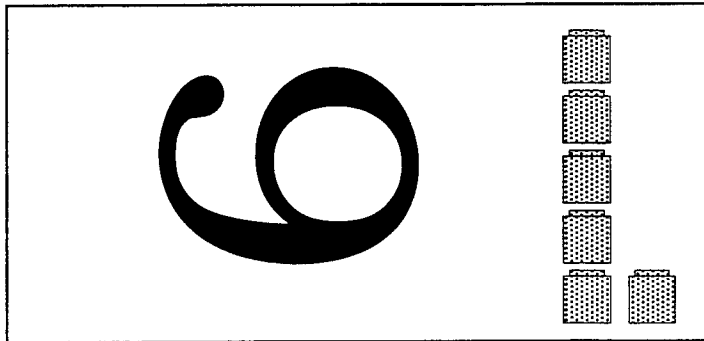
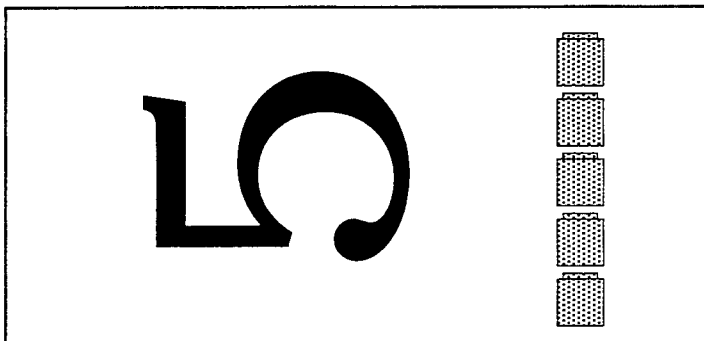
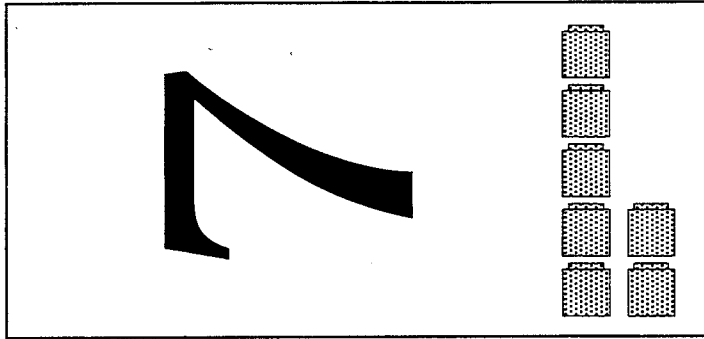
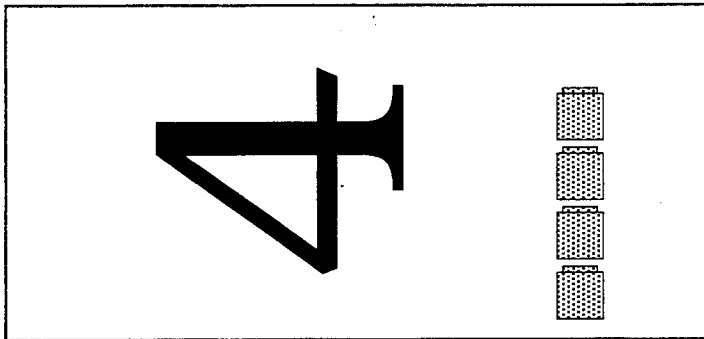
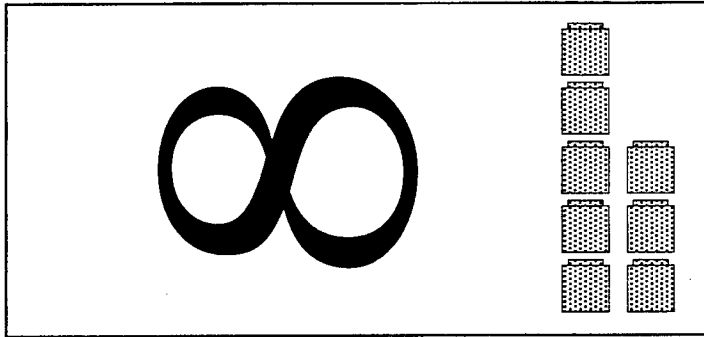
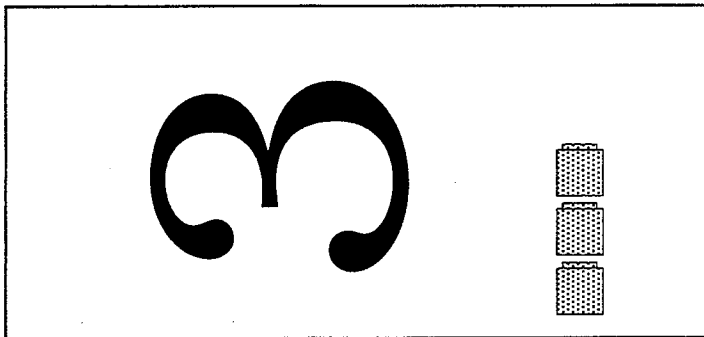
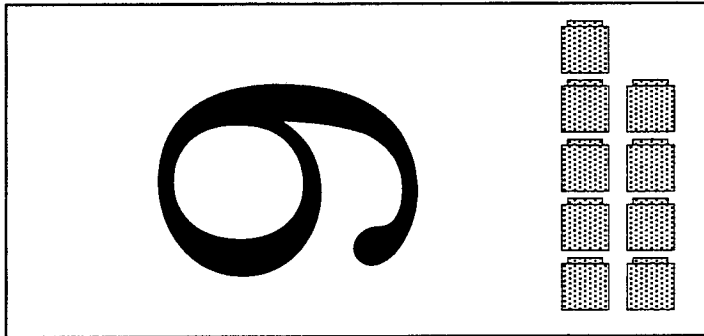
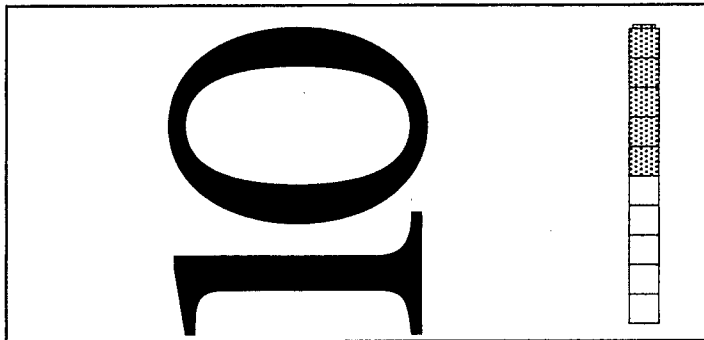
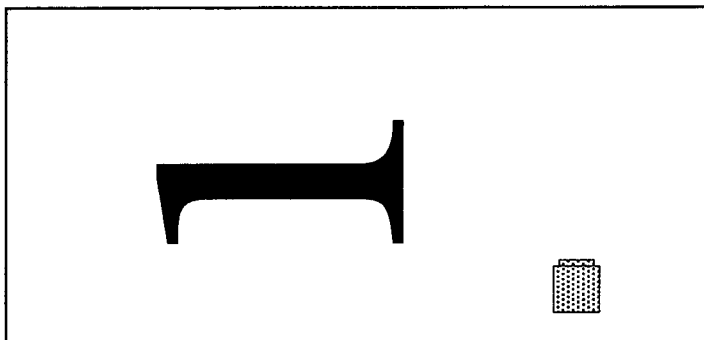

***Fast 9's***

***Fast 10's***

Doubles, Neighbors, Nines, Tens,  
Leftovers Record Sheet

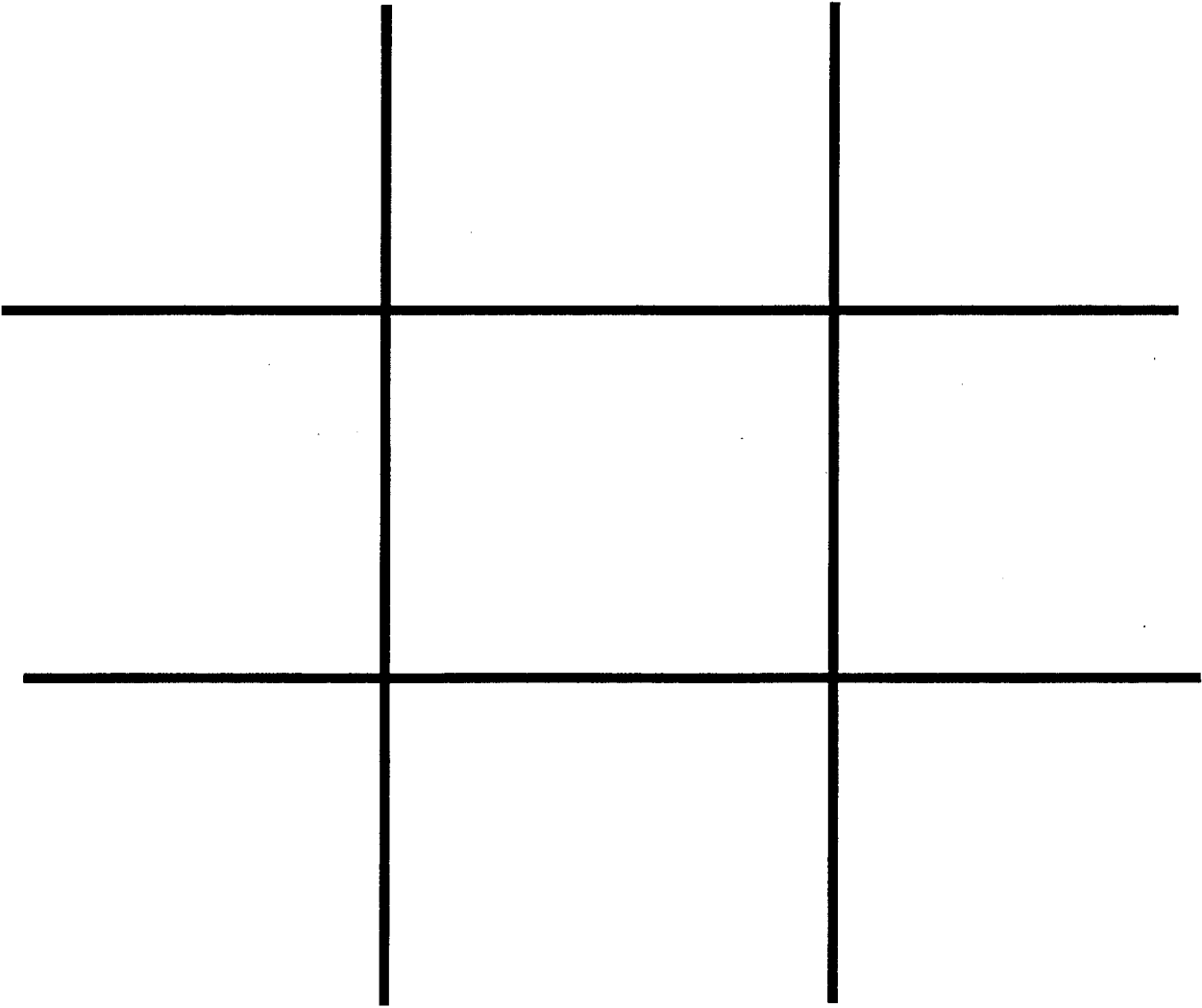
name \_\_\_\_\_

	Fast 9's	Fast 10's	Doubles	Neighbors	Leftovers
Round 4					
Round 3					
Round 2					
Round 1					
					



# Tic Tac Toe

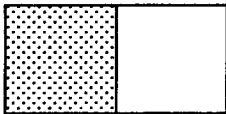
X = \_\_\_\_\_  
O = \_\_\_\_\_



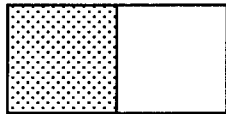


unifix cubes

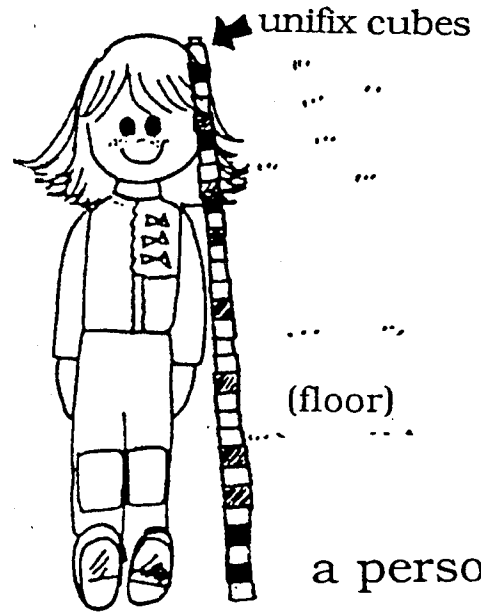
a coat



guess

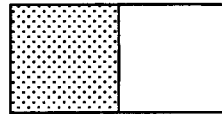


check

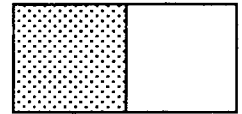


(floor)

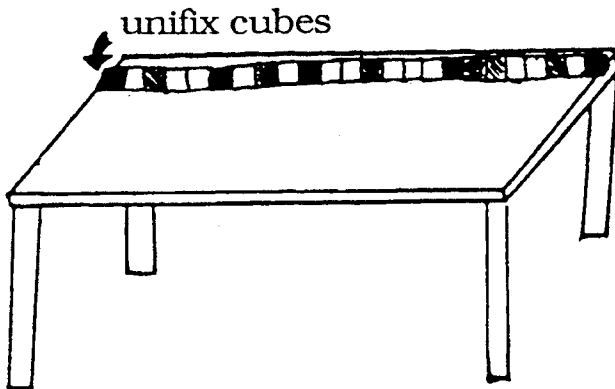
a person



guess

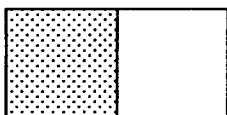


check

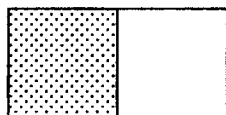


unifix cubes

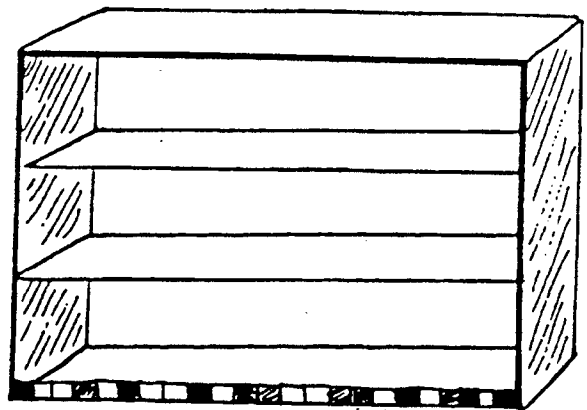
a table



guess

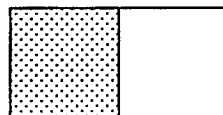


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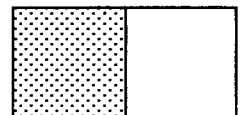


unifix cubes

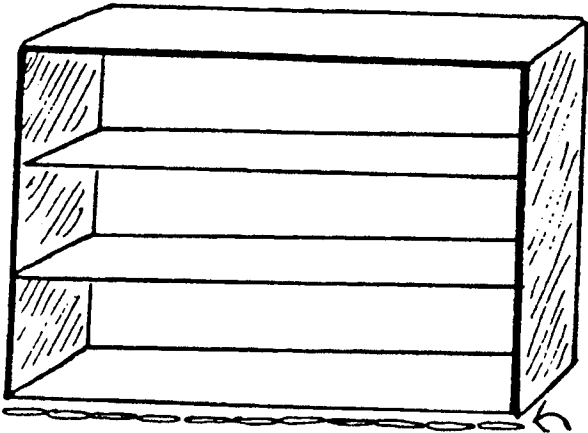
bookshelf



guess

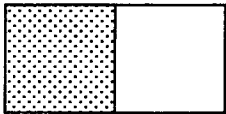


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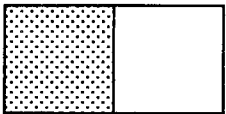


bookshelf

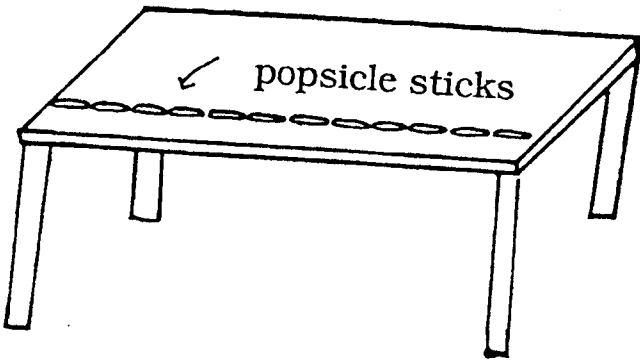
popsicle sticks



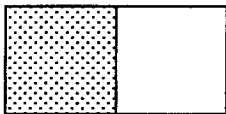
guess



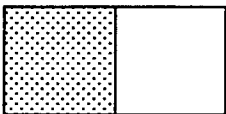
check



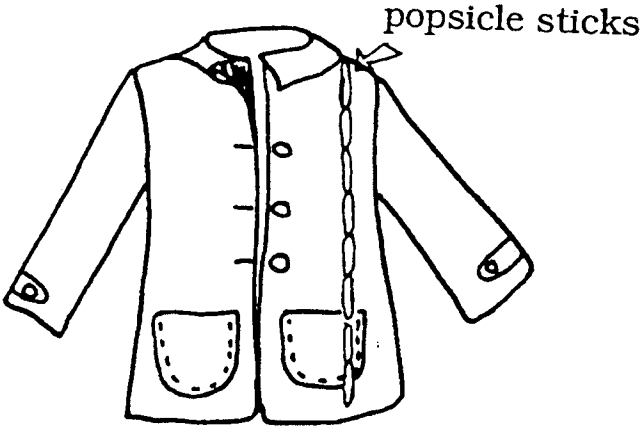
a table



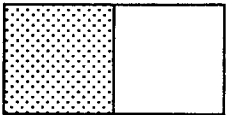
guess



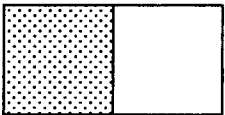
check



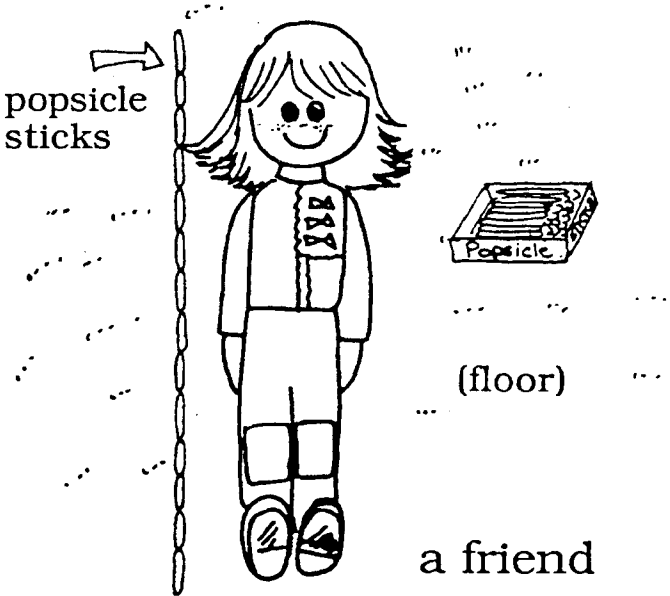
a coat



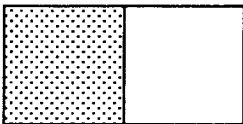
guess



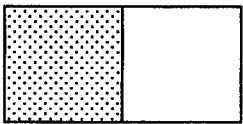
check



a friend



guess



check

# The Balance Scale

name \_\_\_\_\_

guess



's

check



's

guess



's

check



's

guess



's

check



's

Which is heaviest? \_\_\_\_\_

Which is lightest? \_\_\_\_\_

# The Balance Scale

name \_\_\_\_\_

guess



's

check



's

guess



's

check



's

guess



's

check

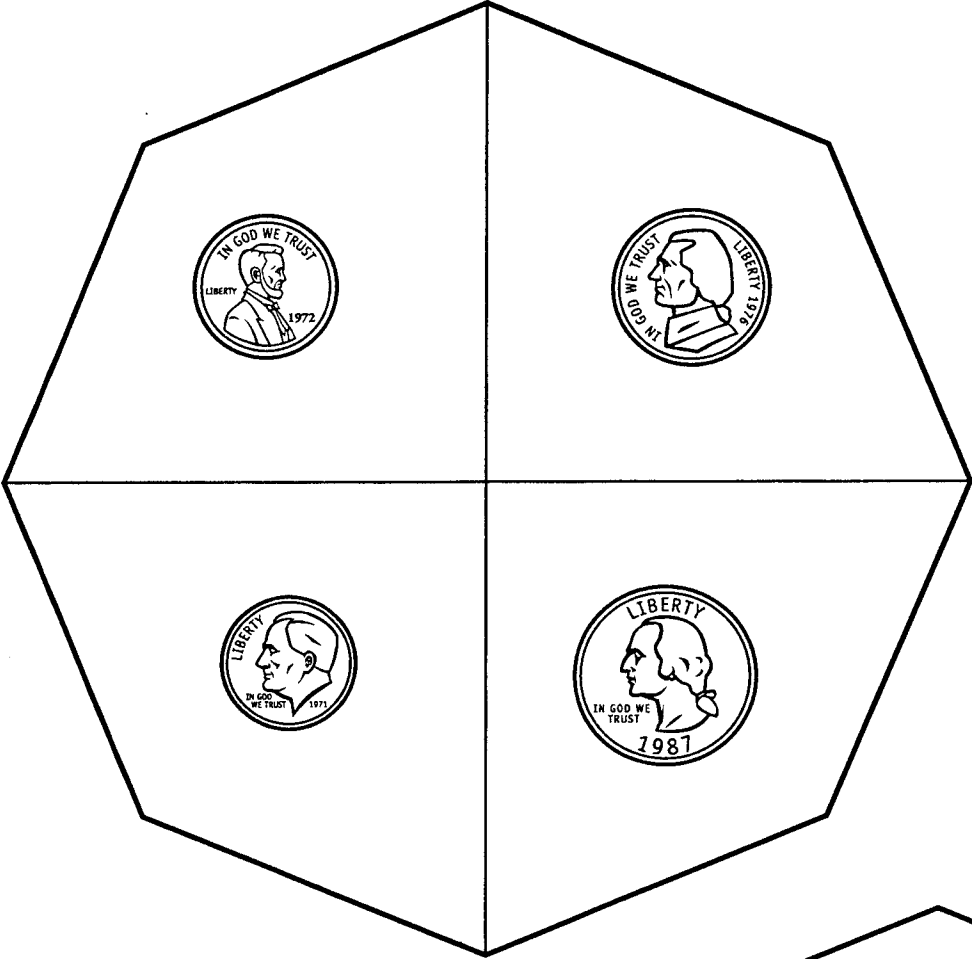


's

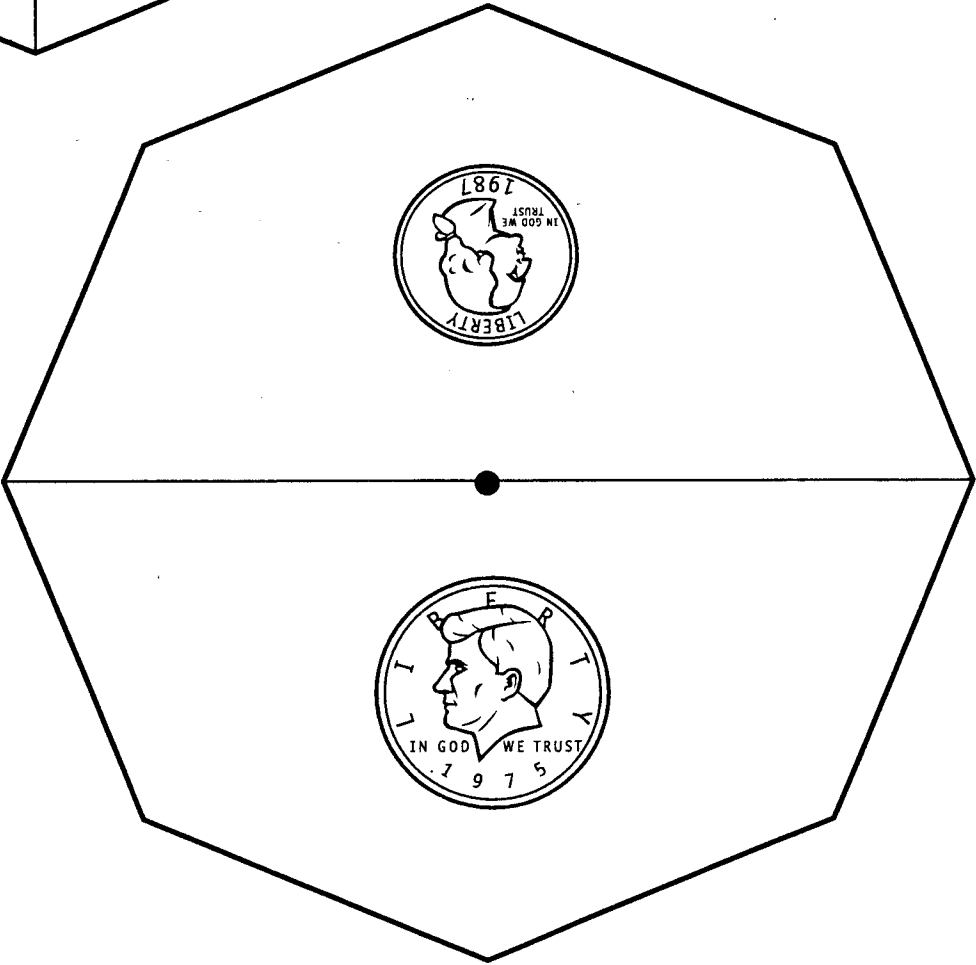
Which is heaviest? \_\_\_\_\_

Which is lightest? \_\_\_\_\_

**Coin Graph**  
Use real coins.







**Making  
Change**

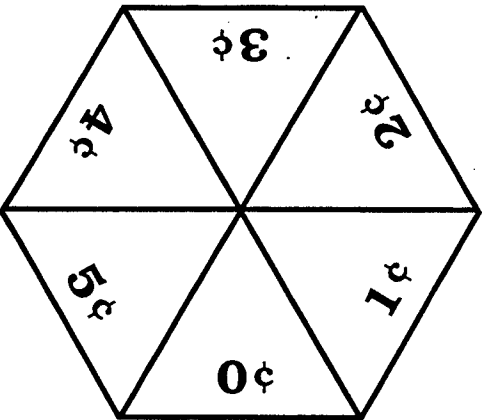
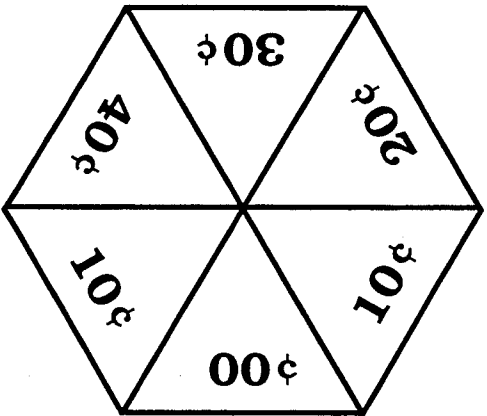
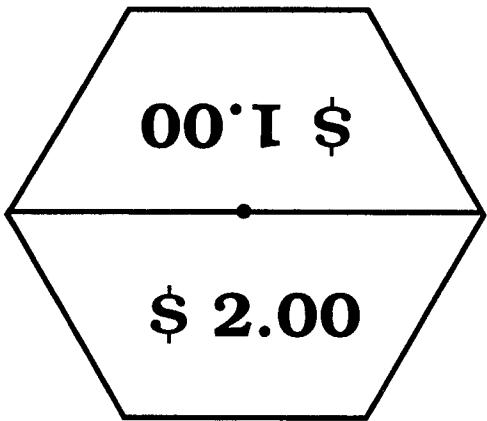




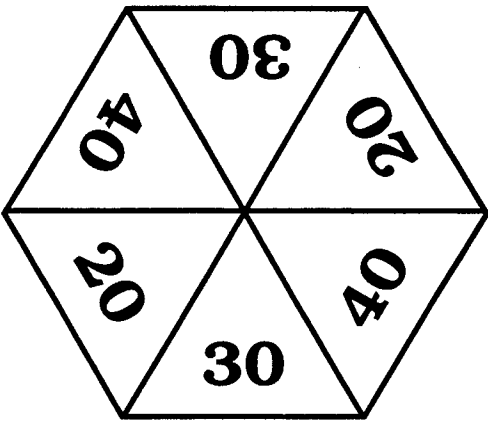
name \_\_\_\_\_

<div>1¢ </div>	<div>5¢ </div>	<div>10¢ </div>	<div>25¢ </div>

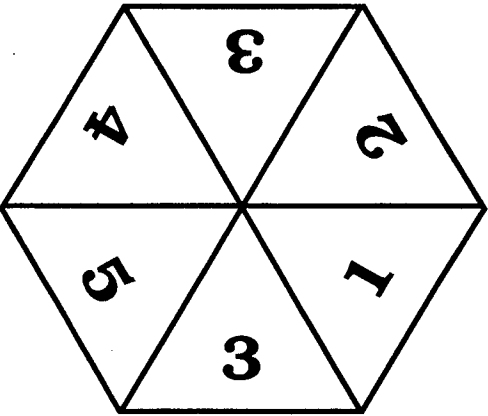
**Big Bucks**  
triple spinner tops



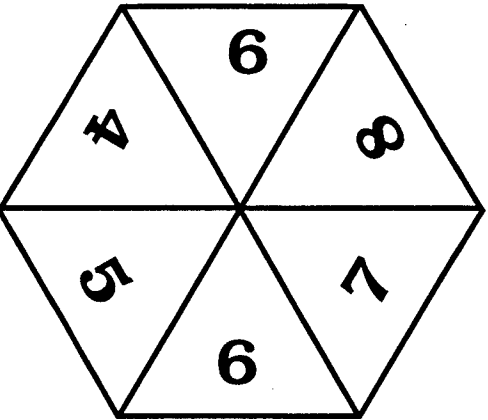
**Triple Spin Take Away**  
spinner tops



Spinner A

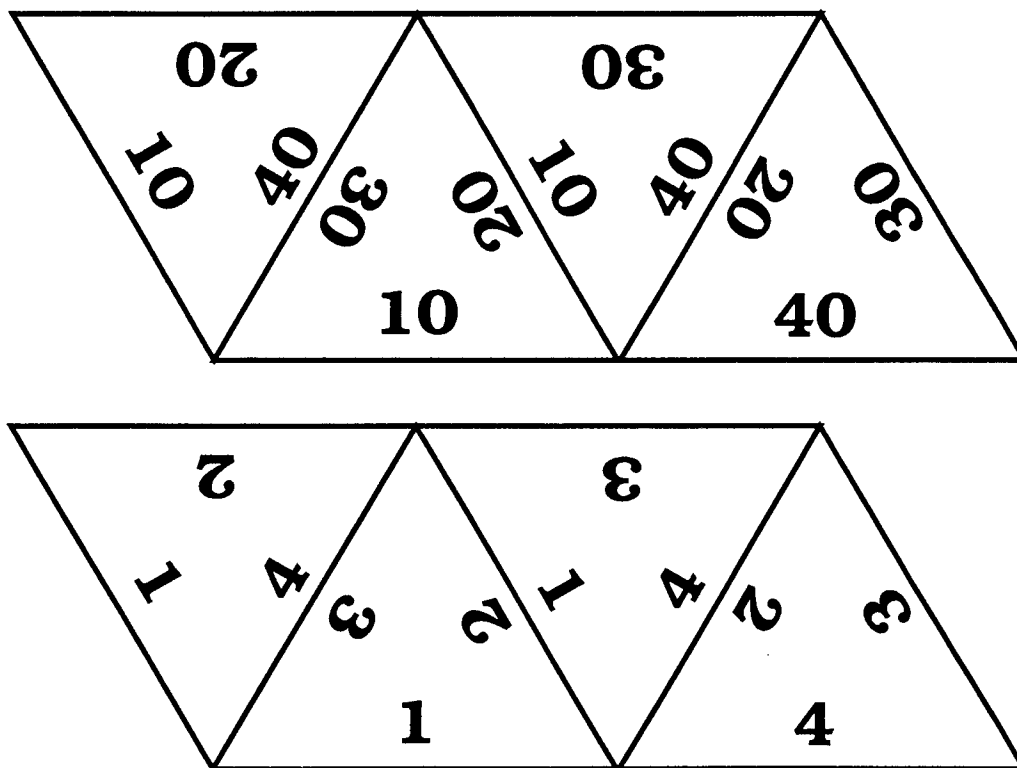


Spinner B



Spinner C

**Triangle Toss  
dice pattern**  
(run on cardstock)



**Cents Off Cards for On Sale lesson**  
(run on cardstock, laminate and cut apart)

\$ .05 off	\$ .10 off	\$ .15 off	\$ .20 off
\$ .06 off	\$ .11 off	\$ .16 off	\$ .21 off
\$ .07 off	\$ .12 off	\$ .17 off	\$ .22 off
\$ .08 off	\$ .13 off	\$ .18 off	\$ .23 off
\$ .09 off	\$ .14 off	\$ .19 off	\$ .24 off

# Pattern



*These bears are going to a party  
2 little bears, 2 big bears, 2  
little bears*

## BOX IT OR BAG IT MATHEMATICS

Practice & Enrichment Boxes

**Donna Burk • Allyn Snider  
Paula Symonds**

Published by The Math Learning Center

**Box It or Bag It Mathematics, Practice & Enrichment Box:  
Pattern**

Box It or Bag It Mathematics consists of:

Teachers Resource Guide and Blackline Masters, Kindergarten  
Teachers Resource Guide and Blackline Masters, 1st and 2nd Grade  
Practice & Enrichment Boxes:

Shapes  
Introduction to Measuring  
Understanding Measuring  
Reading, Writing & Understanding Numerals 0–10  
Pattern  
Arithmetic  
Money  
Place Value Counting  
Place Value Addition & Subtraction

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# Getting Started

*Once you've introduced Pattern through a variety of group lessons, (be sure to see Box It or Bag It Mathematics Teachers Resource Guide, PATTERN), you will want children to practice and extend their understanding using the activities in this packet. Here are a few things we've found helpful for a successful Independent Practice Time.*

*Provide no more than 8–12 boxed activities at one time for a class of 30. Too many activities create more than tolerable chaos. Each Box is designed to be used by 1–4 children.*

*Model each activity thoroughly until children can tell you what to do, step by step. You'll find "box ingredients" and "playing instructions" for each activity in this packet. We use clear Contact paper to put them in our box lids so WE can remember what goes in each Box and how each game is played! Reading the directions would be too difficult for most primary children.*

*Resist the temptation to put out all your challenging Boxes at once—provide a balance of easy and hard. (If you set out too many difficult Boxes, all the children will need you at once and the noise level will be almost unbearable as your children try to cope with the stress of too many difficult tasks.)*

*As you construct these Practice and Enrichment Boxes, cover your box tops with the same design contact paper. That way, you'll be able to pull your Pattern Boxes off the shelf easily, even if they've gotten mixed in with other boxes. (Boxes can be ordered from The Math Learning Center in four sizes: standard (9 X 12 X 2), half size (9 X 6 X 1-7/8), junk (4 X 7 X 1-1/8), and mini (3-1/2 X 4 X 1-1/8). See the Box It or Bag It Mathematics Teachers Resource Guide, MATERIALS INDEX, for additional ordering and making information.*

*Remember the Boxes themselves can be used for group instruction. They are ideal for use by an aide or parent with small groups. Some of them can be easily adapted for use with your whole group.*

*During Independent Practice Time, it's critical that you be available and in circulation to make sure things go smoothly. Once routines even out, you'll have opportunities to observe individuals which are not afforded when you conduct group instruction. You can spot children with problems and see children with understandings beyond your predictions. See the next page for some Observation guidelines.*

*Be sure to see the Box It or Bag It Mathematics Teachers Resource Guide, INTRODUCTION, for more implementation strategies.*



### Children's Names

### Copies patterns

Verbalizes patterns in a variety of ways

### Patterns by attributes other than color (size, shape, texture, position)

Creates simple patterns  
(2 elements)

Creates complex patterns  
(3 or more elements)

Translates auditory or visual patterns to math materials

Works cooperatively

## Shares materials

Helps others

---

## Playdough Patterns (1–4 children)

---

**Box ingredients→** four children's rolling pins or 6-inch lengths of 1" doweling  
homemade playdough (recipe follows) divided and stored in four airtight containers  
6–12 small cookie cutters  
four plastic placemats (store these on classroom tools shelf)  
standard box for storage

### PLAYING INSTRUCTIONS

1. Choose two or three cookie cutters.
2. Roll out playdough.
3. Cut "cookies" using chosen cutters.
4. Arrange your cookies in a pattern on your placemat.
5. Show your completed work to a friend and tell them about your pattern.

### MAKING INSTRUCTIONS

#### Recipe for Homemade Playdough

Thoroughly mix these dry ingredients:

- 2 cups white flour
- 1 cup salt
- 1 tablespoon powdered alum (available in spice section of most grocery stores)

#### Boil:

- 2 cups water
- 2 tablespoons salad oil
- food coloring
- (Lemon or other flavor extract is nice—add it just before pouring water into flour mixture)

Pour boiling water over flour mixture. Stir until well mixed. (Ignore lumps.) Let it cool until easy to handle. Knead a few minutes until smooth and elastic. Let it cool until room temperature (otherwise it gets sticky). Seal into airtight containers.

---

## Unifix Cubes Patterns (1–4 children)

---

**Box ingredients→** starter cards      half box for storage  
tub of unifix cubes

### PLAYING INSTRUCTIONS

1. Choose a starter card.
2. Can you copy the pattern?
3. Can you make it even longer?
4. Can you invent some patterns of your own?

### MAKING INSTRUCTIONS

#### Starter Cards

1. Color simple patterns on starter cards. Be sure colors match your cubes.
2. Laminate cards and cut apart.

---

## Alphabet Stamps (1–4 children)

---

**Box ingredients→** rubber alphabet stamps in half box

ink pads

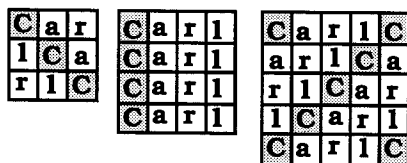
4 X 18 newsprint strips

1"-square graph paper cut into 3 X 3, 4 X 5, 5 X 5, and  
6 X 6 grids

standard box for storage

### PLAYING INSTRUCTIONS

1. Choose two or more stamps and stamp out an alphabet pattern.
2. Use stamps to create a word or two. Stamp your word pattern over and over.
3. Stamp your name over and over on newsprint strips or graph paper grids. It's fun to stamp your first name on a grid, leaving no spaces, and to color the first letter, as illustrated below.



### MAKING INSTRUCTIONS

#### Alphabet Stamps

If you plan to provide a full set of these, it works best to set them up in a divided box (glue in cardboard sections with a glue gun) in alphabetical order with each letter labeled in bottom of box.

#### Ink Pads

Buy these in any stationery store—they even come in various colors. Replacement ink comes in roll-on bottles so the pads can last for years. Your school may even have them available.

---

## Tile Patterns (1–4 children)

---

**Box ingredients→** tub of 1"-square ceramic tiles

starter cards in half box

### PLAYING INSTRUCTIONS

1. Select a starter card.
2. With tiles, copy the pattern on the card and extend it.
3. Can you invent tile patterns of your own?

NOTE: You may wish to have children occasionally record these patterns. Cut construction paper squares the size of your tiles. Children paste onto construction paper strips.

### MAKING INSTRUCTIONS

#### Starter Cards

Locate in cardstock portion of packet. Color to match your tiles. Laminate and cut apart. Store in half box to be set out in tile container.

---

## Coin Patterns (1–4 children)

---

**Box ingredients→** junk box or mini box of real coins  
silver and brown crayons  
starter cards  
newsprint strips  
coin stamps and ink pad  
standard box for storage

### PLAYING INSTRUCTIONS

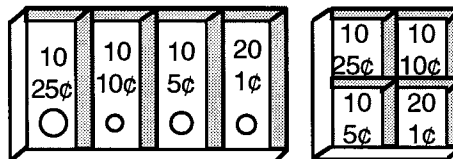
1. Choose a starter card or use your own idea.
2. Lay out a pattern of real money.
3. Stamp out your pattern on a newsprint strip.
4. Color and label your pattern.

Sometimes older children who are very good at counting money like to count up how much they've used in their patterns. You'll need to model this.

### MAKING INSTRUCTIONS

#### Junk Box of Coins

1. Cut cardboard strips to create dividers inside your box. Glue the dividers in with tacky glue or a glue gun.
2. Use coin stamps to label each section and also write in bottom of box how many of each coin per section. (We choose "bankers" to check each box for correct amounts at the end of each work session.)



#### Coin Stamps

These can be purchased from The Math Learning Center. One or two sets will be plenty.

#### Newsprint Strips

Cut 12 X 18 newsprint into 4 X 18 strips to record pattern. Keep a generous supply of these in a box or basket on your classroom tools shelf; that way they won't get crunched and you don't have to worry about frequent refills.

#### Starter Cards

Locate in cardstock portion of the packet, color, laminate and cut apart. Make a tagboard pocket to hold cards.

---

## Pattern Blocks and Mirrors (1–4 children)

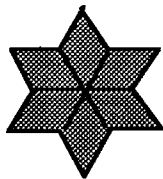
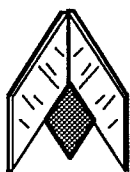
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**Box ingredients→** tub of pattern blocks

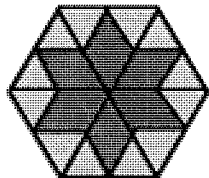
four hinged mirrors in a junk box (This Pattern box is to be placed in a tub of pattern blocks.)

### PLAYING INSTRUCTIONS

1. Set out one pattern block, any shape.
2. Close a hinged mirror around the block until the block fits snugly into the corner.
3. Build what you see in the mirror beside your mirror.



4. Add another block or two. Don't move the mirror. Build what you see now.

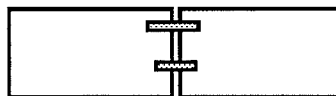


5. Continue to add new blocks into the design, one or two at a time, and build the resulting reflection.

### MAKING INSTRUCTIONS

#### Mirror

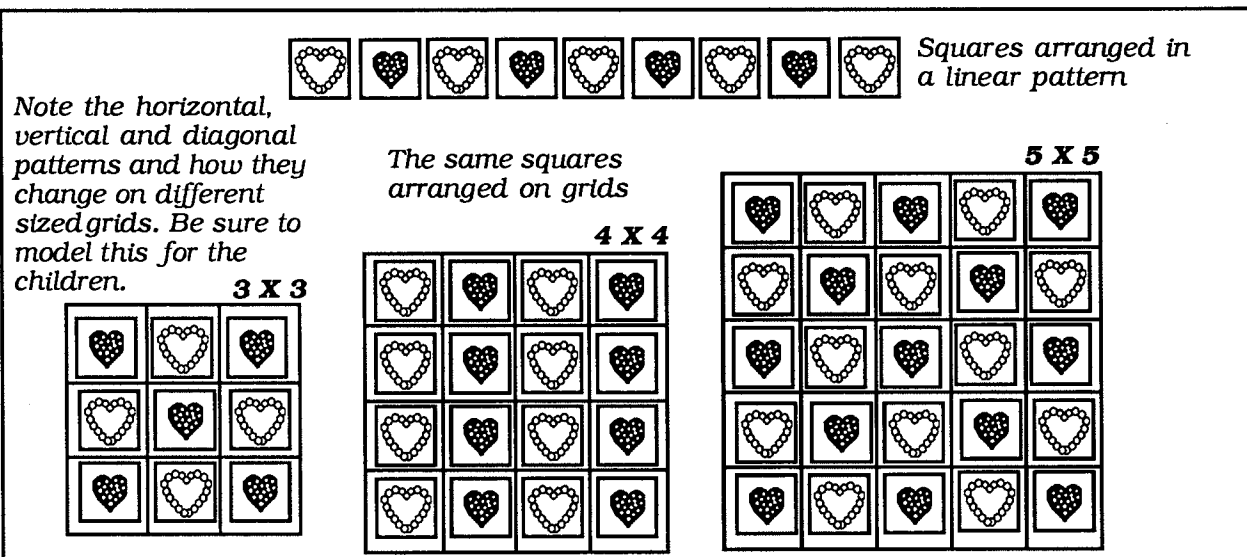
Hinge two small mirrors (available from The Math Learning Center) at the back with two pieces of strapping tape, leaving about 1/4" between them. Make four of these hinged mirrors.



# Sticker Patterns (1-4 children)

**Box ingredients→** sticker cards  
mats for layout

mini boxes to hold each set  
standard box for storage



## PLAYING INSTRUCTIONS

1. Choose a box of sticker cards.
2. Sort your cards so you know what you have for your pattern.
3. Plan your pattern and set it up in a line.
4. What happens when you set it up on one of the grids? Is it the same on every mat?

set has, the more challenging it will be to use. You'll want two or three different sets. Laminate and cut apart. It's smart to have each set on a different color of poster board so it's easier to clean up properly.

Box these sets in mini boxes inside a standard box.

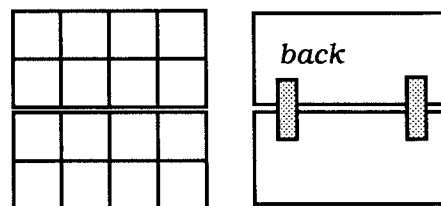
## MAKING INSTRUCTIONS

### Sticker Cards

Purchase packages of stickers and mount them on sheets of 10 X 12 board which you've marked with 2 X 2 squares. You'll need about 20 of each kind of sticker. Each set should have two, three or four kinds; for example, one set might have 20 smiling jack-o-lanterns and 20 frowning jack-o-lanterns; another set might have 20 red hearts, 20 frilly hearts and 20 checkered hearts. The more variables the

### Mats

Make two 3 X 3, 4 X 4 and 5 X 5 grids from tagboard and draw a grid to fit the size of your sticker cards.



---

## Clock Patterns (1-2 children)

---

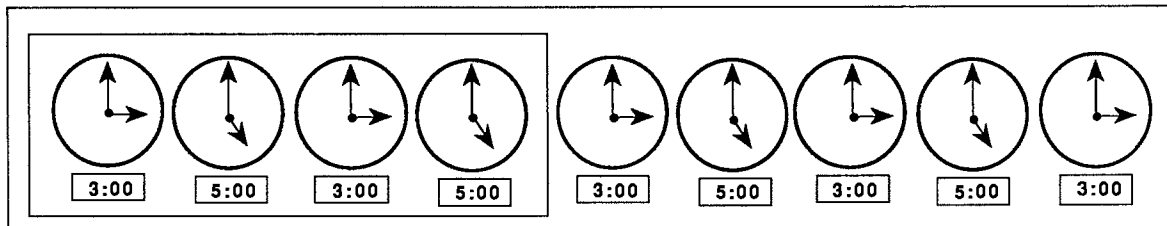
**Box ingredients→** 8-10 small clocks                      starter cards

standard box for storage

*Optional:*

rubber clock stamp and ink pad

newsprint strips



### PLAYING INSTRUCTIONS

1. Choose a starter card.
  2. Read the time shown on each clock face on the card.
  3. Use some small clocks to keep the pattern growing (see illustration above).
- Optional:
4. Use the clock stamp to stamp the pattern on newsprint strip.
  5. Draw in the hands on each clock and write the time on your record strip.

### MAKING INSTRUCTIONS

#### Starter Cards

Locate in cardstock portion of packet. Laminate and cut apart. Make a tagboard pocket to hold cards.

#### Clock Stamp

These are available from The Math Learning Center if you don't already have some at your school.

#### Small Clocks

Check to see if your school has available a kit of little wooden clocks. Otherwise construct some of your own from poster board and brass fasteners.

#### Newsprint Strips

Cut 12 X 18 newsprint into 4 X 18 strips. Keep extras in a box or basket on your classroom tools shelf; that way they won't get crunched.

---

# Calendar Patterns (1-4 children; first and second grade)

---

**Box ingredients→**    calendar grids (2)                      Days of week cards (2 sets)  
                                 Month cards (2 sets)  
                                 record sheets                      templates  
                                 ziplock bags or mini boxes of calendar shapes  
                                 standard calendar for current year  
                                 standard box for storage

## PLAYING INSTRUCTIONS

1. Lay out the calendar grid.
2. Set out the name of the month you've chosen.
3. Set out the days of the week.
4. Decide which calendar pieces you want to use in your pattern. Set those out in the pattern space.
5. Look at this year's calendar. Find out what day was the first day of your month. Begin setting out your calendar pattern on that day.
6. How many days are in your month? Be sure to end your pattern on the correct day.
7. Show your teacher your hard work.

Optional: (making a record to take home)

1. Leave your calendar all set up.
2. Find the template to match your pattern.
3. Get a blank calendar paper to record your pattern.
4. Use the template to draw your pattern.
5. Can you write the numbers on your calendar?
6. Show your teacher your very hard work.

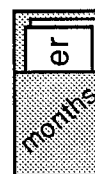
## MAKING INSTRUCTIONS

### Calendar Grid

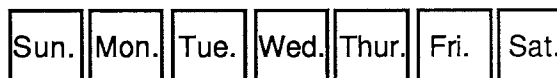
Locate in cardstock portion of packet. Laminate or contact for durability. Hinge together with tape on back side so it will fold to fit into your box.

### Month Names

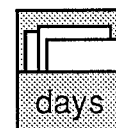
Cut 12 strips of 2 X 10 poster board for month names. Laminate. Place in tagboard pocket. Make two sets.



### Days of Week Cards



Cut 2 X 2 squares of poster board for day names. Place in tagboard pocket. Make two sets.

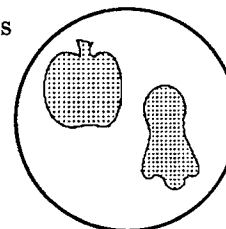


### Pattern Pieces

1. Locate colored Calendar Pattern sheets for pattern shapes and cut out the shapes.
2. Put each set in a ziplock bag or mini box.

### Templates

Cut templates in *clear* lids from Cool Whip, large margarine tubs, large coffee cans, etc. (see blacklines for patterns). Cut all shapes for a set in one lid with small scissors. If you trim the edges off the lids so they set flat on both sides, these templates will be easier for children to use and fit into your box more easily.



### Record Sheets

Locate in blacklines and run ditto copies. Hinge on black with two pieces of scotch tape.



---

## Pattern Blocks (1-4 children)

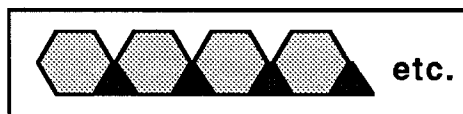
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**Box ingredients**→ starter cards (stored in half box covered with your  
Contact paper for Pattern boxes)

tub of pattern blocks

### PLAYING INSTRUCTIONS

1. Choose a starter card.



2. Build the pattern, repeating it over and over.  
(It is fun to have your pattern stand up like a wall or fence.)



3. Can you invent some patterns of your own?

### MAKING INSTRUCTIONS

#### Starter Cards

1. Locate the two sheets of Pattern Block starter cards in cardstock portion of the packet. Color to match your pattern blocks. Laminate and store in half box. Cards will be used with tub of pattern blocks.

---

## Template Patterns (1-4 children)

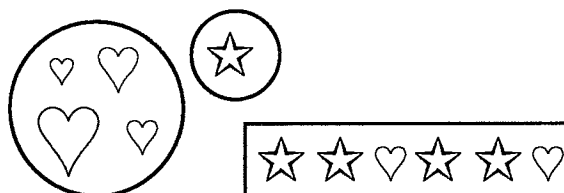
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**Box ingredients**→ plastic templates  
crayon and pencils

newsprint strips  
half for for storage

### PLAYING INSTRUCTIONS

1. Choose the templates you want to use.
2. Plan and draw your pattern using the templates on newsprint strips.
3. Color your pattern if you want.
4. Tell a friend about your work.



### MAKING INSTRUCTIONS

#### Templates

Locate blackline page for template ideas. We like to offer some templates with one item in several sizes, all cut into one template. (Cool Whip size lids work well as long as children can see through lid.) We also use small margarine lids for single items. Small scissors work well for cutting these.

Be sure to trim the edges off the lids to make them easier for children to use.

#### Newsprint Strips

Cut 12 X 18 newsprint into 4 X 18 strips. Keep these in a box or basket on your classroom tools shelf.

NOTE: Some of you may already have commercial stencils or templates which would work well here so you wouldn't need to cut more for this activity.

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## Rubber Stamp Patterns (1–4 children)

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**Box ingredients→** assorted rubber stamps (six are enough to start with—you can add to your collection over the years)

ink pads

rubber stamp grids

4 X 18 newsprint strips (store on classroom tools shelf)

### PLAYING INSTRUCTIONS

1. Choose your favorite stamps.
2. Plan a pattern.
3. Stamp your pattern on a strip.
4. Tell someone about your pattern.
5. Can you stamp your pattern on a grid? What do you see?

### MAKING INSTRUCTIONS

#### Newsprint Strips

Cut 4 X 18 strips. Keep these in a box or basket on your classroom tools shelf.

#### Rubber Stamp Grids

Make a grid master by dividing an 8-1/2 X 11 sheet of paper into 16 sections. Include a place for the student's name. Run copies to place in your box.

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## Geoboards, Nuts and Washers (1–4 children)

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**Box ingredients→** junk box of nuts and washers

four geoboards in tub or storage container

### PLAYING INSTRUCTIONS

1. Get a geoboard and box of nuts and washers to share with other workers.
2. Plan a pattern. Think about how it will go onto your geoboard.
3. Build your pattern.

NOTE: Some children build just the top and bottom row, others build around the outside, others build all rows. The pattern variations are endless here so take lots of time to model multiple patterning possibilities with your class, looking at the boards for horizontal, vertical and diagonal patterns.

### MAKING INSTRUCTIONS

#### Nuts and Washers

Cover a junk box with the contact paper of your pattern boxes. Make elastic tie-down. Fill with nuts and washers (the children could bring these). Place junk box in larger container with geoboards.

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## Mirror Patterns (1–4 children)

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**Box ingredients→** mirror cards                      two single mirrors  
two hinged mirrors                      junk box for storage

### PLAYING INSTRUCTIONS

1. Choose a card and mirror.
2. Fool around with your mirror on the card.  
What do you see? What happens when you move the mirror? Is it different with a single mirror than a hinged mirror?
3. Show a friend your wonderful discoveries.

The hinged mirrors are taped on the back side (two mirrors together). Children love opening and closing them for a variety of outcomes with cards.

### Mirror Cards

Locate in cardstock portion of packet. Laminate and cut apart.

### MAKING INSTRUCTIONS

#### Mirrors

Order these from The Math Learning Center. They are easily assembled with scotch tape.

NOTE: The symmetry children discover here is an element of pattern.

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## Feely Box Patterns (1–4 children)

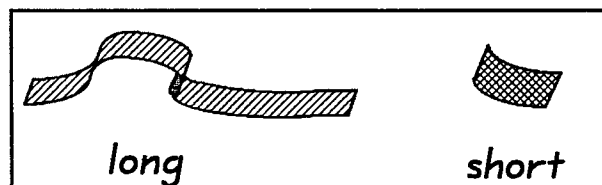
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See *Box It or Bag It Mathematics Teachers Resource Guide*, PATTERN, for group lesson.

**Box ingredients→** two Feely boxes of common items  
idea cards                      half box for storage

### PLAYING INSTRUCTIONS

1. Get a partner or two.
2. Each person needs a Feely box.
3. Choose an Idea card.



4. Reach into Feely boxes to create the pattern.  
Tell one another what you're adding as the pattern grows.

NOTE: Children can do this activity alone if they prefer.

### MAKING INSTRUCTIONS

#### Feely Boxes

Use tuna or cat food cans. If there are any rough edges on the rim, use a hammer to smooth them. Use a child's stretchy sock to go over each can.

#### Common Items

If you have a collection of junk boxes, take 30 or more items from them to fill your Feely boxes—items such as shells, buttons, screws, washers, bolts, plastic lids, fruit pits, bread fasteners, keys.

#### Idea Cards

Locate cards in cardstock portion of packet. Laminate and cut apart. Place in tag pocket.



2. Cut your Stitch Witchery and fabric into 9" squares. This allows for error.
3. Cut white poster board into 9" squares.
4. Make poster board, Stitch Witchery, fabric sandwich.
5. Iron with a steam iron (we found we didn't need a damp cloth) to make fabric adhere to board. (Follow manufacturer's direction—comes with Stitch Witchery—except for damp cloth.)
6. Using a paper cutter, trim ironed blocks to size indicated on fabric cutting guide (see blacklines). Now cut with paper cutter into squares and then triangles. (We ran ditto copies of the cutting guide and lightly glued them on the back side of the poster board. Cutting was very quick that way.)
7. We put complementary fabric colors together in ziplock bags or junk boxes in our game box to help children in choosing fabrics.

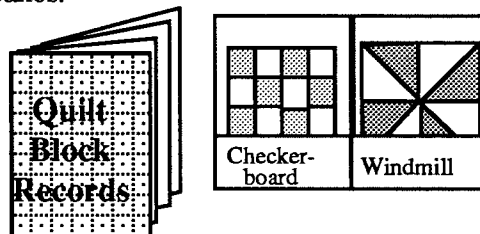
**NOTE:** Contact paper has become available in fabric. If you could share the cost of several rolls with a few friends, it would be easy to cut your triangles from squares of Contact paper adhered to poster board. Even regular Contact paper would work.

### **Quilt Blocks Mats**

Locate in cardstock portion of packet. Do not laminate mats, it makes them too slippery.

### **Quilt Block Record Sheets**

Locate in blacklines; run copies. For most efficient storage, these could either be in ziplock bags inside the box or in a folder set-up. For the latter, tape together three student folders with the pockets on the bottom. Cover the outside folder with the Contact paper of your Pattern baxes.

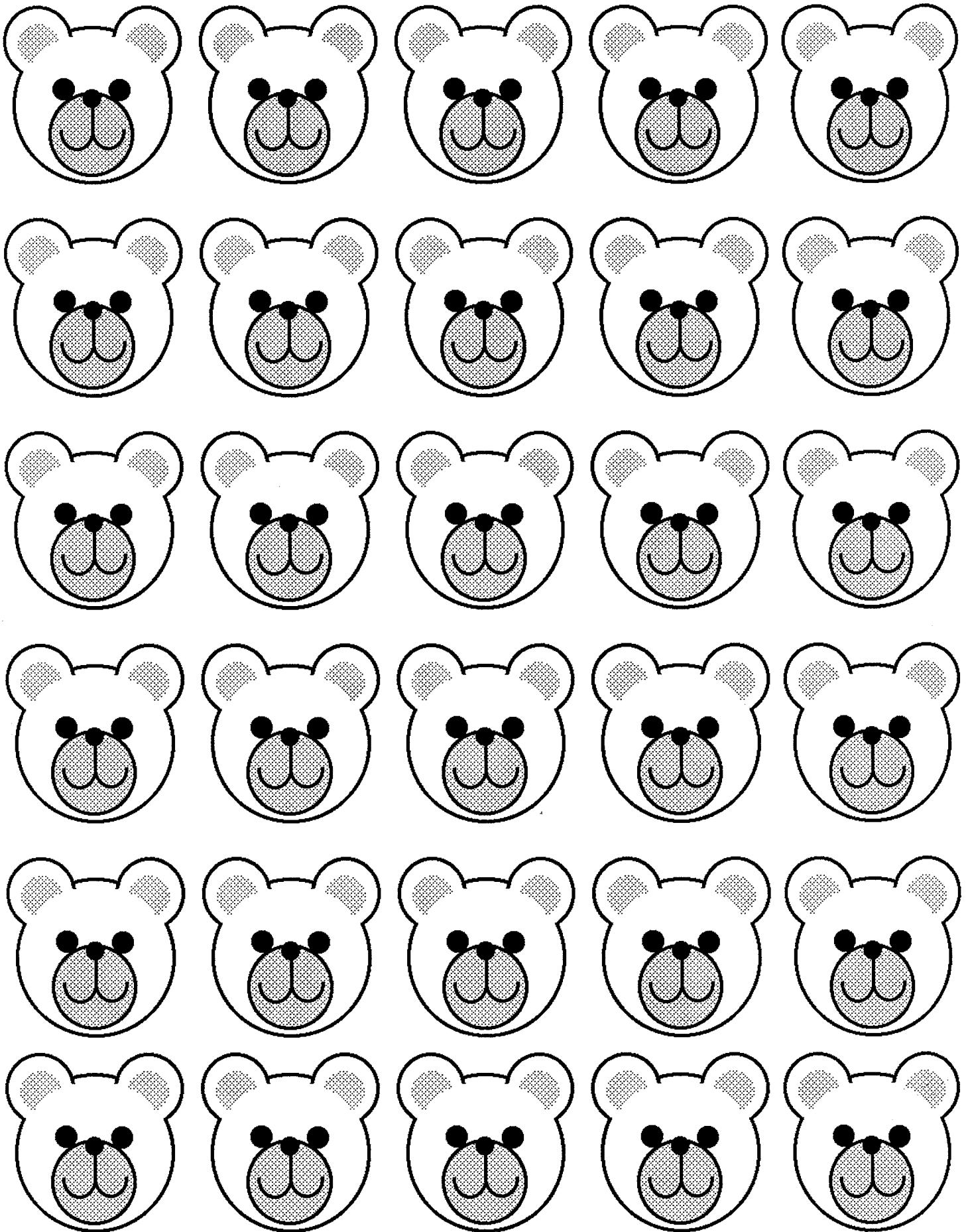


Be sure to model this activity with the children so they get the idea. Point out how corners are alike, etc. If you've never "played" with quilt blocks, play around with it yourself—it's lots of fun!

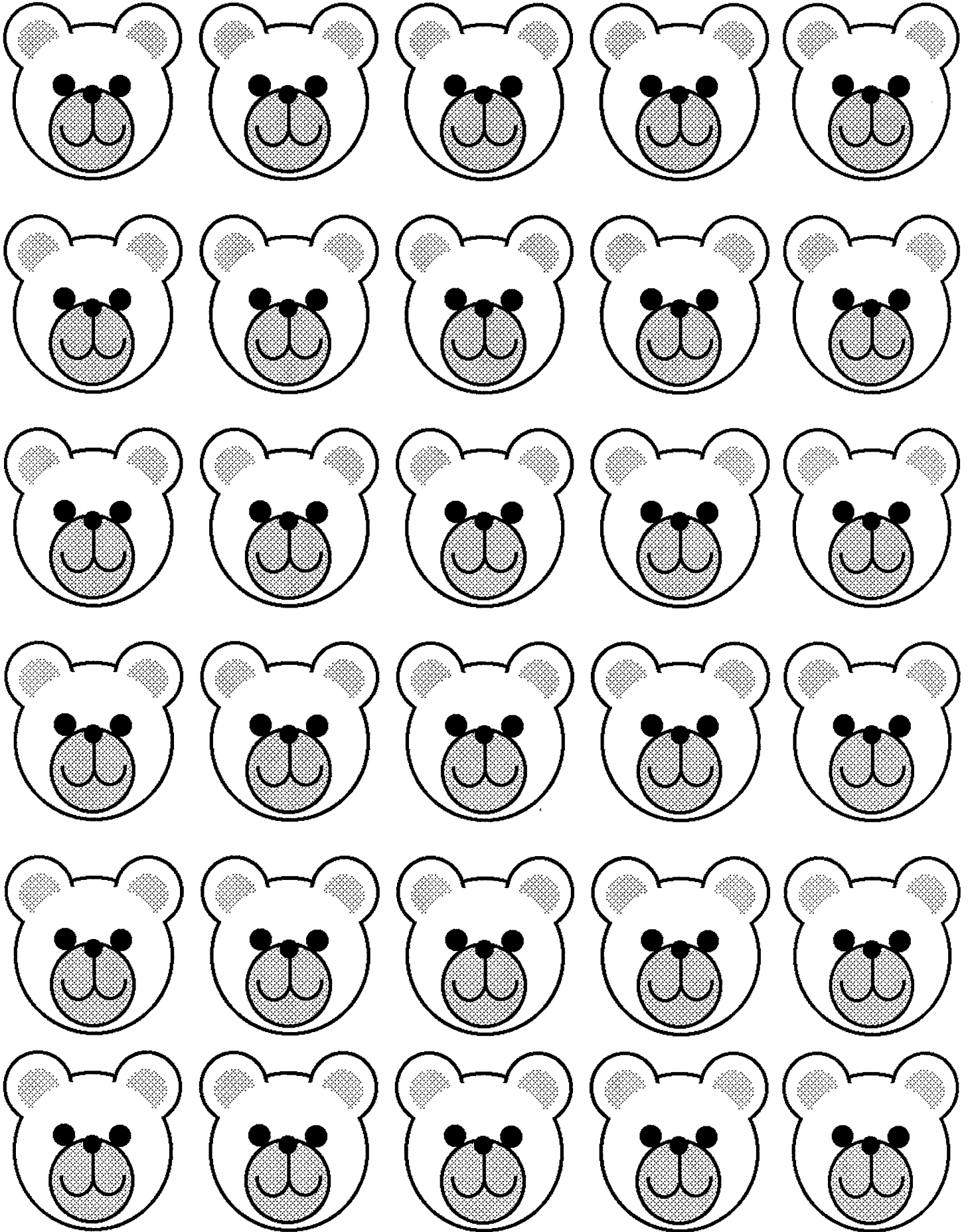
# Blacklines

Patterns, cards, spinners, and other materials you'll make for the  
Practice & Enrichment Boxes described in this packet.

Bears

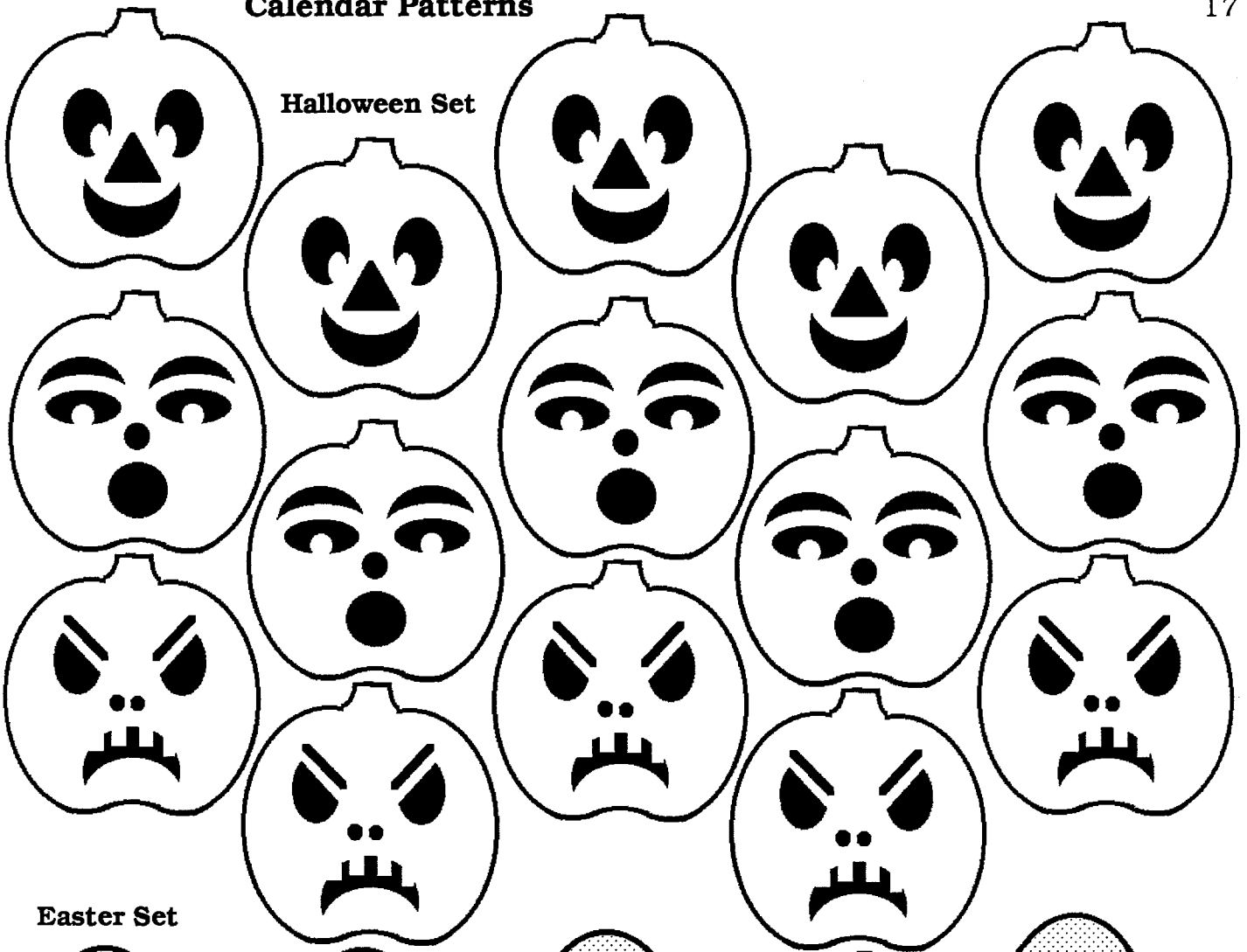


Bears

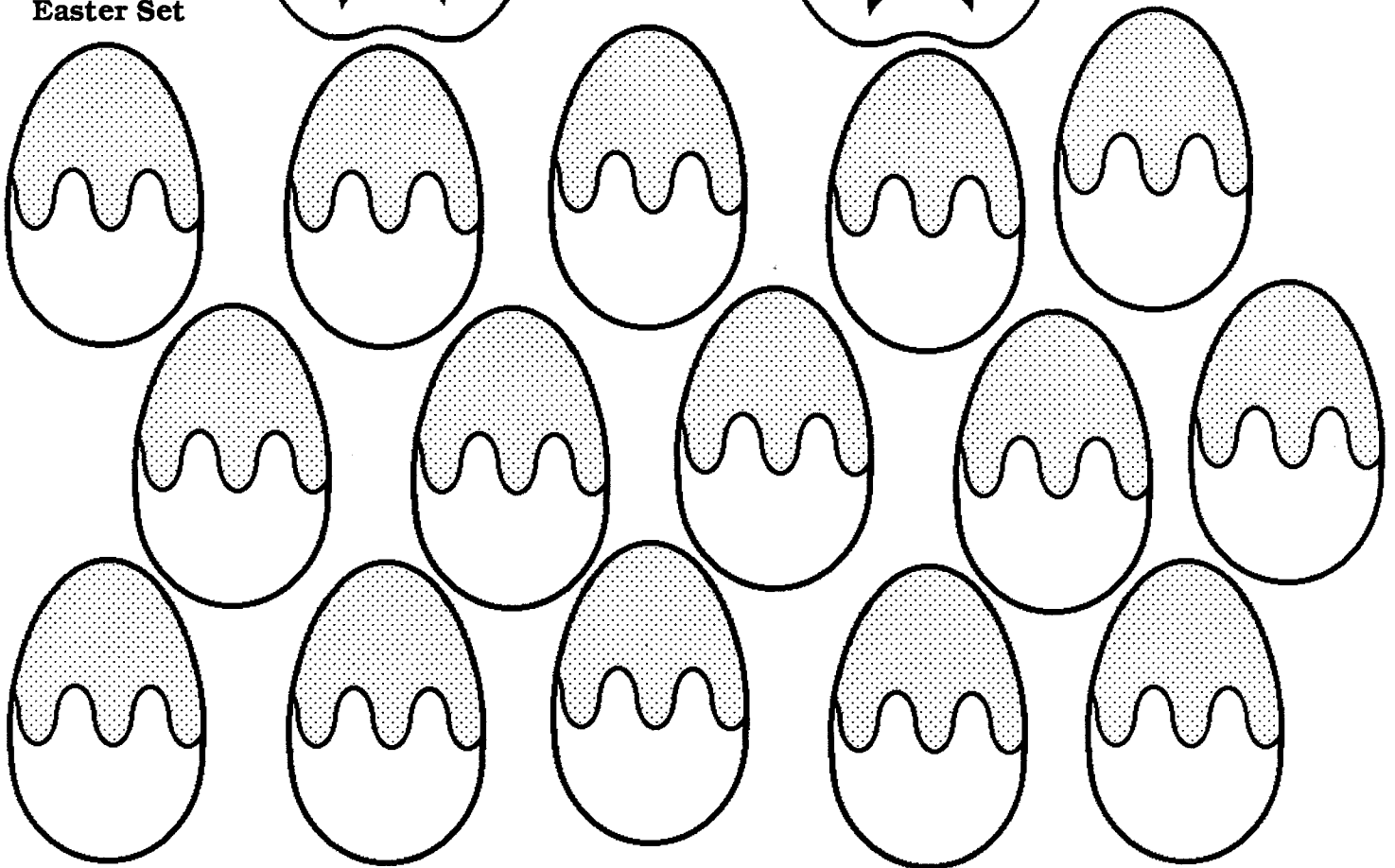




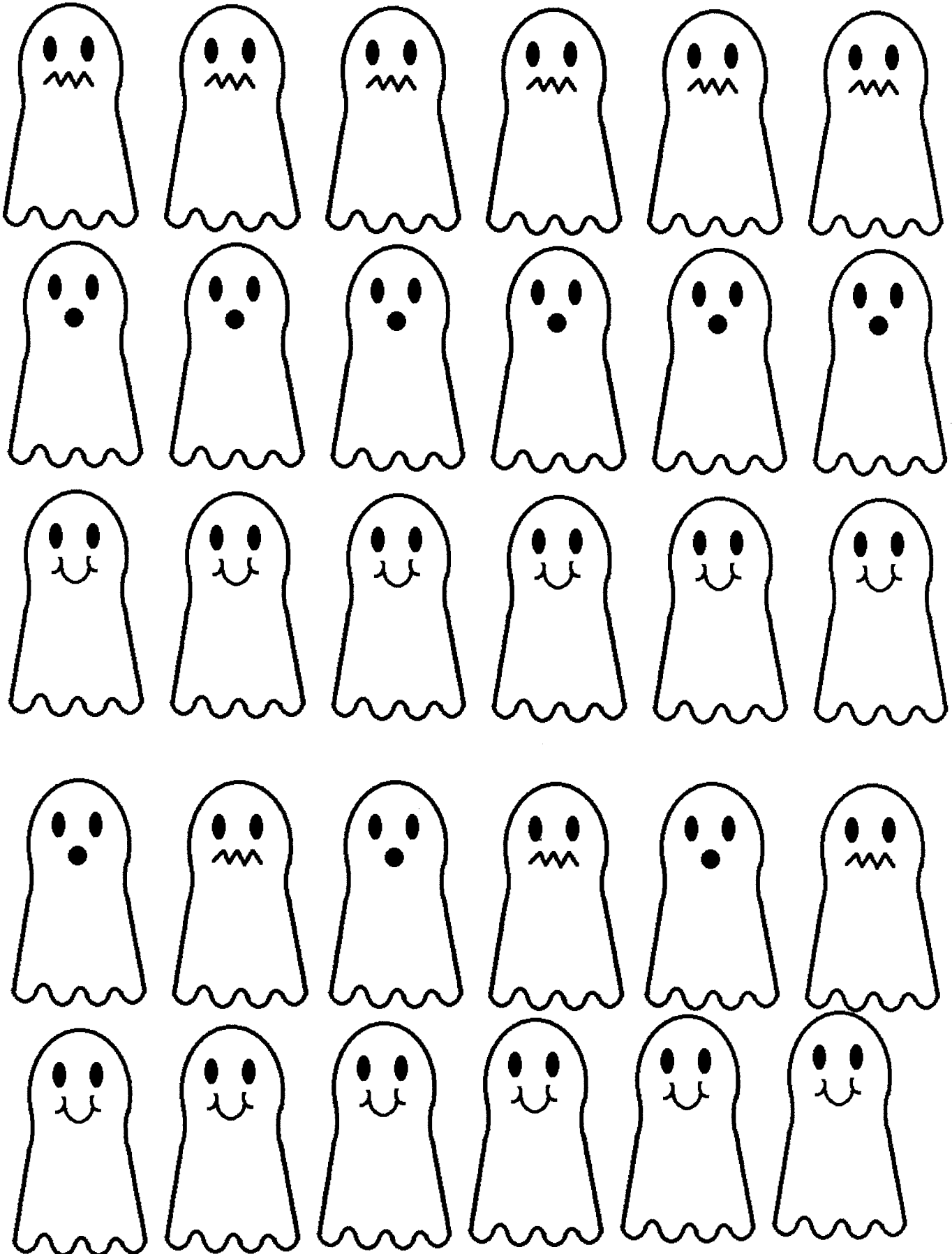
Halloween Set



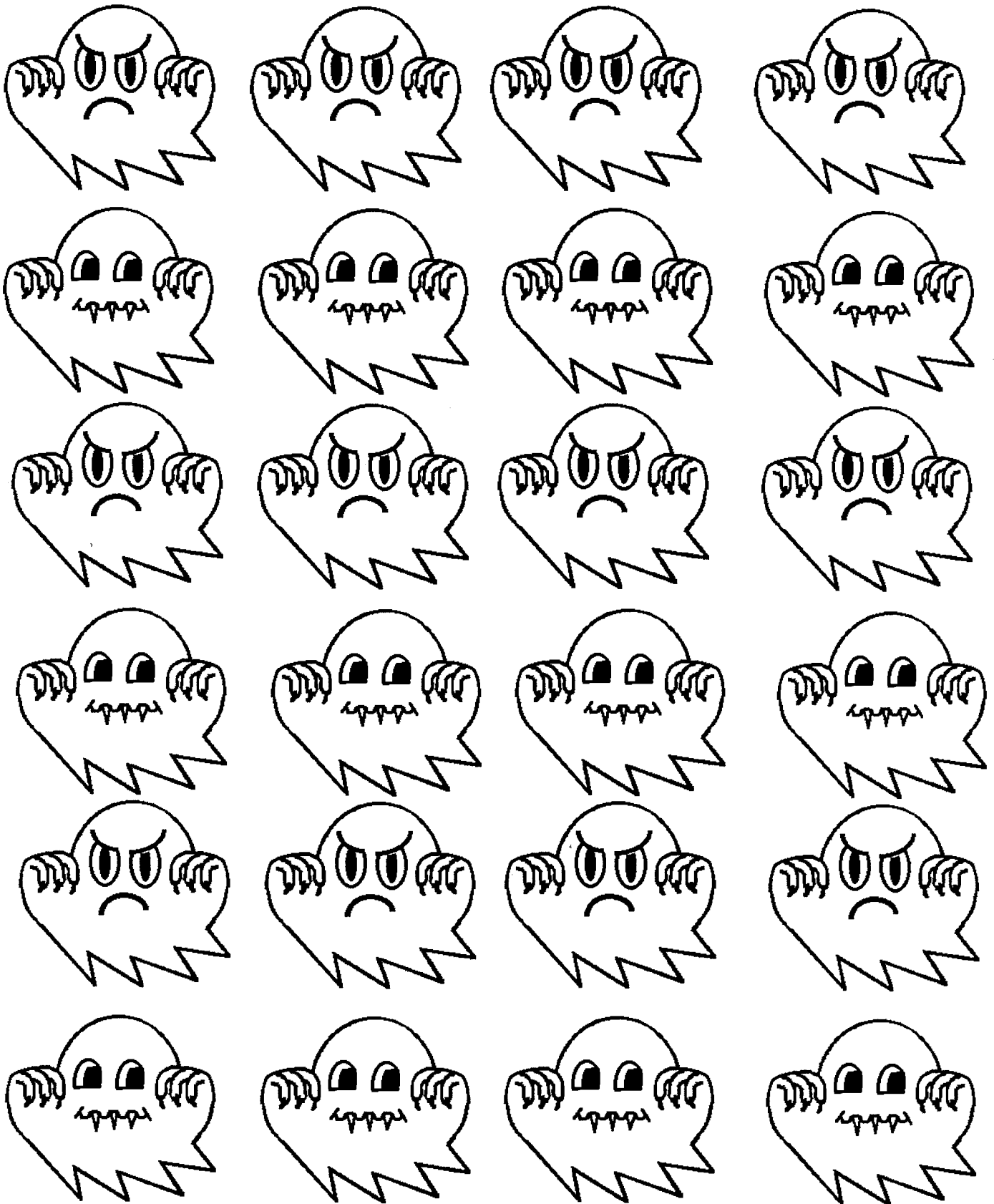
Easter Set



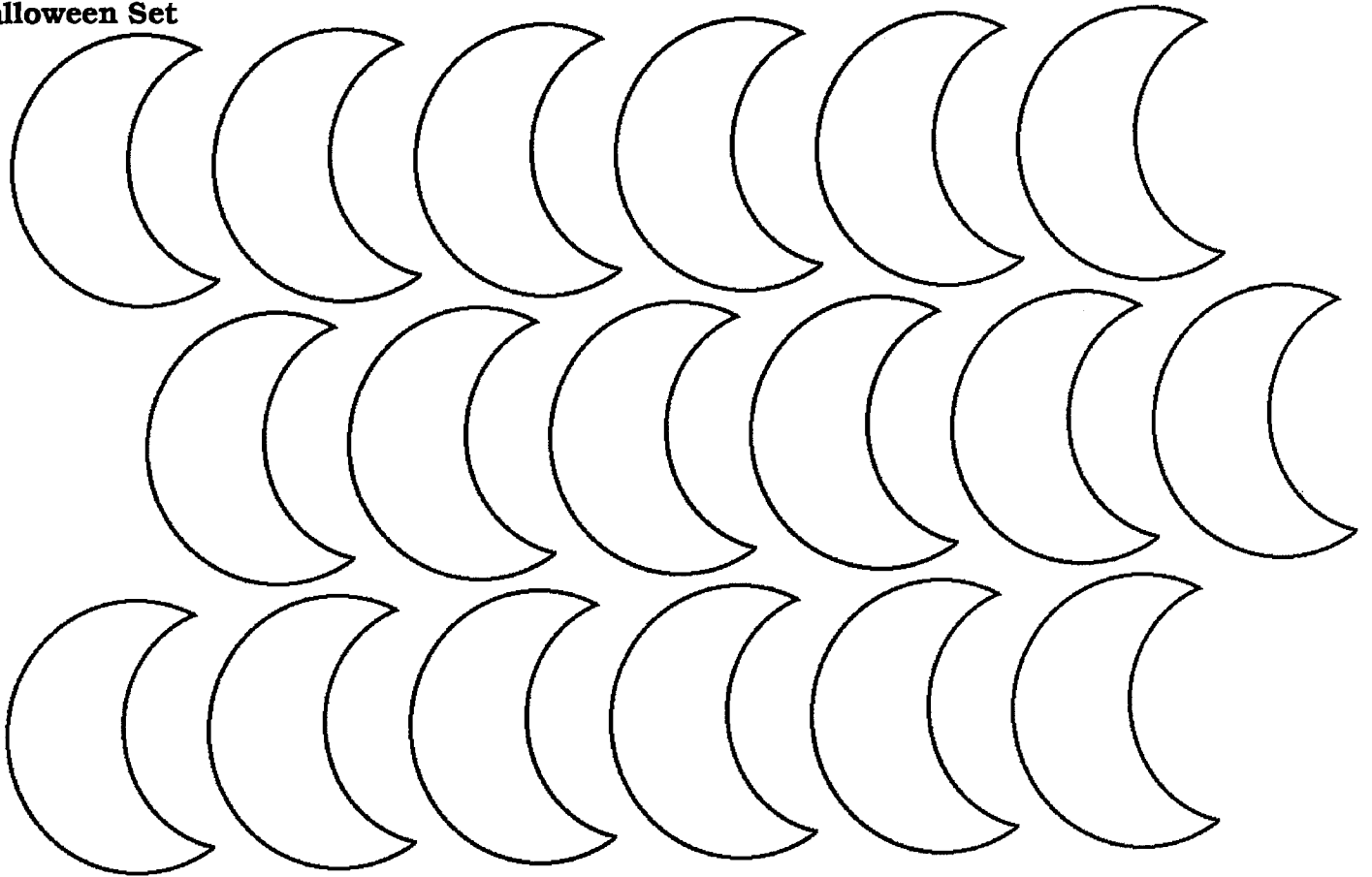
## Halloween Set



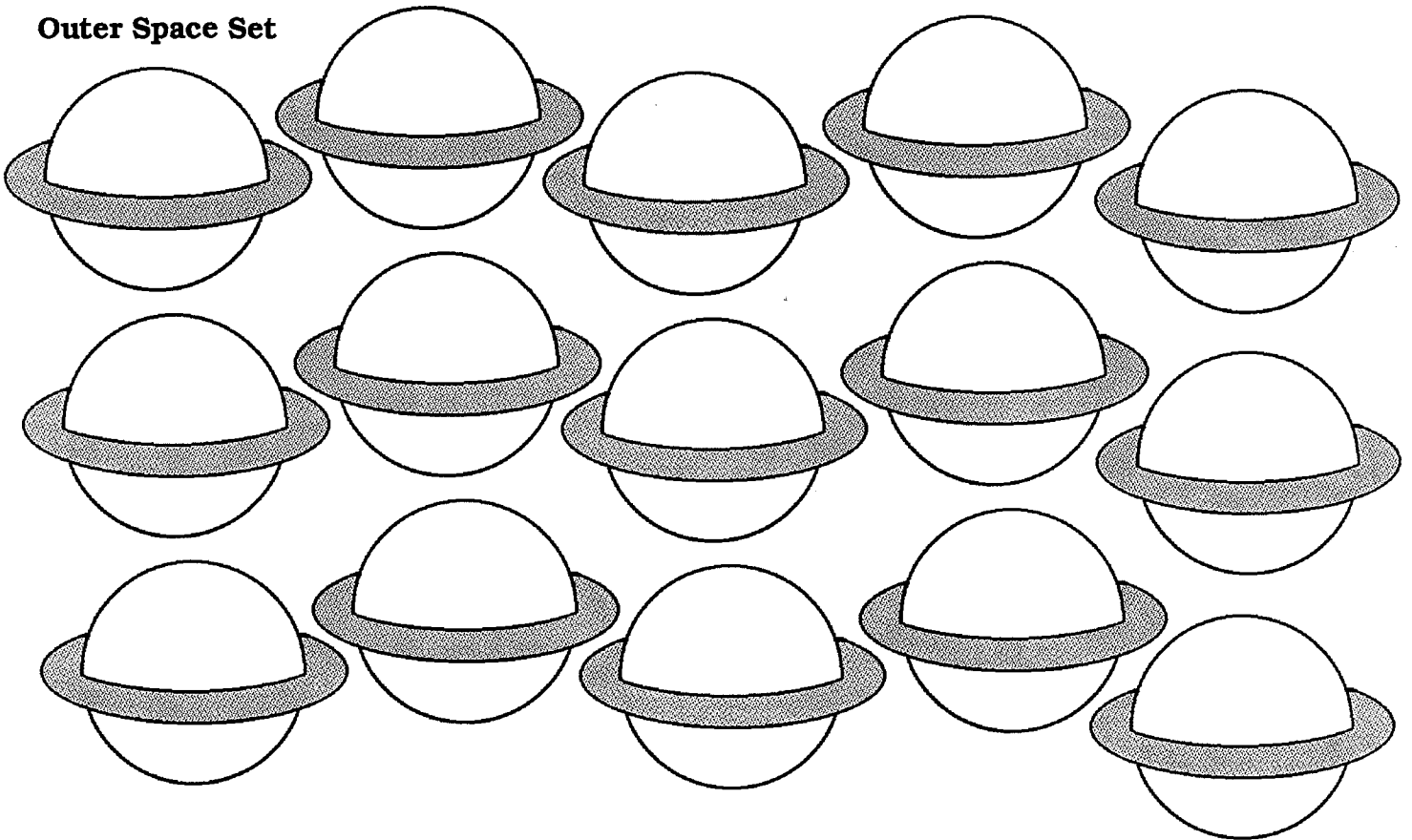
Halloween Set



Halloween Set



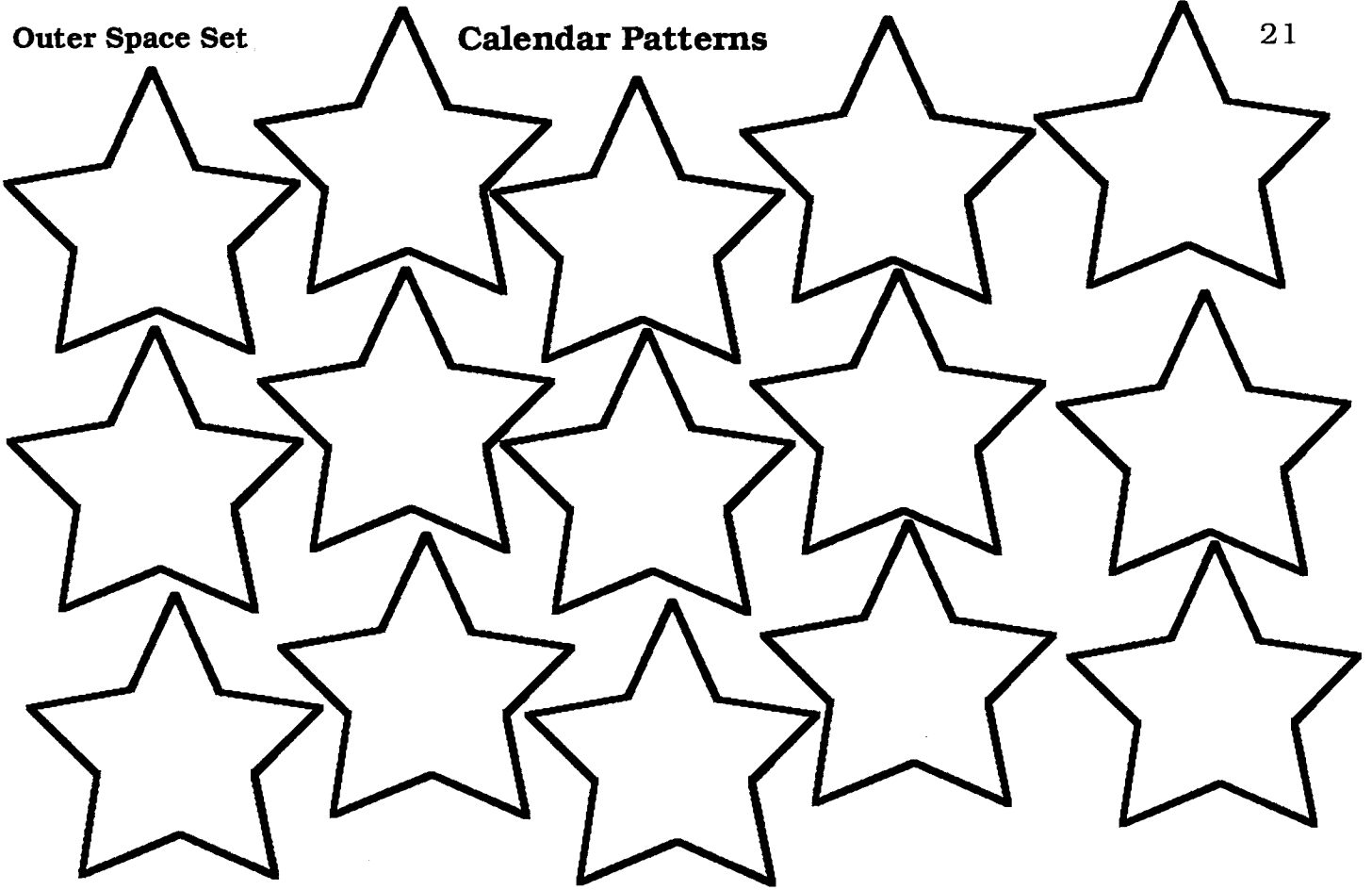
Outer Space Set



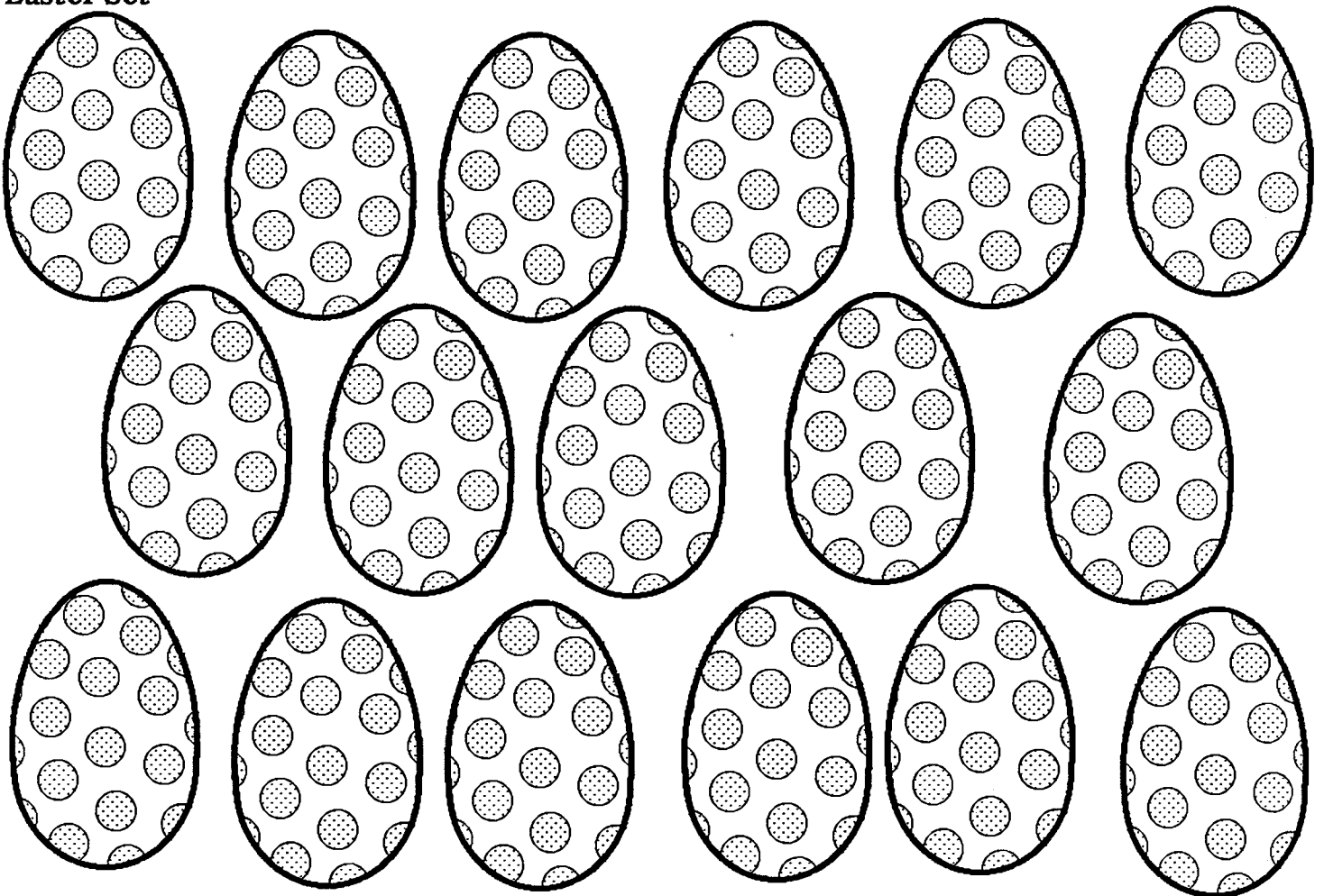
**Outer Space Set**

**Calendar Patterns**

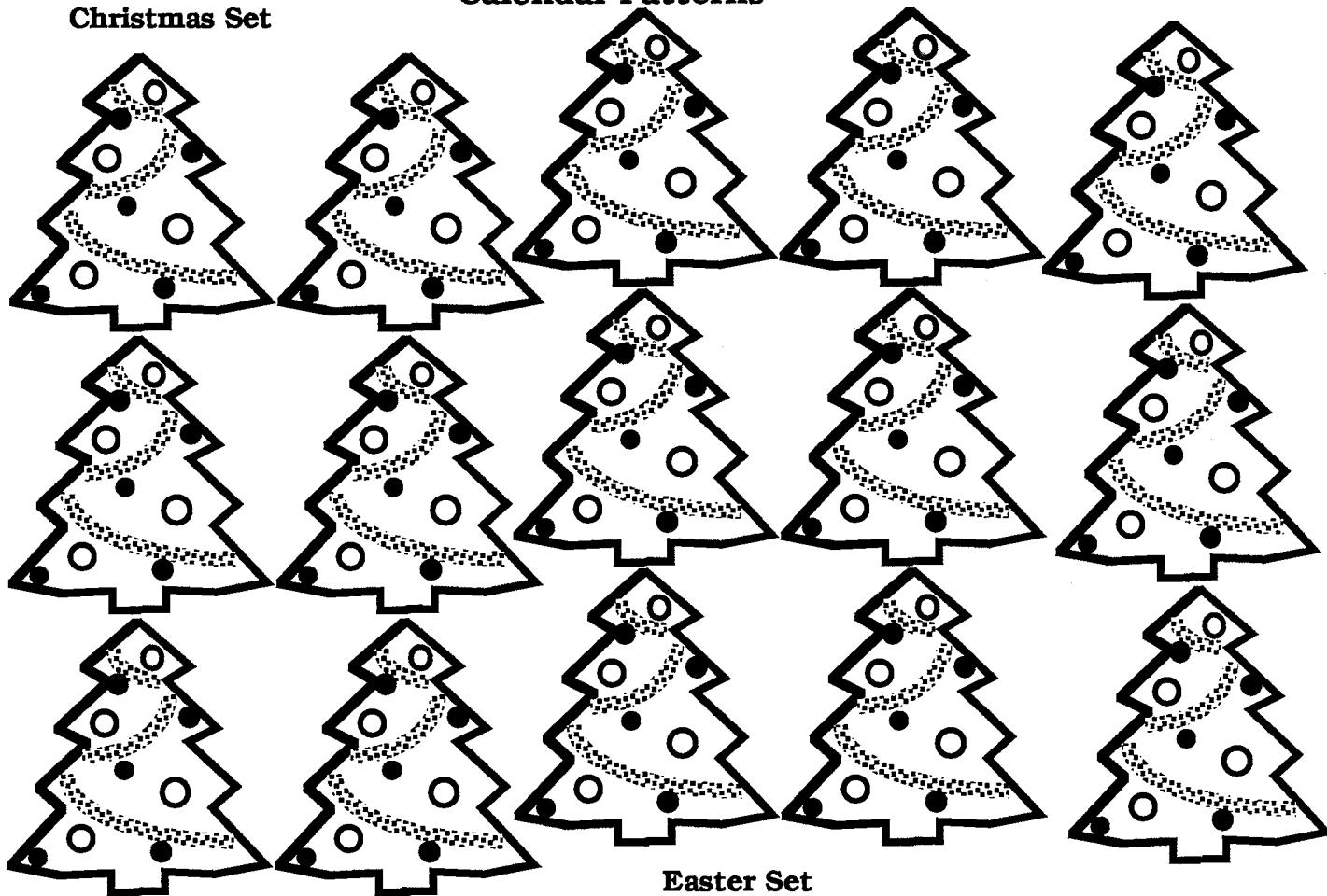
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**Easter Set**



Christmas Set



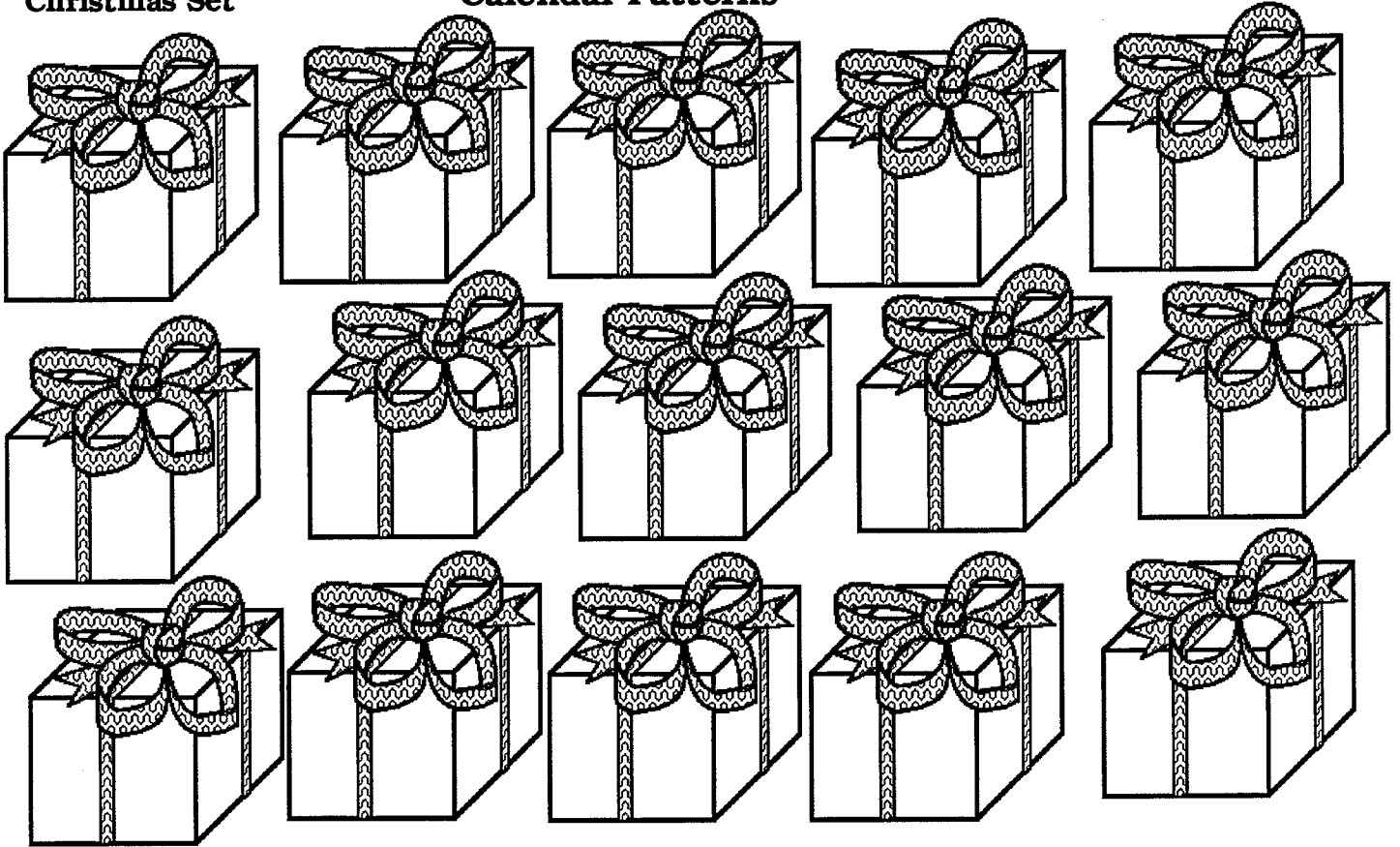
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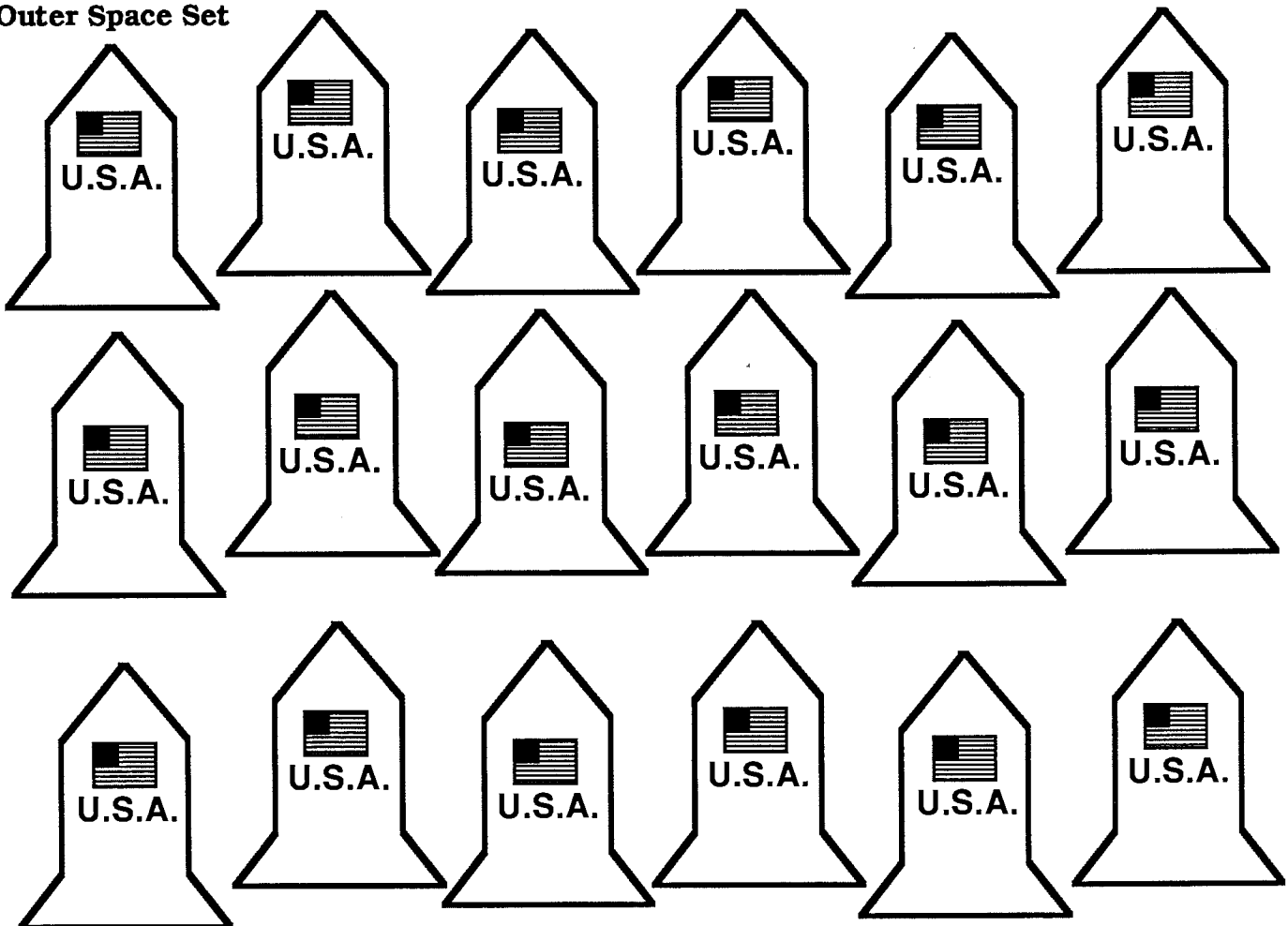
**Christmas Set**

**Calendar Patterns**

23



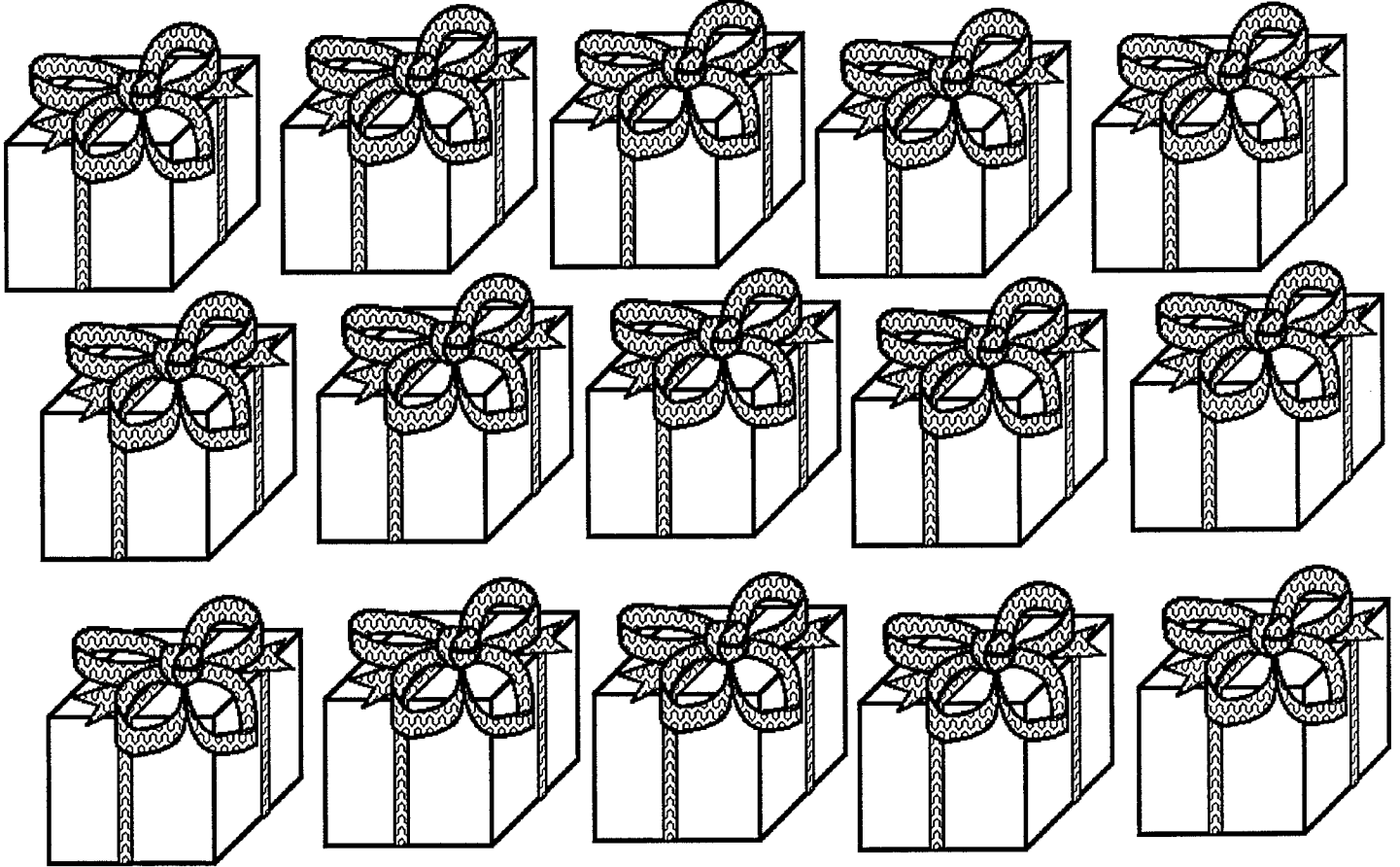
**Outer Space Set**



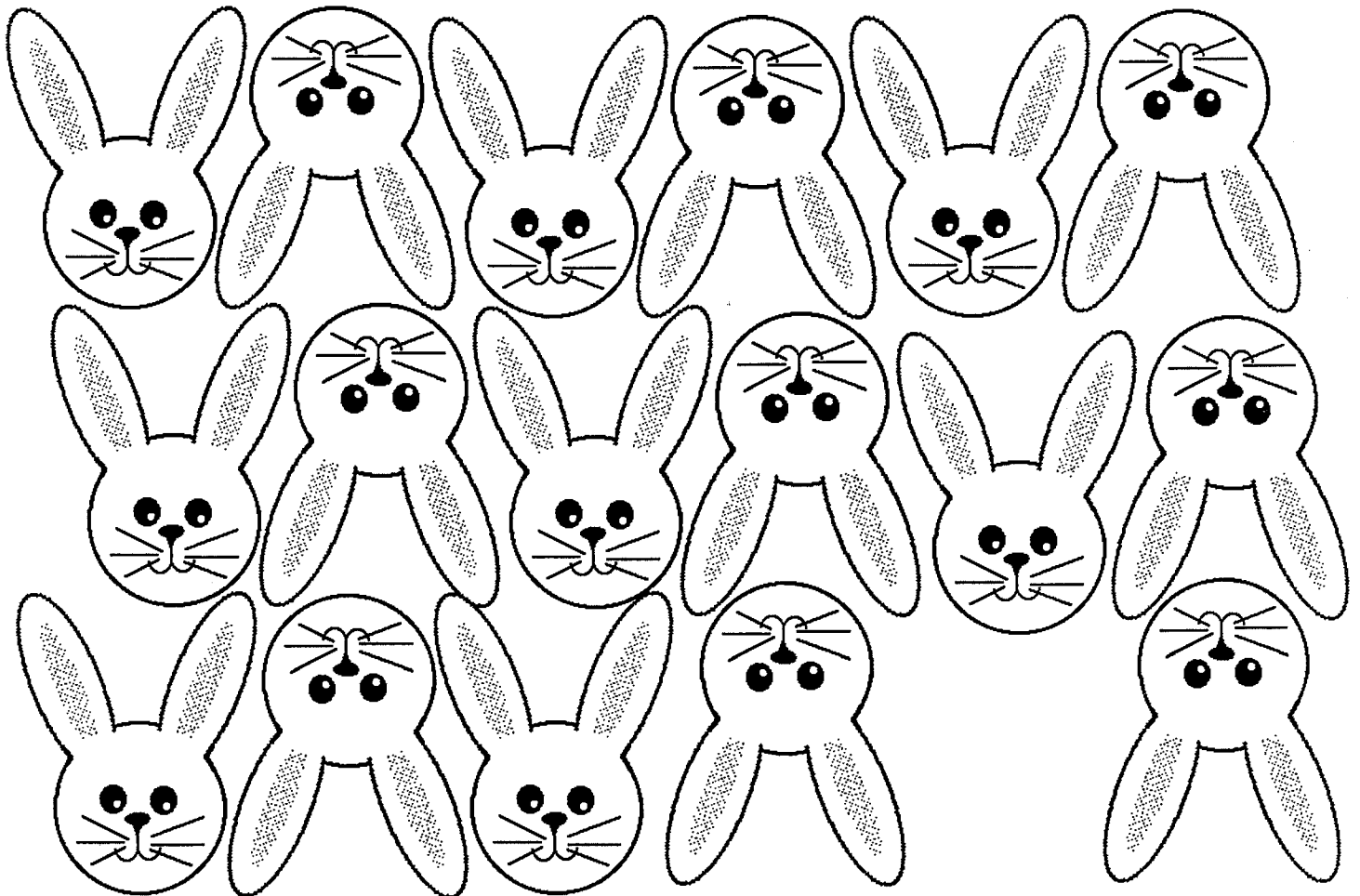
**Christmas Set**

**Calendar Patterns**

24



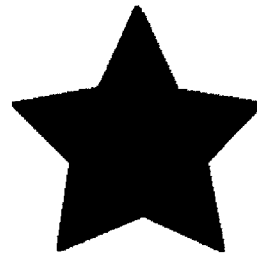
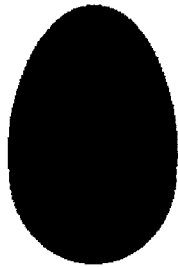
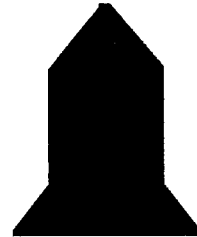
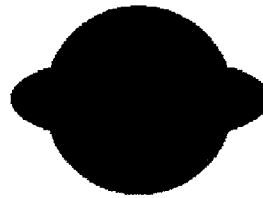
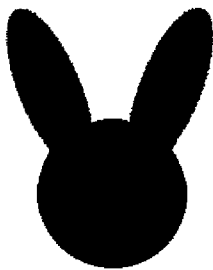
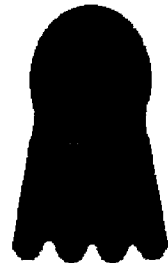
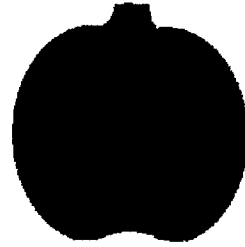
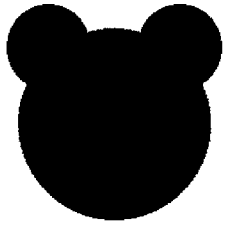
**Easter Set**





**Templates Shapes for Margarine Lids  
for Calendar Patterns**

25

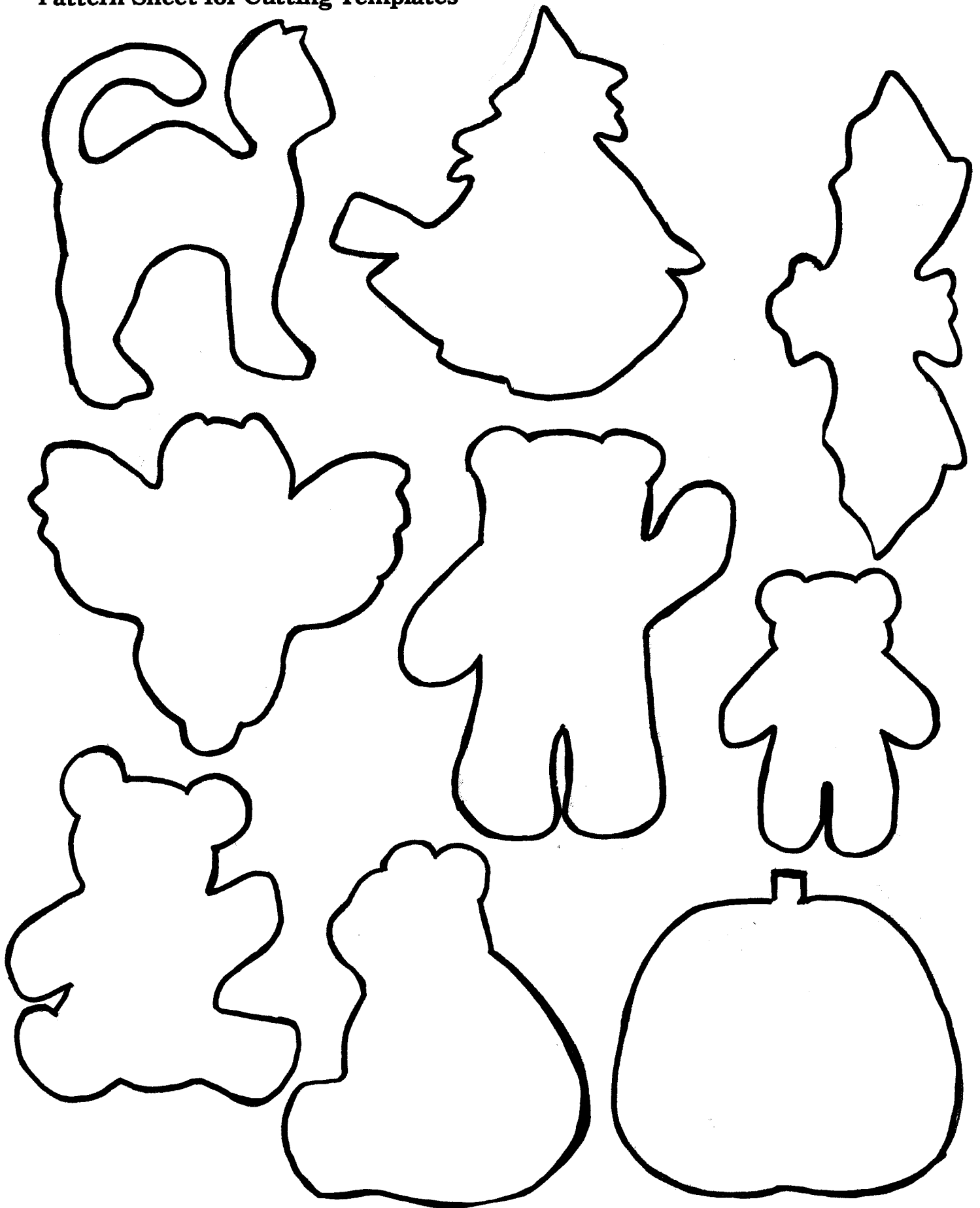


month

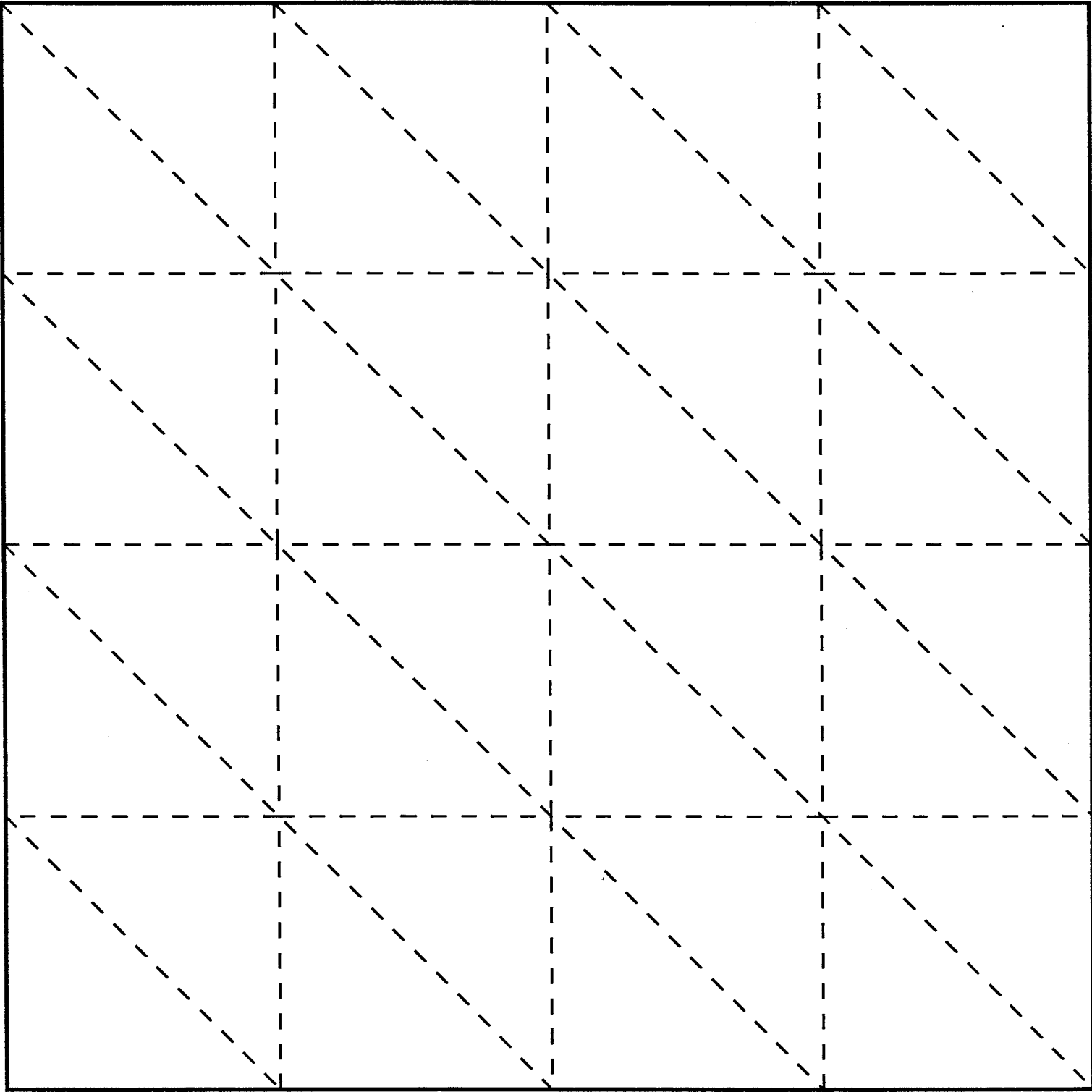
pattern

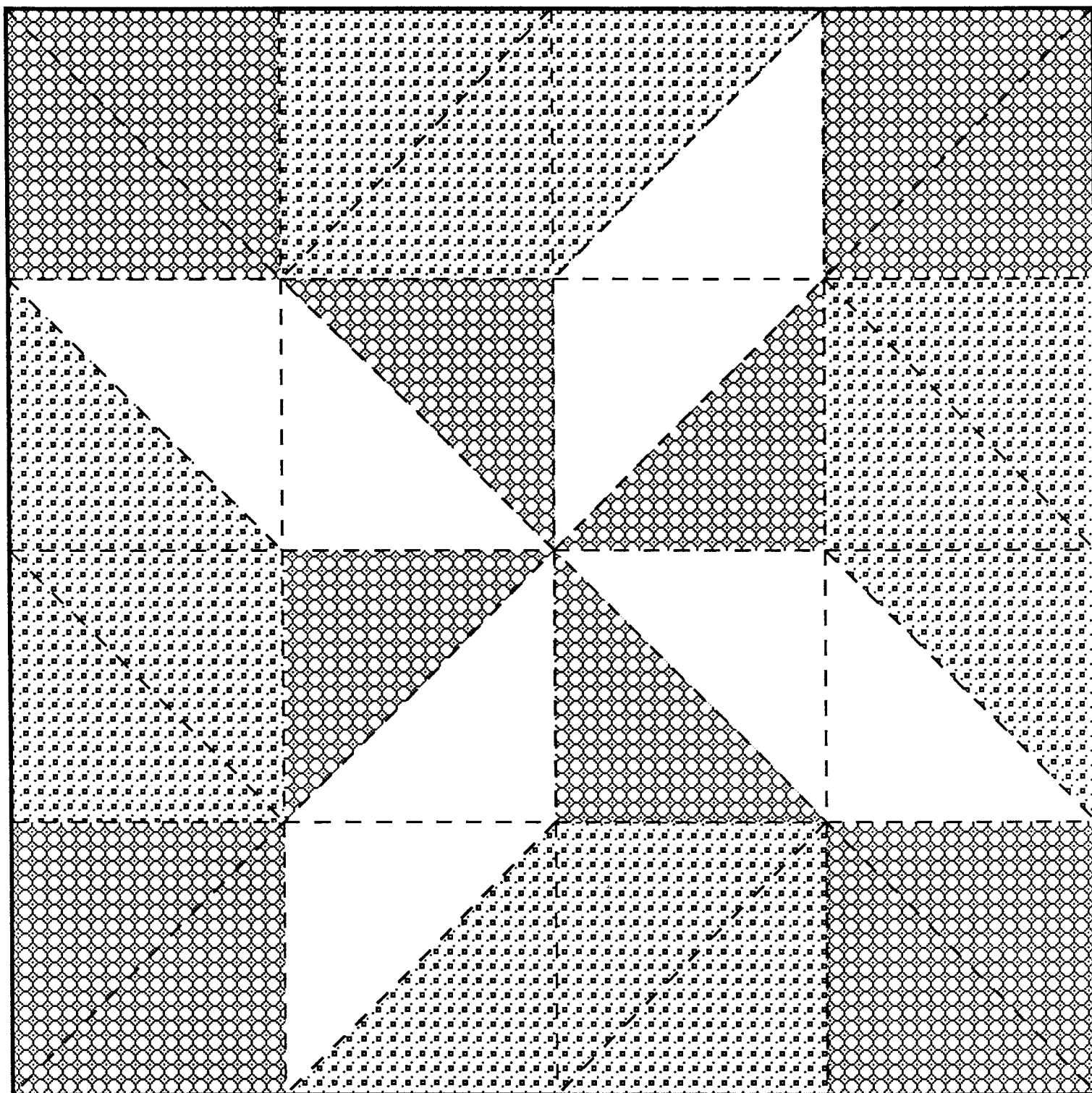
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Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	





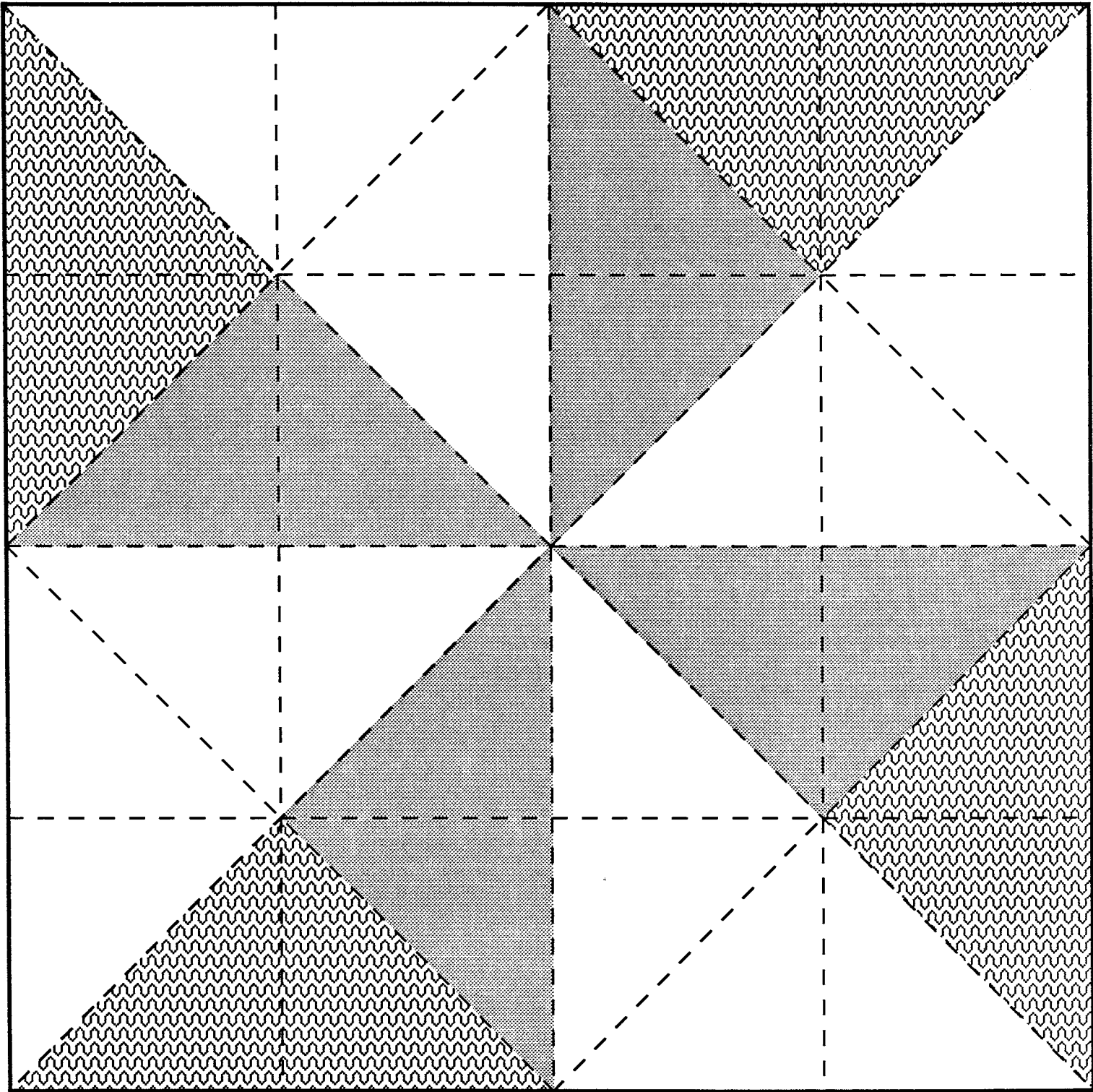
Children also enjoy hearts of varying sizes.





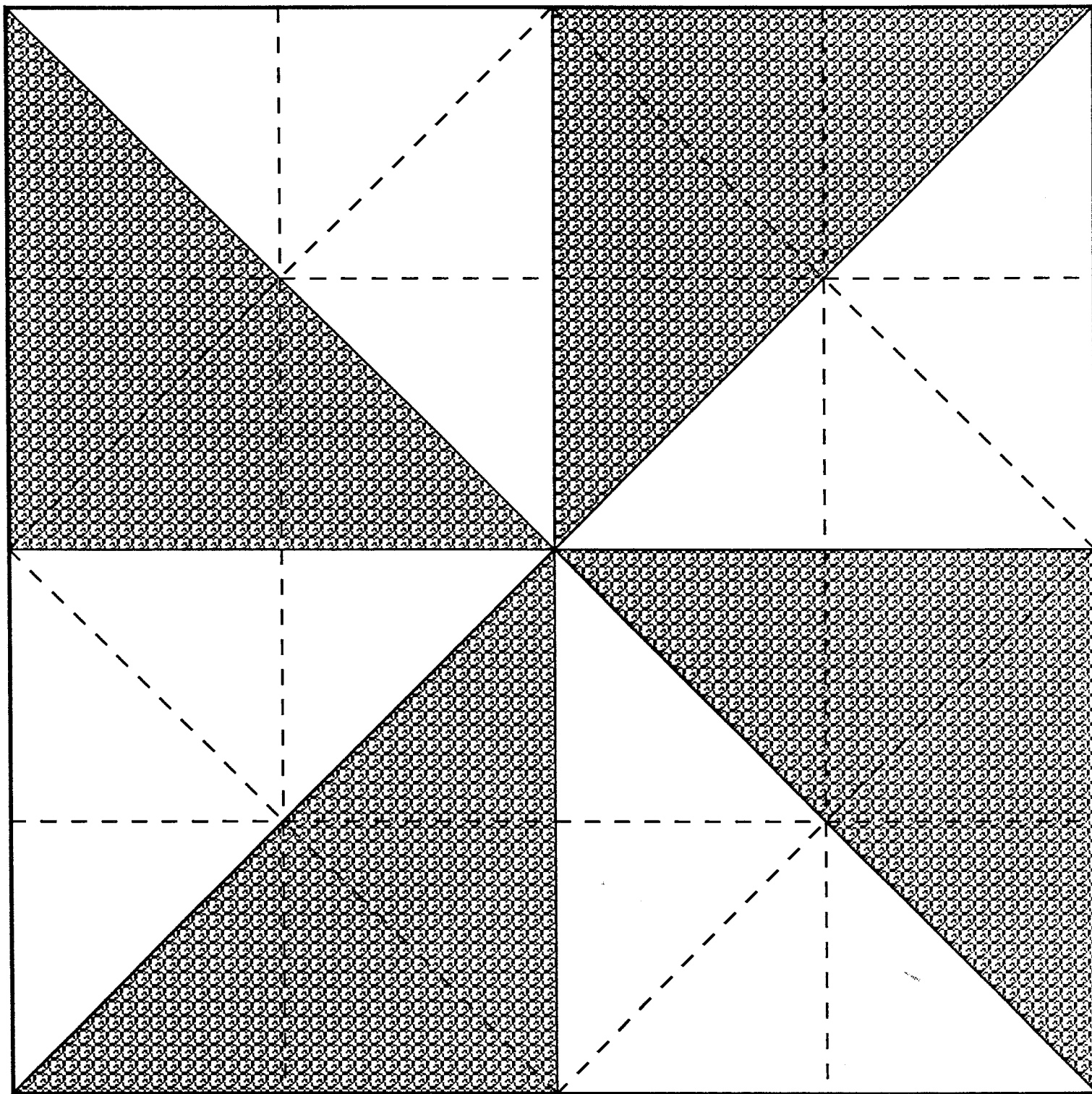
**Clay's Choice**

Name \_\_\_\_\_



**Whirligig**

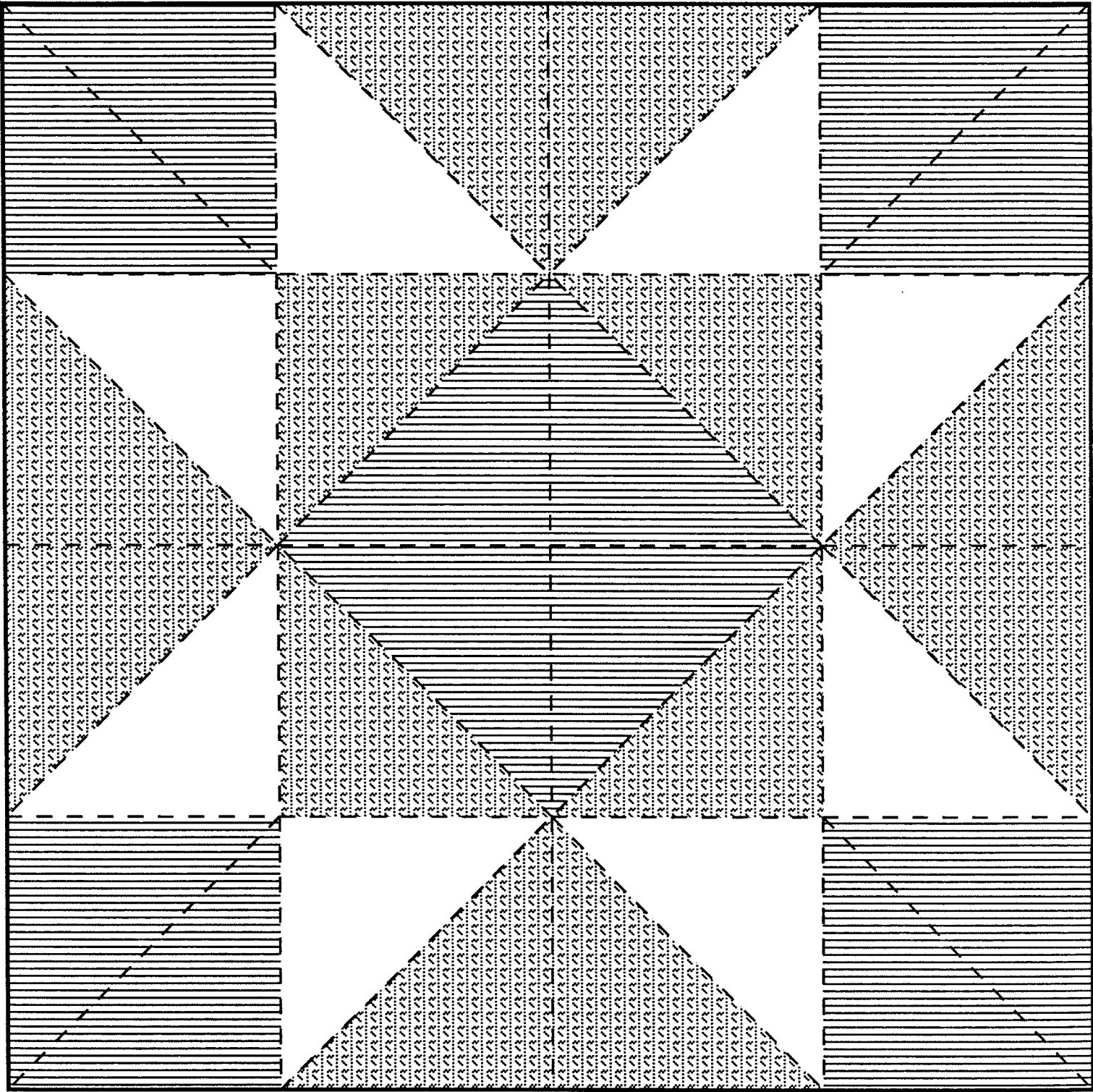
Name \_\_\_\_\_



**Windmill**

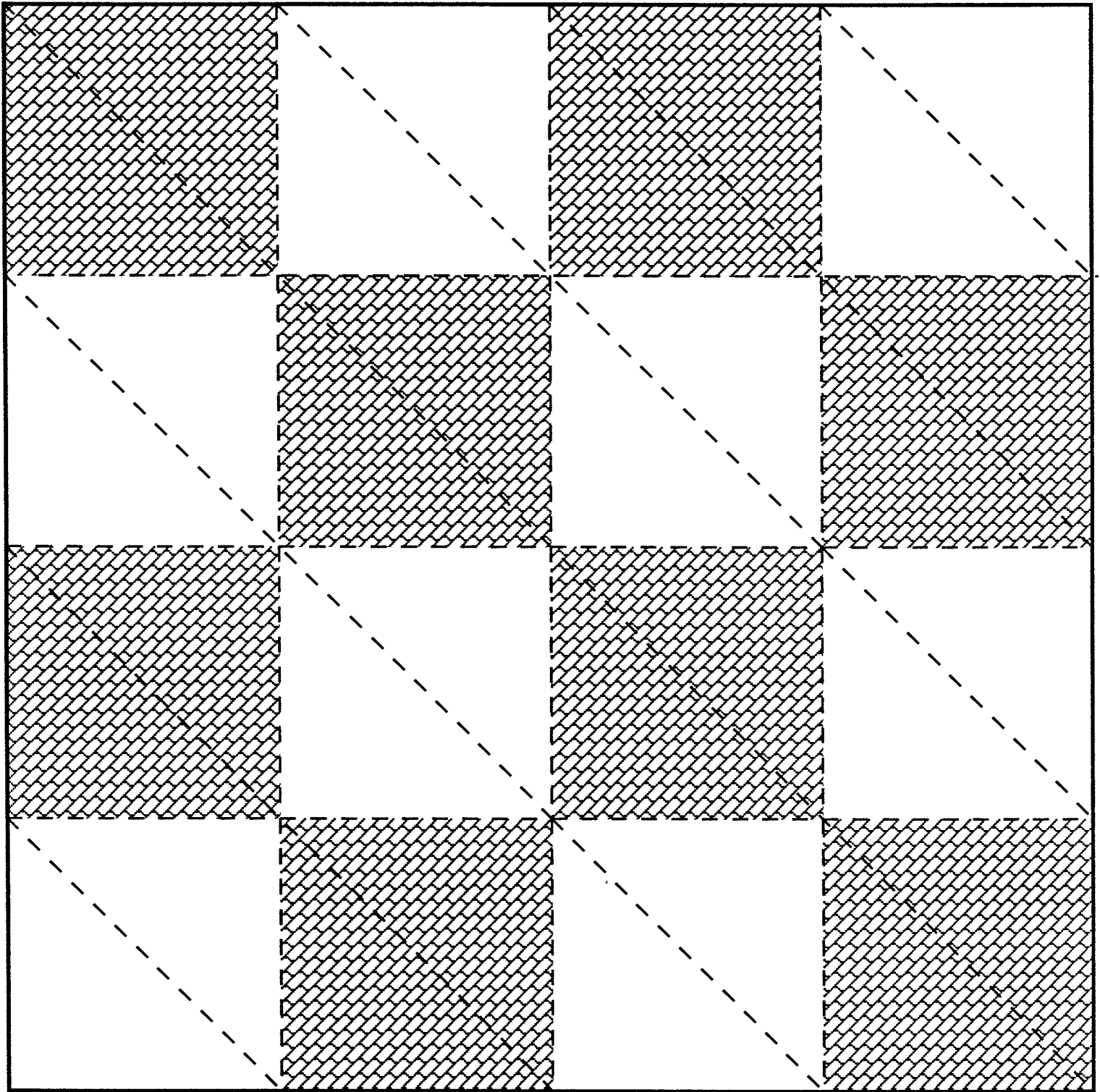
Name \_\_\_\_\_





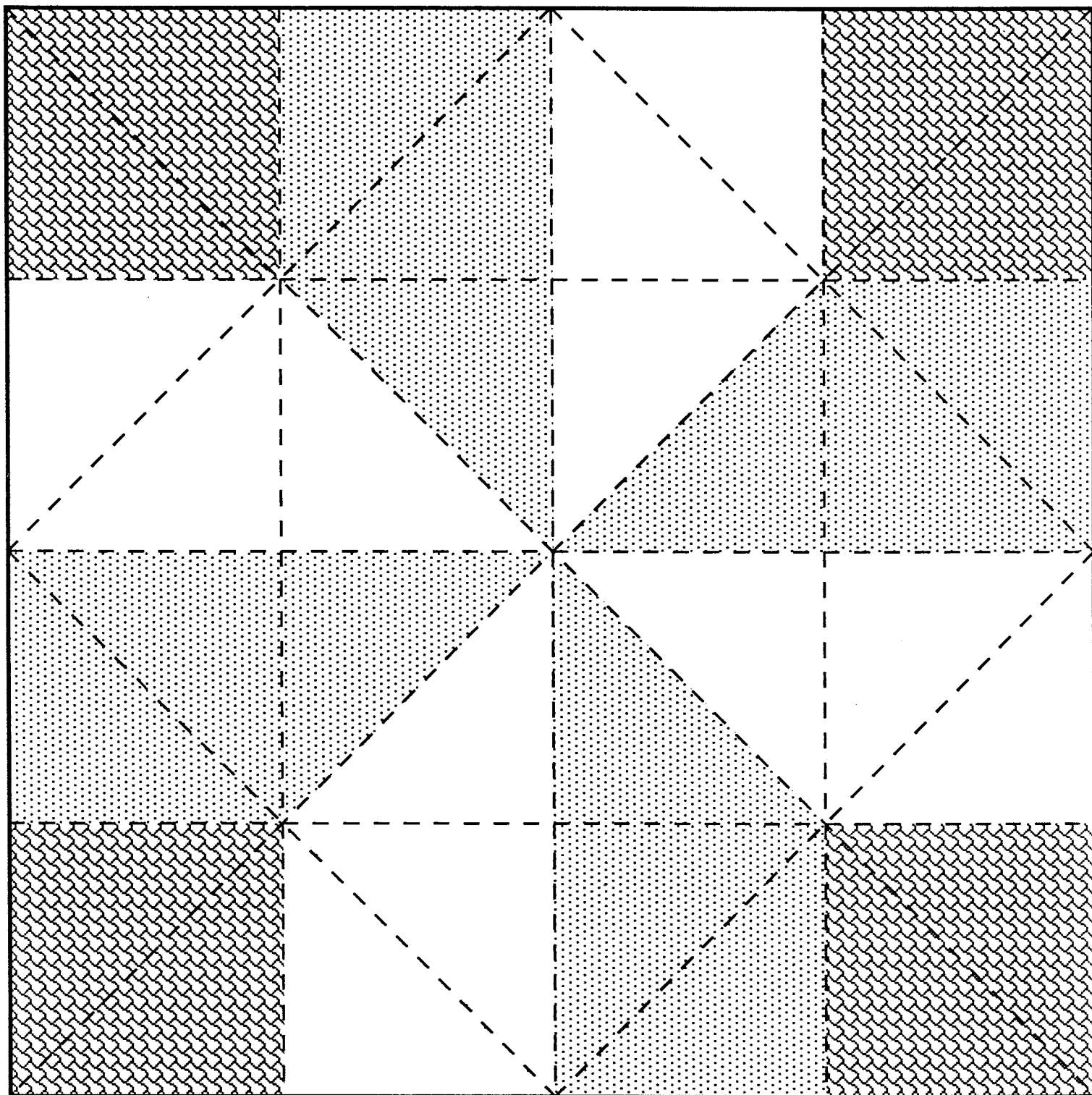
**Evening Star**

Name \_\_\_\_\_



**Checkerboard**

Name \_\_\_\_\_



**Nelson's Victory**

Name \_\_\_\_\_

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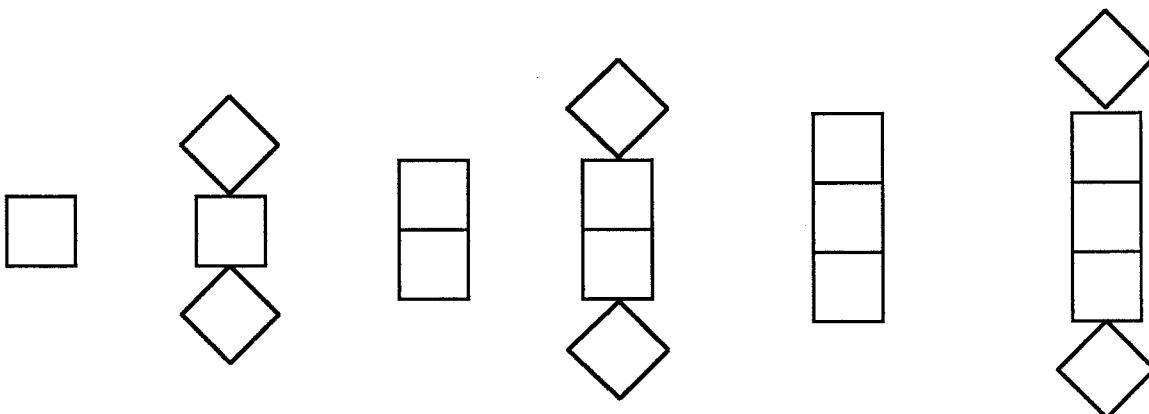
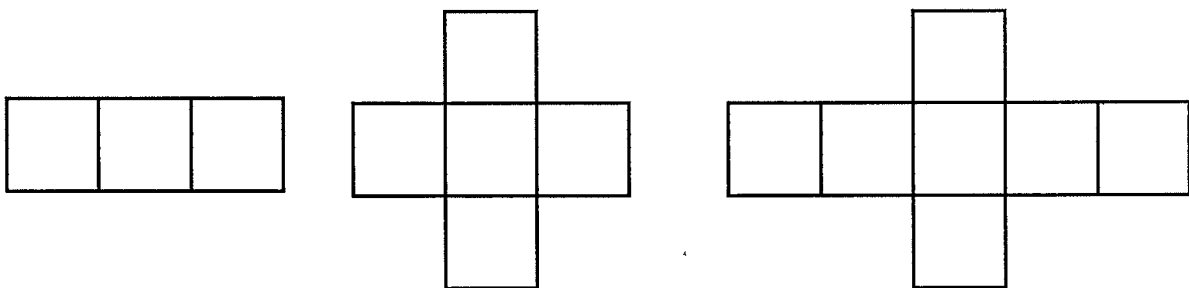
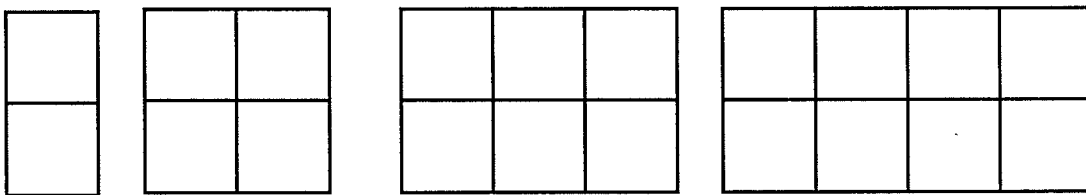
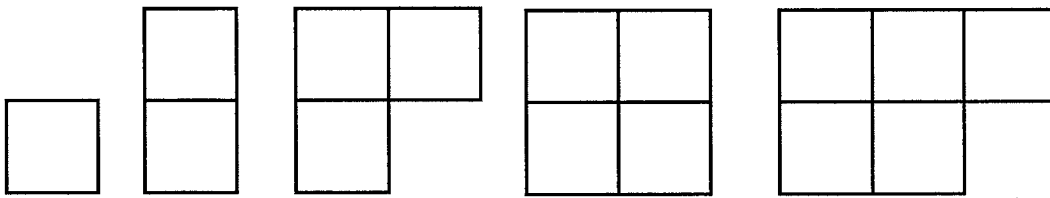
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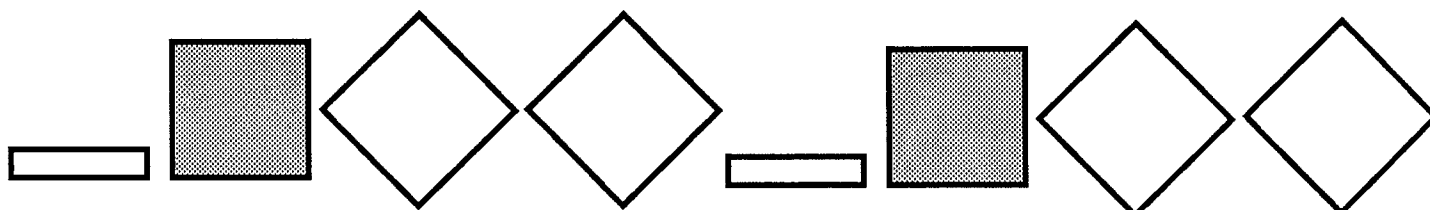
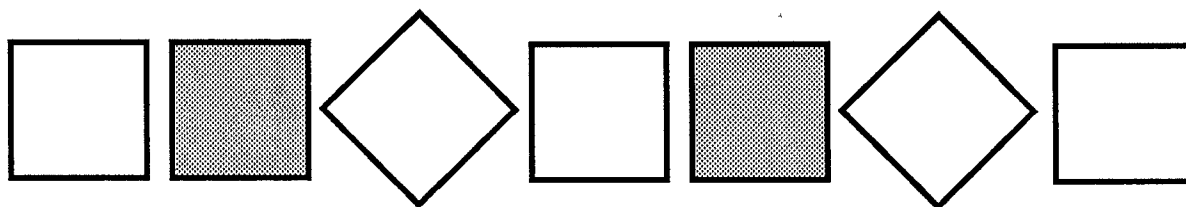
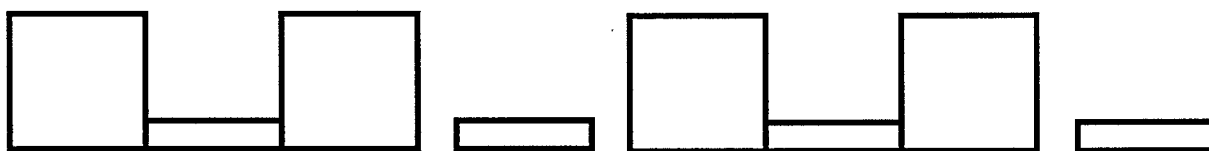
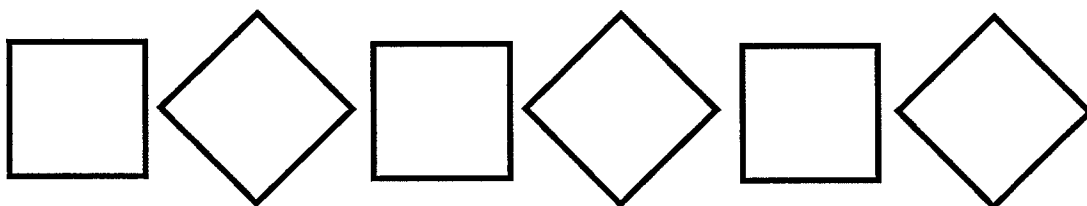
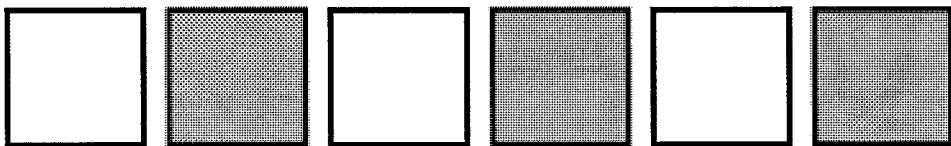
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[illegible]





2 4 6 8 →

1 4 9 16

1 2 4 7 11

1 2 3 4 →

1 3 5 7 9

3 6 9 12 →





1¢



10¢



1¢



10¢



1¢



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5¢



1¢



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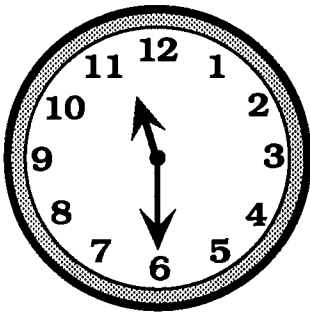
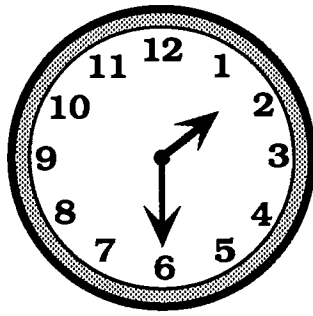
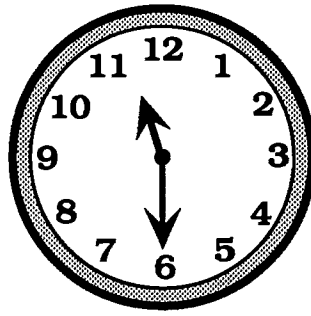
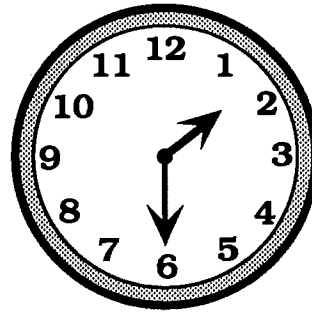
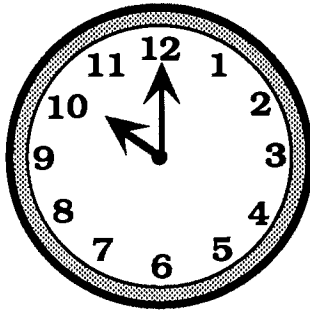
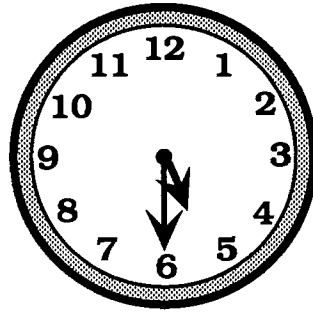
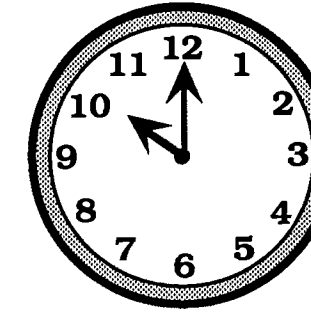
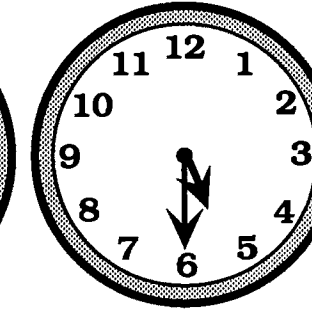
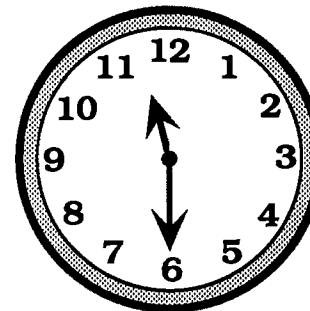
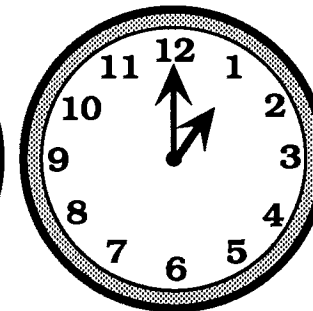
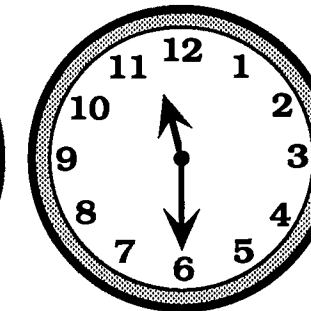
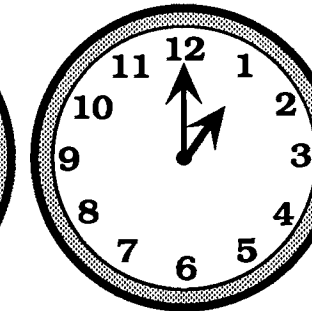
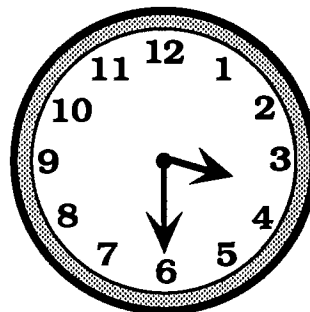
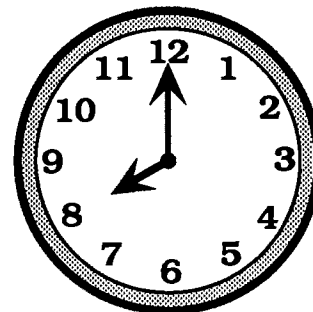
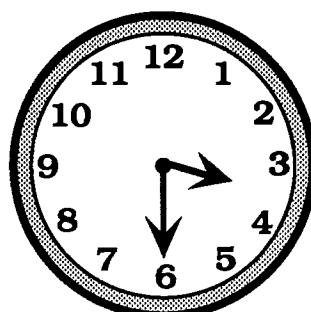
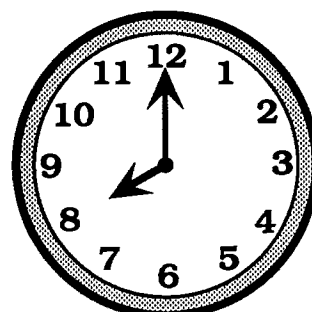
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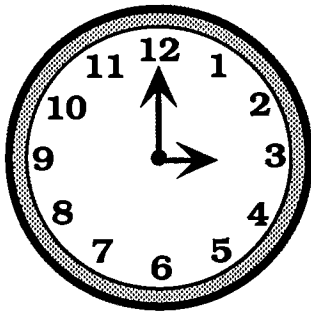
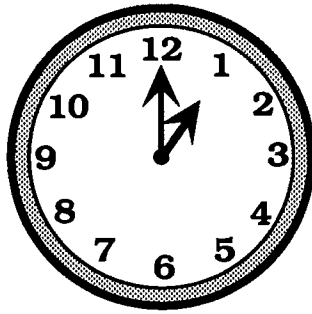
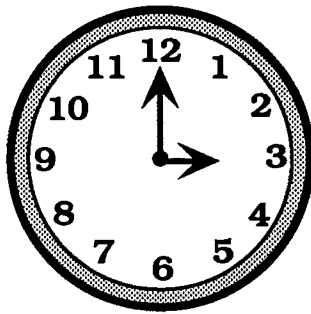
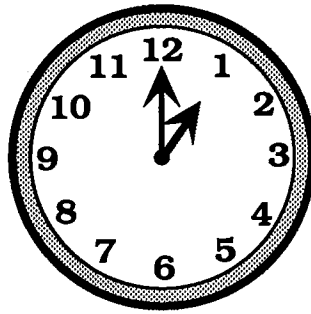
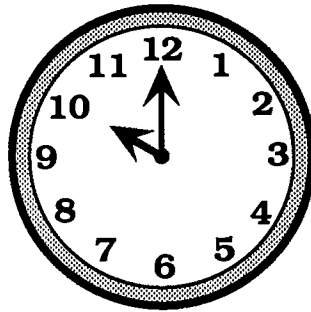
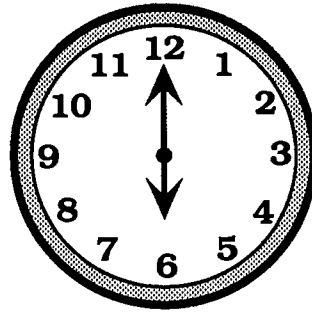
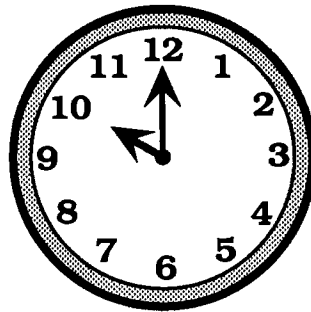
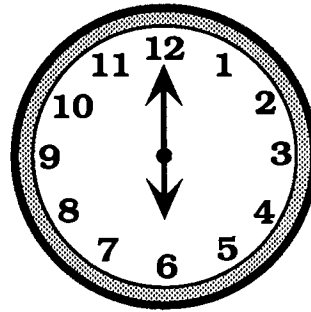
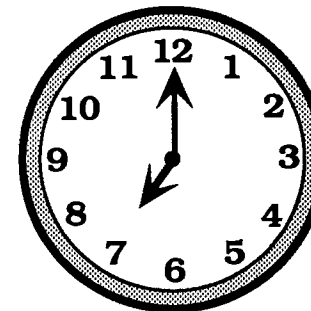
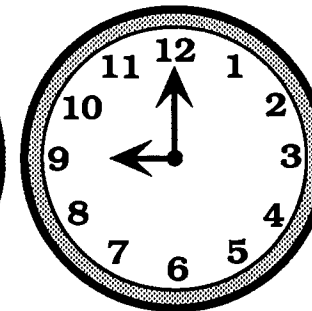
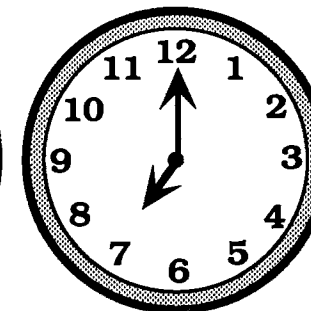
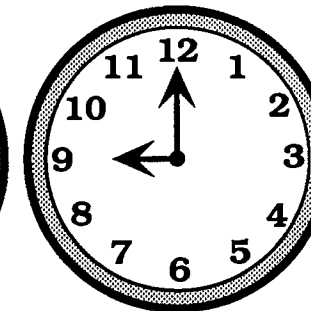
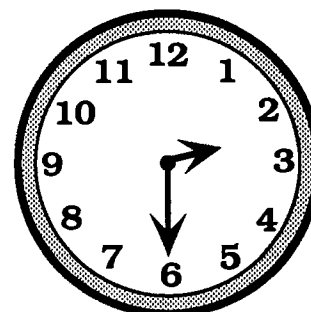
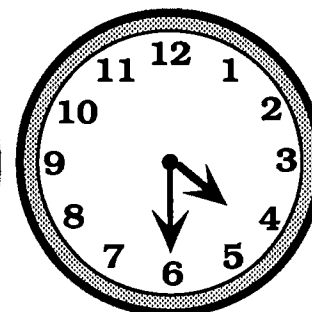
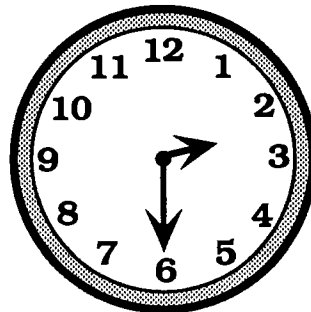
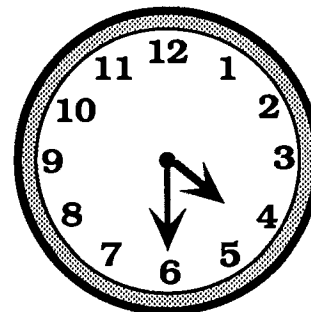


penny



nickel

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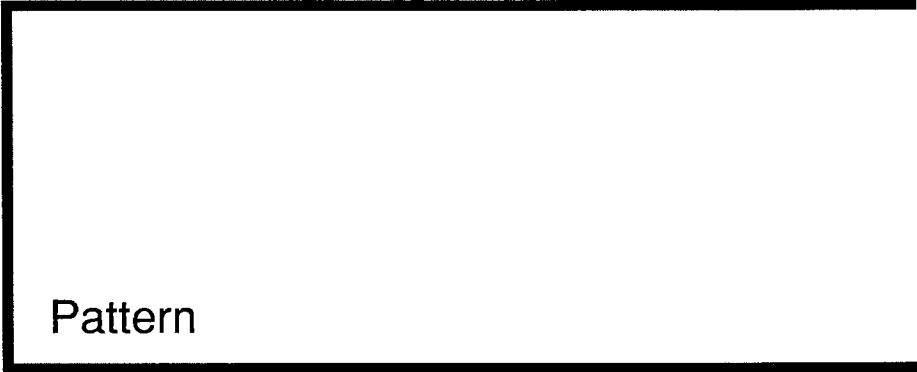
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Days		

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Cut along this line



Days		

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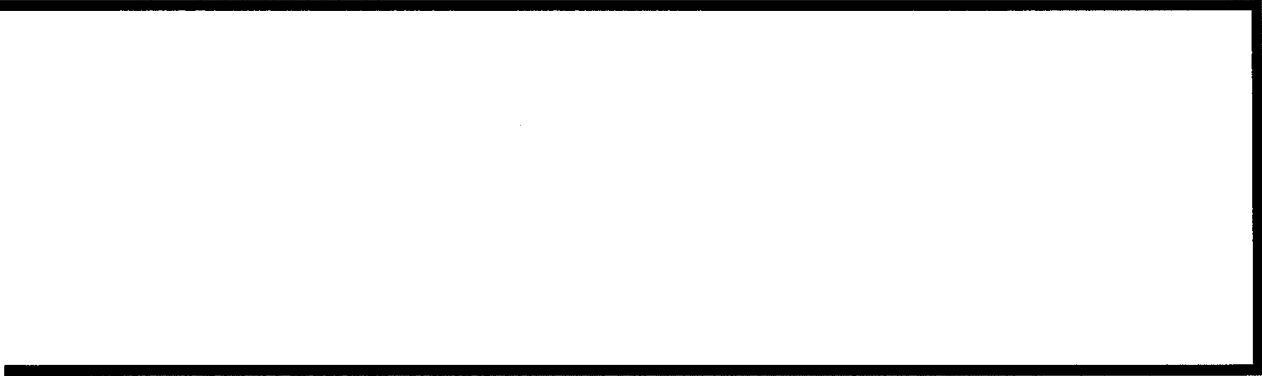
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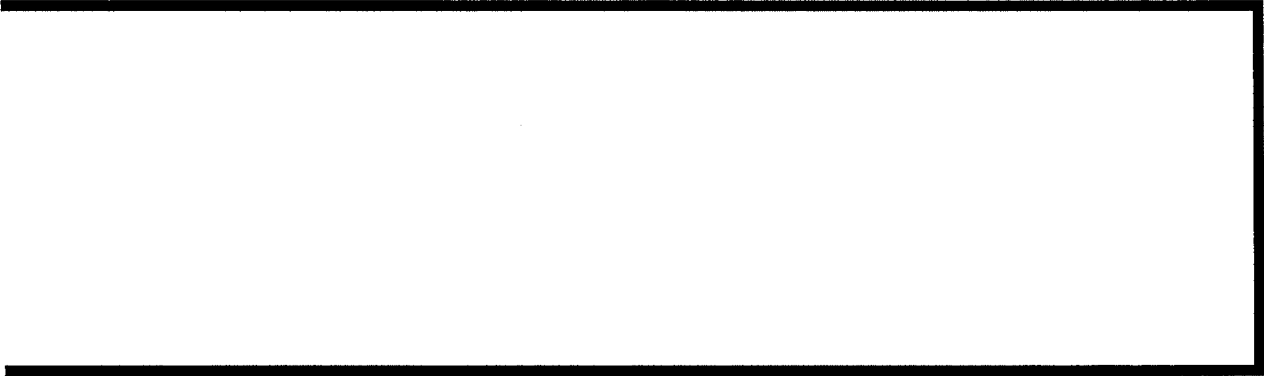
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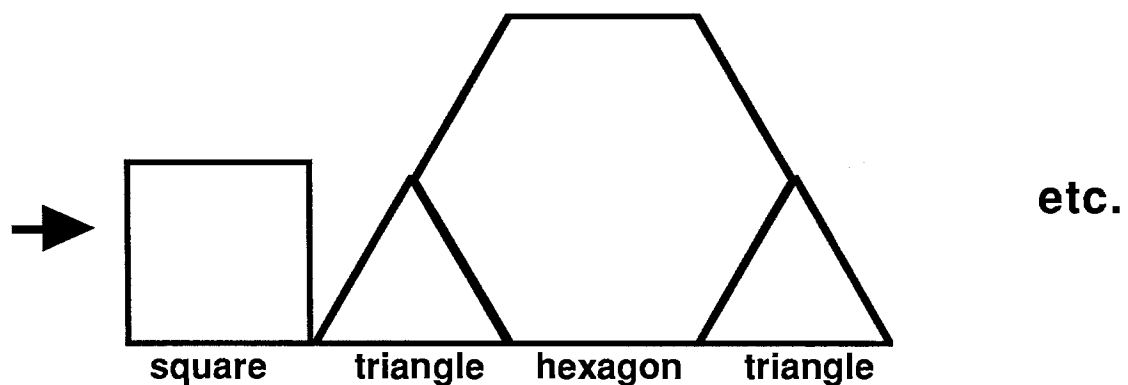
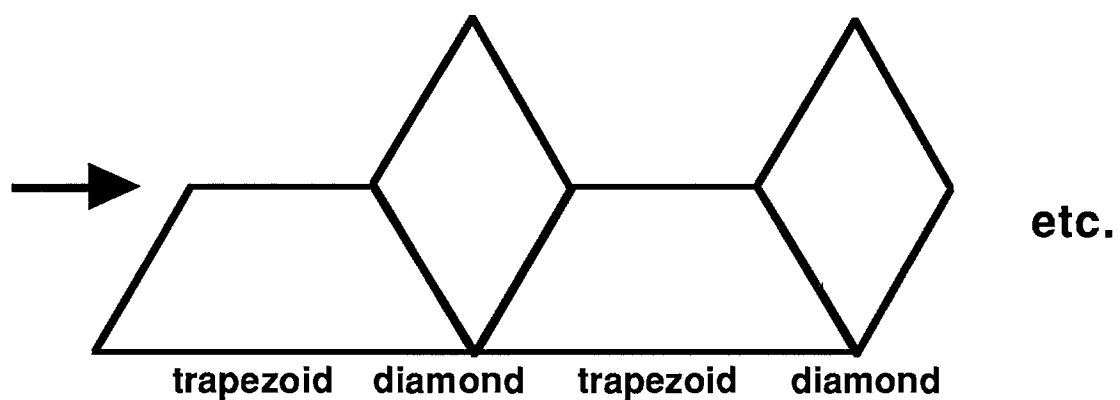
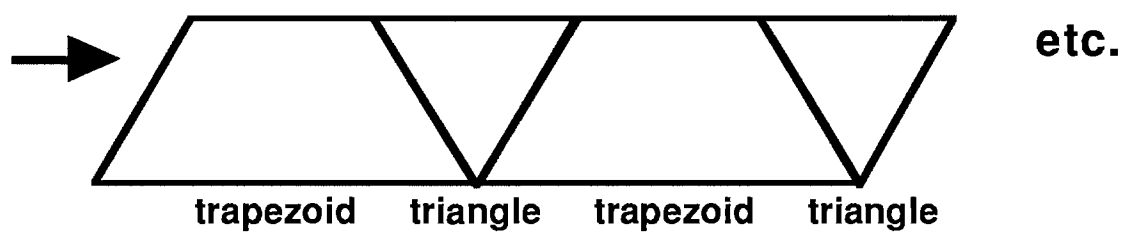
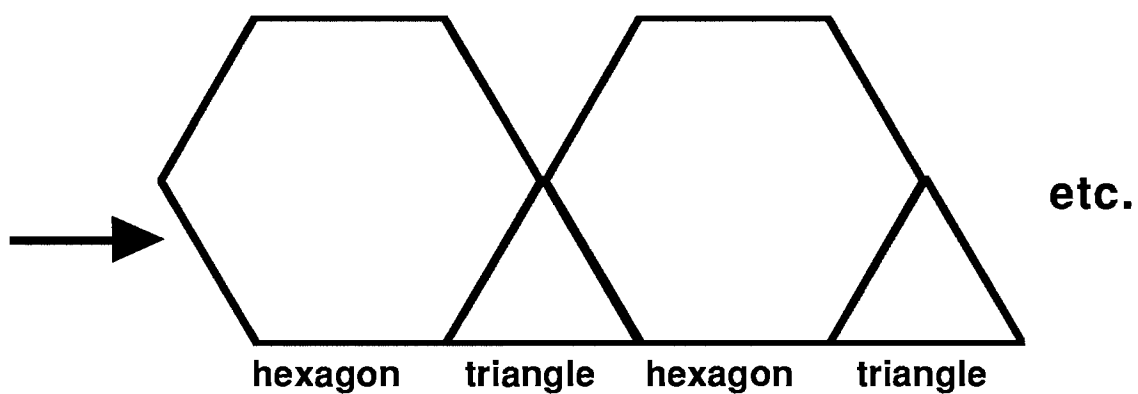

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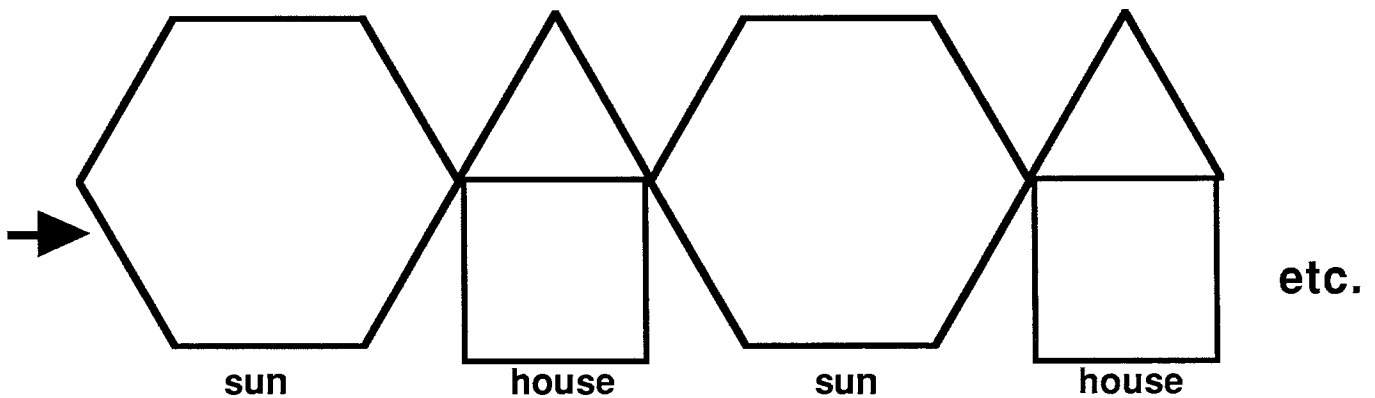
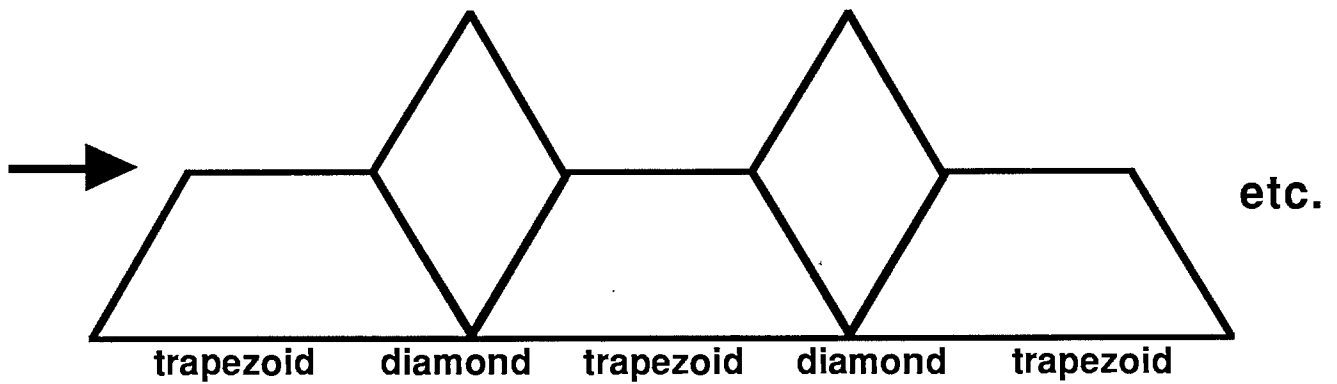
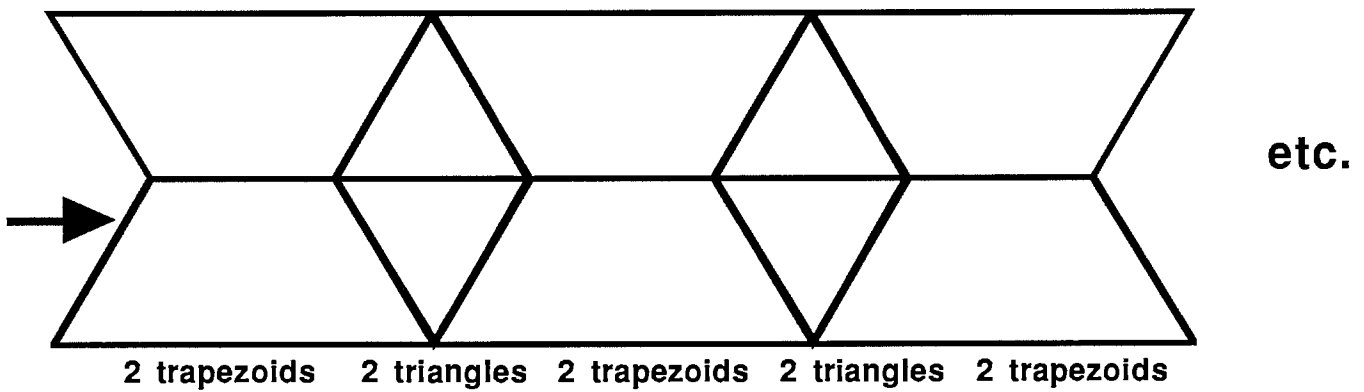
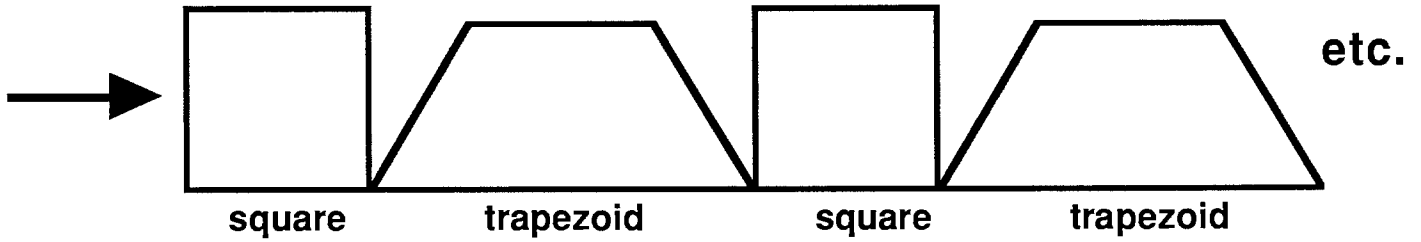




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6

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7

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A

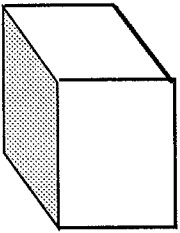
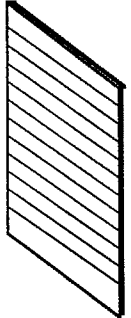



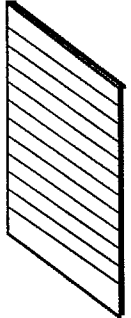






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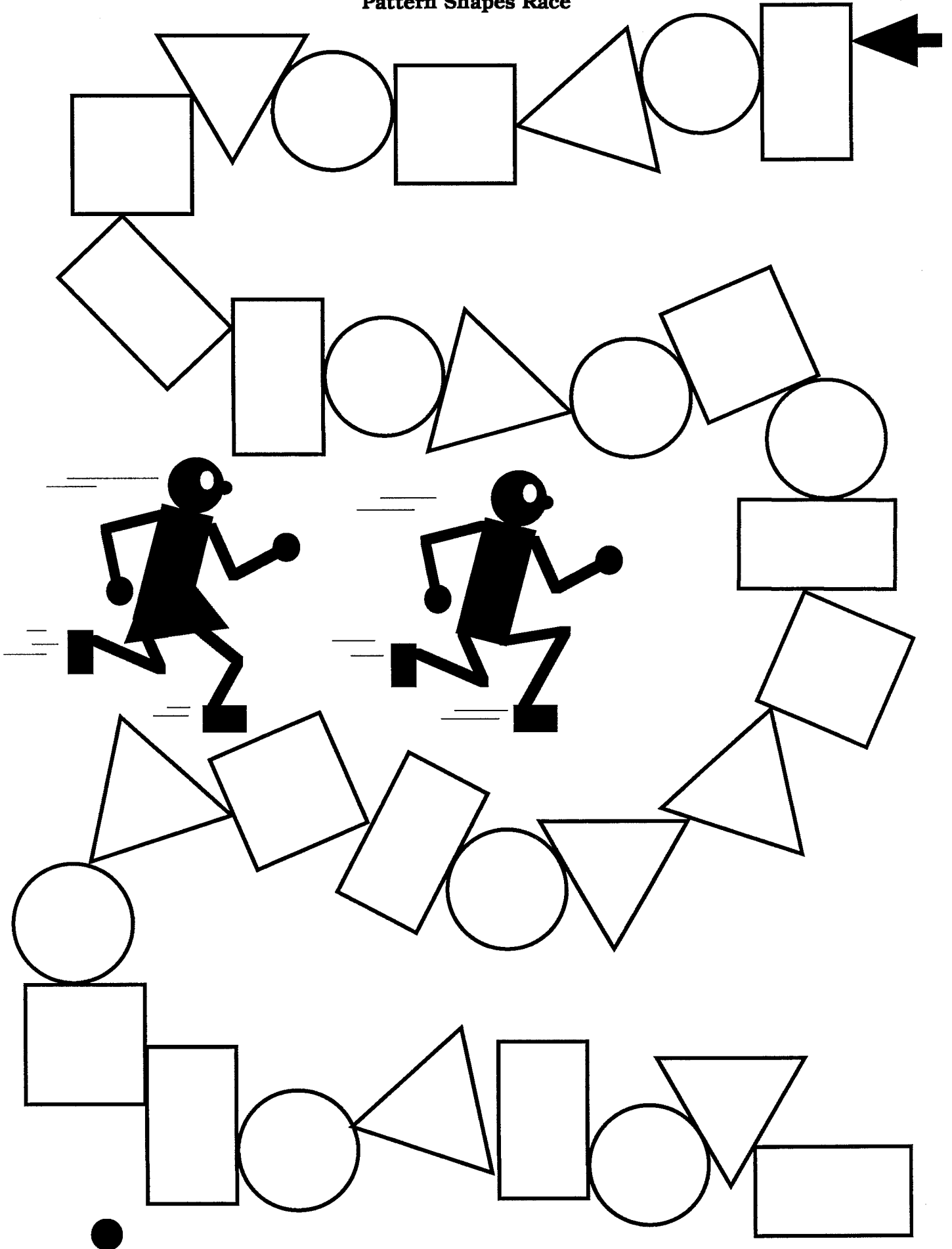
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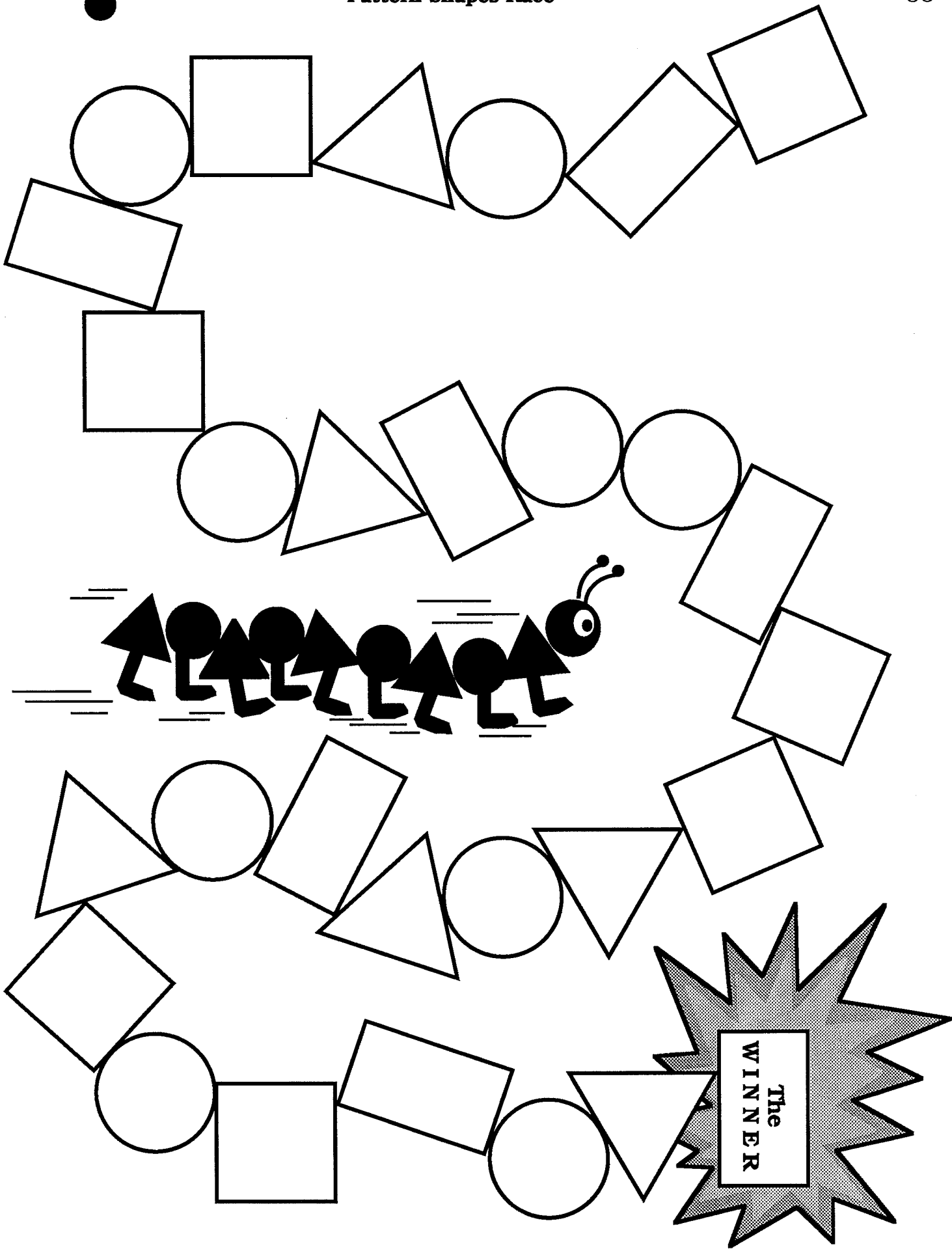
V

 <p>not flat</p>	 <p>flat</p>	 <p>hard</p>	 <p>squishy</p>
 <p>hard</p>	 <p>flat</p>	 <p>hard</p>	 <p>squishy</p>
 <p>hard</p>	 <p>hard</p>	 <p>hard</p>	 <p>hard</p>



Pattern Shapes Race





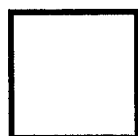
Get an extra turn



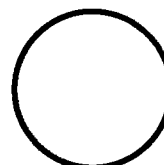
Go back 2 shapes



Move to the nearest



Move to the nearest



Go forward 1

Go back 1

Move to the nearest



Move to the nearest



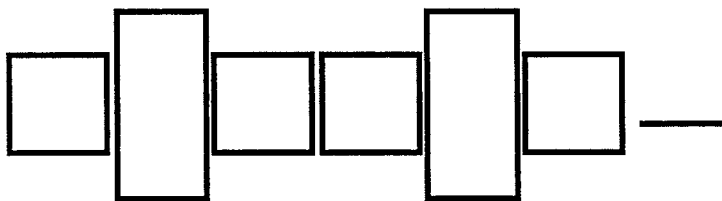
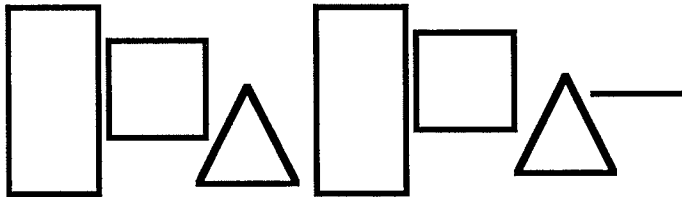
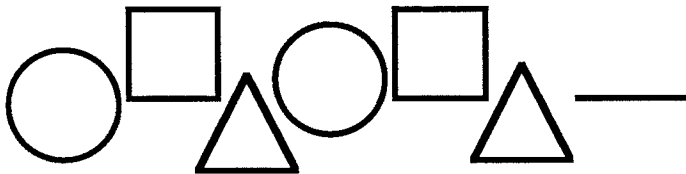
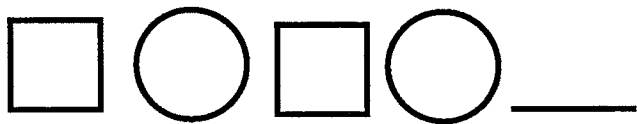
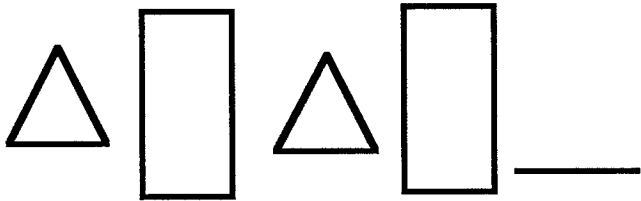
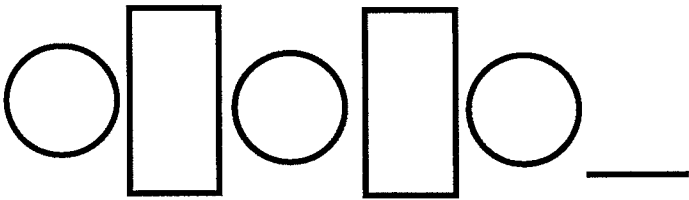
Lose a turn

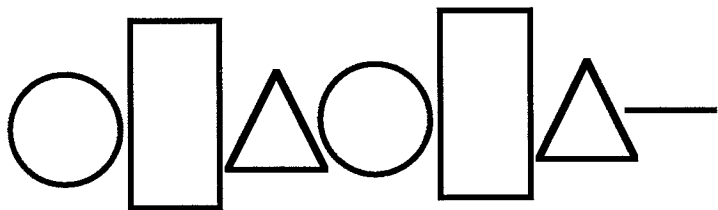
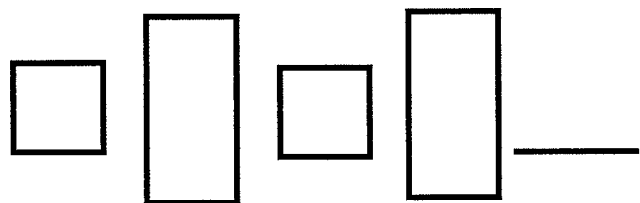
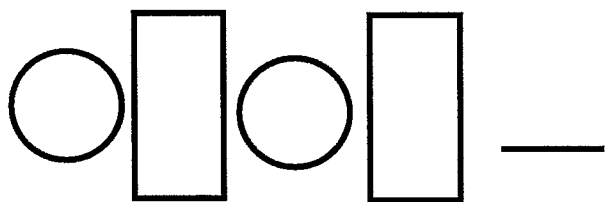


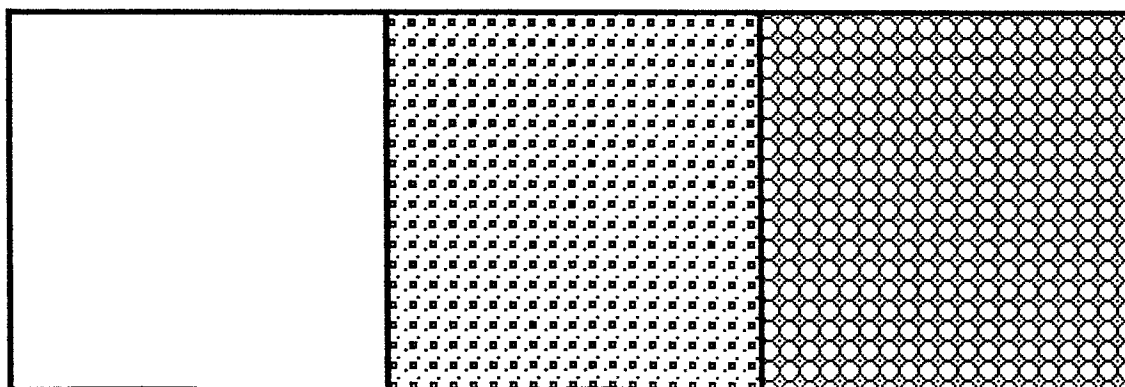
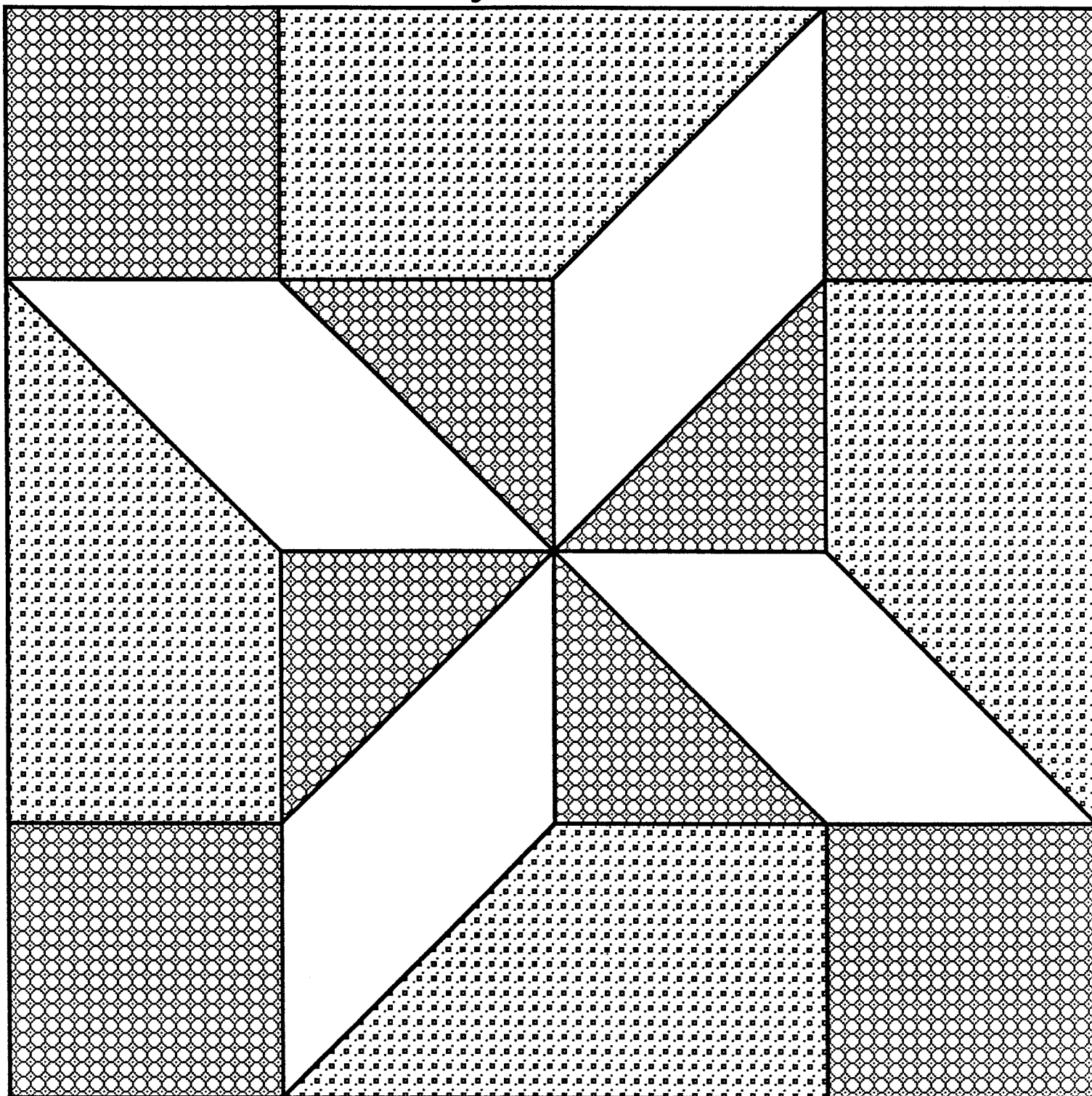
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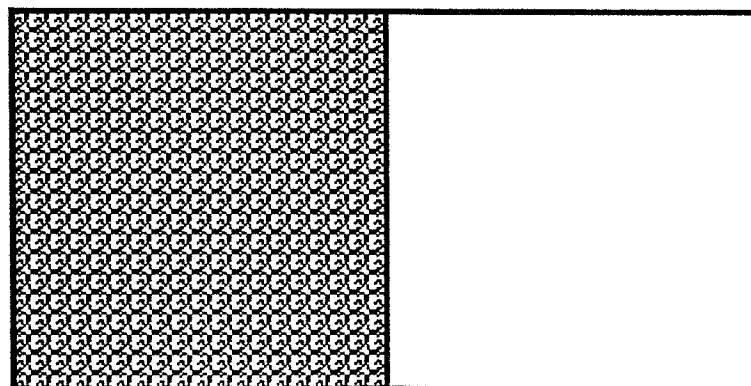
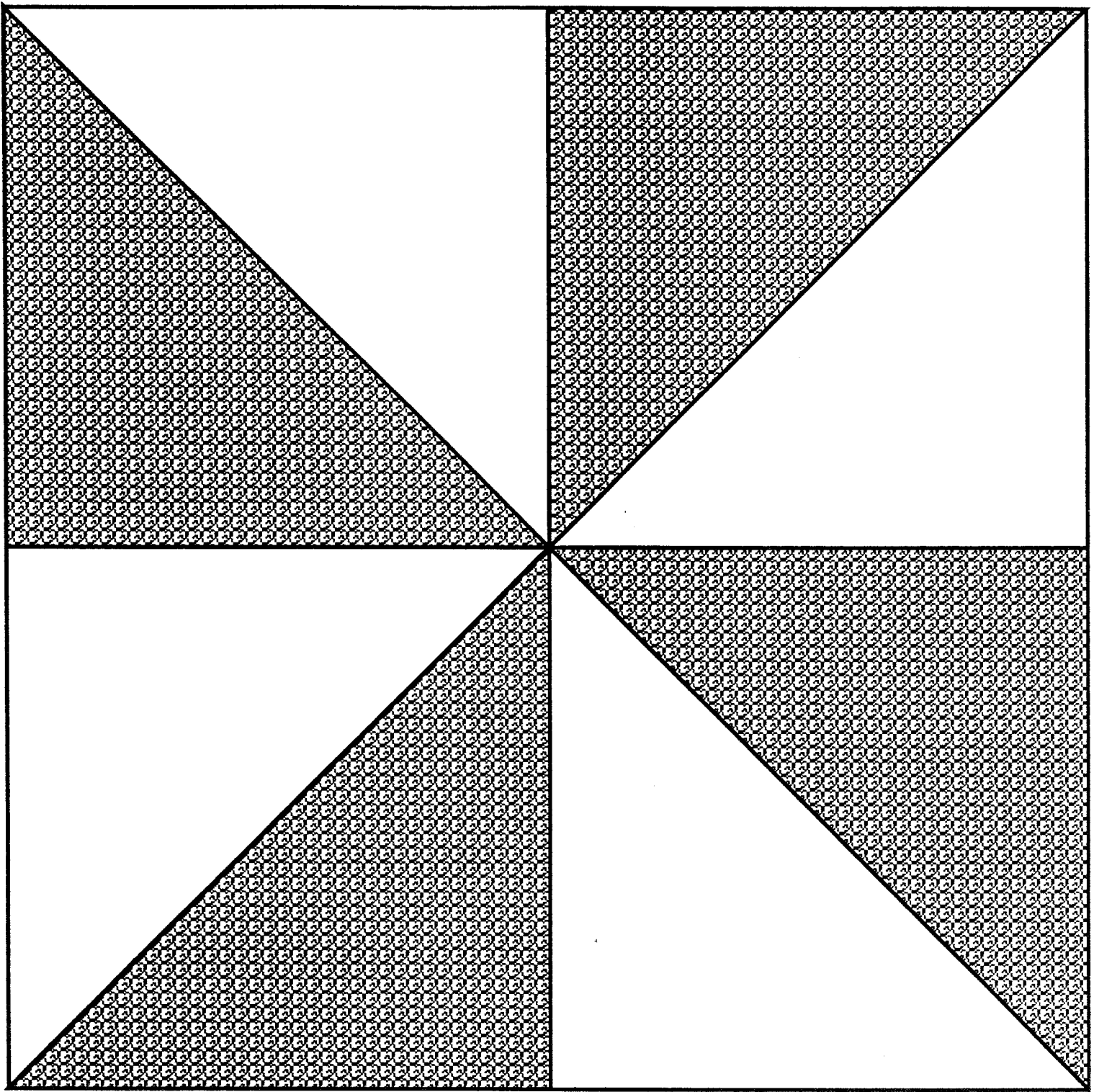
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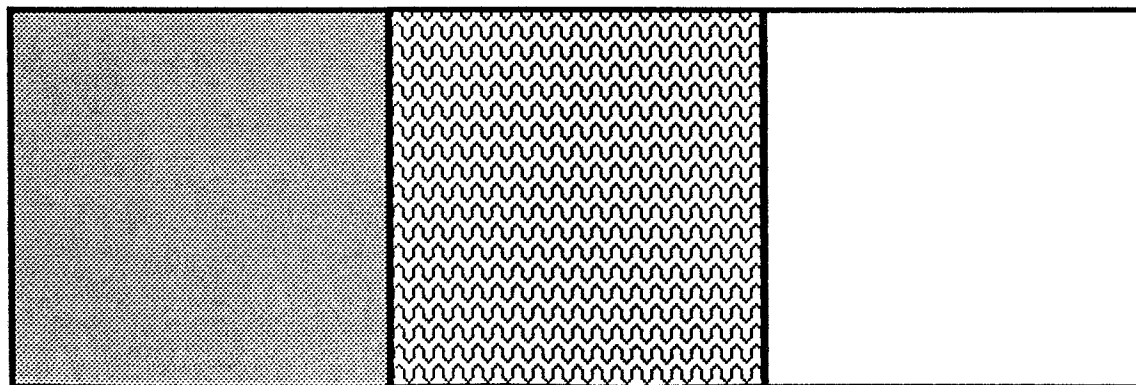
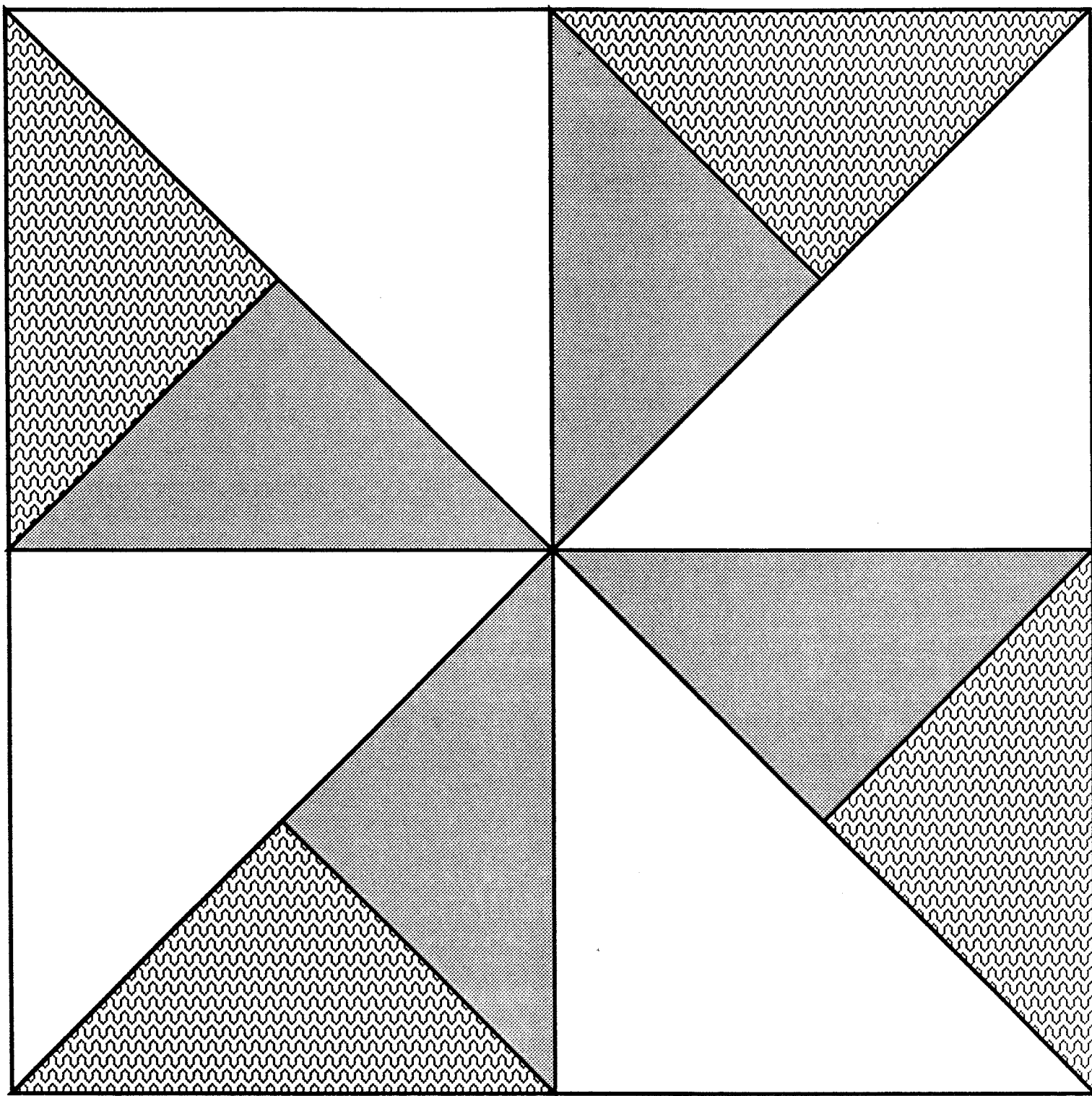
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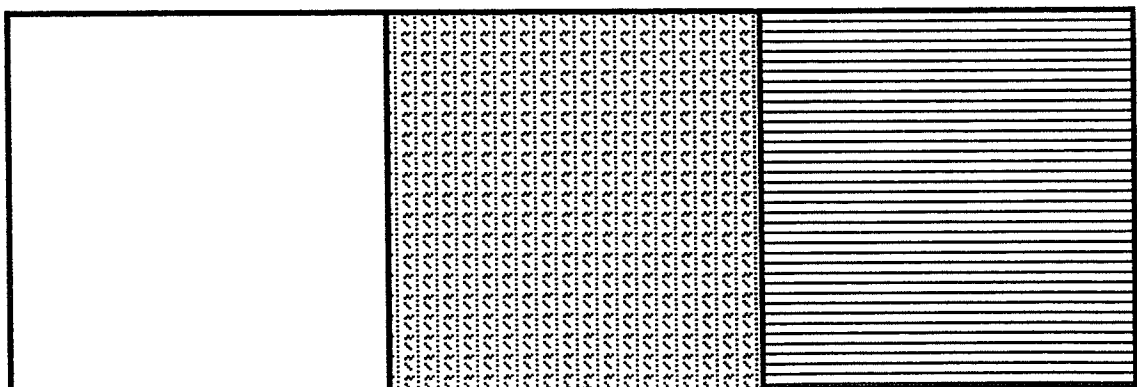
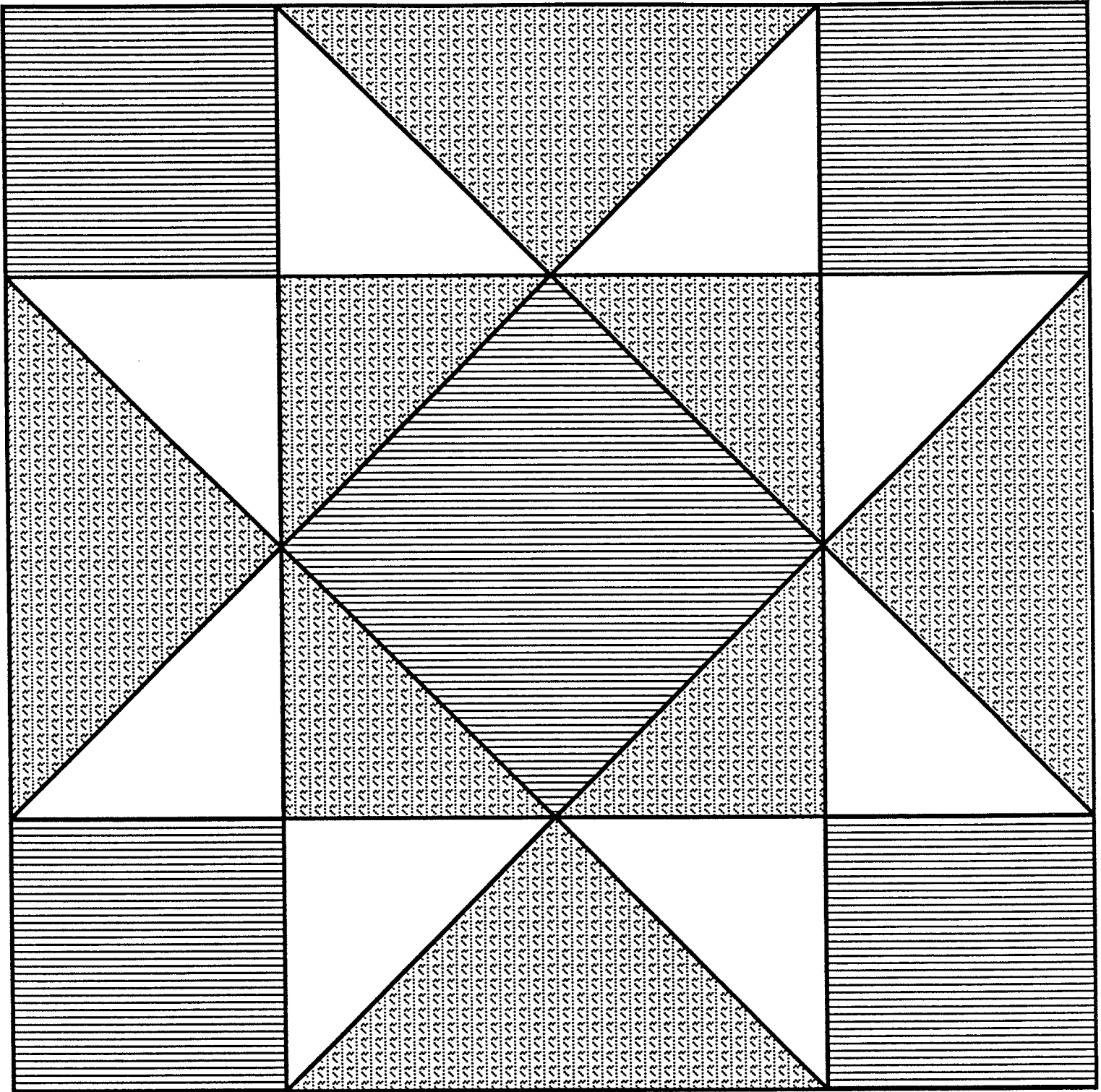


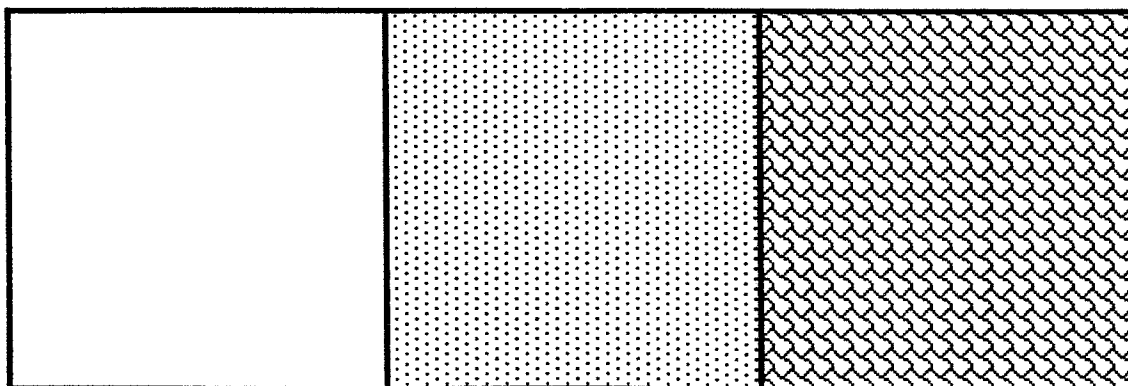
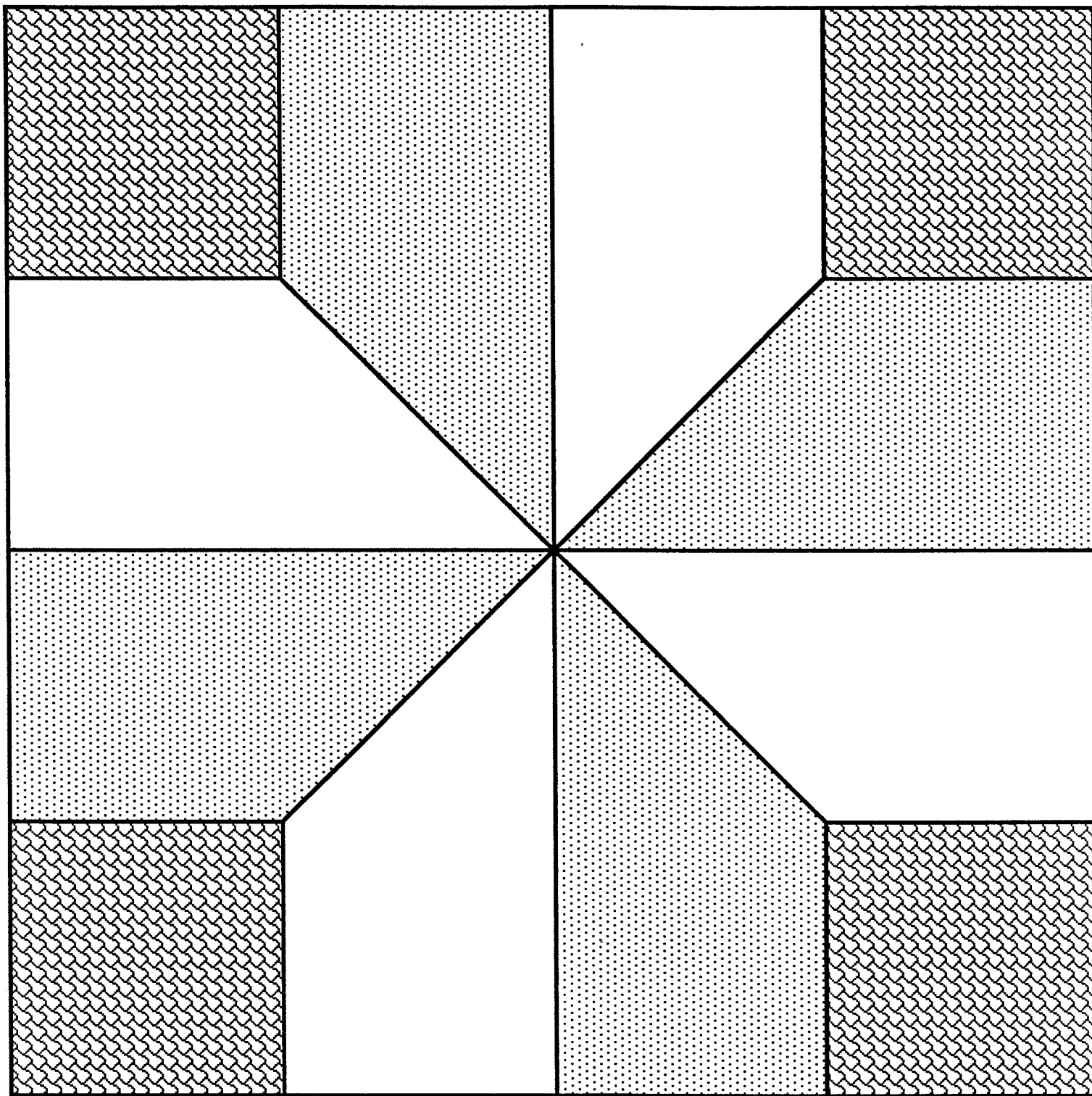


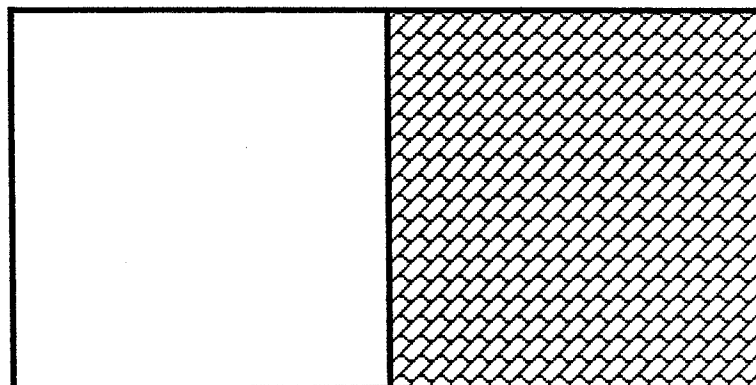
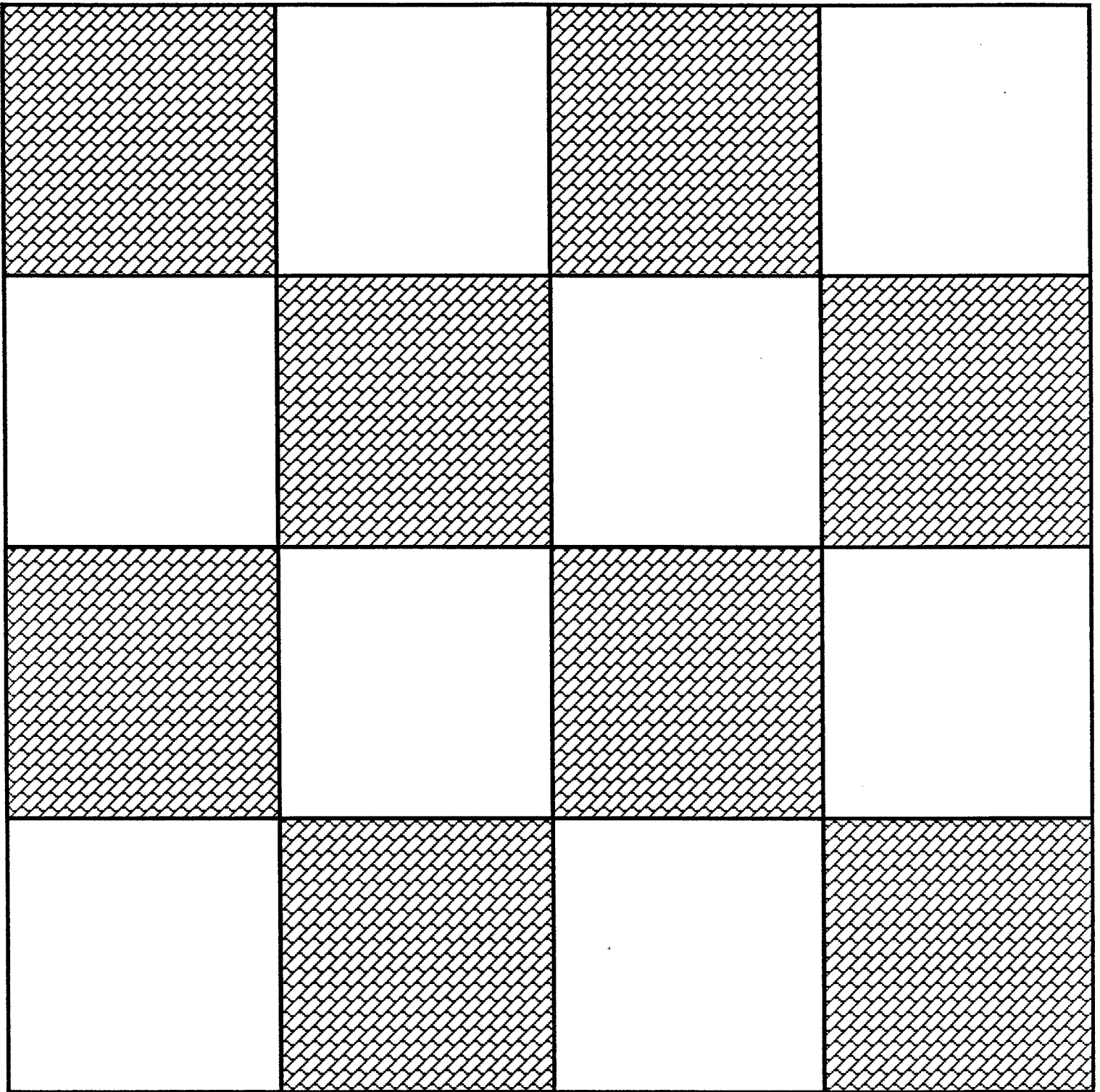












Apply the appropriate labels on both ends of each box lid. Either run the labels on full-sheet Avery Labels No. 5165, cut apart and attach; or simply cut apart these pages and glue or tape on.



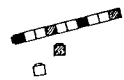
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**A PRACTICE & ENRICHMENT BOX**



**Unifix Cubes Patterns**

**A PRACTICE & ENRICHMENT BOX**



**Alphabet Stamps**

**A PRACTICE & ENRICHMENT BOX**



**Tile Patterns**

**A PRACTICE & ENRICHMENT BOX**



**Coin Patterns**

**A PRACTICE & ENRICHMENT BOX**



**Pattern Blocks and Mirrors**

**A PRACTICE & ENRICHMENT BOX**



**Sticker Patterns**

**A PRACTICE & ENRICHMENT BOX**



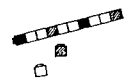
**Clock Patterns**

**A PRACTICE & ENRICHMENT BOX**



**Calendar Patterns**

**A PRACTICE & ENRICHMENT BOX**



**Pattern Blocks**

**A PRACTICE & ENRICHMENT BOX**



**Template Patterns**

**A PRACTICE & ENRICHMENT BOX**



**Rubber Stamp Patterns**

**A PRACTICE & ENRICHMENT BOX**



**Geoboards, Nuts & Washers**

**A PRACTICE & ENRICHMENT BOX**



**Mirror Patterns**

**A PRACTICE & ENRICHMENT BOX**



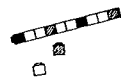
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**Sticker Patterns**

**A PRACTICE & ENRICHMENT BOX**



**Clock Patterns**

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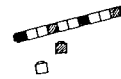
**Calendar Patterns**

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**Pattern Blocks**

**A PRACTICE & ENRICHMENT BOX**



**Template Patterns**

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**Rubber Stamp Patterns**

**A PRACTICE & ENRICHMENT BOX**



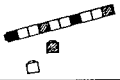
**Geoboards, Nuts & Washers**

**A PRACTICE & ENRICHMENT BOX**



**Mirror Patterns**

**A PRACTICE & ENRICHMENT BOX**



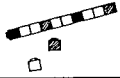
**Feely Box Patterns**

**A PRACTICE & ENRICHMENT BOX**



**Pattern Shapes Race**

**A PRACTICE & ENRICHMENT BOX**



**Quilt Patterns**

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**Feely Box Patterns**

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**Pattern Shapes Race**

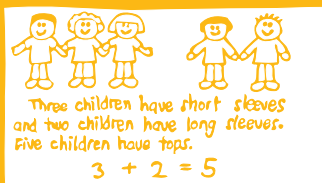
**A PRACTICE & ENRICHMENT BOX**



**Quilt Patterns**

**A PRACTICE & ENRICHMENT BOX**

# Arithmetic



## BOX IT OR BAG IT MATHEMATICS

Practice & Enrichment Boxes

**Donna Burk • Allyn Snider  
Paula Symonds**

Published by The Math Learning Center



**Box It or Bag It Mathematics, Practice & Enrichment Box:  
Arithmetic**

Box It or Bag It Mathematics consists of:

Teachers Resource Guide and Blackline Masters, Kindergarten  
Teachers Resource Guide and Blackline Masters, 1st and 2nd Grade  
Practice & Enrichment Boxes:

Shapes  
Introduction to Measuring  
Understanding Measuring  
Reading, Writing & Understanding Numerals 0–10  
Pattern  
Arithmetic  
Money  
Place Value Counting  
Place Value Addition & Subtraction

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# Getting Started

*Once you've introduced Arithmetic through a variety of group lessons (be sure to see Box It or Bag It Mathematics Teachers Resource Guide, ARITHMETIC), you will want children to practice and extend their understanding using the activities that follow in this packet. Here are a few things we've found helpful to remember for a successful Independent Practice Time.*

*Provide no more than 8–12 boxed activities at one time for a class of 30. Too many activities create more than tolerable chaos. Each Box is designed to be used by 1–4 children.*

*Model each activity thoroughly until children can tell you what to do, step by step. You'll find "box ingredients" and "playing instructions" for each activity in this packet. We use clear contact paper to attach them inside our box lids so WE can remember what goes in each box and how each game is played. Reading the directions would be too difficult for most primary children.*

*Resist the temptation to put out all your challenging Boxes at once—provide an equal balance of easy and hard. (If you set out too many difficult Boxes, all the children will need you at once and the noise level will be almost unbearable as your children try to cope with the stress of too many difficult tasks.)*

*As you construct these Practice and Enrichment Boxes, cover your box tops with the same design contact paper. That way, you'll be able to pull your Arithmetic Boxes off the shelf easily, even if they've gotten mixed in with other boxes. (Boxes can be ordered from The Math Learning Center in three sizes: standard (9" X 12" X 2"), half size (9" X 6" X 1-7/8") and junk (4" X 7" X 1-1/8").) See the Box It or Bag It Mathematics Teachers Resource Guide, MATERIALS INDEX, for additional ordering and making information.*

*Remember the Boxes themselves can be used for group instruction. They are ideal for use by an aide or parent with small groups. Some of them can be easily adapted for use with your whole group.*

*During Independent Practice Time, it's critical that you be available and in circulation to make sure things go smoothly. Once routines even out, you'll have opportunities to observe individuals which are not afforded when you conduct group instruction. You can really spot children with problems or understandings beyond your predictions. See the next page for some Observation guidelines.*

*Be sure to see the Box It or Bag It Mathematics Teachers Resource Guide, INTRODUCTION, for more implementation strategies.*

## Arithmetic Observation Chart

														Children's Names
														Child is able to share materials and work effectively
														Child is able to use work time cooperatively
														Child participates in telling and acting out class story problems
														Child is able to set out appropriate counters in response to story problems
														Child is able to solve story problems with counters
														Child is able to write number sentences for story problems
														Child can count on to solve story problems
														Child uses strategies and patterns to solve problems (Doubles, Neighbors, +10's, +9's, +0, -0, +1, -1 and other patterns)
														Child is becoming aware of reversibility (e.g., $8 - 4 = 4$ because $4 + 4 = 8$ )
														Child knows facts to _____

# Facts to Ten

## Shake Those Beans (1-4 Children)

See Box It or Bag It Mathematics Teachers Resource Guide, CHAPTER 14, Shake Those Beans, for group introduction to this box.

**Box ingredients**→ record sheets  
triple folder

spray-painted lima beans  
junk box for storage

### PLAYING INSTRUCTIONS

1. Choose a record sheet.
2. Count out the appropriate number of beans.
3. Hold the beans in your hand, shake, and drop them gently onto the table.

Shake those beans! 7 name _____									
0+7	1+6	2+5	3+4	4+3	5+2	6+1	7+0		

"If I read the blues first, it's  $4 + 3$ !"

4. Record your shake in the appropriate column. Always record the blues first and then the whites. Continue until at least three columns are filled.

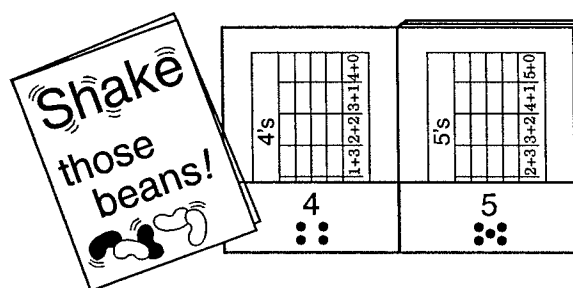
### MAKING INSTRUCTIONS

#### Record Sheets

Locate the 4 through 9 record sheets in the blacklines. Run many copies of each.

#### Folder to Hold Record Sheets

Buy three colored folders, the kind that have the pockets at the bottom. Tape the folders together to form a book of pockets. Cover the outside with contact paper to match your Arithmetic Boxes and label.



#### Beans

Buy a one pound bag of regular size lima beans. Pour about one third of the beans into one smooth layer on newspapers. Spray paint with a bright glossy blue on *one side only*. (Testor's model paints are excellent.) Store beans in a labeled junk box covered with contact paper to match your Arithmetic boxes.

#### Looking Beyond

You might eventually want to make charts for review (one of those two-minute sponge activities) to help children solidify their visual images.

fives		sixes	
	?		?
	3 + 2		2 + 4
	?		?
	2 + 3		5 + 1
	?		?
	0 + 5		6 + 0

## Dice Toss (1-4 Children)

See Box It or Bag It Mathematics Teachers Resource Guide, CHAPTER 14, Dice Toss, for group introduction to this box.

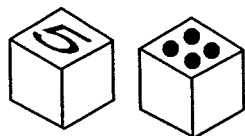
**Box ingredients**→ dice (four numbered and four dotted)

record sheets

standard box for storage


## PLAYING INSTRUCTIONS

1. Choose a dotted die and a numbered die.
2. Get a record sheet.
3. Roll your dice and read them, counting on from the number to the dots.



"Five...six, seven, eight, nine"

2	3	4	5	6		7	8	9	10	11

4. Record your problem on the record sheets as above. Continue working until one column is filled. (Many children love working until three columns are filled and then awarding columns 1st, 2nd, or 3rd place by drawing prize ribbons.)
- 

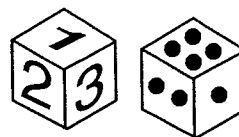


## MAKING INSTRUCTIONS

## Record Sheets

Locate two Dice Toss record sheets in black-lines. Run copies. Tape together in middle with two pieces of scotch tape.

## Dice



Use plain wooden cubes or foam cubes (available from MLC Materials). Make four cubes numbered from 1-6. Make four cubes with dots 0-5. Store dice and record sheets in a standard box.

# Piggybank Subtraction (1-4 Children)

See Box It or Bag It Mathematics Teachers Resource Guide, CHAPTER 14, Piggybank Subtraction, for group introduction to this box.

**Box ingredients→** piggy banks (4) pennies in coin tube  
record sheets subtraction cards in pockets  
standard box for storage

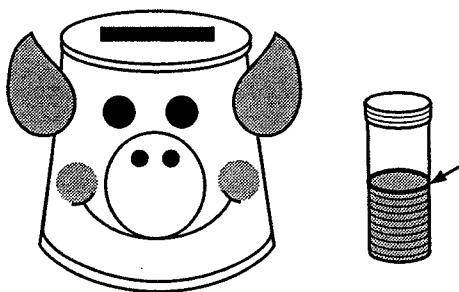
## PLAYING INSTRUCTIONS

1. Choose a set of subtraction cards.
2. Get out enough pennies to do your set of cards.
3. Read each card and drop as many pennies in the bank as the card tells you. Record what you did and how many are left.
4. Work until you complete your set of cards.

## MAKING INSTRUCTIONS

### Piggy Banks (4)

It's great if you can find a package of solid pink or beige bathroom Dixie cups—the sturdier kind. Cut slits in bottoms (they will now become the top). Make the cups into pigs by adding felt or construction paper ears, eyes, and snouts. If you can't find Dixie cups, any plain small paper cups are fine.



### Pennies in Coin Tube

Borrow 30-40 pennies from your own piggy bank. Buy a *nickel* size coin tube (sold for coin collectors at many hobby shops, large stationery and craft stores, and many dime

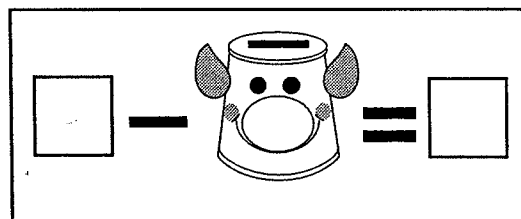
stores). Put pennies inside and use a Sanford Sharpie pen to draw a line to where the pennies fill the tube. (See previous illustration.) This makes an easy way to check if all pennies have been returned at clean-up.

### Record Sheets

Locate Piggy Bank Subtraction record sheets in blacklines and run copies.

### Subtraction Cards

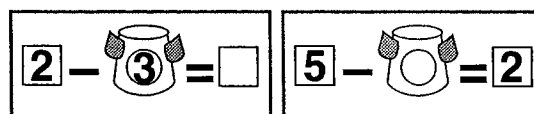
Find Piggybank Subtraction cards in card-stock portion of this packet. Make them up for all number families 4-9. It is helpful to write each set in a different color marking pen to make them easier to sort at clean-up.



Laminate. Put each set of cards on a binder ring or in a tag pocket for storage. Store sets of cards, record sheets, tube of pennies, and piggy banks in standard box.

### Looking Beyond

This could be made up either as a take away model or missing subtrahend model.

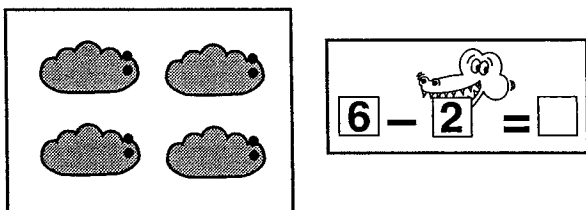


# Alligator Subtraction (1-4 Children)

**Box ingredients**→ swamps (4) swamp critters in junk box  
 record sheets subtraction cards  
 standard box for storage

## PLAYING INSTRUCTIONS

1. Choose a set of subtraction cards.
2. Get out enough swamp critters to do your set of cards. Place them in the swamp.
3. Read each card and have the "alligator" (your hand, or a puppet if Teacher was feeling rich) eat as many "critters" as the card tells you. Record what you did and how many are left in the swamp.



*"The card says 6 - 2, so I took 2 out of the swamp!"*

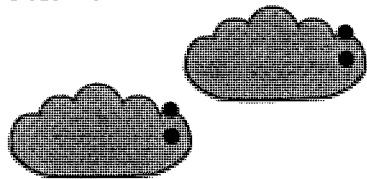
4. Work until you complete your set of cards.

## MAKING INSTRUCTIONS

### Swamps (4)

Cut up 6 X 9 pieces of construction paper to serve as swamps. It's fun to have the children color swamp grass, etc., on these.

### Swamp Critters



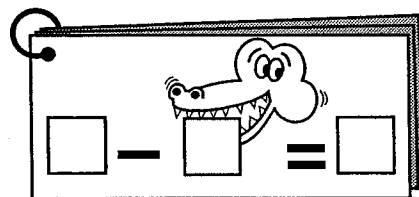
Buy some critter-shaped macaroni (thick). Dye it with 1/2 teaspoon to 1 teaspoon of rubbing alcohol and about 20-25 drops of green food coloring. Shake in a sealed ziplock bag until it's fully colored, then dry on newspapers for 1/2 hour. Use a black slick pen (craft stores, about \$1) to add eyes. These need to dry overnight.

## Record Sheets

Locate Alligator Subtraction record sheets in blacklines and run copies.

## Subtraction Cards

Find Alligator Subtraction cards in cardstock portion of this packet. Make them up for all number families 4-9. It's helpful to write each set in a different color marking pen to make them easier to sort at clean-up time. Laminate. Put each set of cards on a binder ring or in a tag pocket for storage.

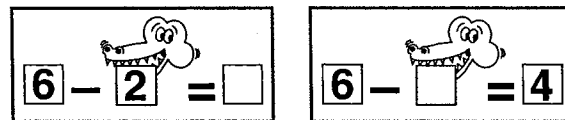


Store sets of cards, record sheets, boxed swamp critters, swamp papers, and puppets, if you have them, in a standard box.

NOTE: Children can use their hands to be the alligators, or, if you're feeling rich, there are very cute alligator puppets available commercially. It is nice to have one puppet to model the activity with your group.

## Looking Beyond

This could be made up either as a take away model or missing subtrahend model.



## Mountain Subtraction (1-4 Children)

**Box ingredients**→ caves (4)

junk box of counters

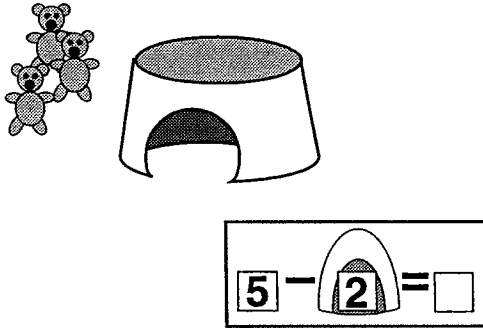
record sheets

subtraction cards

standard box for storage

## PLAYING INSTRUCTIONS

1. Choose a set of subtraction cards.
2. Get out enough counters to do your set of cards.
3. Read each card and tell a story using your counters and the cave. Record a number sentence for each story.

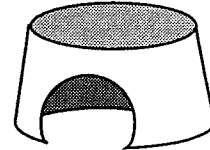


*"There were five bears out in the snow. Two of them got so sleepy they went into their cave to hibernate. Three are still playing outside."*

## MAKING INSTRUCTIONS

### Caves (4)

To make each “cave,” cut down a small margarine tub or 8 oz. yogurt container to a height of two inches. Cut a small cave opening in the side.



### Counters (35-40)

Although small plastic bears or other animals are ideal, any small counters (unifix cubes, buttons, wooden cubes, etc.) will do. Children can pretend these markers are bears or hikers or bats, or any other critters that might have reason to go into a cave. Store counters in a junk box.

## Record Sheets

Locate the Mountain Subtraction record sheet in blacklines. Run copies.

### Subtraction Cards

**Find Mountain Subtraction cards in card-stock portion of this packet. Make them up for all number families 4-9. It is helpful to write each set in a different color marking pen to make them easier to sort at clean-up time. Laminate. Put each set of cards on a binder ring or in a tag pocket for storage. Store card sets, record sheets, box of counters, and caves in standard box.**



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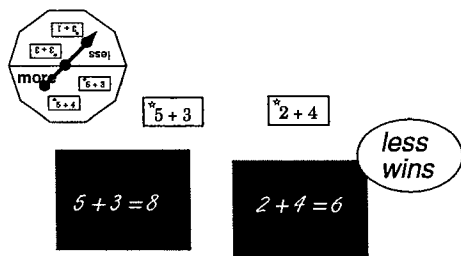
## Add, Tell, Spin and Win (2 Children)

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**Box ingredients**→ more/less spinner      addition equation cards  
tiny chalkboards, chalk, and felt erasers (2 of each)  
spinner components      half box for storage

### PLAYING INSTRUCTIONS

1. Mix up cards and place them face down in a pile.
2. Take a card and have your partner do the same. Compute the sums on your chalkboards and compare to determine whose sum is greater, and whose is less.
3. Spin the more/less spinner to determine which of you gets to take both cards.
4. Draw two more cards, compute, compare, and spin. Continue until all the cards have been used. Count your stacks of cards and compare for more or less. The spinner determines the winner.



### MAKING INSTRUCTIONS

#### More/less Spinner

1. Locate spinner top in blacklines.
2. Use a glue stick to glue spinner top to poster board or even sturdy matte board.
3. Cut around edges and cover with clear contact paper, overlapping contact to back side by at least 1/2 inch.
4. Use one set of spinner components (available from MLC Materials) and assemble spinner as shown on instructions.

#### Chalkboards

Cut two tiny chalkboards from an individual chalkboard. Small matte board "chalkboards" can be ordered from MLC Materials. We invite children to get Unifix cubes or junk boxes if that would help them solve the problems.

#### Equation Cards

Locate cards. Laminate and cut apart. Store equation cards, chalkboards, chalk, felt erasers and spinner in a half box.

---

## Subtract, Tell, Spin and Win (2 Children)

---

**Box ingredients**→ more/less spinner      subtraction equation cards  
tiny chalkboards, chalk, and felt erasers (2 of each)  
half box for storage

### PLAYING INSTRUCTIONS

1. Mix up cards and place them face down in a pile.
2. Take a card and have your partner do the same. Compute the differences on your chalkboard and compare to determine whose difference is greater and whose is less.
3. Spin the more/less spinner to determine which of you gets to take both cards.
4. Draw two more cards, compute, compare, and spin. Continue until all the cards have been used. Count your stacks of cards and compare for more or less. The spinner determines the winner.

### MAKING INSTRUCTIONS

#### Spinner

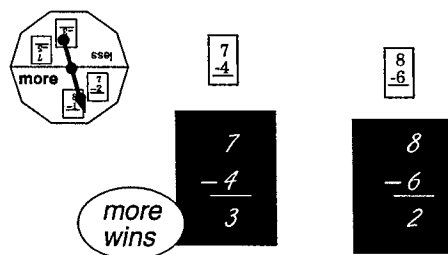
Locate Subtract, Tell, Spin and Win more/less spinner top in blacklines. See Add, Tell, Spin, and Win for assembly instructions.

#### Chalkboards

See Add, Tell, Spin and Win for instructions.

#### Equation Cards

Locate cards, laminate, and cut apart. We invite children to get Unifix cubes or junk boxes if that would help them solve the problems. Store equation cards, chalkboards, chalk, felt erasers and spinner in a half box.

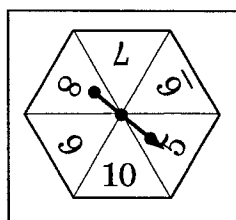


# Add and Think (2-4 Children)

**Box ingredients**→ gameboards (4) spinner  
 record sheets junk box of game markers  
 standard box for storage

## PLAYING INSTRUCTIONS

1. Spin spinner to see who starts game. High spin begins.
2. First player spins and searches for addends of number spun. Place your game markers over the addends you choose.



①	4	0	3
5	6	3	4
6	②	4	②
5	8	7	3

*In this case where 5 is spun, player could cover the following: 1, 2, 2; or 2, 3; or 5, 0*

3. Record the combination you made on your record sheet.
4. Partner spins, searches for addends on his/her board and then records.
5. Play continues as above until one player has covered four in a row vertically, horizontally or diagonally. (Some players love to play for blackout.)
6. When a game ends, each player draws a red line under the last equation written and game can begin again. (This way they continue to use the same record sheet.)

Add and Think! <small>Dayna</small>
$1 + 2 + 2 = 5$

## MAKING INSTRUCTIONS

### Spinner

Locate *easy* Add and Think spinner top in blacklines. See spinner information in Add, Tell, Spin, and Win.

### Record Sheet

Locate in blacklines and run copies.

### Gameboards

Locate gameboards, laminate and cut apart.

### Markers

Assure children that they may use chalkboards or junk boxes or Unifix cubes to help figure these out.

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## Math Magic (2-4 Children)

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**Box ingredients**→ gameboards  
equation cards

markers (4)  
standard box for storage

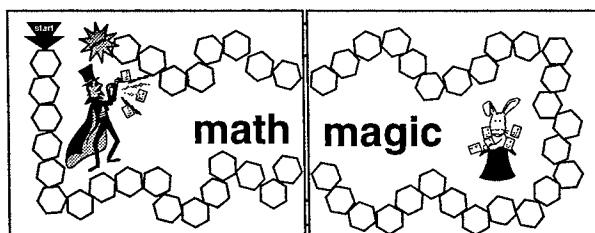
### PLAYING INSTRUCTIONS

1. Set your markers on "Go".
2. Shuffle the equation cards and place them face down in a pile.
3. Take turns drawing a card, computing the sum or difference and moving the appropriate number of spaces on the gameboard. (Some of our children love moving backwards for subtraction and forward for addition. They decide before beginning how they will move.)

### MAKING INSTRUCTIONS

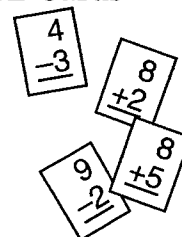
#### Math Magic Gameboard

Locate the gameboard (two sheets) in card-stock portion of packet. Color the spaces on the gameboard sheets. Cover with clear contact or laminate. Hinge them together with tape.



#### Addition/Subtraction Equation Cards

Make up a set of 30-40 addition and subtraction cards appropriate to the levels you want your children to practice. Use 2-1/2 X 3-1/2 tag, or precut cards available commercially. Laminate.



#### Game Markers (4)

Use Unifix cubes in four different colors. Buttons or other small colored counters will work, too. Store game markers, equation cards, and gameboard in standard box.

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## Addition Lotto (2-4 Children)

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**Box ingredients**→ record sheets  
double folder

equation cards  
junk box for storage

### PLAYING INSTRUCTIONS

1. Select a record sheet. Make sure yours is a different color than anyone else's.
2. Have one person be the caller. He/She holds up a card and all the players read it. The players quickly solve the combination and record it on their record sheet in an appropriate box. Caller continues to hold up card until all have recorded the number sentence.
3. Continue playing until someone has four in a row, vertically, horizontally, or diagonally. Many children enjoy playing for blackout.

Addition Lotto				Robby
$2+8$ <b>10</b>	<b>4</b>	$4+3$ <del><b>7</b></del>	<b>7</b>	
$1+4$ <b>5</b>	<b>9</b>	$2+4$ <del><b>6</b></del>	$1+5$ <b>6</b>	
<b>9</b>	$5+0$ <b>5</b>	$2+3$ <del><b>5</b></del>	<b>10</b>	
$1+3$ <b>4</b>	<b>7</b>	$4+4$ <del><b>8</b></del>	<b>8</b>	

## MAKING INSTRUCTIONS

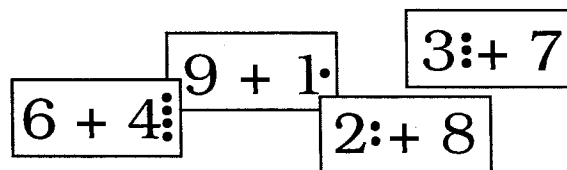
### Record Sheets

Locate Addition Lotto record sheets in blacklines. Run copies. Each blackline will be run on its own color of copier paper.

### Equation Cards—Addition

Locate cards, laminate and cut apart.

Dots are put by smaller number in equation to enable children to “count on” to total if needed.



Store equation cards in a junk box covered to match your Arithmetic boxes.

### Folder to Hold Record Sheets

Buy two colored folders—the kind that have pockets at the bottom. Tape and cover as in Shake Those Beans.

## Subtraction Lotto (2-4 Children)

**Box ingredients→** record sheets

double folder

equation cards

junk box for storage

## PLAYING INSTRUCTIONS

1. Select a record sheet. Make sure yours is a different color than anyone else's.
2. Have one person be the caller. He/She holds up a card and all the players read it. Solve the combination together and record it on your record sheets in an appropriate box. Caller continues to hold up card until all have recorded the number sentence.

Subtraction Lotto				Cesar
<del>7-1=</del> 6	4	6-3= 3	2	
7-5= 2	<del>7-2=</del> 5	3	1	
5-4= 1	4	<del>4-0=</del> 4	1	
5	0	2	<del>6-3=</del> 3	

3. Continue playing until someone has four in a row, vertically, horizontally, or diagonally. (See illustration.) Many children enjoy playing for blackout.

## MAKING INSTRUCTIONS

### Record Sheets

Locate Subtraction Lotto record sheets in blacklines. Each blackline will be run on its own color of copier paper. See Addition Lotto for double folder directions.

### Equation Cards—Subtraction

Locate cards, laminate and cut apart. Store equation cards and record sheets in a junk box.

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## Subtraction Top Draw (2 Children)

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**Box ingredients**→ subtraction cards

junk box for storage

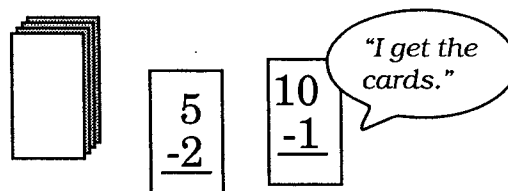
### PLAYING INSTRUCTIONS

1. Shuffle the cards and place them face down in a pile.
2. Take a card from the pile and have your partner do the same. Get a junk box from the math materials shelf if you need counters to compute the difference on your card.
3. Compare answers. The person with the larger answer captures both cards.
4. Continue playing until there are no more cards. The person with the most cards wins.

### MAKING INSTRUCTIONS

#### Subtraction Cards

Locate cards, laminate and cut apart. Store subtraction cards in a covered and labeled junk box. **Note:** Tiny chalkboards could be added if desired.



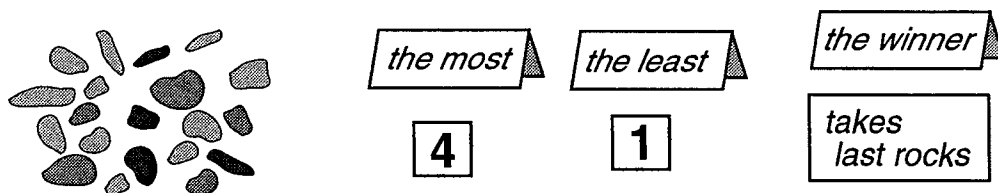
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## Rock Pile (2 Children)

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**Box ingredients**→ junk box of small rocks      labeling cards

half box for storage



### PLAYING INSTRUCTIONS

1. Decide how many rocks will be in the starting pile. Set out that many in a pile.
2. Decide what the maximum number of rocks you can take in one turn will be. Set out a numeral card to show that.
3. Decide what the fewest number of rocks you can take in one turn will be. Set out a numeral card to show that.
4. Decide whether it will be the "winner" or "loser" who picks up the last rocks. Set out a card to show that.
5. Take turns removing rocks according to the rules you've set up until winner is determined.

### MAKING INSTRUCTIONS

#### Rocks

Have children bring in beautiful pebbles. (Donna's children colored gray rocks with crayons.) Or spray paint lima beans to serve as "rocks." You'll probably want 30-40 for your set. Store in a junk box.

#### Cards

Cut four pieces of tag 5 X 8 and fold in half lengthwise to create stand-up cards. Label the cards individually with: *the most*; *the least*; *the winner*; *the loser*. Numeral Cards—Cut seven pieces of tag 4 X 4. Label each with a numeral 1-7. *Takes Last Rocks*—Cut one piece of tag 3 X 7. Label. Store cards and boxed rocks in a half box.

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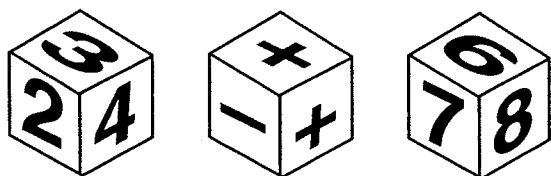
## Go For It (2 or 4 Children)

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**Box ingredients**→    gameboards (2)                      game markers (4)  
                                 numeral and operation dice (6)  
                                 standard box for storage

### PLAYING INSTRUCTIONS

1. Place your marker on the start arrow. Have your partner do the same.
2. Take turns. Roll two numbered dice and one +/- die. Arrange the dice to form an equation and compute the sum or difference.



3. Move your marker forward the sum or difference on your side of the gameboard. Some players prefer to go backwards when a subtraction equation is made. Decide on this before you start.
4. Continue playing back and forth until one of you reaches the end.

### MAKING INSTRUCTIONS

#### Gameboards (2)

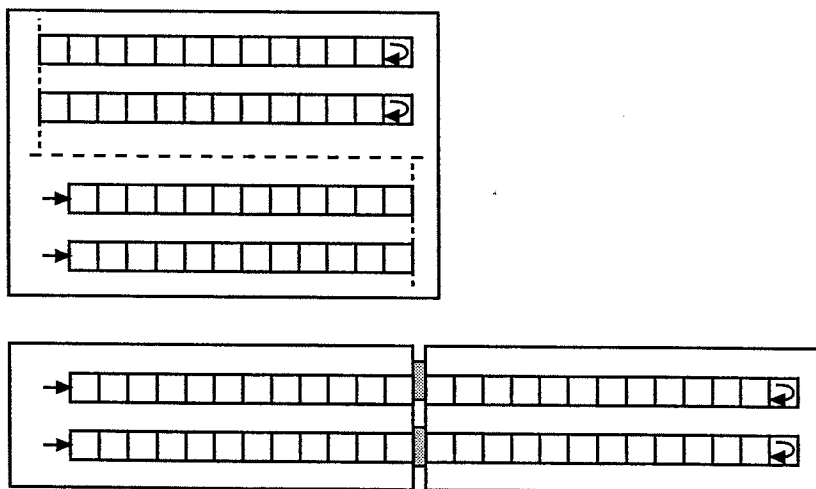
Locate gameboards, laminate, and cut on dotted lines. Tape pieces at the back with filament tape hinges. (See illustration below.)

#### Dice (6)

Use plain wooden cubes or foam cubes for dice. Cubes are available from MLC Materials. Write on your cubes with a permanent Sanford Sharpie marking pen. Make two 0-5 dice, two 6-10 dice, and two +/- dice.

#### Game Markers (4)

Use Unifix cubes in four different colors or other small colored counters. Store game markers, gameboards, and dice in a standard box.



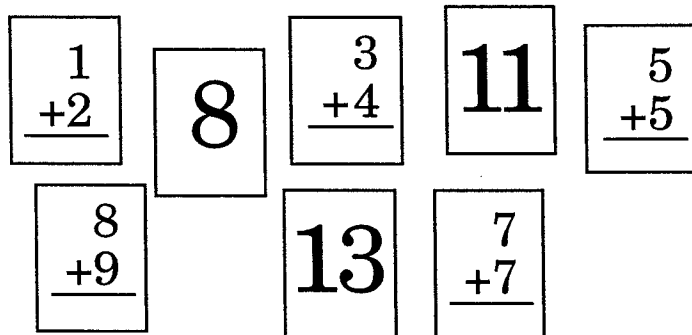
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# Number Muncher (2-4 Children)

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**Box ingredients→** equation cards

junk box for storage



## PLAYING INSTRUCTIONS

1. Shuffle the cards and place them face down in a pile.
2. Pass out cards to every player until all cards are used.
3. Players look through cards and find any pairs in their hands. They lay all matches down.
4. Just as grownups play cards drawing from one another, the children take turns drawing from each other's hands in clockwise or counterclockwise fashion. They lay any matching pairs down on the table.
5. The children left with the Number Muncher loses or wins the game—the children decide! This game gets noisy but we think it's worth it. The children really love the game.

## MAKING INSTRUCTIONS

### Equation Cards

Locate equation cards, laminate and cut apart. Store equation cards in covered and labeled junk box.



# Facts to Eighteen

## Doublesland (2-4 Children)

See Box It or Bag It Mathematics Teachers Resource Guide, CHAPTER 14, Doubles, for group introduction to this box.

**Box ingredients→** gameboard                      doubles game cards  
game markers (4)                      standard box for storage

### PLAYING INSTRUCTIONS

1. Shuffle the game cards and place them face down on the gameboard.
2. All players place your markers at start.
3. Take turns. Draw a game card and compute the sum. Try to find that sum in the first cluster. If it is there, you may move to that cluster. If the sum is not there, you may not move.
4. Move in the same fashion from cluster to cluster.
5. The first player to return to the starting cluster wins. Some children like to play twice or even three times around.

### MAKING INSTRUCTIONS

#### Gameboard

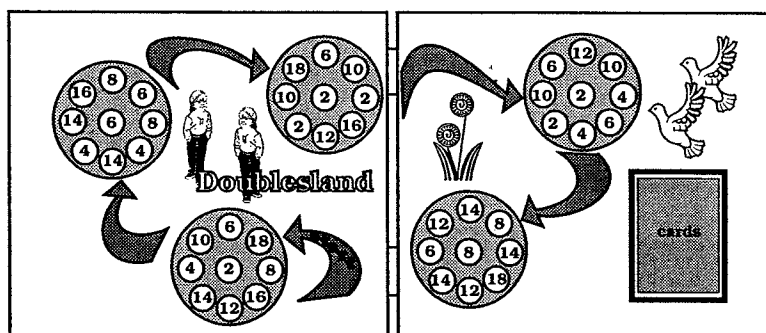
Locate gameboards in cardstock portion of this packet. Color and contact or laminate. Hinge the boards together with tape so it folds to fit your box.

#### Equation Cards

Locate in packet. Laminate or contact and cut apart.

#### Game Markers (4)

Use four Unifix cubes in different colors or other small colored counters. Store game markers, gameboard, and equation cards in a standard box.



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## Fast Tens (1-4 Children)

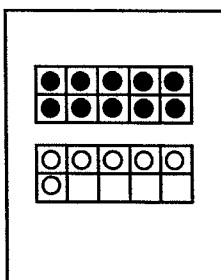
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See Box It or Bag It Mathematics Teachers Resource Guide, CHAPTER 14, Fast Tens, for group introduction to this box.

**Box ingredients→** record sheets                      spinners (2)  
ten frame boards (2)                      junk box of counters  
crayons                      standard box for storage

### PLAYING INSTRUCTIONS

1. Work with a partner to set out a ten frame board and lay out ten counters on the upper frame. These will remain set up for the whole activity.
2. Spin the spinner. Set the appropriate number of counters out on the lower frame. Compute the total and color a space in the appropriate column of the record sheet.



*"We spun ten plus six.  
We set it up on our  
board and we can see  
it's 16!"*

3. Continue spinning and coloring in your record sheets until at least one column is filled.

### MAKING INSTRUCTIONS

#### Fast Ten Spinners (2)

Find spinner tops in blacklines. Color each section of the spinner a different color so it can be more easily read. See spinner information in Add, Tell, Spin, and Win.

#### Record Sheets

Locate Fast Tens record sheet in blacklines. Run copies.

#### Ten Frame Boards (2)

Locate ten frame boards in cardstock portion of this packet. Laminate.

#### Counters (30-40)

Use any small objects that don't roll (bread tags, buttons, Unifix cubes, etc.). Store them in a junk box. Store boxed counters, ten frame boards, spinners and record sheets in a standard box.

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## Fast Nines (1-2 Children)

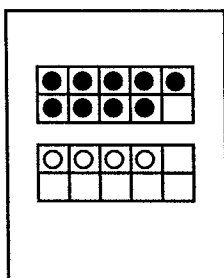
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See Box It or Bag It Mathematics Teachers Resource Guide, CHAPTER 14, Fast Nines, for group introduction to this box.

**Box ingredients→** spinners (2)                      record sheets  
ten frame boards (2)                      junk box of counters  
crayons                                      standard box for storage

### PLAYING INSTRUCTIONS

1. Work with a partner to set out a ten frame board and lay out nine counters on the upper frame. These will remain set up for the whole activity.
2. Spin the spinner. Set the appropriate number of counters out on the lower frame. Compute the total and color a space in the appropriate column of the record sheet.



*"We spun nine plus four. We'll set that out. Now we'll move one up. That'll make it ten plus three, which is thirteen, so we know  $9 + 4 = 13$ !"*

3. Continue spinning and coloring in your record sheets until at least one column is filled.

### MAKING INSTRUCTIONS

#### Spinner

Locate the Fast Nines spinner tops in the blacklines. Color each section of the spinner a different color so it can be more easily read. See spinner information in Add, Tell, Spin, and Win

#### Record Sheets

Locate Fast Nines record sheet in blacklines. Run copies.

#### Ten Frame Boards (2)

Locate ten frame boards in cardstock portion of this packet. Laminate.

#### Counters (30-40)

Use any small objects that don't roll (bread tags, buttons, Unifix cubes, etc.). Store in a junk box. Store box of counters, ten frame boards, spinners, and record sheets in a standard box.

## Fast Nines and Fast Tens Dice Toss (1-4 Children)

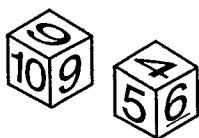
See Box It or Bag It Mathematics Teachers Resource Guide, CHAPTER 14, Fast Nines and Fast Tens Dice Toss, for group introduction to this box.

**Box ingredients**→ dice (12) record sheets  
standard box for storage

## PLAYING INSTRUCTIONS

1. Roll the 9's and 10's die and the 0-5 die. Add the two numbers. Record the combination on the appropriate side of your record sheet.
2. Repeat, but use the 9's and 10's die and the 4-9 die. Continue to roll and record on your record sheet, switching the 0-5 and 4-9 dice frequently. Keep playing until at least one column is completely filled.

$9 + 9 = 18$	
$9 + 4 = 13$	$10 + 8 = 18$
$9 + 3 = 12$	$10 + 3 = 13$
$9 + 1 = 10$	$10 + 2 = 12$
$9 + 5 = 14$	$10 + 1 = 11$
<b>Fast 9's</b>	<b>Fast 10's</b>



$$9 + 4 = 13$$

"It's a fast 9!"

## MAKING INSTRUCTIONS

## Record Sheets

Locate Fast Nines and Fast Tens Dice Toss  
in the blacklines. Run copies.

## Dice

Use plain wooden cubes or foam cubes (available from MLC Materials). Using a Sanford Sharpie pen, label four with nines and tens on all surfaces, four with numerals 0-5, and four with numerals 4-9. .

Store dice and record sheets in a standard box.

# Doubles, Neighbors, Fast Nines, Fast Tens, and Leftovers Dice Toss (2 or 4 Children)

See Box It or Bag It Mathematics Teachers Resource Guide, CHAPTER 14, Doubles, Neighbors, Fast Nines, Fast Tens, and Leftovers, for group introduction to this box.

**Box ingredients**→ record sheets                      dice (4)

wall charts of Fast Nines, Fast Tens, Doubles and Neighbors

standard box for storage

## PLAYING INSTRUCTIONS

1. You and your partner both get a record sheet.
2. Take turns rolling a 4-9 die and a 5-10 die. Figure out what *kind* of combination you rolled. Is it a fast nine, a fast ten, a double, a neighbor, or a leftover? (A leftover is any combination that is *not* one of the above.) If you're not sure, refer to the wall charts.
3. Once you have it figured out, enter the combination you rolled in the appropriate column on your record sheet. Put in the answer, too.

Round 3	9 + 7 = 16		6 + 6 = 12	8 + 9 = 17	
Round 2	9 + 4 = 13	10 + 7 = 17	5 + 5 = 10	6 + 7 = 13	4 + 8 = 12
Round 1 ★	9 + 3 = 12	10 + 4 = 14	8 + 8 = 16	6 + 7 = 13	4 + 6 = 10
	Fast 9's	Fast 10's	Doubles	Neighbors	Leftovers

4. The first person to complete a row *across* wins that round and can put a star by the number of that round. If you roll a double, 6 + 6, for instance, and you've already filled that box, you have to wait until your partner has had a turn and try again. Play as many rounds as you have time for. The record sheet above shows a player who is up to Round 3 and has won Round 1.

## MAKING INSTRUCTIONS

### Record Sheets

Locate the Doubles, Neighbors, Nines, Tens, and Leftovers Dice Toss record sheet in the blacklines. Run copies.

### Dice

Use plain wooden or foam cubes (available from MLC Materials) and a Sanford Sharpie pen. Make two dice numbered 4-9 and two numbered 5-10. Store dice and record sheets in a standard box.

### Wall Charts

Use large chart paper of some sort.

Fast 9's						Fast 10's					
9	9	9	9	9		10	10	10	10	10	
+0	+1	+2	+3	+4		+0	+1	+2	+3	+4	
9	10	11	12	13		0	11	12	13	14	
9	9	9	9	9		10	10	10	10	10	
+5	+6	+7	+8	+9		+5	+6	+7	+8	+9	
14	15	16	17	18		15	16	17	18	19	
9						10					
+10						+10					
19						20					

Doubles & Neighbors					
2	2	3	3	4	4
+2	+3	+3	+4	+4	+5
4	5	6	7	8	9
5	5	6	6	7	7
+5	+6	+6	+7	+7	+8
10	11	12	13	14	15
8	8	9	9	10	
+8	+9	+9	+10	+10	
16	17	18	19	20	

Write doubles in one color, neighbors in another.

# Tic Tac Toe (2 or 4 Children)

See Box It or Bag It Mathematics Teachers Resource Guide, CHAPTER 14, Tic Tac Toe, for group introduction to this box.

**Box ingredients→** dice (4) record sheets  
standard box for storage

## PLAYING INSTRUCTIONS

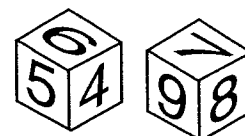
1. Each child needs a record sheet. The children determine who will be "X" and "O" and write their names on their record sheet.
2. The grids are filled in using numerals 8-18. It's OK to repeat numerals. Our children like to take turns selecting the numerals. We have found it helpful to display inside our box lid the numerals needed to fill in the grids.

<b>Tic - Tac - Toe</b>		
X = <u>Carl</u>		
O = <u>David</u>		
15	10	12
9	14	8
11	18	13

3. Take turns rolling two 4-9 dice. Both players mark their record sheets on every turn.
4. The first player to get three X's or three O's in a row wins.

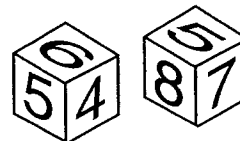
<b>Tic - Tac - Toe</b>		
X = <u>Carl</u>		
O = <u>David</u>		
15	10	12
9	14	8
<del>11</del>	18	13
6 + 5 = 11      6 + 7 = 13		

Player O rolls:



This toss would be recorded as

Player X rolls:



This toss would be recorded as

## MAKING INSTRUCTIONS

### Record Sheets

Locate Tic Tac Toe record sheets in the blacklines. Run copies.

### Dice (4)

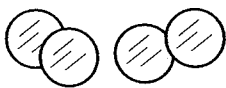
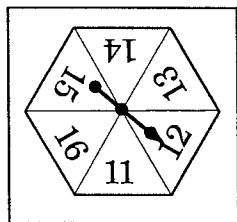
Use plain wooden cubes or foam cubes (available from MLC Materials) and a Sanford Sharpie pen. Number all four dice with the numerals 4-9. Store dice and record sheets in a standard box.

# Add and Think (2 Children)

**Box ingredients**→ gameboards (2) spinner  
 record sheets junk box of game markers  
 standard box for storage

## PLAYING INSTRUCTIONS

1. Spin spinner to see who starts game. High spin begins.
2. First player spins and searches for a way to make the number spun. Place your game markers over the addends you choose.



In this case where 12 is spun, player could cover the following: 6, 6; or 5, 4, 3; or 5, 6, 1; or 8, 4; etc. Pick one set of factors and cover them.

3. Record the combination you made on your record sheet.
4. Let your partner spin, mark addends on his/her board and record on his/her record sheet.
5. Continue playing until one of you has covered four in a row vertically, horizontally, or diagonally. (Some children love to play for blackout.)
6. When a game ends, draw a red line under the last equations you wrote on your record sheets and start again.

Add & Think Darrell
$8 + 4 = 12$

## MAKING INSTRUCTIONS

### Spinner

Locate *hard* Add and Think spinner top in blacklines. Assemble as directed in Add, Tell, Spin, and Win.

### Record Sheets

Locate Add and Think record sheet in blacklines. Run copies.

### Gameboards

Locate boards, laminate and cut apart.

### Game Markers (35-40)

Clear colored plastic round game markers (available from MLC Materials) are ideal, but any small counters will do. Store in a junk box.

Store boxed markers, spinner, gameboards, and record sheets in standard box.

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## 21 (2-4 Children)

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See Box It or Bag It Mathematics Teachers Resource Guide,  
CHAPTER FOURTEEN, 21, for group introduction to this box.

**Box ingredients→** scorecards (4) cards  
tiny box of “jewels” half box for storage

### PLAYING INSTRUCTIONS

1. Each child takes a scorecard.
2. The box of “jewels” is opened and set in the center.
3. The deck of cards is mixed up and placed face down in a pile.
4. The dealer deals two cards to each player, one face up and one face down. Each player adds up those two cards.
5. Each player may continue asking for cards in his/her effort to get closest to 21.
6. All players display cards. The player who gets closest to 21 (*without going over*) wins each time.
7. The winner takes a “jewel” and places it on scorecard.
8. At the end of the game, the player with the most jewels wins.

### MAKING INSTRUCTIONS

#### Cards (52)

Locate cards, laminate and cut apart.

#### Scorecards

Cut four cards (3 X 4) which children will use to hold winning jewels.

#### Jewels

Anything you have available works! You could use tiny shells, colored macaroni, fake coins, whatever. Store in a tiny box. Store boxed jewels, cards, and scorecards in a half box.



“Who is closest to 21?”



“23  
Too much...  
I went over!”

“20!”



# What's Missing? (1-4 Children)

**Box ingredients→** dice (8)

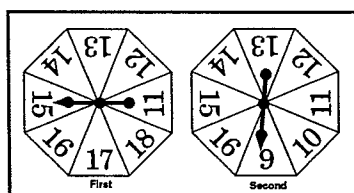
record sheets

Unifix cubes

standard box for storage

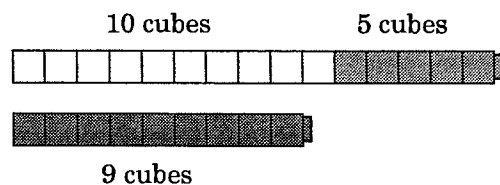
## PLAYING INSTRUCTIONS

1. Take a double spinner. Spin the first spinner, add, and record the amount beside the words "first spin" on your record sheet.
2. Set out the appropriate number of Unifix cubes.
3. Spin the second spinner, add, and record the amount by "second spin." Compare your stacks and record the difference by the question mark.



*"I got 15 on my first spin and 9 on my second. Now I have to figure out how to get from 15 to 9. Looks like I have to take some away."*

first spin	15
?	
second spin	9



*"The difference is 6."*

## MAKING INSTRUCTIONS

### Record Sheets

Locate What's Missing? record sheet in the blacklines. Run copies.

### Spinners

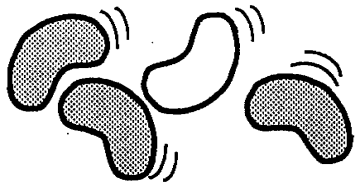
Locate spinner tops and make up double spinner. See spinner information in Add, Tell, Spin and Win.

### Junk Box of Counters

Any small, non-rolling counters (pebbles, shells, buttons, bread tags, Unifix cubes, etc.) will do. Store in a junk box. Store spinners and record sheets in standard box.

# Blacklines

Patterns, cards, spinners, and other materials you'll make for the  
Practice & Enrichment Boxes described in this packet.

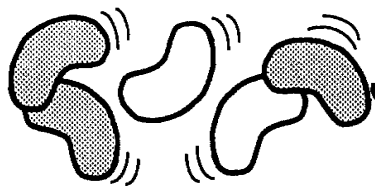


*Shake* those  
beans!

**4**

name \_\_\_\_\_

<b>0 + 4</b>	<b>1 + 3</b>	<b>2 + 2</b>	<b>3 + 1</b>	<b>4 + 0</b>



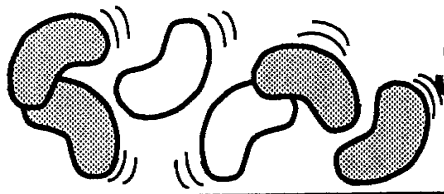
*Shake*

those  
beans!

**5**

name \_\_\_\_\_

<b>0 + 5</b>	<b>1 + 4</b>	<b>2 + 3</b>	<b>3 + 2</b>	<b>4 + 1</b>	<b>5 + 0</b>



*Shake* those  
beans!

6

name \_\_\_\_\_

<b>0 + 6</b>	<b>1 + 5</b>	<b>2 + 4</b>	<b>3 + 3</b>	<b>4 + 2</b>	<b>5 + 1</b>	<b>6 + 0</b>



*Shake* those  
beans!

7

name \_\_\_\_\_

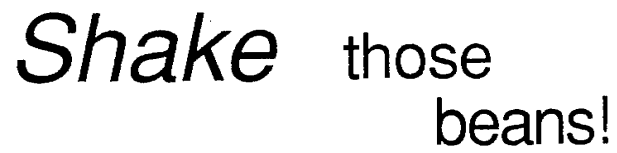
<b>0 + 7</b>	<b>1 + 6</b>	<b>2 + 5</b>	<b>3 + 4</b>	<b>4 + 3</b>	<b>5 + 2</b>	<b>6 + 1</b>	<b>7 + 0</b>



8

name \_\_\_\_\_

<b>0 + 8</b>	<b>1 + 7</b>	<b>2 + 6</b>	<b>3 + 5</b>	<b>4 + 4</b>	<b>5 + 3</b>	<b>6 + 2</b>	<b>7 + 1</b>	<b>8 + 0</b>



name \_\_\_\_\_

30



name \_\_\_\_\_

Dice Toss

2	3	4	5	6

Dice Toss

7

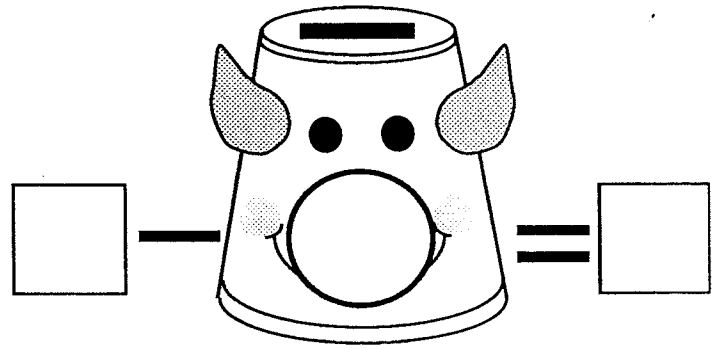
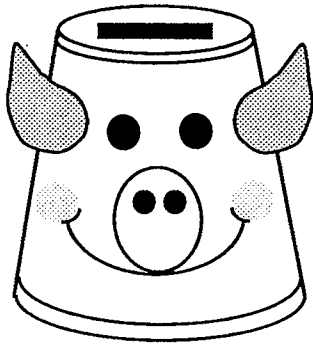
8

9

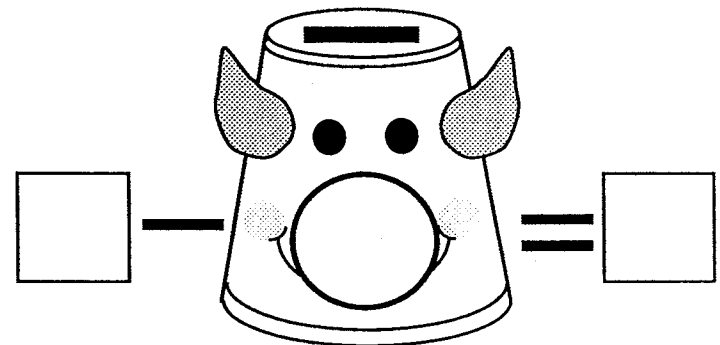
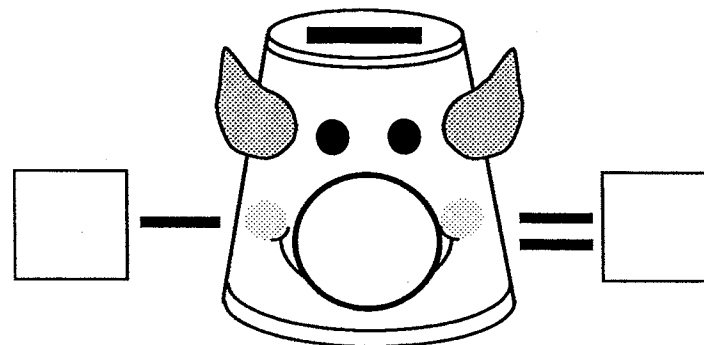
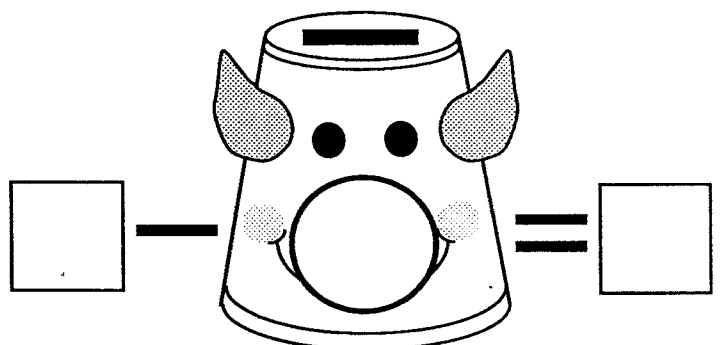
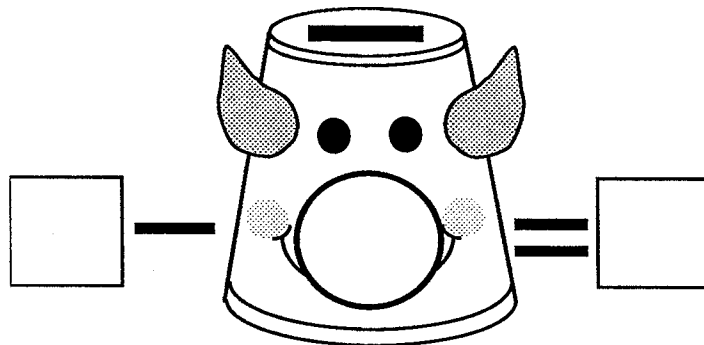
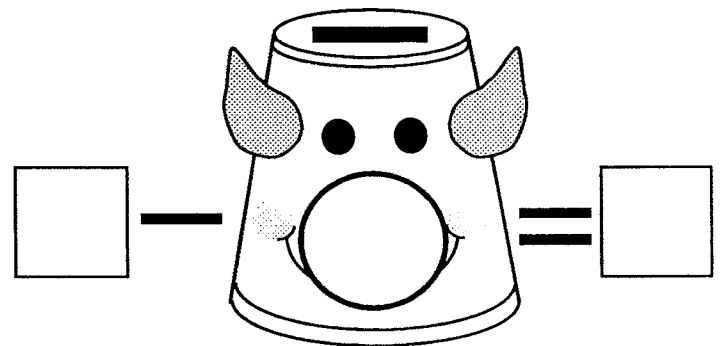
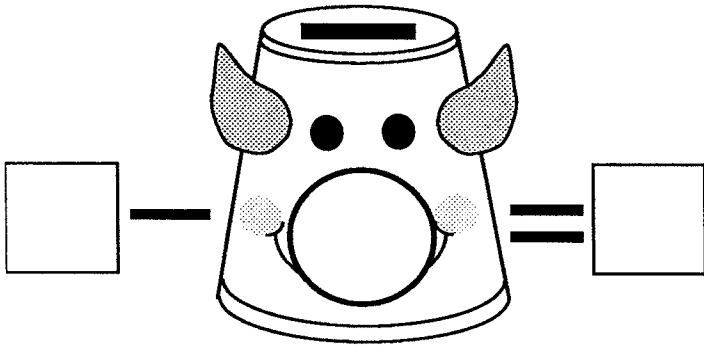
10

11

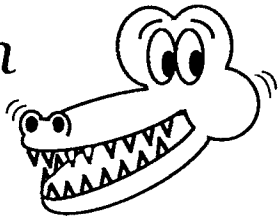
Piggy  
Bank  
Subtraction



name \_\_\_\_\_



# Alligator Subtraction



name \_\_\_\_\_

$$\square - \square = \square$$

$$\square - \square = \square$$

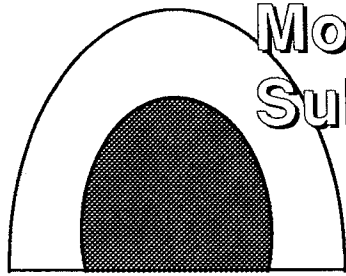
$$\square - \square = \square$$

$$\square - \square = \square$$

$$\square - \square = \square$$

$$\square - \square = \square$$

$$\square - \square = \square$$



# Mountain Subtraction

name \_\_\_\_\_

$$\square - \text{Mountain} = \square$$

$$\square - \text{Mountain} = \square$$

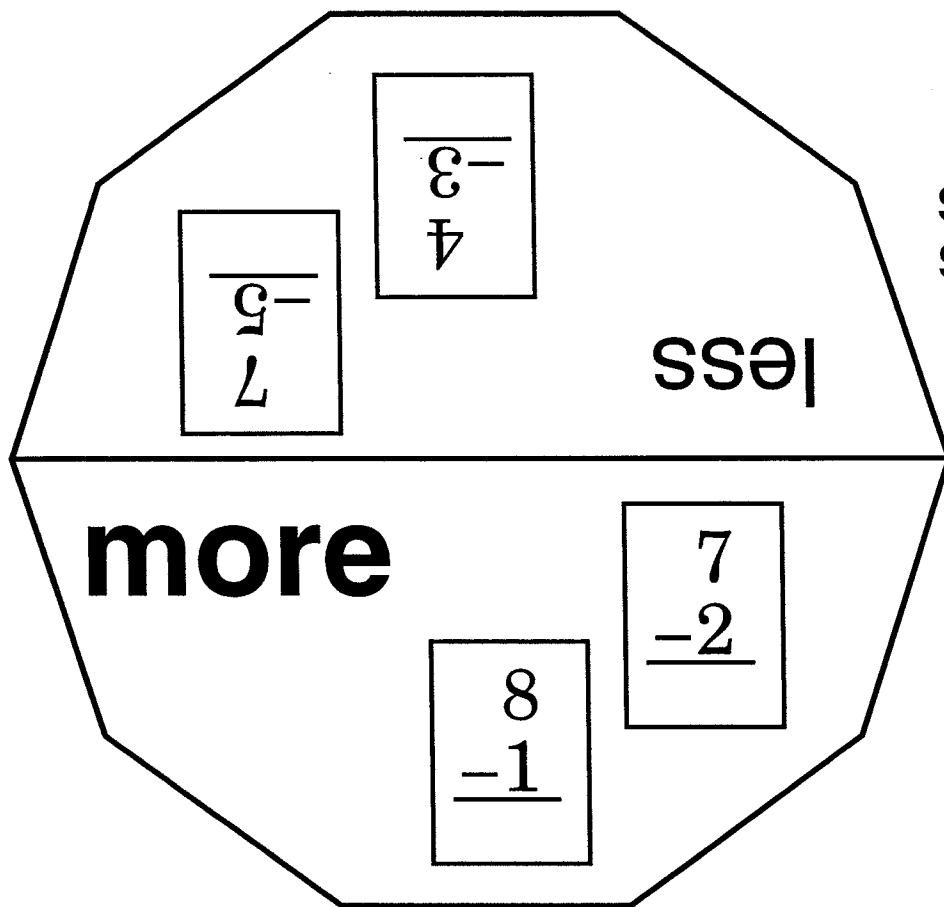
$$\square - \text{Mountain} = \square$$

$$\square - \text{Mountain} = \square$$

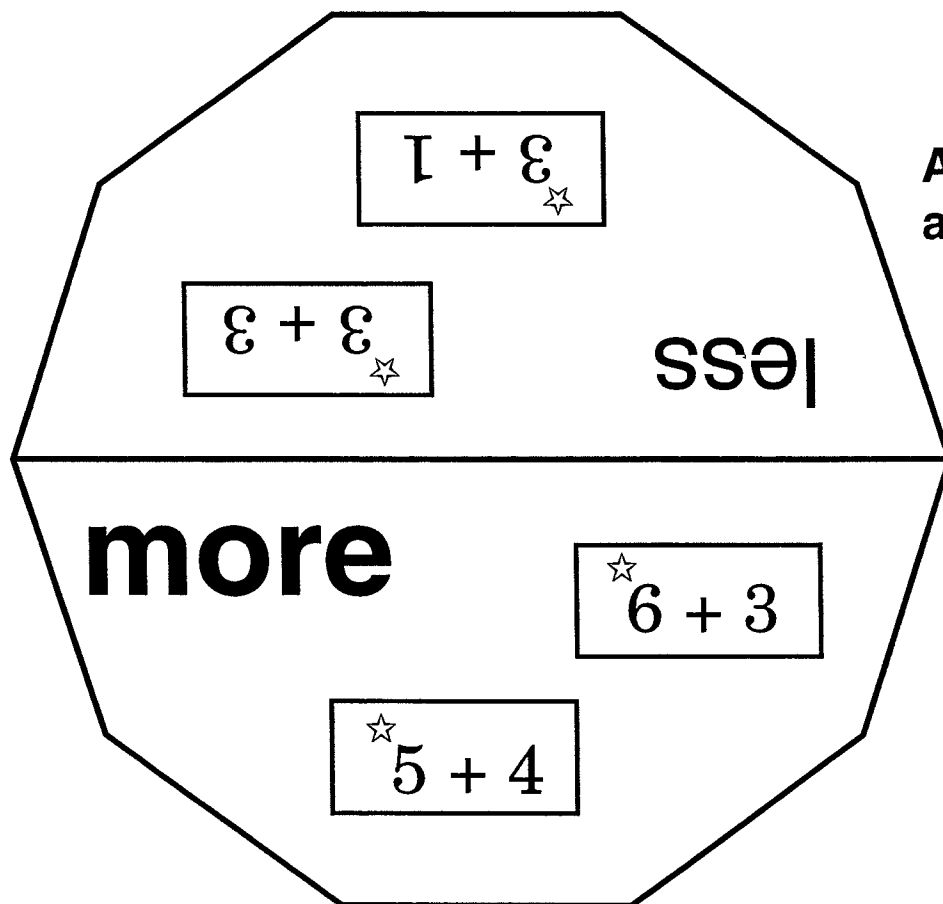
$$\square - \text{Mountain} = \square$$

$$\square - \text{Mountain} = \square$$

$$\square - \text{Mountain} = \square$$



**Subtract, Tell,  
Spin and Win**  
(spinner top)



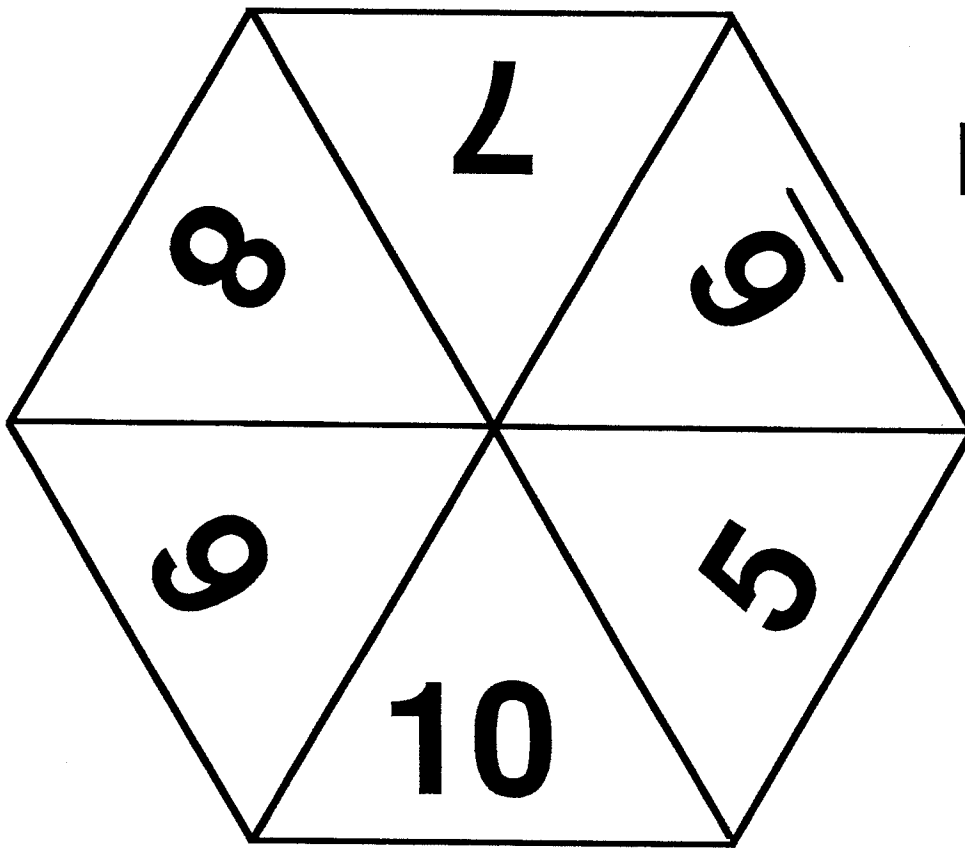
**Add, Tell, Spin  
and Win**  
(spinner top)

Add and Think !

name \_\_\_\_\_

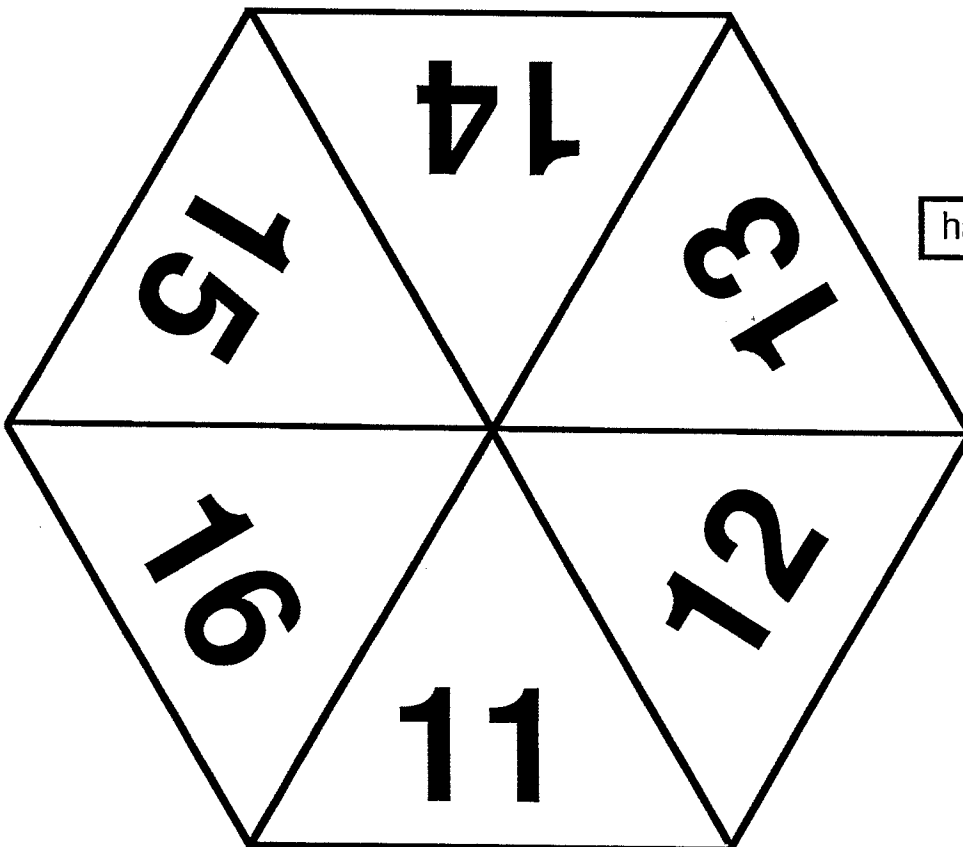
Add and Think !

name \_\_\_\_\_



easier level

Add and Think !



harder level



# Addition Lotto

name \_\_\_\_\_

**5**

**7**

**8**

**6**

**9**

**4**

**5**

**9**

**6**

**10**

**8**

**4**

**9**

**10**

**9**

**7**

copy A

# Addition Lotto

name \_\_\_\_\_

4	6	7	8
8	4	9	5
9	5	10	9
10	6	10	7

copy B

# Addition Lotto

name \_\_\_\_\_

10	7	5	9
4	9	8	10
8	10	6	5
6	7	4	9

copy C

# Addition Lotto

name \_\_\_\_\_

**9**

**7**

**4**

**6**

**10**

**6**

**5**

**7**

**7**

**9**

**10**

**4**

**8**

**10**

**5**

**8**

copy D

# Subtraction Lotto

name \_\_\_\_\_

6	4	3	2
2	5	3	1
1	4	4	1
5	0	2	3

copy A

# Subtraction Lotto

name \_\_\_\_\_

**2**

**6**

**4**

**2**

**5**

**4**

**1**

**3**

**3**

**0**

**3**

**4**

**1**

**0**

**2**

**3**

copy B

# Subtraction Lotto

name \_\_\_\_\_

**3**

**1**

**3**

**2**

**4**

**4**

**0**

**1**

**0**

**6**

**3**

**5**

**4**

**3**

**2**

**2**

copy C

# Subtraction Lotto

name \_\_\_\_\_

**2**

**3**

**5**

**1**

**6**

**4**

**0**

**3**

**5**

**1**

**4**

**0**

**3**

**6**

**2**

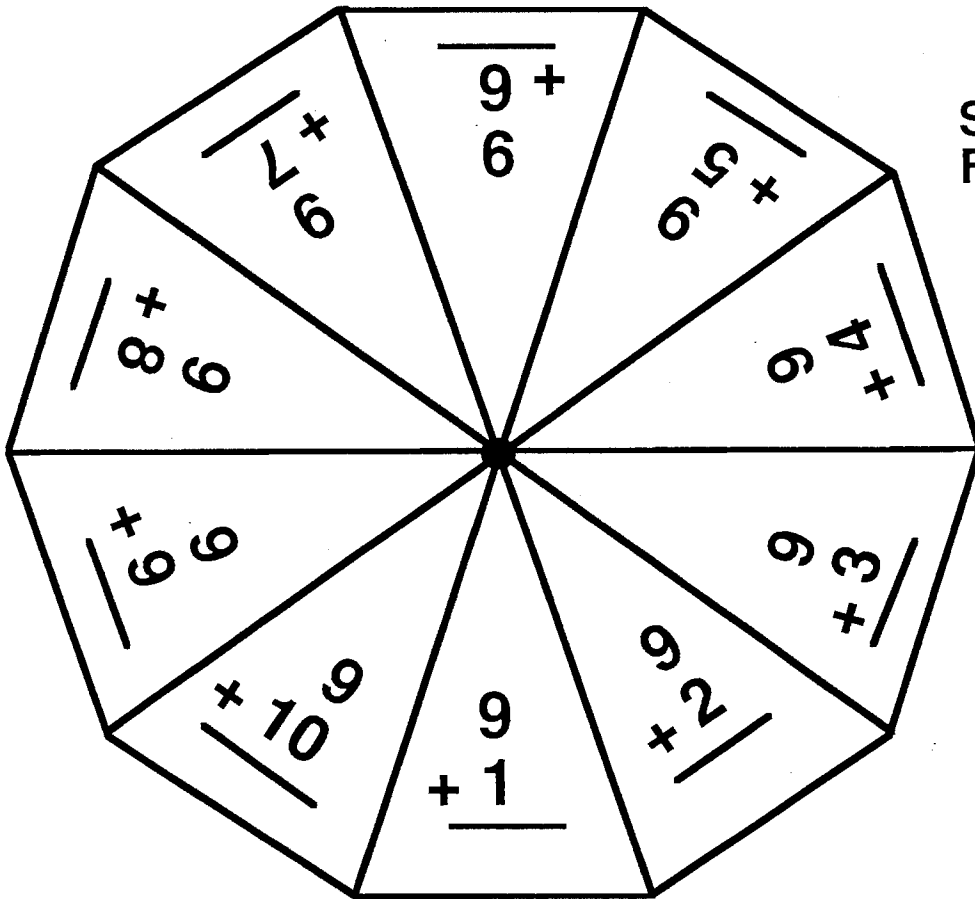
**5**

copy D

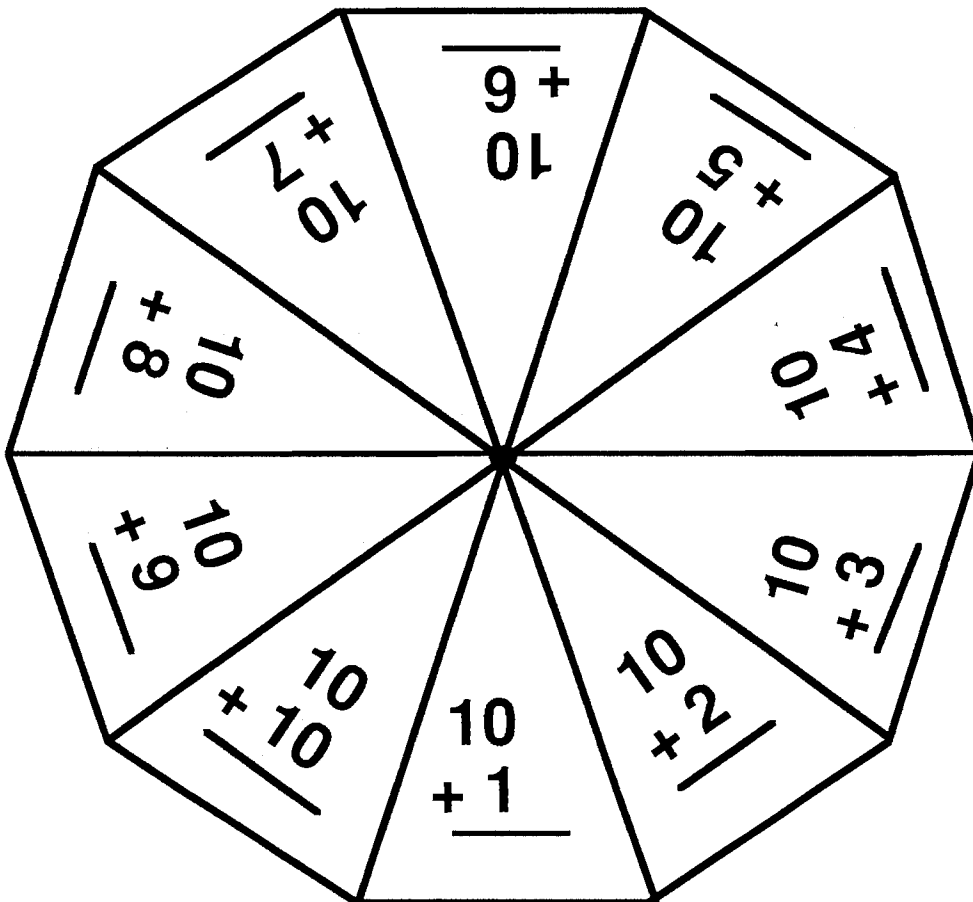


# ***Fast 10's Record Sheet***

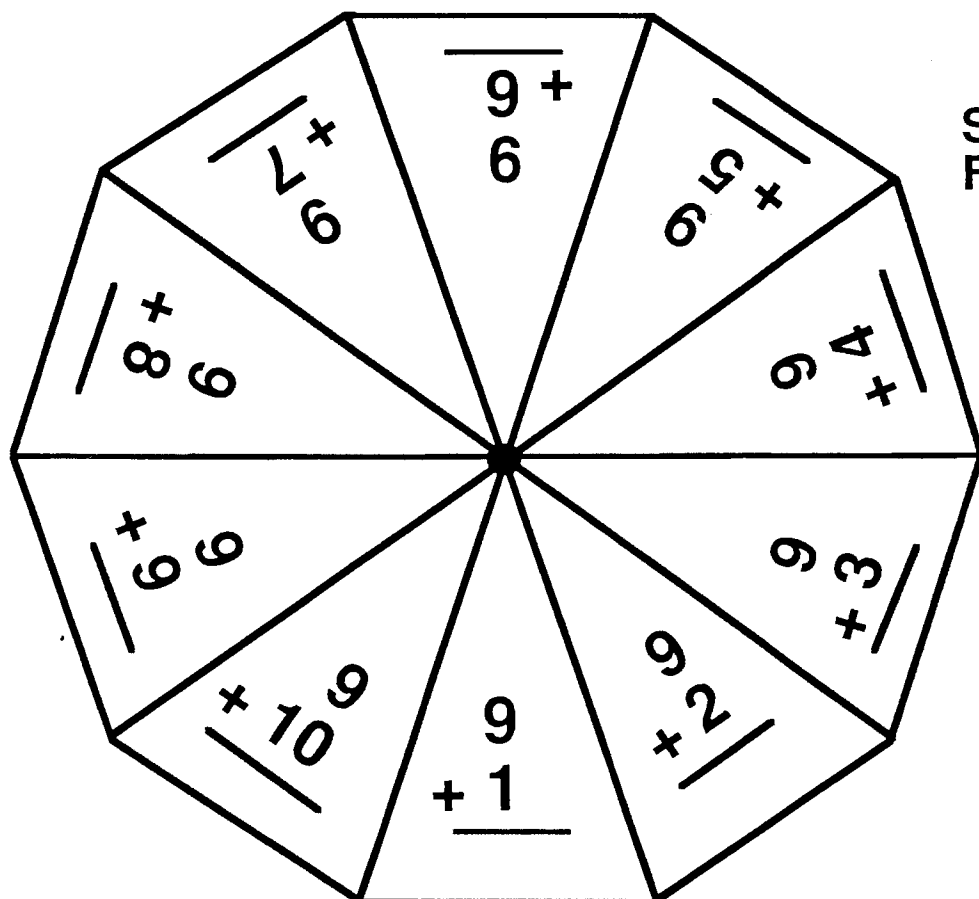
<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>



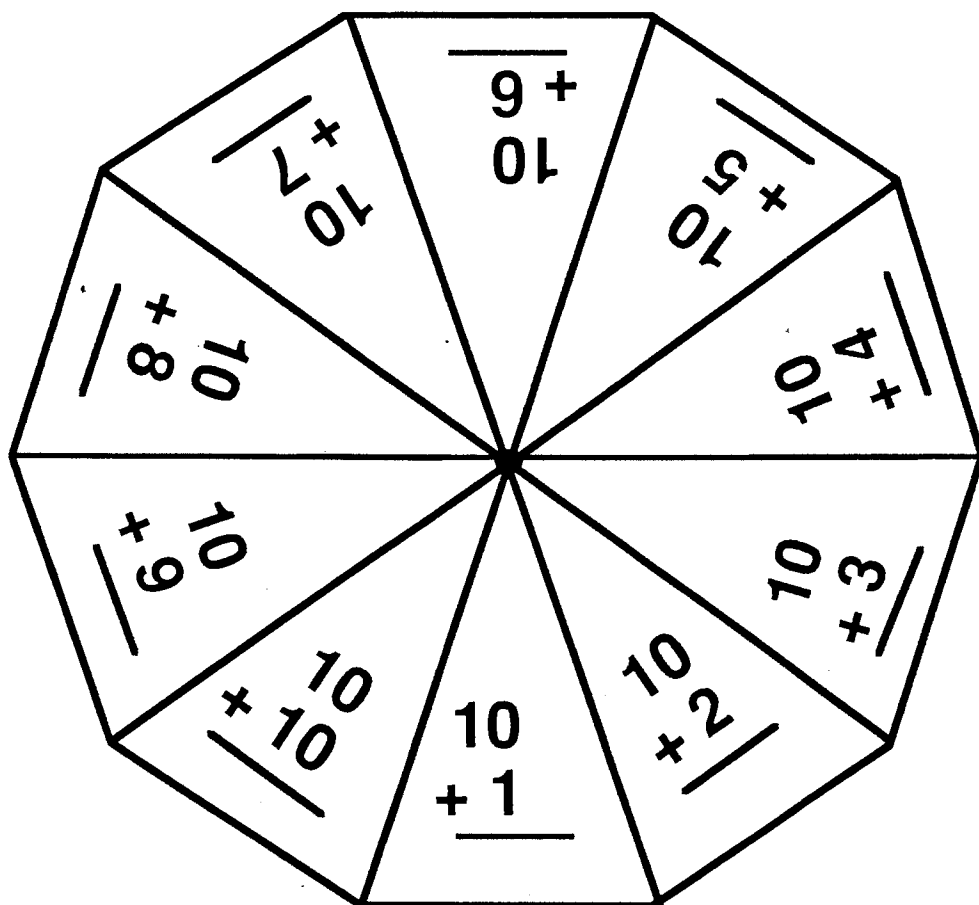
Spinner for  
Fast 9's



Spinner for  
Fast 10's



Spinner for  
Fast 9's



Spinner for  
Fast 10's

# *Fast 9's* Record Sheet

10	11	12	13	14	15	16	17	18	19

***Fast 9's and Fast 10's***  
**Dice Toss**

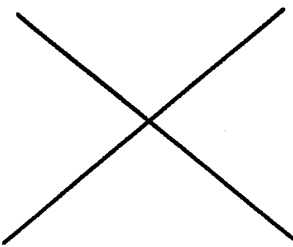
\_\_\_\_\_ name

***Fast 9's***

***Fast 10's***

Doubles, Neighbors, Nines, Tens,  
and Leftovers Dice Toss

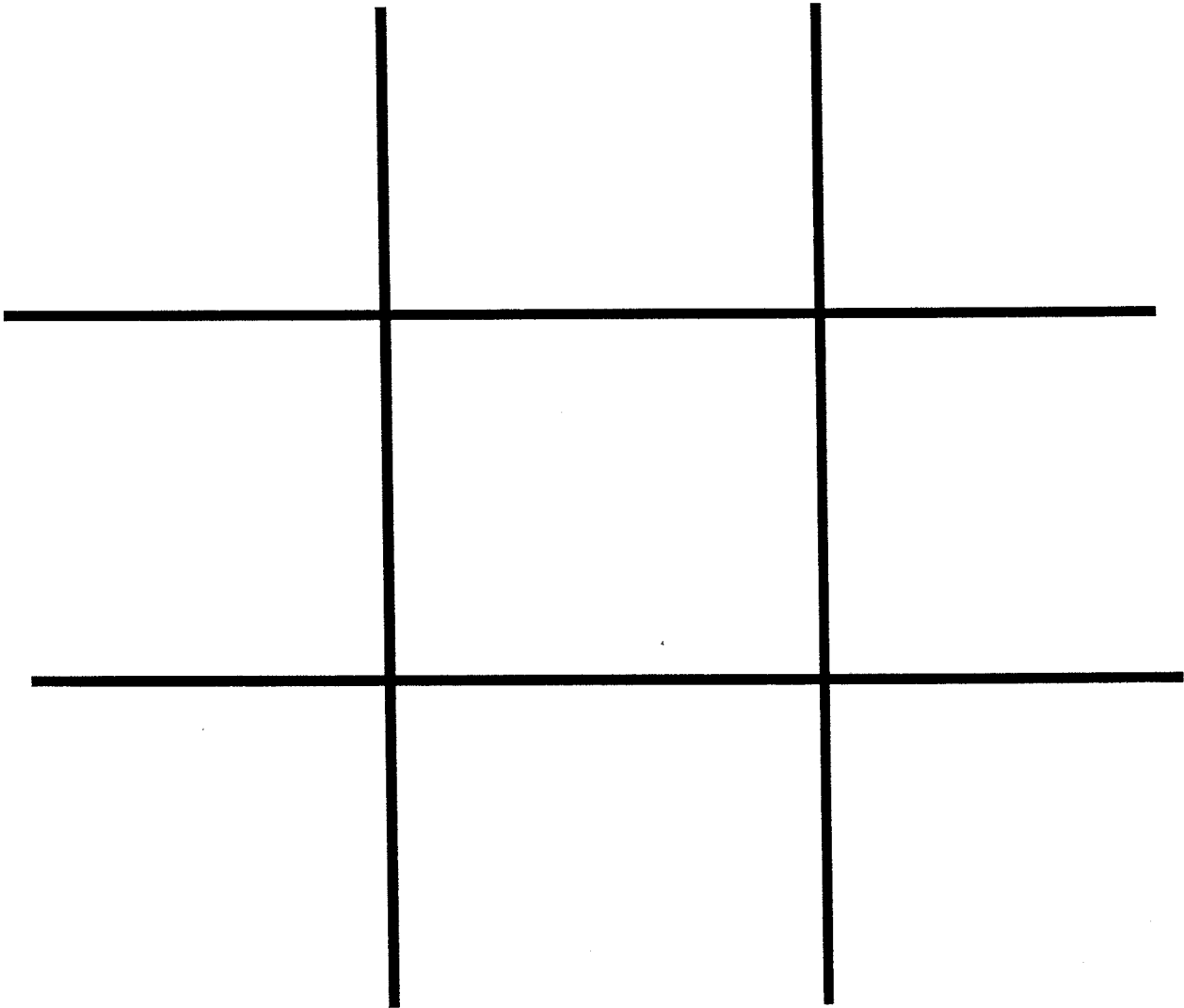
name \_\_\_\_\_

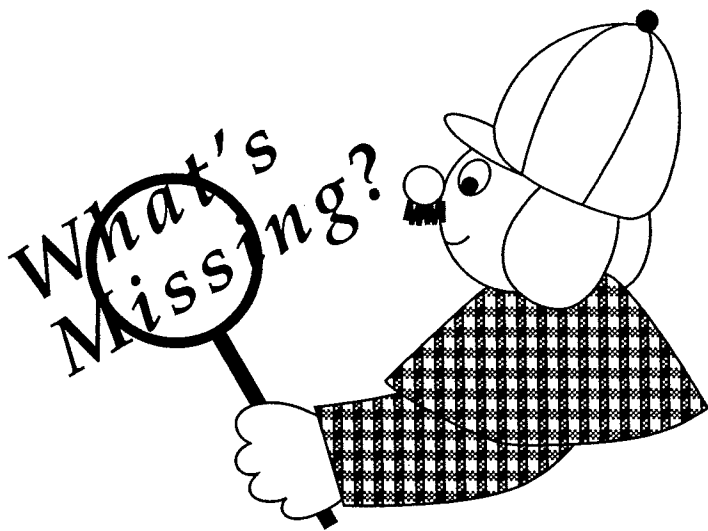
Round 4					
Round 3					
Round 2					
Round 1					
	Fast 9's	Fast 10's	Doubles	Neighbors	Leftovers

# Tic - Tac - Toe

**X** = \_\_\_\_\_

**O** = \_\_\_\_\_





name \_\_\_\_\_

first spin

?

second spin

first spin

?

second spin

first spin

?

second spin

first spin

?

second spin

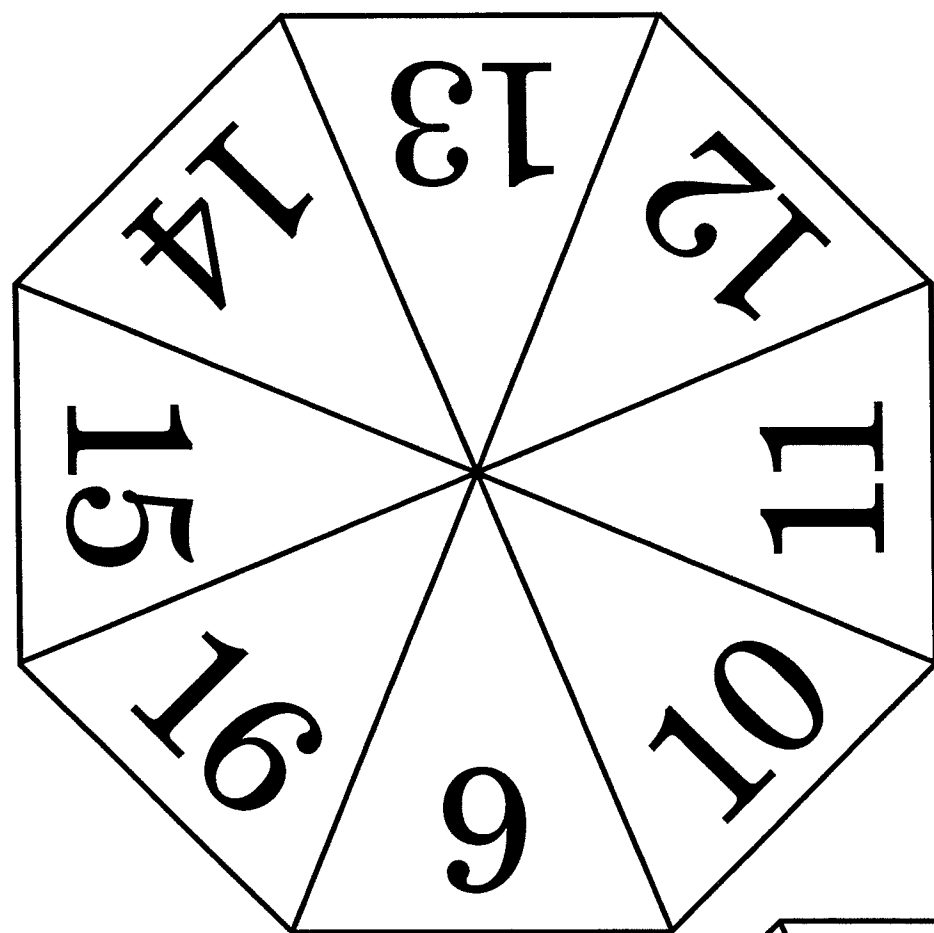
first spin

?

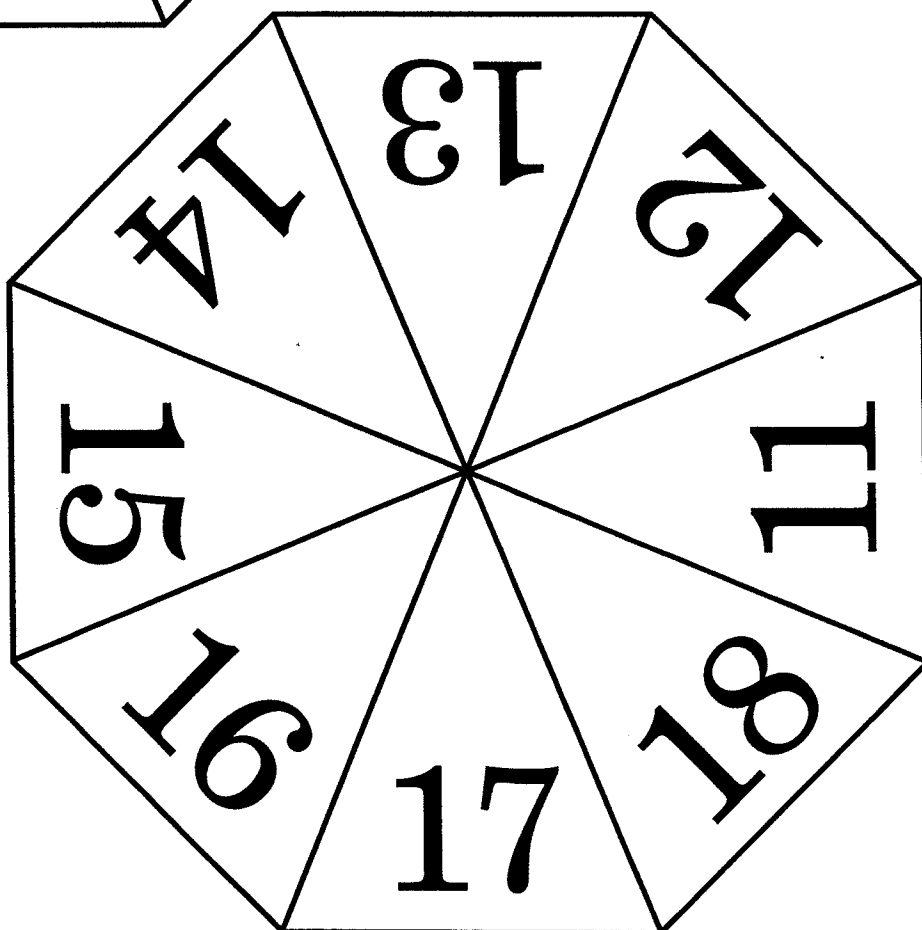
second spin



# What's Missing? Spinner Tops

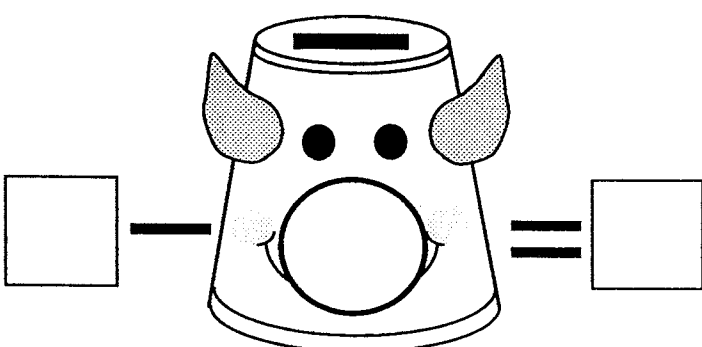
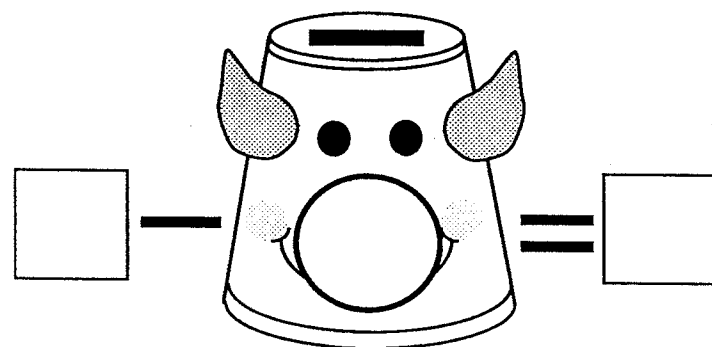
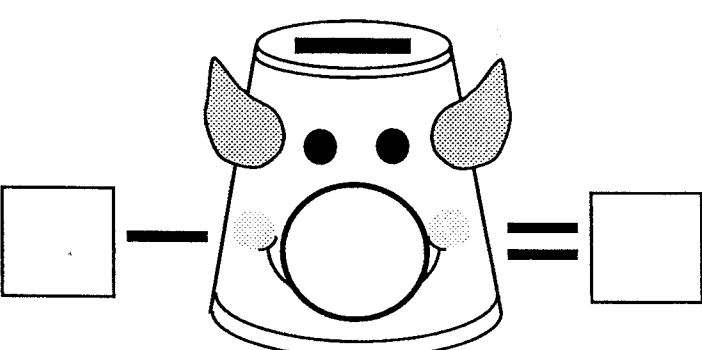
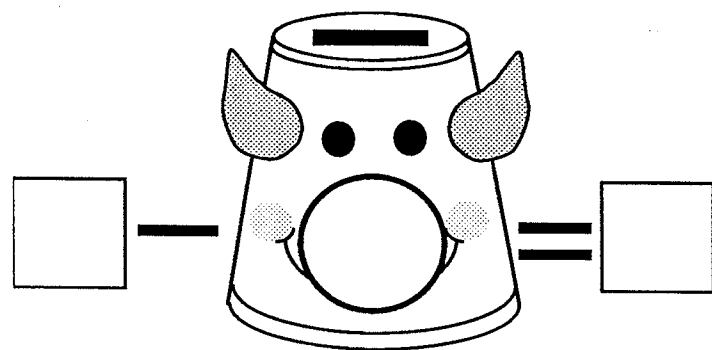
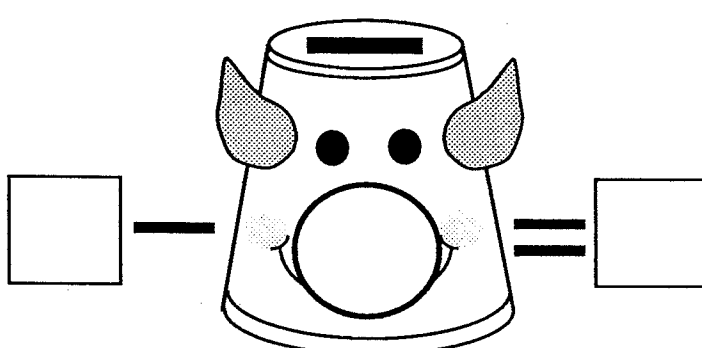
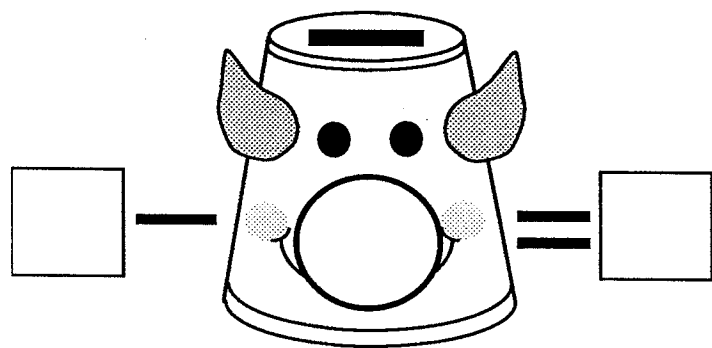
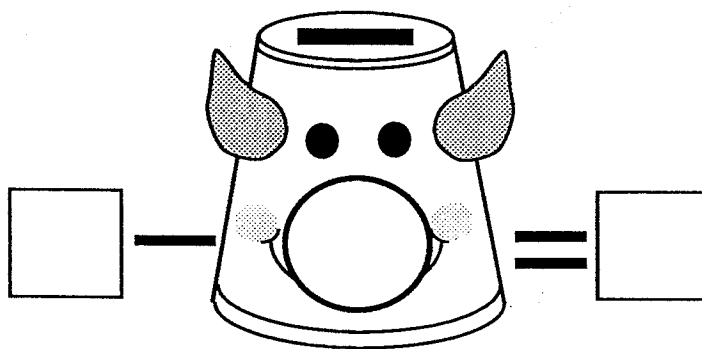
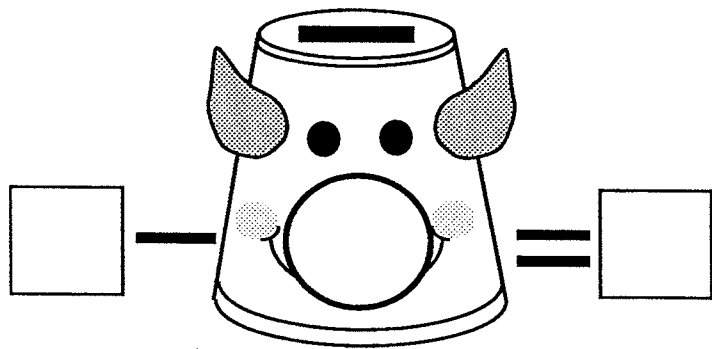


First

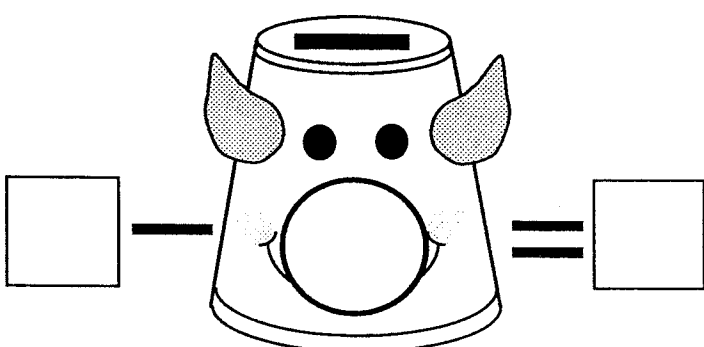
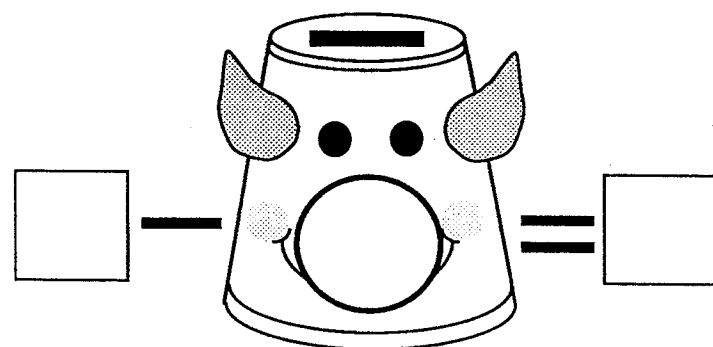
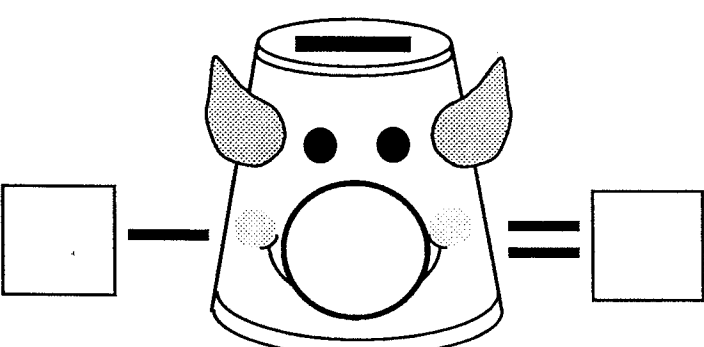
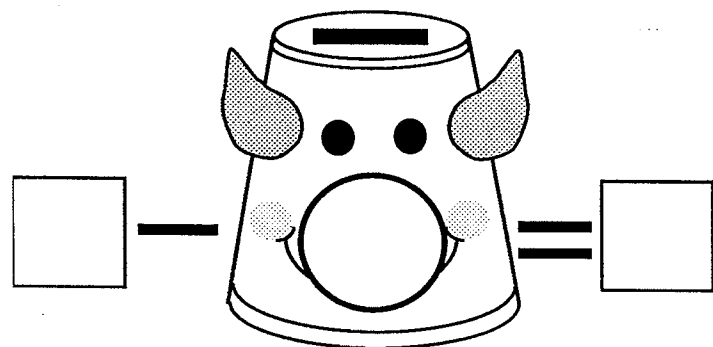
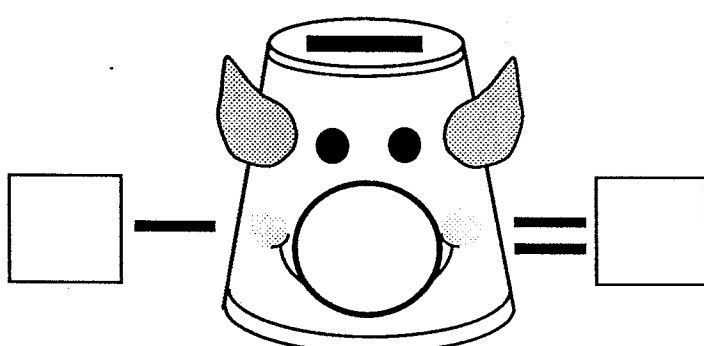
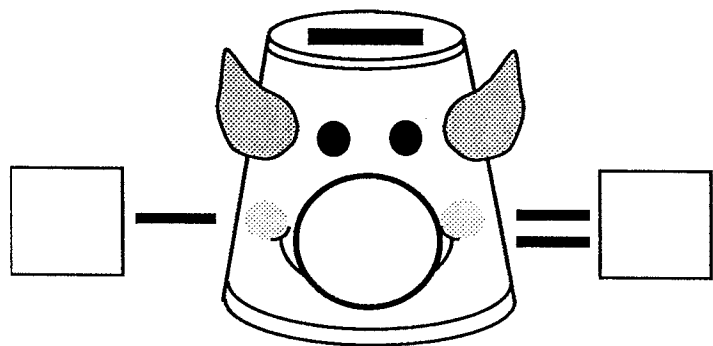
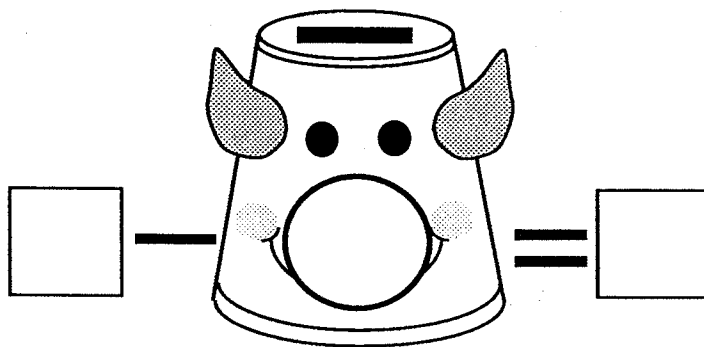
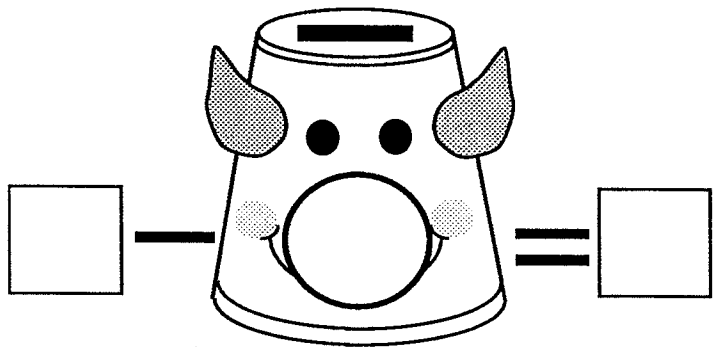


Second

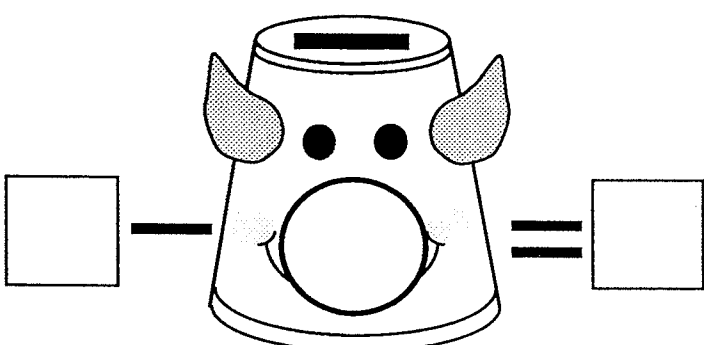
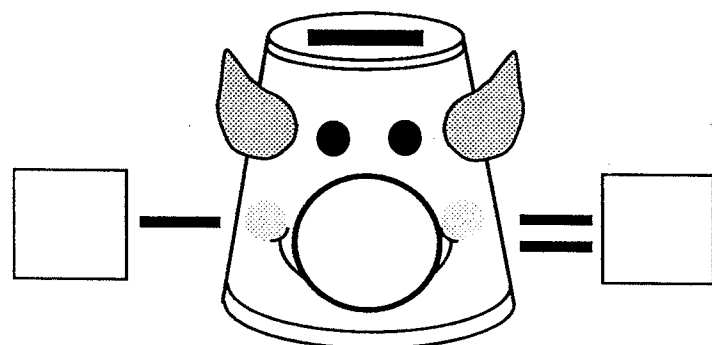
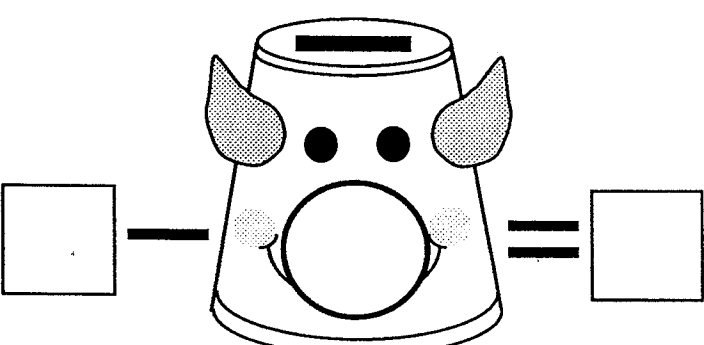
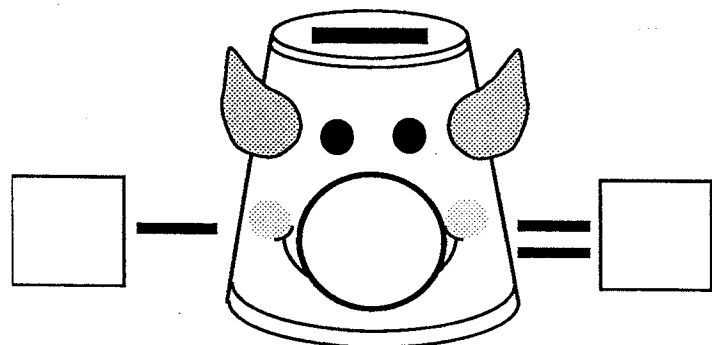
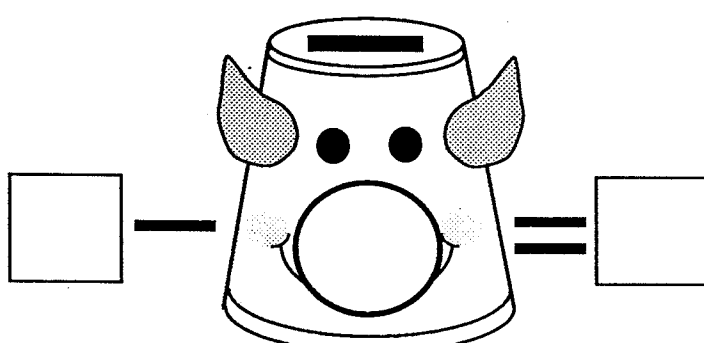
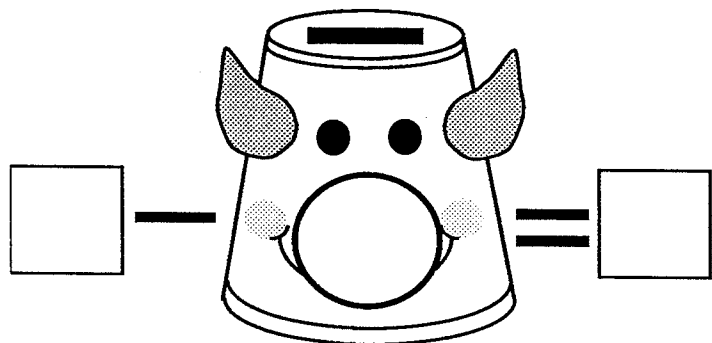
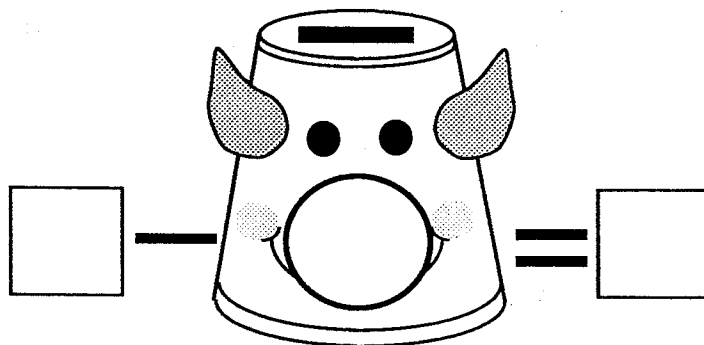
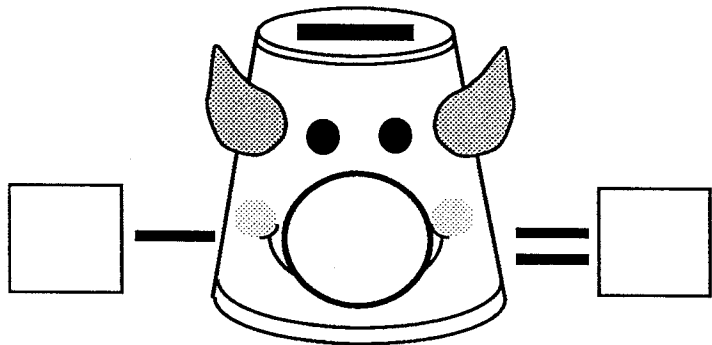
Piggy Bank Subtraction



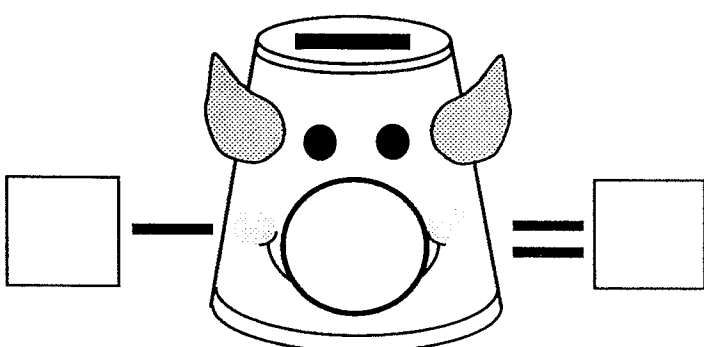
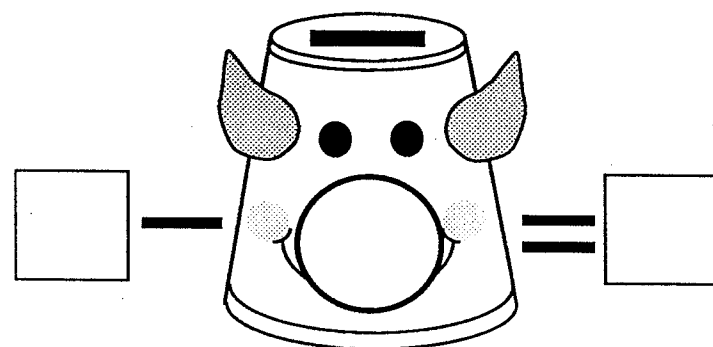
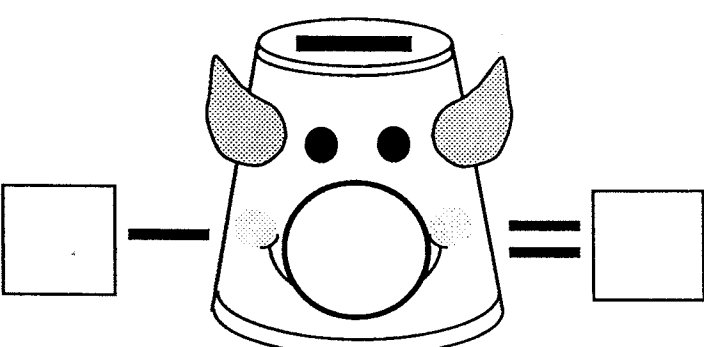
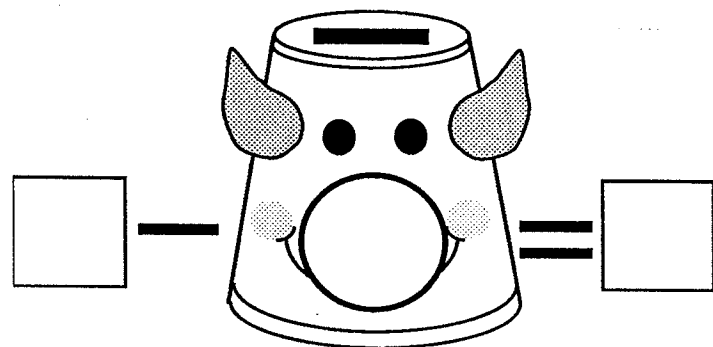
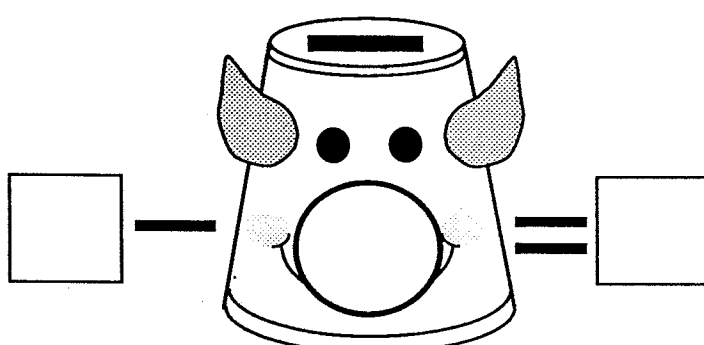
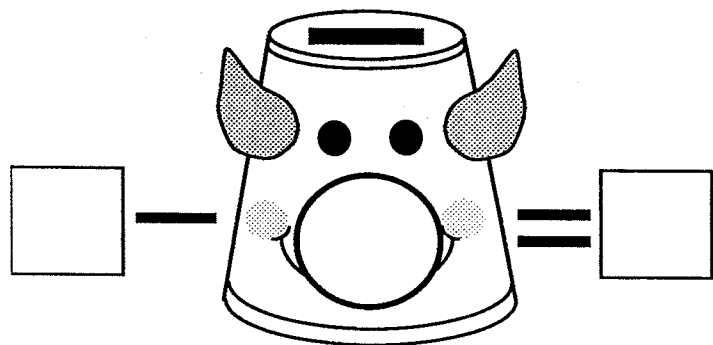
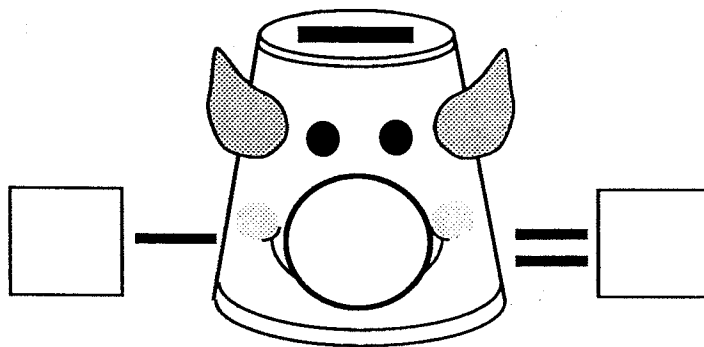
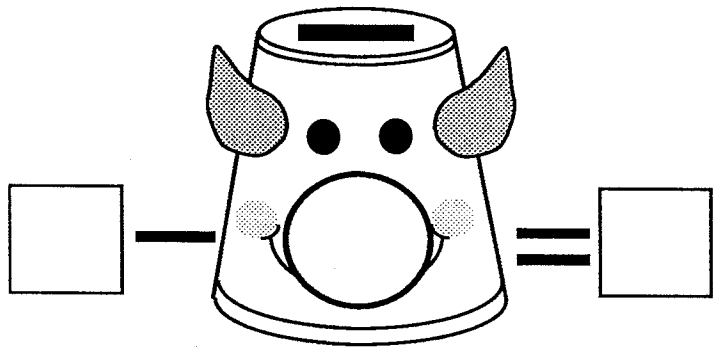
Piggy Bank Subtraction



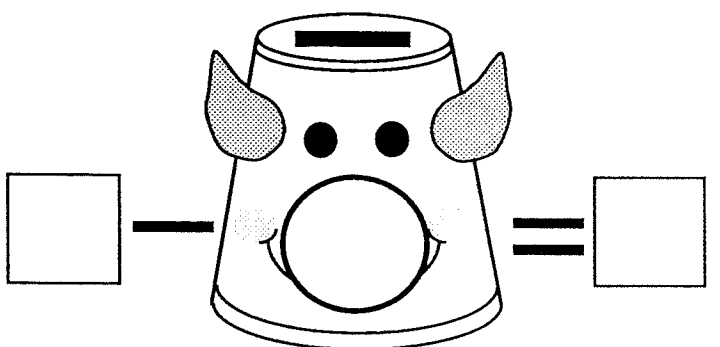
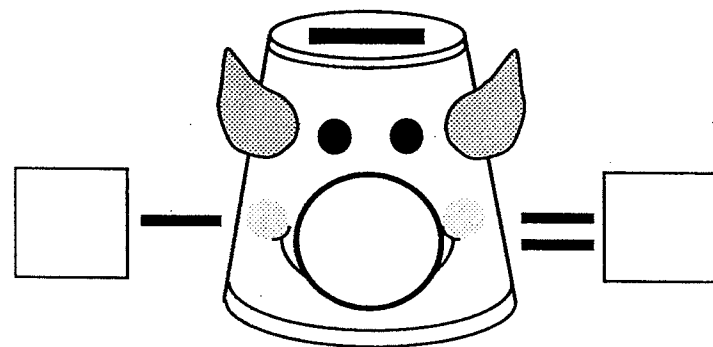
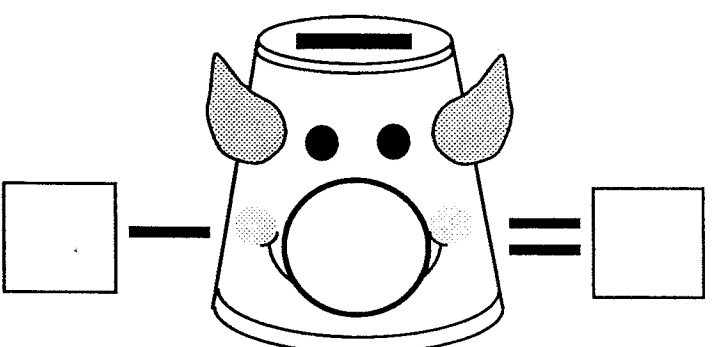
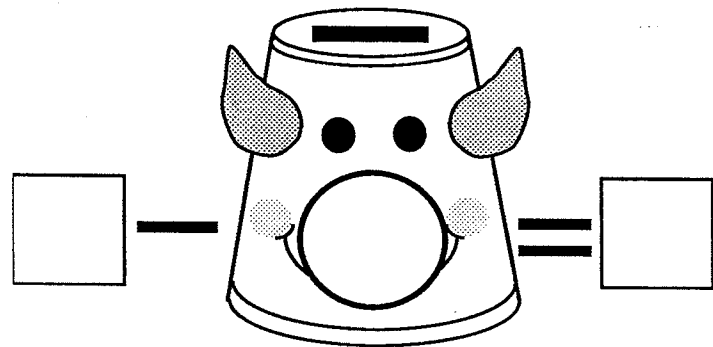
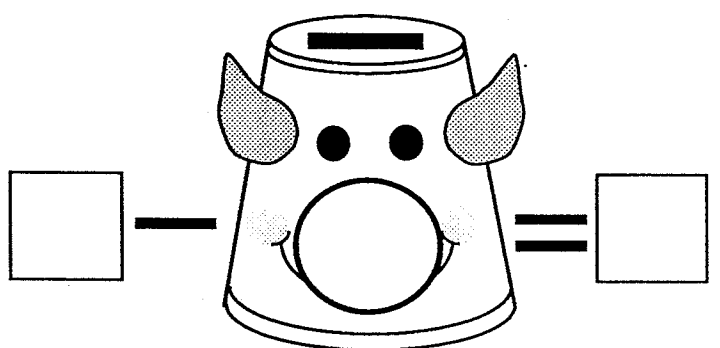
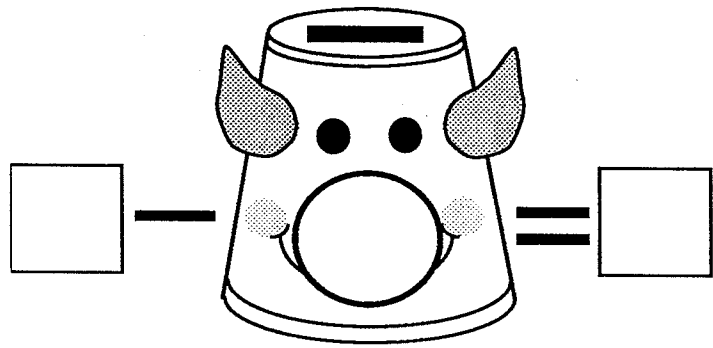
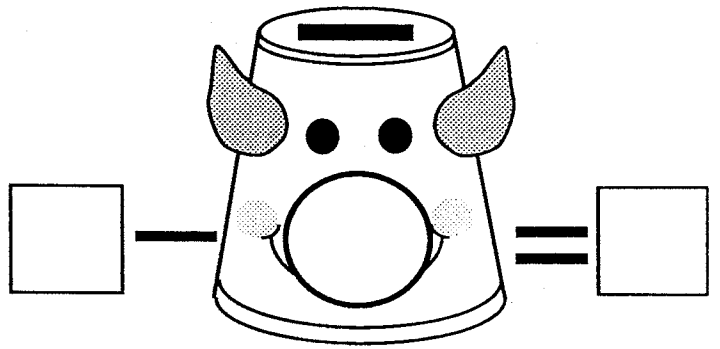
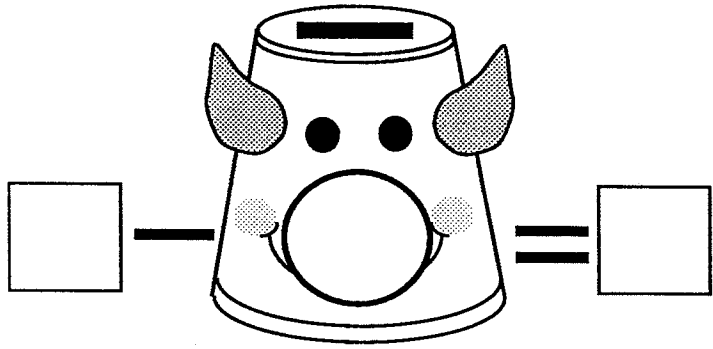
Piggy Bank Subtraction



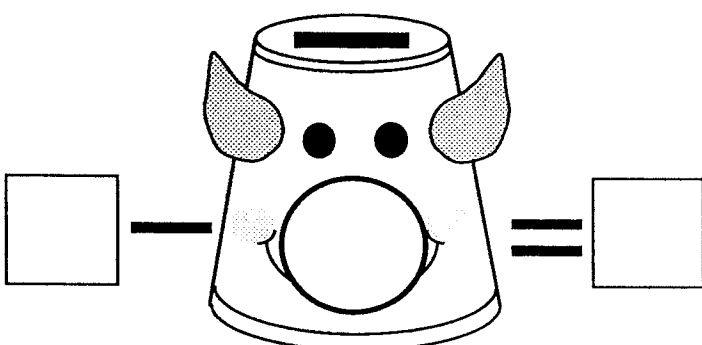
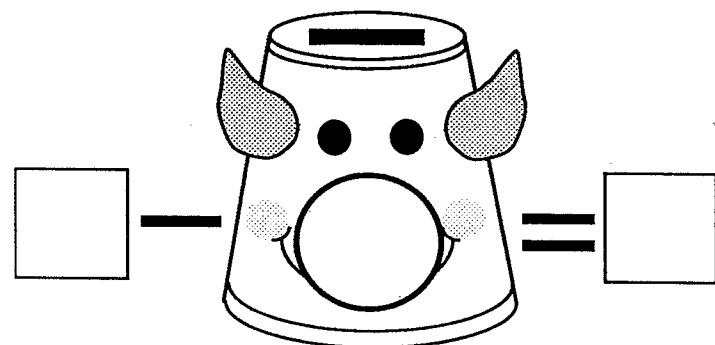
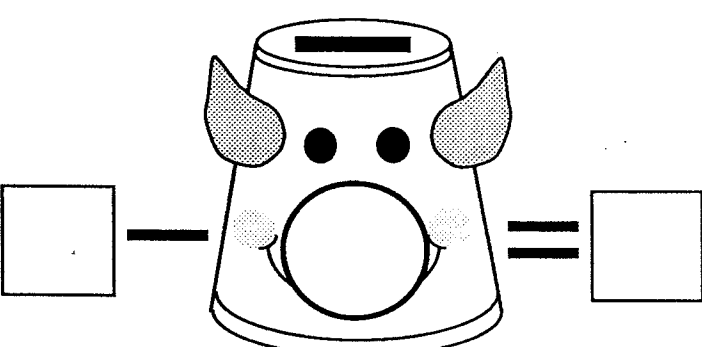
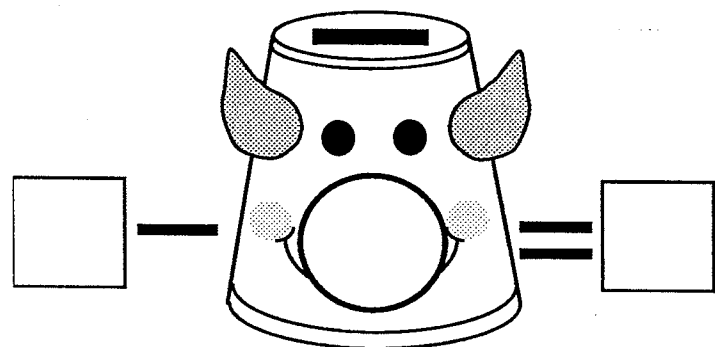
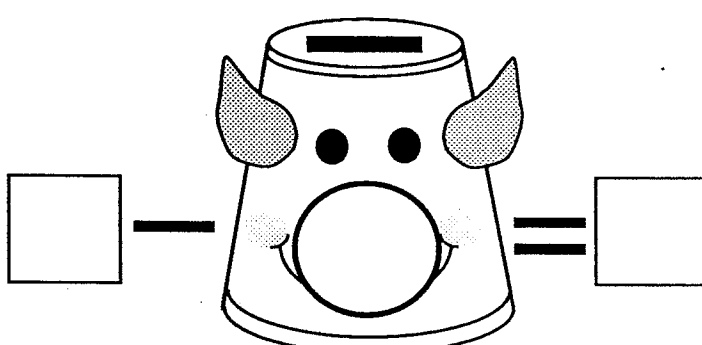
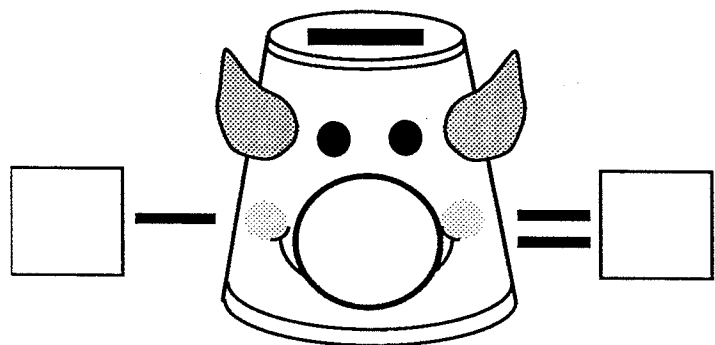
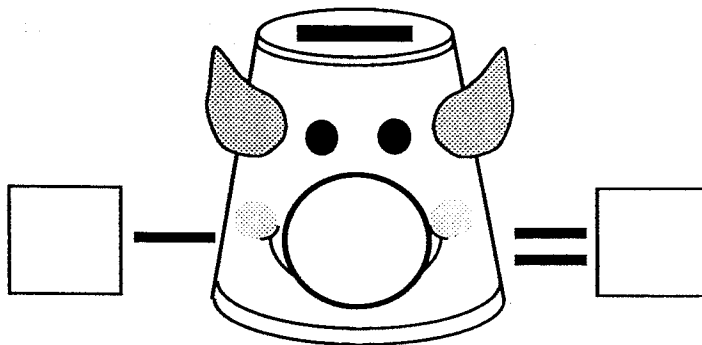
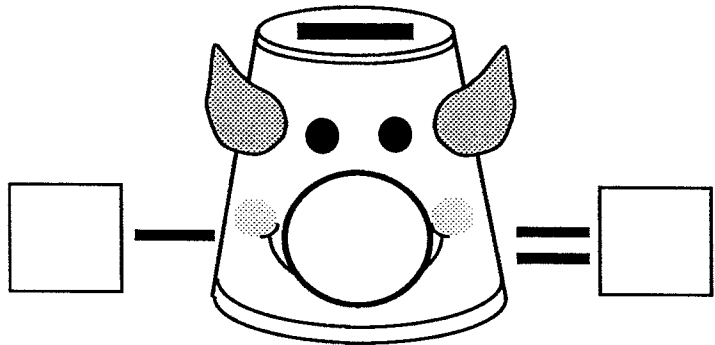
Piggy Bank Subtraction



Piggy Bank Subtraction



Piggy Bank Subtraction



Alligator Subtraction

$$\square - \text{[alligator eating } \square] = \square$$

$$\square - \text{[alligator eating } \square] = \square$$

$$\square - \text{[alligator eating } \square] = \square$$

$$\square - \text{[alligator eating } \square] = \square$$

$$\square - \text{[alligator eating } \square] = \square$$

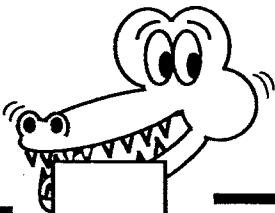
$$\square - \text{[alligator eating } \square] = \square$$

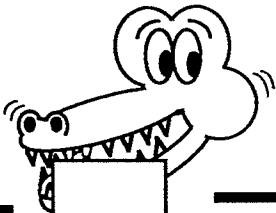
$$\square - \text{[alligator eating } \square] = \square$$

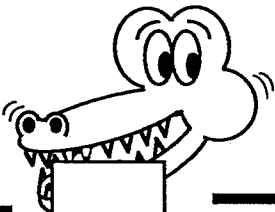
$$\square - \text{[alligator eating } \square] = \square$$

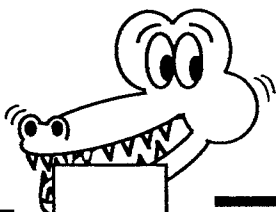


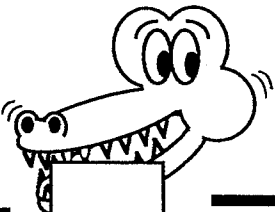
Alligator Subtraction

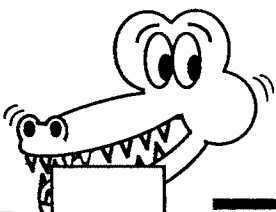
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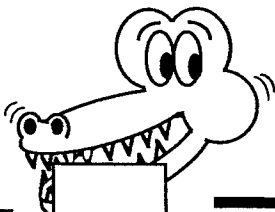
-   =

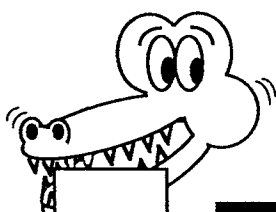
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# Alligator Subtraction

$$\square - \text{[Alligator]} = \square$$

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$$\square - \text{[Alligator]} = \square$$

$$\square - \text{[Alligator]} = \square$$

# Alligator Subtraction

$$\square - \text{[alligator eating } \square] = \square$$

$$\square - \text{[alligator eating } \square] = \square$$

$$\square - \text{[alligator eating } \square] = \square$$

$$\square - \text{[alligator eating } \square] = \square$$

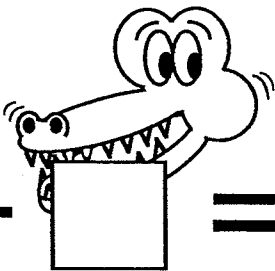
$$\square - \text{[alligator eating } \square] = \square$$

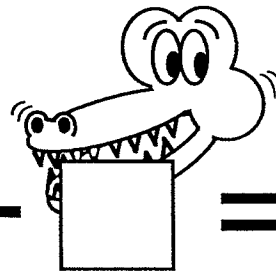
$$\square - \text{[alligator eating } \square] = \square$$

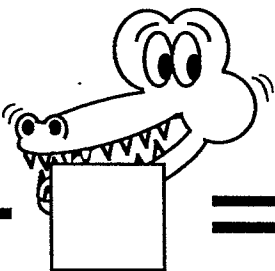
$$\square - \text{[alligator eating } \square] = \square$$

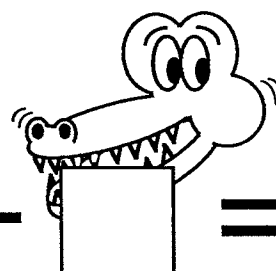
$$\square - \text{[alligator eating } \square] = \square$$

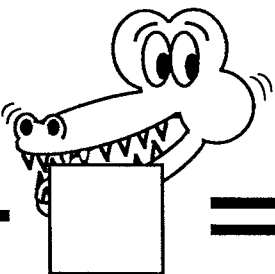
Alligator Subtraction

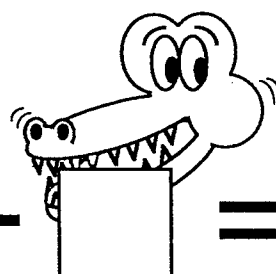
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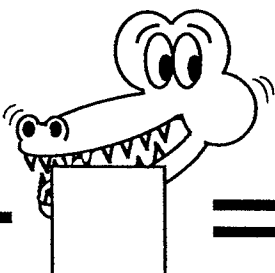
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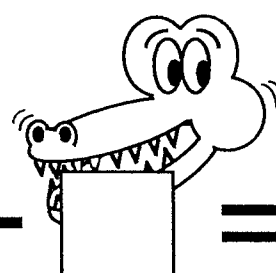
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# Alligator Subtraction

$$\square - \text{Alligator} = \square$$

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## Mountain Subtraction

$$\square - \text{Mountain} = \square$$

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## Mountain Subtraction

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# Mountain Subtraction

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## Mountain Subtraction

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## Mountain Subtraction

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## Mountain Subtraction

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$$\square - \text{Mountain} = \square$$







<div>★</div> <div>1 + 4</div>	<div>★</div> <div>4 + 0</div>	<div>★</div> <div>2 + 1</div>
<div>★</div> <div>5 + 0</div>	<div>★</div> <div>2 + 3</div>	<div>★</div> <div>2 + 2</div>

 1 + 6	 6 + 0	 1 + 5
 5 + 2	 3 + 3	 4 + 2

Add, Tell, Spin & Win (Challenging)

<div>3</div> <div>+</div> <div>6</div> <div>★</div>	<div>8</div> <div>+</div> <div>1</div> <div>★</div>	<div>3</div> <div>+</div> <div>5</div> <div>★</div>
<div>4</div> <div>+</div> <div>5</div> <div>★</div>	<div>7</div> <div>+</div> <div>2</div> <div>★</div>	<div>9</div> <div>+</div> <div>0</div> <div>★</div>

Add, Tell, Spin & Win (Challenging)

 2 + 6	 8 + 0	 3 + 4
 4 + 4	 7 + 1	 7 + 0

Subtract, Tell, Spin & Win

$$\begin{array}{r} 5 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ -0 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ -4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ -0 \\ \hline \end{array}$$



Subtract, Tell, Spin & Win

$$\begin{array}{r} 6 \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -5 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -4 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -0 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ -5 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ -4 \\ \hline \end{array}$$

Subtract, Tell, Spin & Win (Challenging)

$$\begin{array}{r} 8 \\ -8 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -0 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -4 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -5 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -7 \\ \hline \end{array}$$

Subtract, Tell, Spin & Win (Challenging)

$$\begin{array}{r} 9 \\ -0 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -0 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -4 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -5 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -7 \\ \hline \end{array}$$

Subtract, Tell, Spin & Win (Challenging)

$$\begin{array}{r} 9 \\ -9 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -4 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -5 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -7 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -8 \\ \hline \end{array}$$

Add & Think

1	6	5	4
9	2	7	0
1	8	3	5
4	3	2	6

---

2	0	3	1
4	5	2	9
3	6	8	2
1	7	4	5

## Add & Think

3	4	3	5
8	2	5	3
4	7	1	6
8	0	2	1

---

4	0	5	2
5	8	2	6
1	3	6	4
1	3	5	7

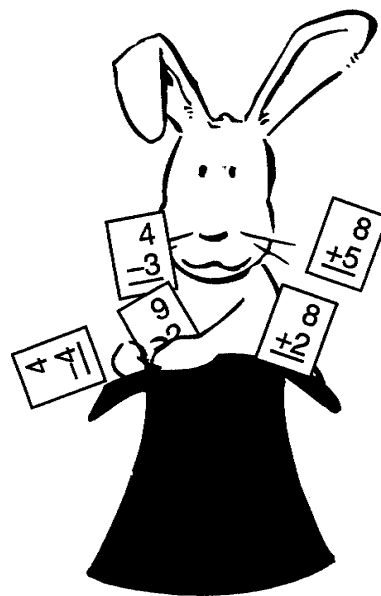
start

winner



math<sup>69</sup>

# **magic**





## Addition Lotto

$1 + 4$	$1 + 3$
$4 + 0$	$2 + 2$
$5 + 0$	$2 + 3$

## Addition Lotto

$6 + 1$	$3 + 3$	$1 + 5$
$2 + 5$	$0 + 6$	$2 + 4$

## Addition Lotto

$2 + 6$	$8 + 0$	$4 + 3$
$5 + 3$	$7 + 1$	$7 + 0$

## Addition Lotto

$$4 + 4$$

$$9 + 0$$

$$8 + 1$$

$$2 + 7$$

$$6 + 3$$

$$5 + 4$$

## Addition Lotto

$10 + 0$	$9 + 1$
$2 + 8$	$3 + 7$
$6 + 4$	$5 + 5$

Subtraction Lotto

$6 - 2$	$6 - 4$	$6 - 6$
$6 - 1$	$6 - 3$	$6 - 5$

Subtraction Lotto

$5 - 2$	$5 - 4$	$6 - 0$
$5 - 1$	$5 - 3$	$5 - 5$

Subtraction Lotto

$5 - 0$	$4 - 4$
$4 - 3$	$4 - 2$
$4 - 1$	$4 - 0$



## Subtraction Top Draw

$$\begin{array}{r} 5 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ -0 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ -4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ -0 \\ \hline \end{array}$$

## Subtraction Top Draw

$$\begin{array}{r} 6 \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -5 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -4 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ -0 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ -5 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ -4 \\ \hline \end{array}$$

# Subtraction Top Draw (Challenging)

$$\begin{array}{r} 8 \\ -8 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -0 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -4 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -5 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ -7 \\ \hline \end{array}$$

# Subtraction Top Draw (Challenging)

$$\begin{array}{r} 9 \\ -0 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -0 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -4 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -5 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ -7 \\ \hline \end{array}$$

Subtraction Top Draw (Challenging)

$$\begin{array}{r} 9 \\ -9 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -1 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -2 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -3 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -4 \\ \hline \end{array}$$

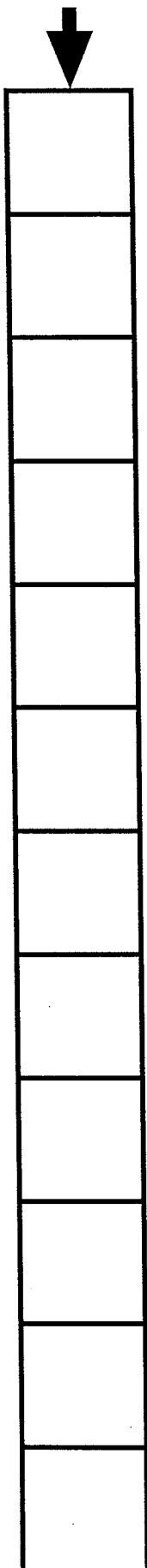
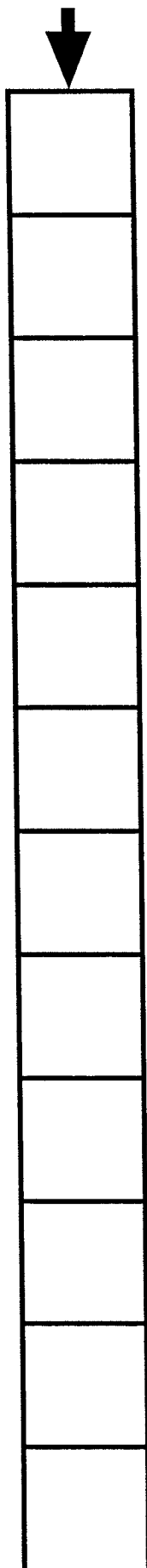
$$\begin{array}{r} 9 \\ -5 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ -7 \\ \hline \end{array}$$

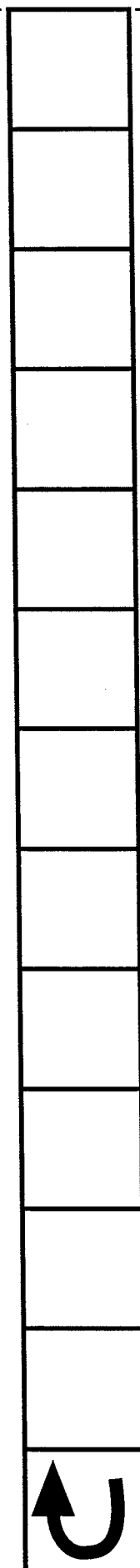
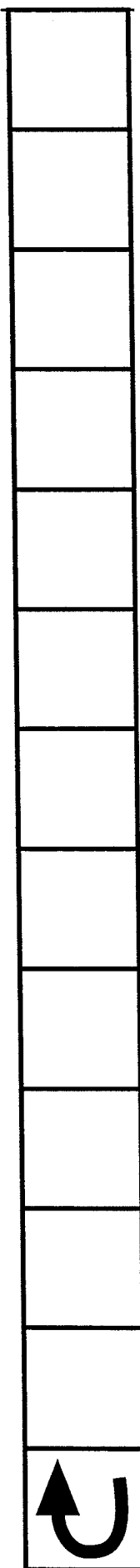
$$\begin{array}{r} 9 \\ -8 \\ \hline \end{array}$$

## Go For It

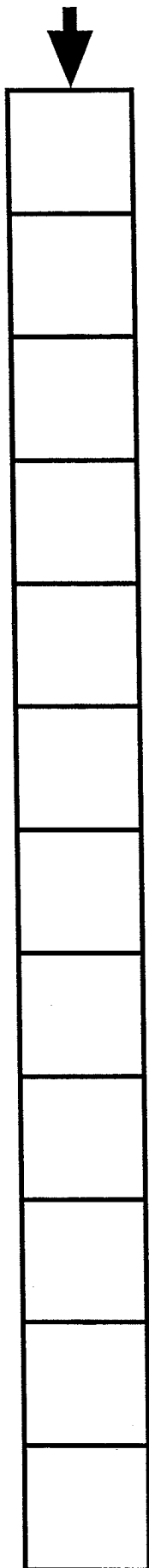
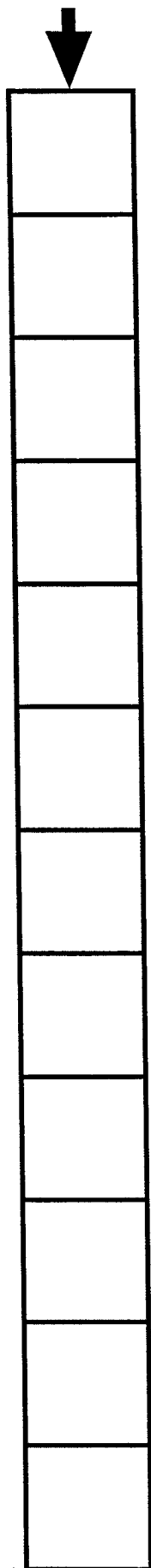


cut here

cut here

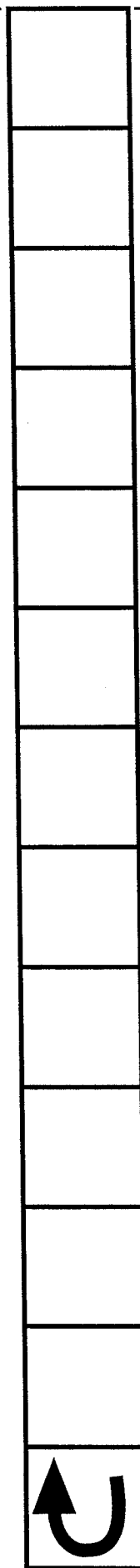
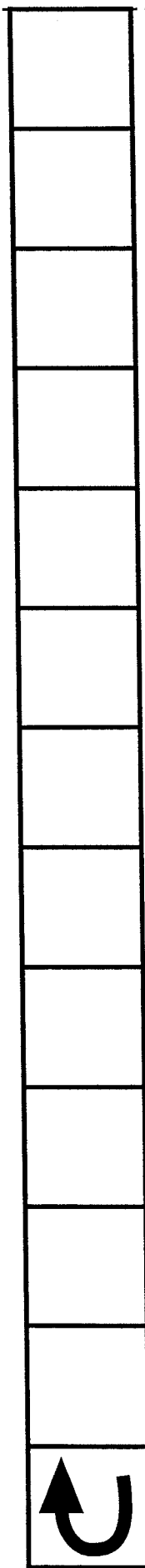


## Go For It



cut here

cut here



# Number Muncher Cards



$$\begin{array}{r} 1 \\ +1 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \\ +2 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ +2 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ +3 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ +3 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ +4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +4 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ +5 \\ \hline \end{array}$$



# Number Muncher Cards

$$\begin{array}{r} 5 \\ +5 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ +6 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ +7 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ +8 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ +9 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ +9 \\ \hline \end{array}$$

## Number Muncher Cards

	2	3
4	5	6
7	8	9

## Number Muncher Cards

10

11

12

13

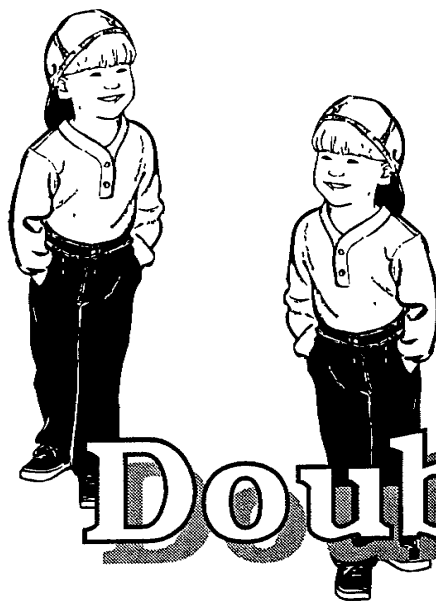
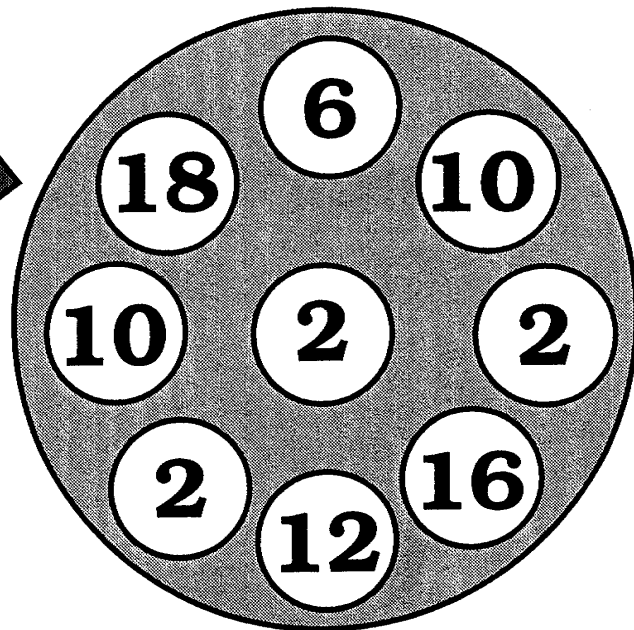
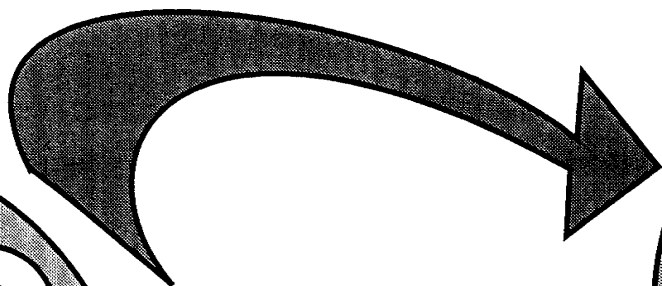
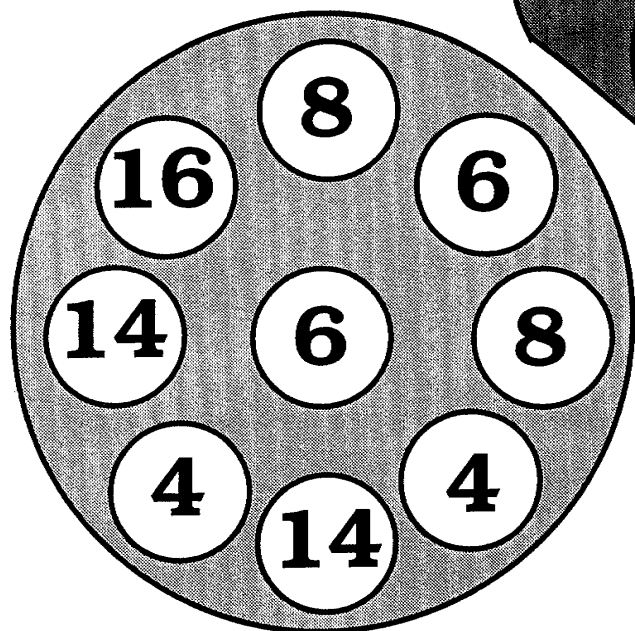
14

15

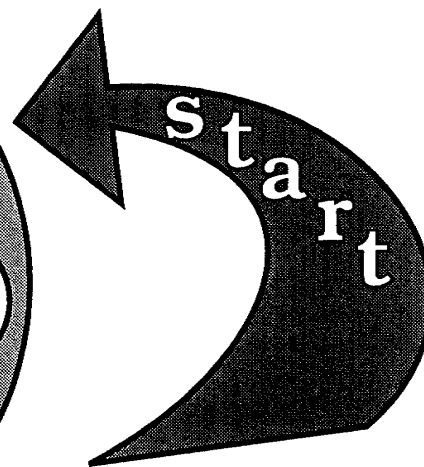
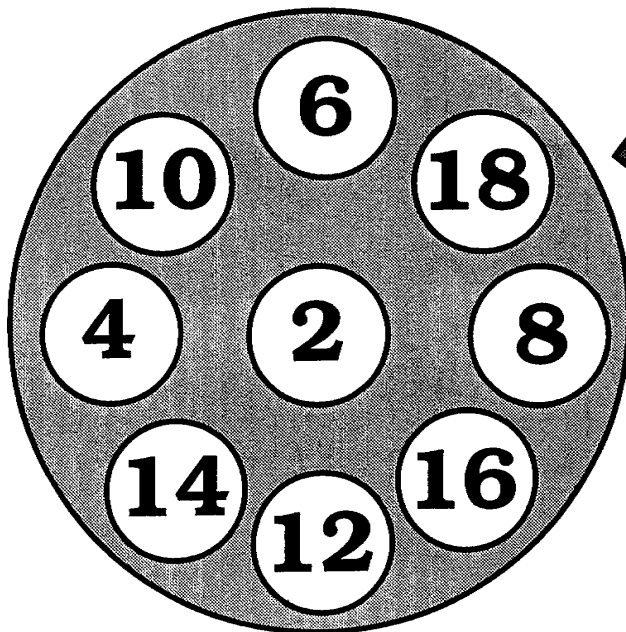
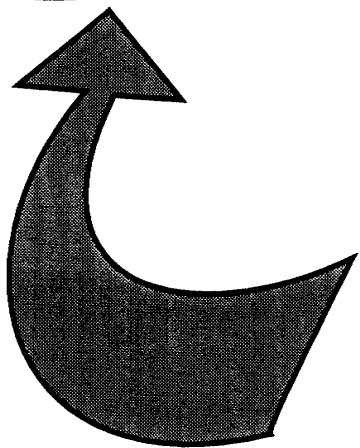
16

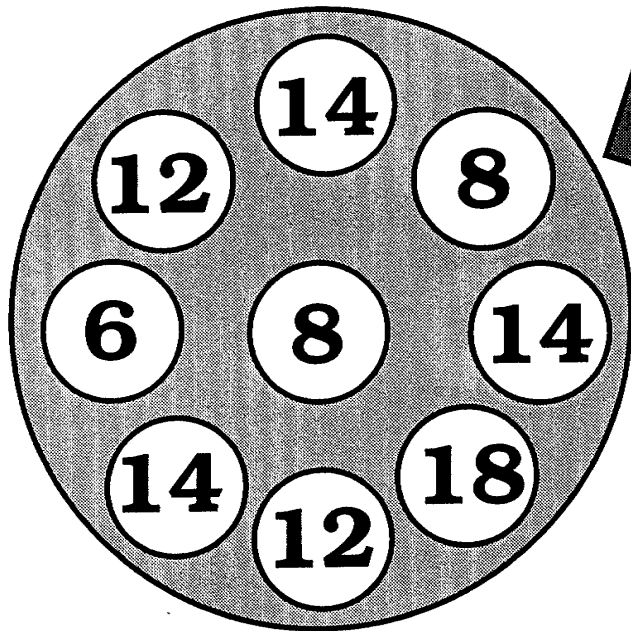
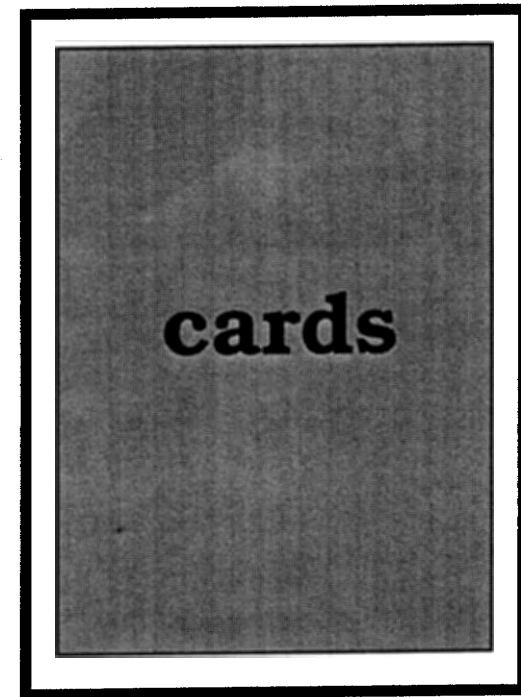
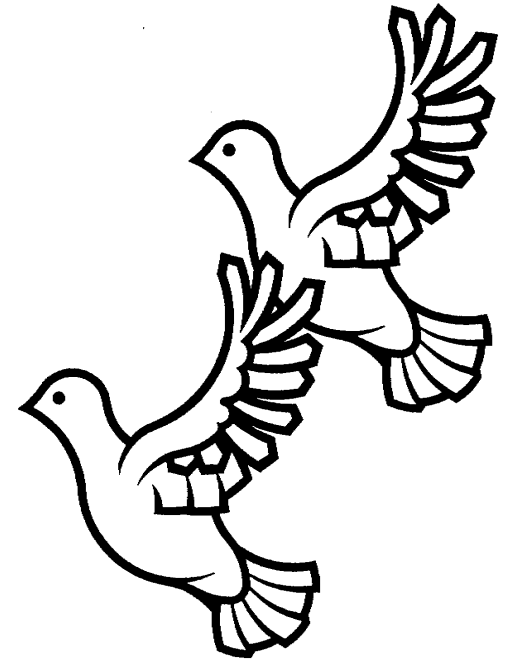
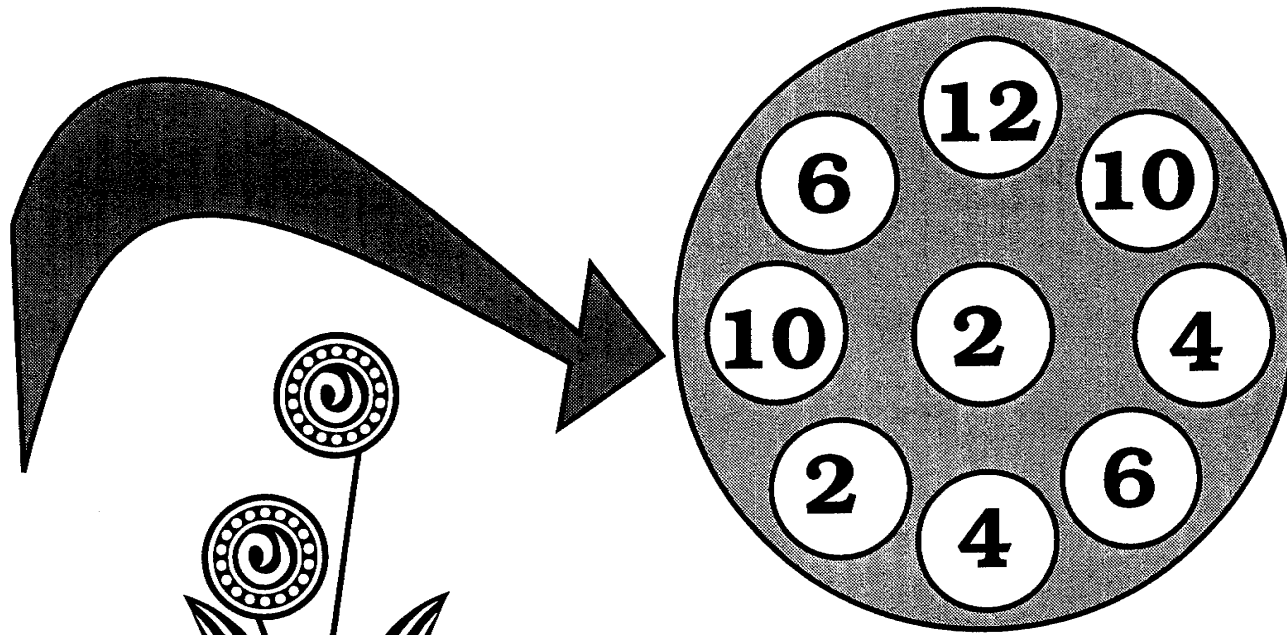
17

18



# Doublesland





$$\begin{array}{r} 2 \\ + 2 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ + 3 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ + 4 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \\ + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \\ + 4 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ + 7 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ + 5 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ + 6 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \\ + 7 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ + 2 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ + 5 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ + 8 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \\ + 8 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ + 9 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \\ + 1 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \\ + 3 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ + 6 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \\ + 9 \\ \hline \end{array}$$

## Ten Frame Board—Fast Tens



## Ten Frame Board—Fast Tens





## Ten Frame Board—Fast Nines



## Ten Frame Board—Fast Nines



**Add & Think (Facts to 18)**

0	3	3	6
2	1	5	4
8	6	7	3
4	5	2	2

---

1	7	8	3
4	2	0	1
4	6	3	6
9	10	2	5

21 Cards

1



2



3



4



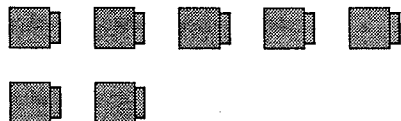
5



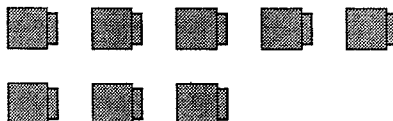
6



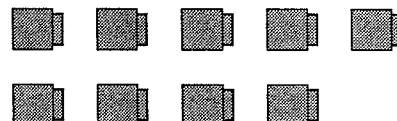
7






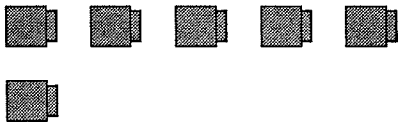
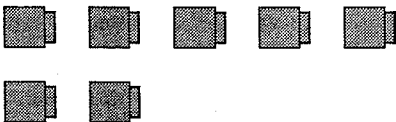
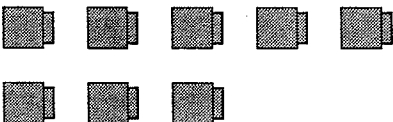
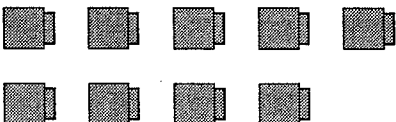


8



9



<div>1</div> <div></div>	<div>2</div> <div></div>	<div>3</div> <div></div>
<div>4</div> <div></div>	<div>5</div> <div></div>	<div>6</div> <div></div>
<div>7</div> <div></div>	<div>8</div> <div></div>	<div>9</div> <div></div>

21 Cards

1



2



3



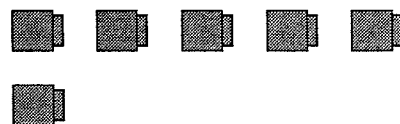
4



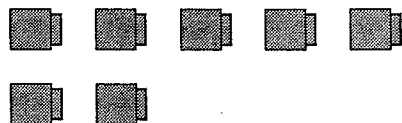
5



6



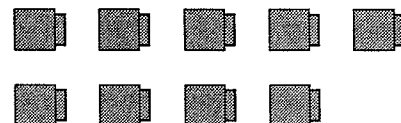
7



8



9



21 Cards

1



2



3



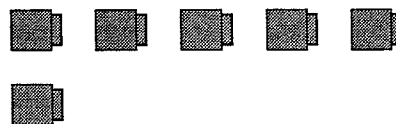
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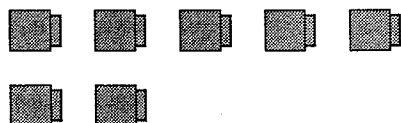
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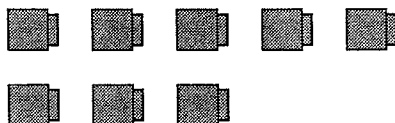
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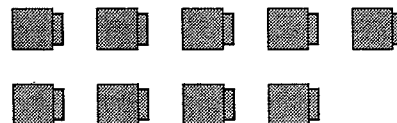
7

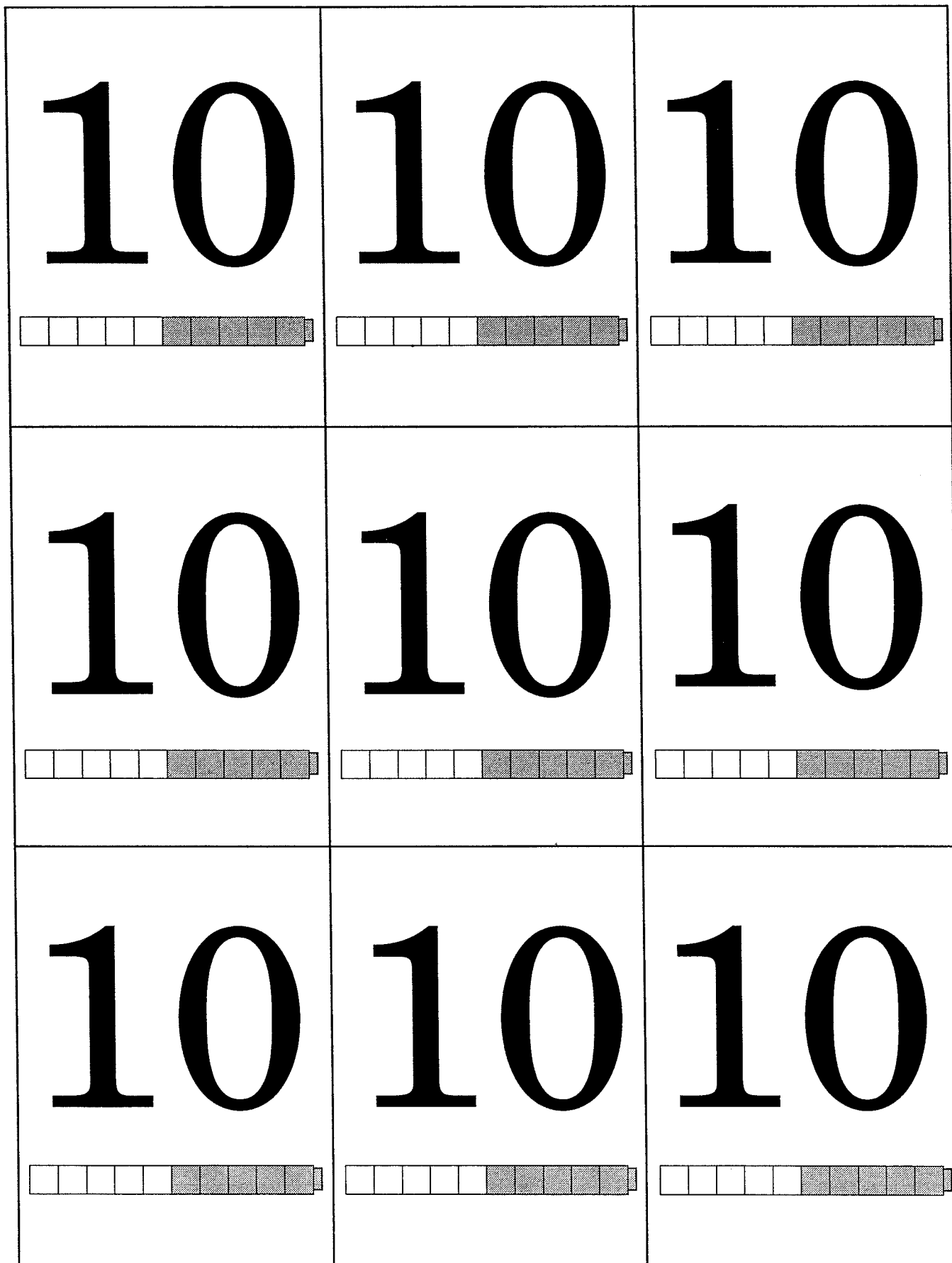


8

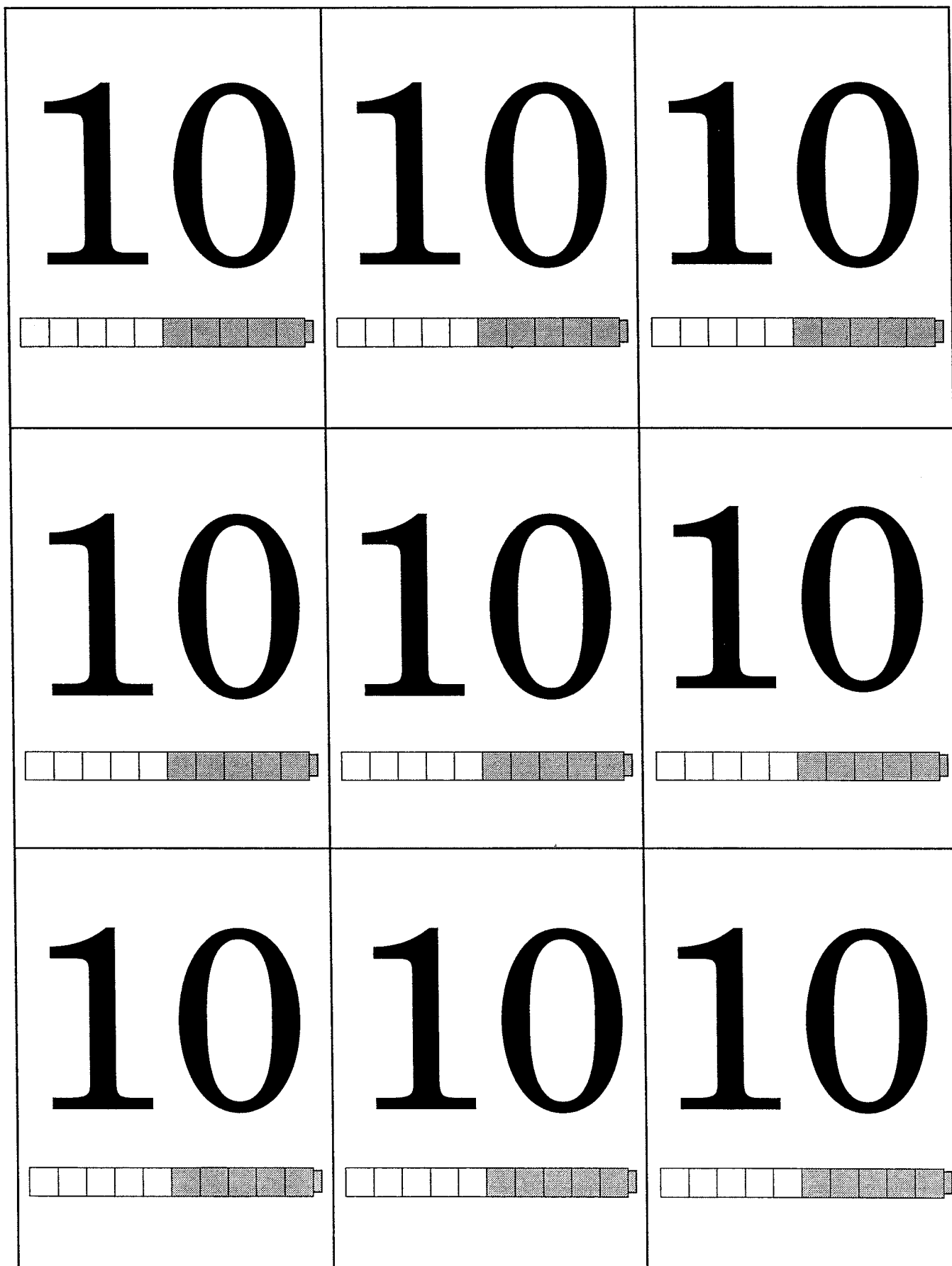


9









Apply the appropriate labels on both ends of each box lid. Either run the labels on full-sheet Avery Labels No. 5165, cut apart and attach; or simply cut apart these pages and glue or tape on.

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Shake Those Beans**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Dice Toss**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Piggy Bank Subtraction**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Alligator Subtraction**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Mountain Subtraction**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Add, Tell, Spin and Win**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Subtract, Tell, Spin and Win**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Add and Think—level 1**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Math Magic**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Addition Lotto**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Subtraction Lotto**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Subtraction Top Draw**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Rock Pile**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Go For It**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Shake Those Beans**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Dice Toss**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Piggy Bank Subtraction**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Alligator Subtraction**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Mountain Subtraction**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Add, Tell, Spin and Win**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Subtract, Tell, Spin and Win**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Add and Think—level 1**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Math Magic**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Addition Lotto**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Subtraction Lotto**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Subtraction Top Draw**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Rock Pile**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ \hline 2 \end{array} \begin{array}{r} 9 \\ +7 \\ \hline 16 \end{array}$$

**Go For It**

**A PRACTICE & ENRICHMENT BOX**

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

## Number Muncher

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Doublesland

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Fast Tens

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Fast Nines

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Fast Nines and Tens Dice Toss

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Doubles, Neighbors, Nines, Tens and Leftovers Dice Toss

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Tic Tac Toe

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Add and Think—level 2

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### 21

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### What's Missing?

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

## Number Muncher

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Doublesland

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Fast Tens

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Fast Nines

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Fast Nines and Tens Dice Toss

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Doubles, Neighbors, Nines, Tens and Leftovers Dice Toss

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Tic Tac Toe

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### Add and Think—level 2

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### 21

### A PRACTICE & ENRICHMENT BOX

$$\begin{array}{r} 5 \\ -3 \\ 2 \end{array} \begin{array}{r} 9 \\ +7 \\ 16 \end{array}$$

### What's Missing?

### A PRACTICE & ENRICHMENT BOX

## Practice & Enrichment Boxes

Published by The Math Learning Center

**Box It or Bag It Mathematics, Practice & Enrichment Box:  
Understanding Measuring**

Box It or Bag It Mathematics consists of:

Teachers Resource Guide and Blackline Masters, Kindergarten  
Teachers Resource Guide and Blackline Masters, 1st and 2nd Grade  
Practice & Enrichment Boxes:

Shapes  
Introduction to Measuring  
Understanding Measuring  
Reading, Writing & Understanding Numerals 0–10  
Pattern  
Arithmetic  
Money  
Place Value Counting  
Place Value Addition & Subtraction

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# Getting Started

*Once you've introduced Measuring through a variety of group lessons (be sure to see Box It or Bag It Mathematics First and Second Grade Teachers Resource Guide, UNDERSTANDING MEASURING), you will want children to practice and extend their understanding using the activities in this packet. Here are a few things we've found helpful to remember for a successful Independent Practice Time.*

*Provide no more than 8-12 boxed activities at one time for a class of 30. Too many activities create more than tolerable chaos. Each Box is designed to be used by 1-4 children. The Measuring Boxes require many general math materials. We box the booklets, record sheets, string wrapped on popsicle sticks, etc., and set those boxes into larger boxes, baskets, or tubs with the needed support materials to make the daily setup easy.*

*Model each activity thoroughly until children can tell you what to do, step by step. You'll find "box ingredients" and "playing instructions" for each activity in this packet. We use clear contact paper to attach them inside our box lids so WE can remember what goes in each box and how each game is played. Reading the directions would be too difficult for most primary children.*

*Resist the temptation to put out all your challenging activities at once—provide an equal balance of easy and hard. (If you set out too many difficult Boxes, all the children will need you at once and the noise level will be almost unbearable as your children try to cope with the stress of too many difficult tasks.)*

*Take time to plan where each task should be placed in your room (tiles on a rug for less noise; rice and jars in an area that's safe, but easy to clean up, etc.).*

*As you construct these Practice and Enrichment Boxes, cover your box tops with the same design contact paper. That way, you'll be able to pull your Measuring Boxes off the shelf easily, even if they've gotten mixed in with other boxes. (Boxes can be ordered from The Math Learning Center in three sizes: standard (9 X 12 X 2), half size (9 X 6 X 1-7/8) and junk (4 X 7 X 1-1/8.) See the Box It or Bag It Mathematics Teachers Resource Guide, MATERIALS INDEX, for additional ordering and making information.*

*Remember, the Boxes themselves can be used for group instruction. They are ideal for use by an aide or parent with small groups. Some of them can be easily adapted for use with your whole group.*



*During Independent Practice Time, it's critical that you be available and in circulation to make sure things go smoothly. Once routines even out, you'll have ample opportunity to observe individual students at work. You can spot children with problems or understandings beyond your predictions. See the next page for some observation guidelines.*

*Be sure to see the Box It or Bag It Mathematics Teachers Resource Guide, INTRODUCTION, for more implementation strategies.*

## UNDERSTANDING MEASURING OBSERVATION CHART

															Children's Names
															Child is able to share materials and work cooperatively
															Child estimates before actually measuring
															Child is able to measure length with a variety of materials
															Child is able to measure weights with a variety of scales
															Child is able to order counters used for measuring into tens and ones
															Child is able to record data accurately
															Child is able to compare data

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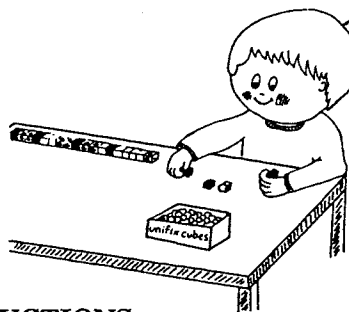
# Length

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See *Box It or Bag It Mathematics First and Second Grade Teachers Resource Guide*, UNDERSTANDING MEASURING, Measuring Length, for group introduction to this Box and the next.

## HOW LONG IS IT? MEASURING WITH UNIFIX CUBES (1-4 Children)

**Box Ingredients→** record booklets  
tub of unifix cubes  
half box for storage



### PLAYING INSTRUCTIONS

1. Guess how many unifix cubes it will take to measure the first thing in your booklet. Write down your guess.
2. Find the item in your classroom. Measure it with unifix cubes.
3. Break the unifix cubes into tens and ones. Count them. Write the number in your booklet.
4. Do the rest of the pages. Get your work checked.

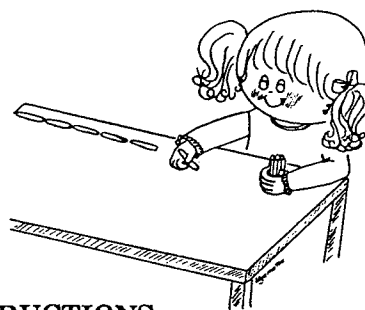
### MAKING INSTRUCTIONS

#### Record Booklets

Locate record sheets in the blacklines. Select 5-8 items children could measure in your classroom. Run copies of these, along with the cover, and collate into small booklets. Place booklets in a half box. Store the half box in the tub of unifix cubes.

## HOW LONG IS IT? MEASURING WITH POPSICLE STICKS (1-4 Children)

**Box Ingredients→** record booklets  
popsicle sticks  
half box for storage



### PLAYING INSTRUCTIONS

1. Guess how many popsicle sticks it will take to measure the first thing in your record booklet. Write down your guess.
2. Find the item in your classroom. Measure it with popsicle sticks.
3. Count the popsicle sticks by tens and ones. Write the number in your record booklet.
4. Do the rest of the pages. Get your work checked.

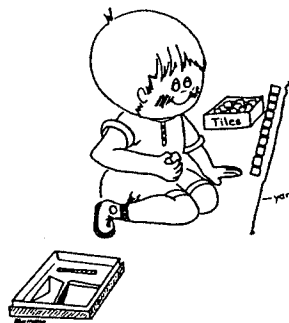
### MAKING INSTRUCTIONS

#### Record Booklets

Locate record sheets in blacklines. Select 5-8 items children could measure in your classroom. Run copies of these, along with the cover, and collate into small booklets. Place booklets in a half box along with popsicle sticks.

## HOW LONG IS IT? MEASURING WITH TILES

**Box Ingredients→** 10-15 items to measure  
record sheets  
25-30 1"-square ceramic tiles  
half box for storage



### PLAYING INSTRUCTIONS

1. Choose something to measure. Write its name on your record sheet. Guess how many tiles long it will be. Write your guess on the record sheet.
2. Measure the object with tiles.
3. Count the tiles by tens and ones. Write the number on your record sheet.
4. Measure two more things. Use your record sheet. Answer the questions at the bottom. Get your work checked.

### MAKING INSTRUCTIONS

#### Record Sheets and Things to Measure

Locate record sheet in the blacklines. Run copies and place in a half box, along with some objects to measure (shoelace, drinking straw, playing card, post card, strip of negatives, piece of ribbon, pencil, candle, etc.), and 25-30 tiles.

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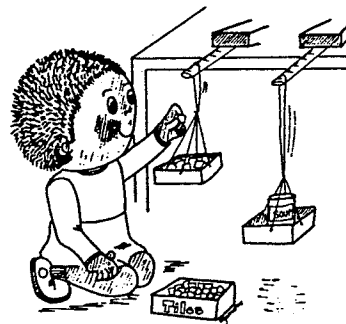
## Weight

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See *Box It or Bag It Mathematics First and Second Grade Teachers Resource Guide*, UNDERSTANDING MEASURING, Determining Weight and Weighing Booklets, for group introduction to this Box and the next.

## WEIGHING THINGS WITH TILES (1-2 Children)

**Box Ingredients→** two milk box scales  
two rulers  
heavy books or blocks to secure rulers  
10-15 objects to weigh, all heavier than a box of crayons  
1"-square ceramic tiles  
record sheets  
half box for storage



## PLAYING INSTRUCTIONS

1. Set up milk box scales.
2. Choose something to weigh. Guess how many tiles it will weigh. Write your guess.
3. Put the object in one of the scales. Put tiles in the other scale until both scales are hanging at the same level.
4. Dump the tiles out of the scale. Count them by tens and ones. Write the number on your record sheet.
5. Weigh two more things and record. Answer the questions at the bottom. Get your work checked.

## MAKING INSTRUCTIONS

### Milk Jug Scales

See Box It or Bag It Mathematics Teachers Resource Guide, MATERIALS INDEX, for making instructions.

### Record Sheets

Locate record sheets in blacklines. Run copies and place in a half box. Set out this box, along with a tub of ceramic tiles, a container of things to weigh, and the scales.

### Things to Weigh

Here are some ideas: a can of tomato sauce, a can of green chilies (be multi-national!), a candle, an orange, a block, a big old dog bone, a large bolt, a screwdriver, a wrench, a toy truck, a small (1-cup size) box of detergent sealed with filament tape, a bag of metal washers, a lump of clay in a plastic bag, and so on. The list is endless. Scrounge around your kitchen cupboards, your children's rooms, your garage—common, everyday items seem to capture children's interest best.

Label each item with its name on a gummed label. Store items in a tub or box.

## THE BALANCE SCALE (1-2 Children)

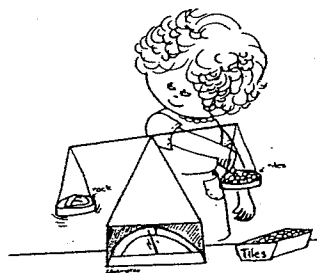
**Box Ingredients→** balance scale (you can find them in science kits such as ESS, make them, or order them through curriculum supply houses)

10-15 objects of varying weights  
(see ideas above)

supply of 1"-square ceramic tiles

record sheets

half box for storage



## PLAYING INSTRUCTIONS

1. Choose something to weigh. Write down its name on your record sheet. Guess how many tiles it will weigh. Write your guess on the record sheet.
2. Put the object on one side of the balance scale. Put tiles on the other side until the scale is balanced.
3. Dump out the tiles. Count them by tens and ones. Write the number on your record sheet.
4. Weigh two more things. Use your record sheet. Answer the questions at the bottom. Get your work checked.

## MAKING INSTRUCTIONS

### Record Sheets

Locate record sheets in blacklines. Run copies and place in a half box. During Independent Practice Time this box comes out, along with the tub of ceramic tiles, the container of things to weigh, and the scales.

### Items to Weigh

Label each item with its name on a gummed label.

## THE PAN BALANCE (1-2 Children)

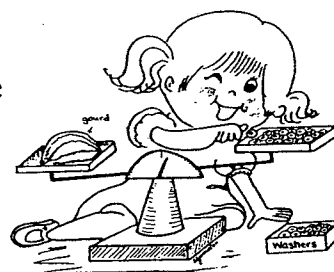
**Box Ingredients→** pan balance (many school science kits furnish these; they also can be ordered through curriculum supply houses)

10-15 objects to weigh

80-100 3/16" flat washers  
(available at any hardware store)

record sheets

half box for storage



### PLAYING INSTRUCTIONS

1. Choose something to weigh. Write its name on your record sheet. Guess how many washers it will weigh. Write your guess on the record sheet.
2. Put the object on one side of the pan balance. Put washers on the other side until the scale is balanced.
3. Dump the washers out. Count them by tens and ones. Write the number on your record sheet.
4. Weigh two more things. Use your record sheet. Answer the questions at the bottom. Get your work checked.

### MAKING INSTRUCTIONS

#### Record Sheets

Locate record sheets in blacklines. Run copies and place in a half box along with the washers (in their own small box) and a collection of things to weigh. Label each item to weigh with a gummed label so children can record the item's name on their record sheets.

#### Things to Weigh

The objects for this activity should be fairly light. Ideas include: small stuffed animals, a bracelet, a mini-box of cereal sealed with filament tape, an eraser, a gourd, a spool of thread, a model car, plastic animal or people models, a spoon, a small ball of yarn, a small candle, a large marble, etc.

## CALIBRATED SCALE (1-2 Children)

**Box Ingredients→** milk box scale

record pad

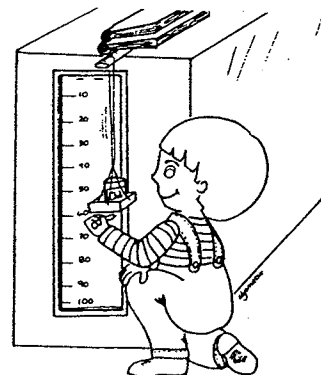
ruler

heavy books or blocks to secure ruler

10-15 items of varying weights  
(see ideas under Weighing  
Things with Tiles)

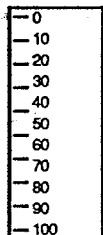
10 bags of ten 1"-square ceramic tiles (double-bag each set of ten tiles in sandwich bags; rubber band securely and trim tops)

half box for storage

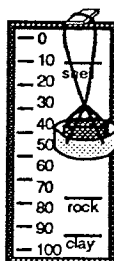


## PLAYING INSTRUCTIONS

1. Set up milk box scale by record pad.
2. Put your name on the record pad sheet.
3. Mark a line on the record pad where the bottom of the scale is. Since there are no tiles in the scale, write "0" by that line.
4. Put one bag of ten tiles in the scale. Mark a line on the record pad where the bottom of the scale is. Write a "10" by that mark. Put in another bag of tiles. Mark a line on the record pad where the bottom of the scale comes. Write "20" by that mark. Keep adding one bag at a time and marking where the scale comes each time until you've used all ten bags and the record pad is marked.



5. Take out all the bags of tiles. Now your scale is set to go. Choose something to weigh. Put it in the scale. Mark where the scale comes and write the object's name. Can you tell how many tiles it weighs?
6. Weigh some other things. See if you can find the heaviest and lightest. Tear the sheet off the record pad when you're finished and get it checked.



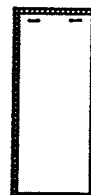
## MAKING INSTRUCTIONS

### Milk Box Scale

See Box It or Bag It Mathematics Teachers Resource Guide, MATERIALS INDEX, for making instructions.

### Record Pad

Attach 10-15 sheets of 8 X 18 or 8 X 24 newsprint to a sheet of poster board, or 10 X 20 or 10 X 26.



When you set up the Measuring activities in your room, attach the record pad to the side of a bookshelf first. Children set up the books and ruler on top of the bookshelf so the milk box scale hangs down in front of the record pad.

### Items to Weigh

Label each item by writing its name on a gummed label. See Weighing Things with Tiles for ideas. Store items in a tub or other sturdy container.

### Bags of Tiles

Store bags of tiles in a half box.

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## Volume

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### RICE SPOONFULS (1-2 Children)

#### Box Ingredients→

jars in divided box

funnels

5 lbs. of rice (stored in a large cookie tin or other container that can be sealed every night against mice and moths)

brush and dust pan

several spoons, different sizes

record sheets

half box for storage



## PLAYING INSTRUCTIONS

1. Choose a jar. Write its letter on your record sheet. Guess how many spoonfuls of rice it will take to fill the jar. Write your guess on the record sheet.
2. Set a funnel on the jar. Fill your jar with rice, using the spoon. Make sure each spoonful is level. Write on your record sheet how many spoonfuls it took to fill the jar.
3. Fill two more jars. Use your record sheet. Answer the questions at the bottom. Get your work checked.

## MAKING INSTRUCTIONS

### Record Sheets

Locate record sheets in blacklines. Make

## CALIBRATED JAR (1-2 Children)

- Box Ingredients→**
- |                                                                                                |                      |
|------------------------------------------------------------------------------------------------|----------------------|
| straight-sided jar, such as a 10-oz.<br>pickle jar or large peanut butter jar                  |                      |
| a measuring scoop that will fill the jar<br>exactly (or as close as possible) in<br>ten scoops |                      |
| jars in divided box                                                                            | pencils              |
| rice set-up                                                                                    | funnels              |
| brush and dust pan                                                                             | masking tape         |
| record sheet                                                                                   | half box for storage |



copies and place in a half box, along with the spoons.

### Jars

Label each jar with a letter. Store in a divided box.

### Funnels

Cut the tops from large plastic pop bottles with scissors, leaving about 4-5 inches. These are great funnels!

## PLAYING INSTRUCTIONS

1. Put a strip of masking tape up the side of the straight-sided jar.
2. Fill the special measuring scoop with rice. Pour it into the jar. Mark with a pencil on the tape where the rice is. Pour another scoop of rice into the jar. Mark on the tape where the rice is now. Keep pouring scoopfuls of rice into the jar, marking the tape each time, until the jar is full. You should have ten marks. Pour out the rice. Your jar is calibrated now and ready to use.
3. Choose a regular jar and fill it with rice.

4. Guess how far it will fill your calibrated jar.
5. Color the "guess" jar on the record sheet to show how high you think it will come.
6. Using a funnel between jars, pour the jar of rice into your calibrated jar.
7. Color the "check" jar on the record sheet to show what really happened.

## MAKING INSTRUCTIONS

### Record Sheets

Locate record sheets in blacklines. Run copies, cut apart, and store them in a half box along with the measuring scoop.



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# Perimeter

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## PERIMETERS (1-4 Children)

**Box Ingredients→** record booklet

tub of wooden cubes, 3/4", 1",  
2", or whatever you have

half box for storage



### PLAYING INSTRUCTIONS

1. Guess how many wooden cubes it will take to go around the first thing in your booklet. Write down your guess.
2. Find the thing in your classroom. Put wooden cubes around it.
3. Count the cubes by tens and ones. Write the number in your booklet.
4. Do the rest of the pages. Get your work checked.

### MAKING INSTRUCTIONS

#### Record Booklets

Locate record sheets in blacklines. Select 3-6 items children could measure in your classroom. Run copies of these, along with the cover, and collate into small booklets. Place booklets in a half box. Store the half box in the tub of wooden cubes.

---

# Circumference

---

## HOW BIG AROUND? (1-4 Children)

**Box Ingredients→** record booklets

masking tape

string wrapped around  
tongue depressors

tub of unifix cubes



half box for storage

### PLAYING INSTRUCTIONS

1. Choose an item to measure.
2. Use your string to measure around it exactly. Cut the string. Use little pieces of masking tape to anchor it to the floor.
3. Guess how many unifix cubes long it is. Write your guess on your record sheet.
4. Measure your string with unifix cubes.
5. Break the cubes into tens and ones to count them. Write the number.

6. Do the rest of your pages. Get your work checked.

### MAKING INSTRUCTIONS

Locate record sheets in blacklines. Select 5-8 items children could measure in your classroom. Run copies of these, along with the cover, and collate into small booklets. Place booklets in a half box, along with string on tongue depressors. Store the half box in the tub of unifix cubes.

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# Area

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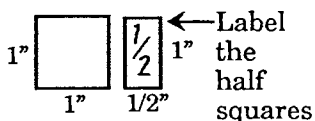
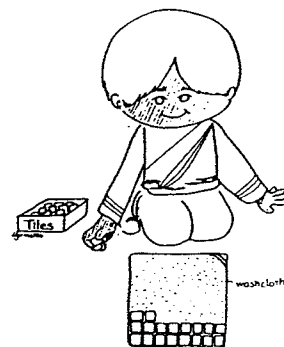
## HOW BIG IS IT? SMALL AREAS

**Box Ingredients→** 10-15 square or rectangular items to measure, all small enough to fit into a half box

record sheets

half box for storage

ziplock of 1" and 1/2" posterboard squares, laminated (60 whole squares and 20 half squares are enough)



## PLAYING INSTRUCTIONS

1. Pick something to measure. Write its name on the record sheet. Guess how many measuring squares it will take to cover the object. Write your guess on the record sheet.
2. Use the whole and half squares to cover one surface of the object.
3. Dump off the squares. Count them by tens and ones. Write down how many squares it took.
4. Measure two more things. Use your record sheet. Get your work checked.

## MAKING INSTRUCTIONS

### Items to Measure:

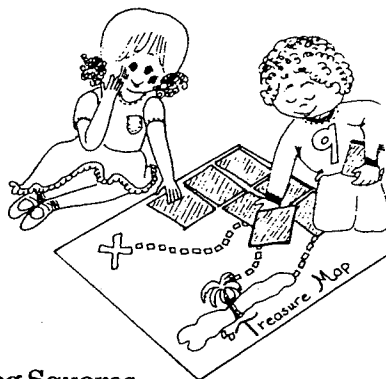
You'll probably want to provide flat items of fairly regular shape. Ideas include: a small book, a "mini box" of cereal secured with filament tape, a baseball trading card, a piece of pretty contact paper (backing left on!), a special piece of gift wrap, a small tablet, a playing card, etc.

### Record Sheets

Locate record sheet in blacklines. Run copies and store them in half box along with items to measure and ziplock of measuring squares. Label each item to be measured by writing its name on a gummed label.

## HOW BIG IS IT? LARGE AREAS

**Box Ingredients**→ record booklets  
measuring squares  
half box for storage



### PLAYING INSTRUCTIONS

1. Find the item shown on the first page of your booklet.
2. Guess how many large measuring squares it will take to cover it. Write your guess.
3. Cover it with measuring squares.
4. Count the squares by tens and ones. Write the number in your booklet.
5. Do the rest of the pages. Get your work checked.

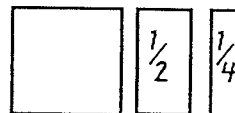
### Measuring Squares

1. Cut sixty 5" squares from one color construction paper.
2. Cut twenty 5 X 2-1/2 pieces of construction paper in a second color and label each "1/2".
3. Cut twelve 5 X 1-1/4 pieces of construction paper in a third color and label each "1/4".

### MAKING INSTRUCTIONS

#### Record Booklets

Locate record sheets in blacklines. Select 4-6 items children could measure in your classroom. Run copies of these along with the cover and collate into small booklets. Place booklets in a half box along with the measuring squares.



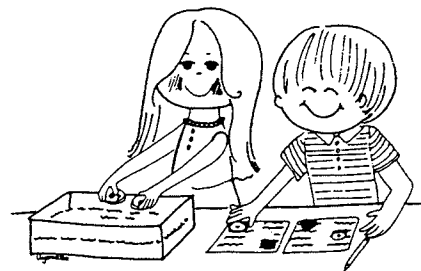
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## Duration

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### SINKERS (1-2 Children)

**Box Ingredients**→ variety of metal lids (15-20)  
with holes drilled in the  
center of each  
  
clear container of water  
  
two towels for spills  
  
time records



half box for storage

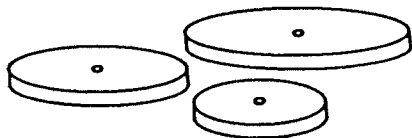
### PLAYING INSTRUCTIONS

1. Choose two lids from the collection. Predict which one will sink faster, which one slower.
2. Set the two lids on top of the water and watch to see which one sinks faster. (If your lids don't sink, get them completely wet and start again.)
3. Put the two lids on a time record. Show which one sank faster and which sank slower.
4. Try it again with two different lids.
5. Can you discover anything that's the same about the lids that sink quickly? Share your ideas with someone.

## MAKING INSTRUCTIONS

### Metal Lids

Use a hammer and a very large nail or a drill to make a hole approximately 1/8" in diameter in each lid.

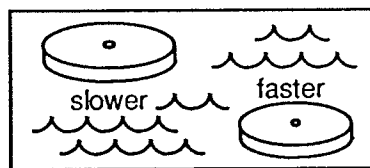


### Water

To make lids sink with ease, add liquid dish detergent to your water to break the surface tension.

### Time Records

Use a piece of oilcloth or an old shower curtain to create ten 4 X 9 time records. Draw the diagram below on each record with a black permanent marking pen.



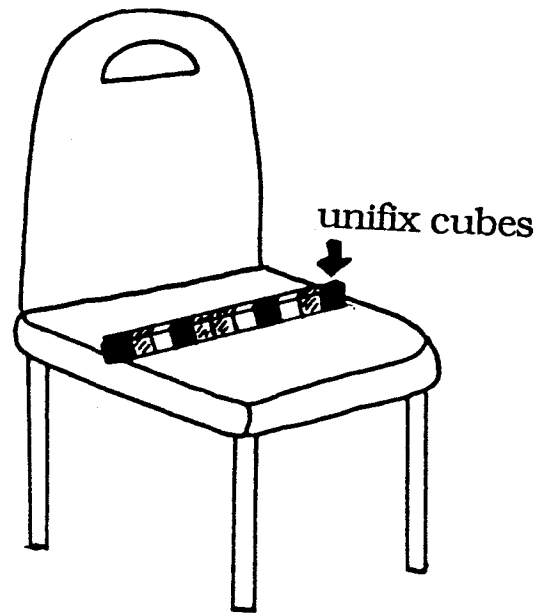
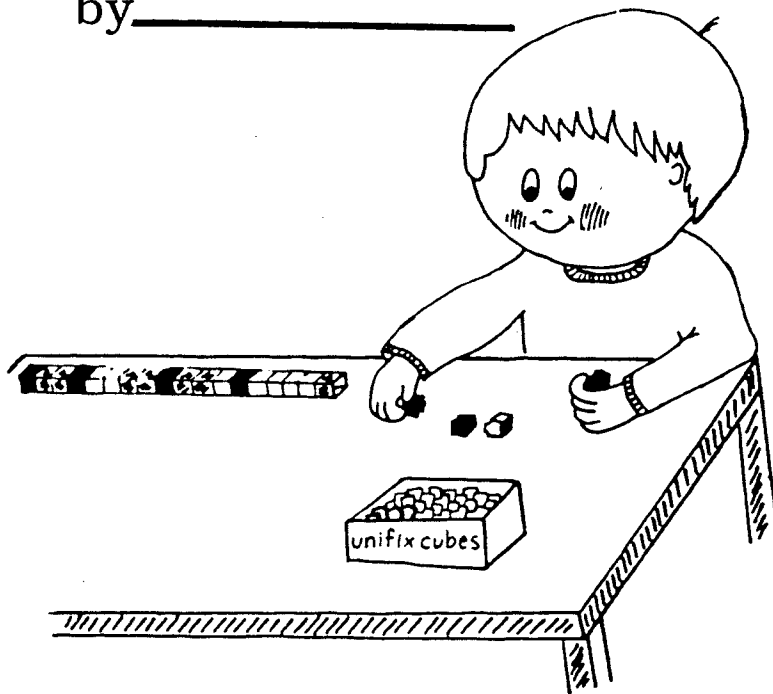
Store time records and lids in a half box. Leave the towels and water container near your sink area.

# Blacklines

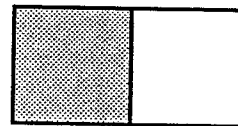
Patterns, cards, spinners, and other materials you'll make for the  
Practice & Enrichment Boxes described in this packet.

# How Long Is It? (measuring with unifix cubes)

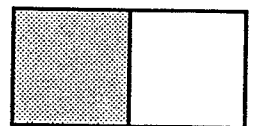
by \_\_\_\_\_



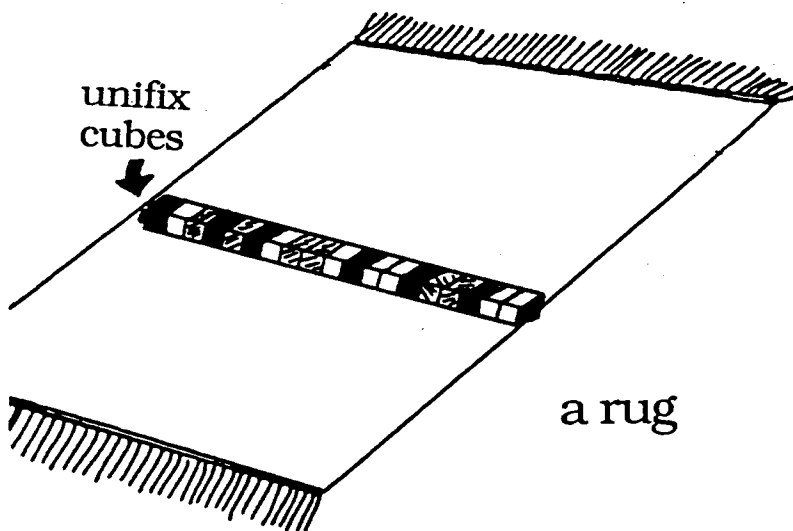
a chair seat



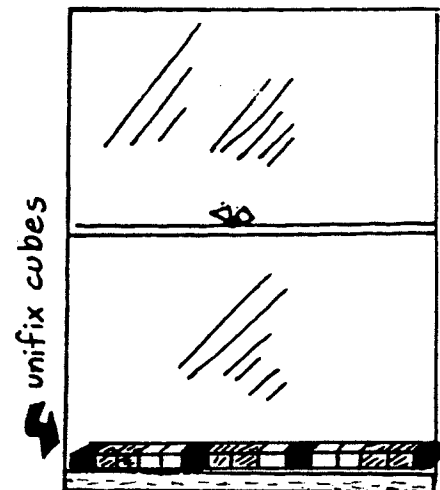
guess



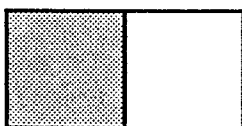
check



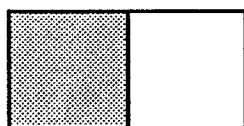
a rug



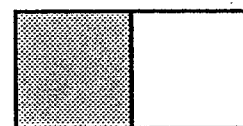
a window (ledge)



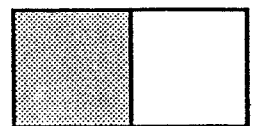
guess



check



guess



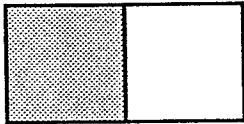
check

# How Long Is It? (measuring with unifix cubes)

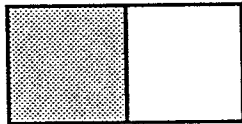


unifix cubes

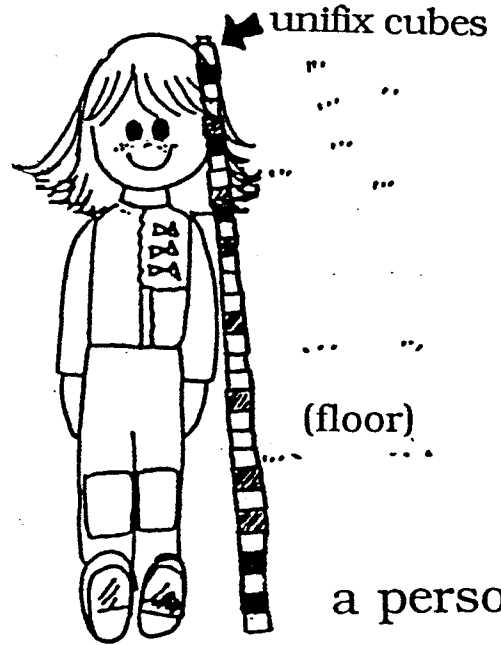
a coat



guess



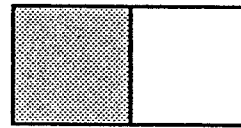
check



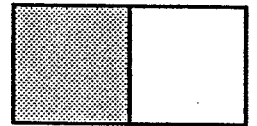
unifix cubes

(floor)

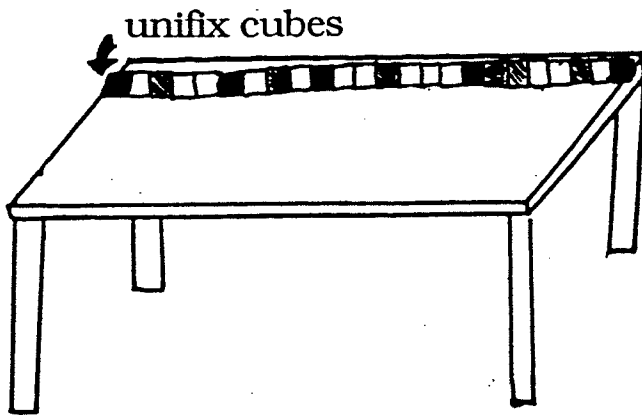
a person



guess

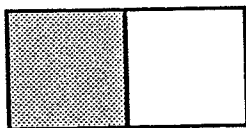


check

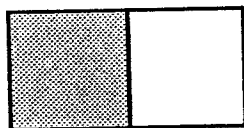


unifix cubes

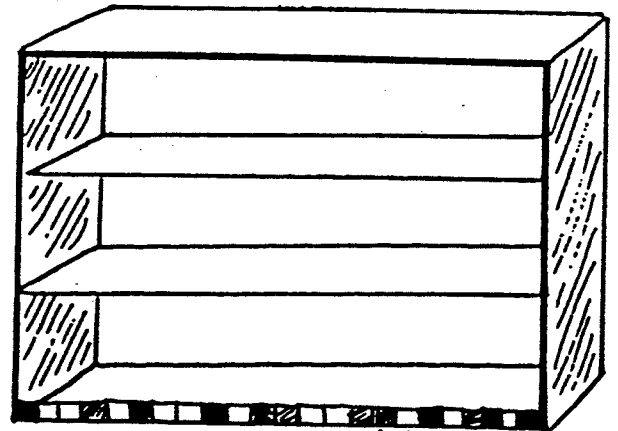
a table



guess

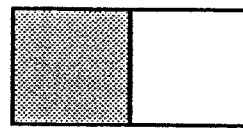


check

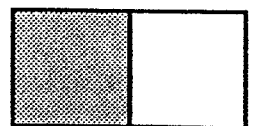


bookshelf

unifix cubes

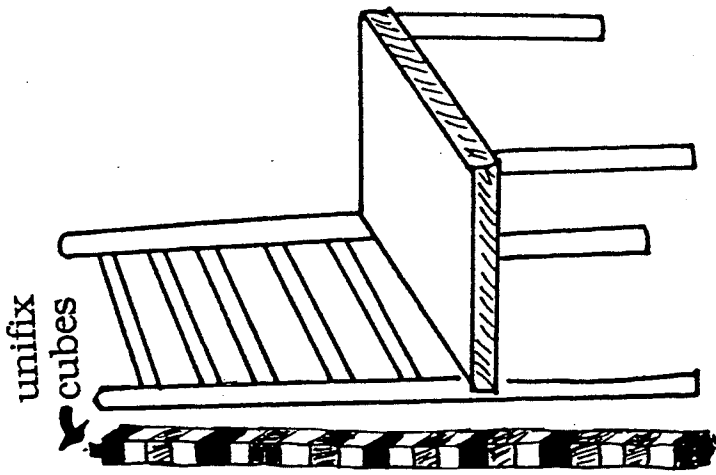


guess

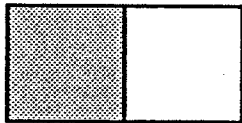


check

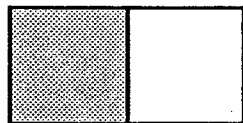
# How Long Is It? (measuring with unifix cubes)



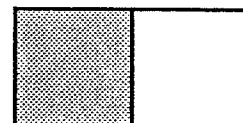
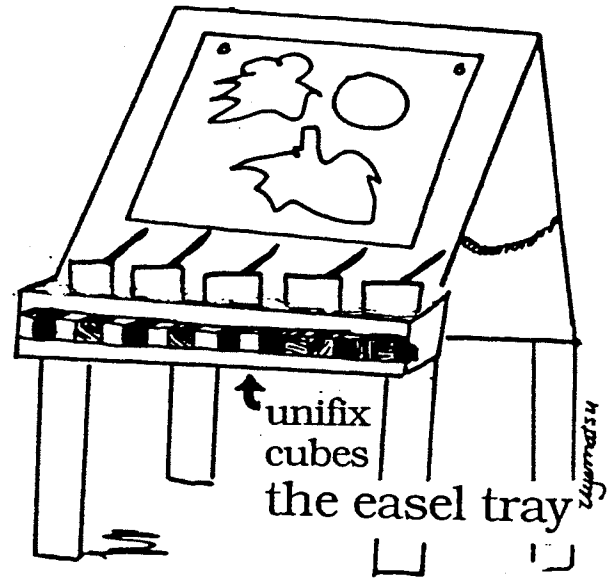
chair on the floor



guess



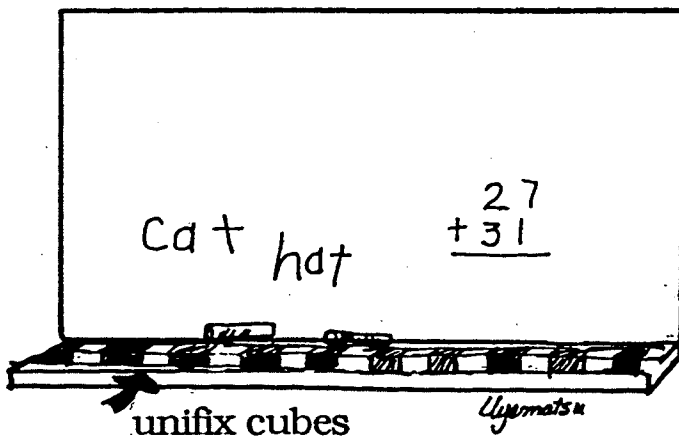
check



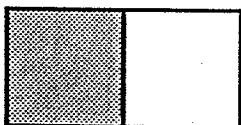
guess



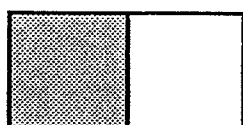
check



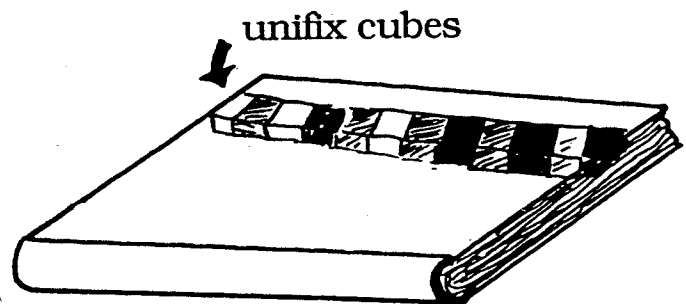
chalk tray



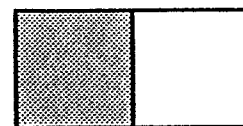
guess



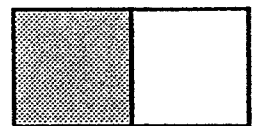
check



a book



guess

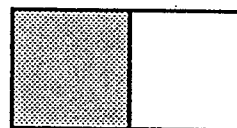
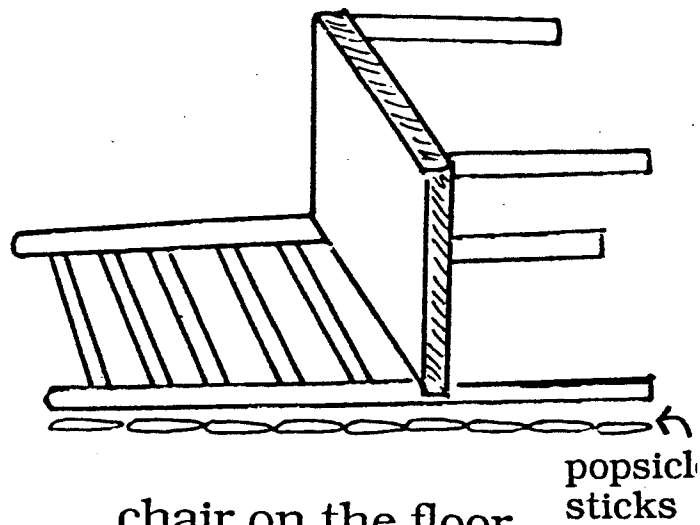
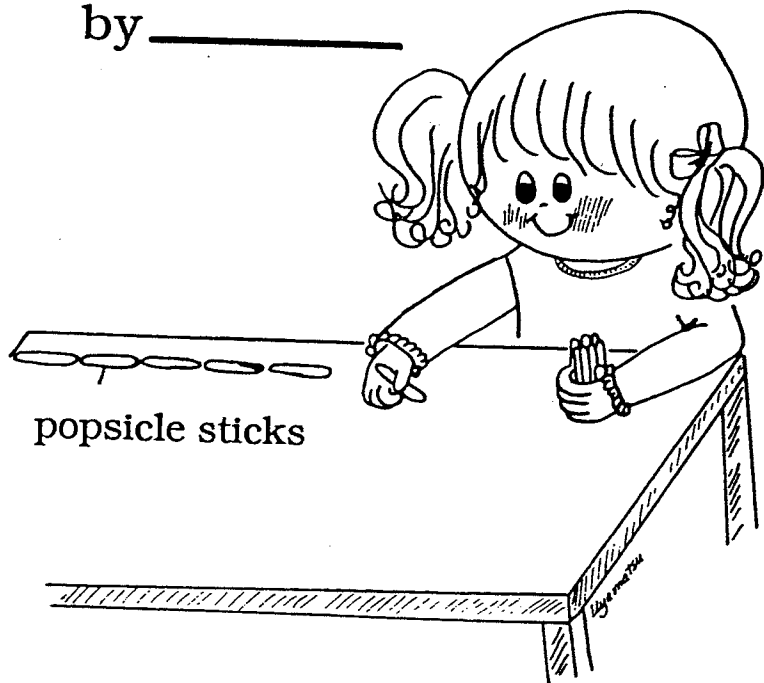


check

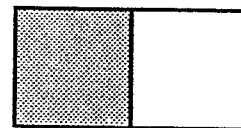


# How Long Is It? (measuring with popsicle sticks)

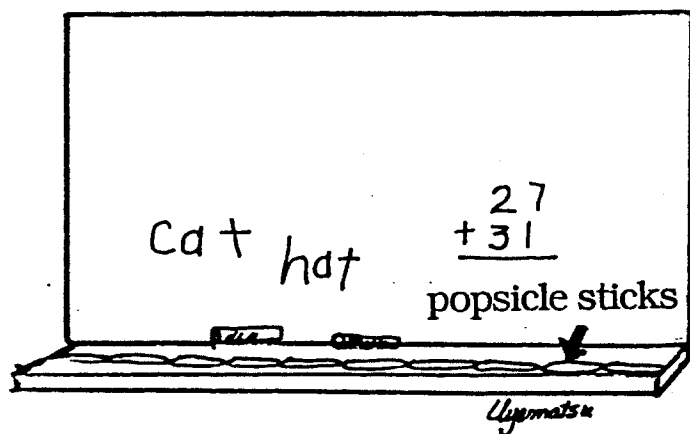
by \_\_\_\_\_



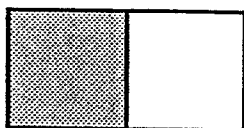
guess



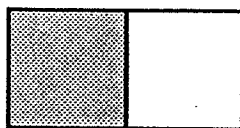
check



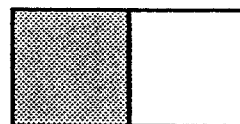
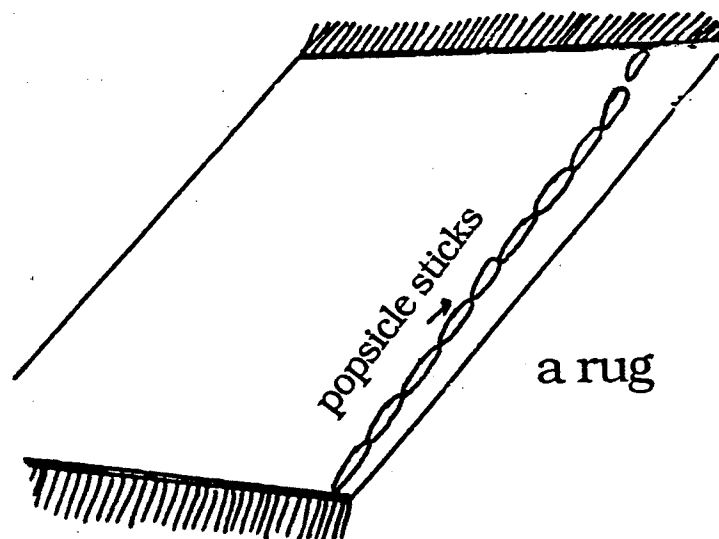
chalk tray



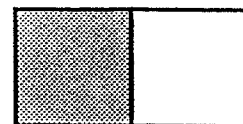
guess



check

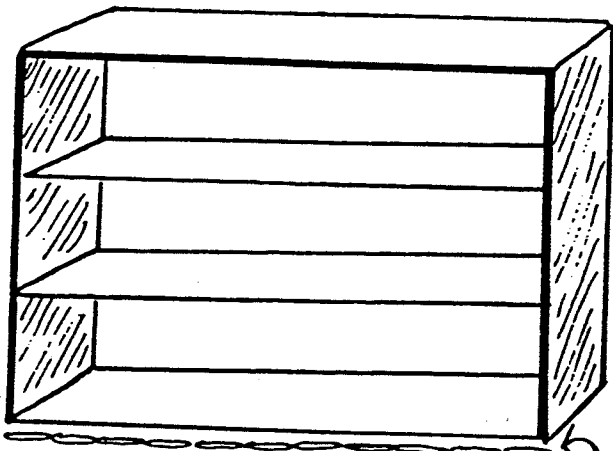


guess



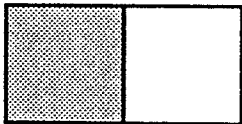
check

# How Long Is It? (measuring with popsicle sticks)

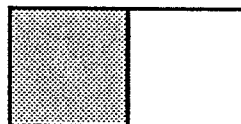


bookshelf

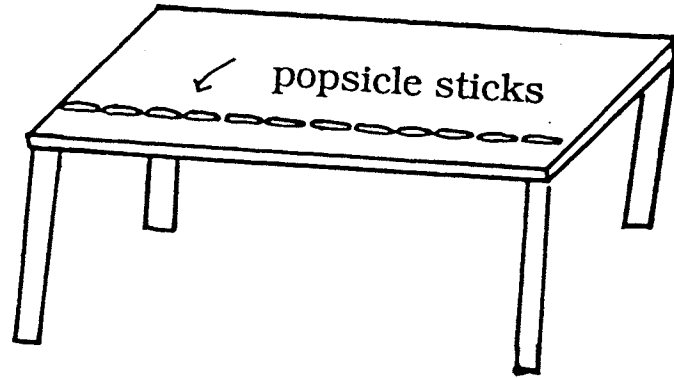
popsicle sticks



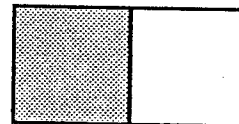
guess



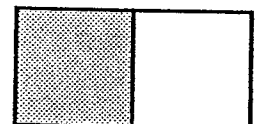
check



a table



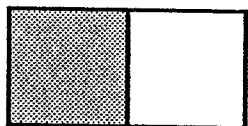
guess



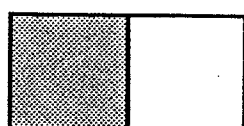
check



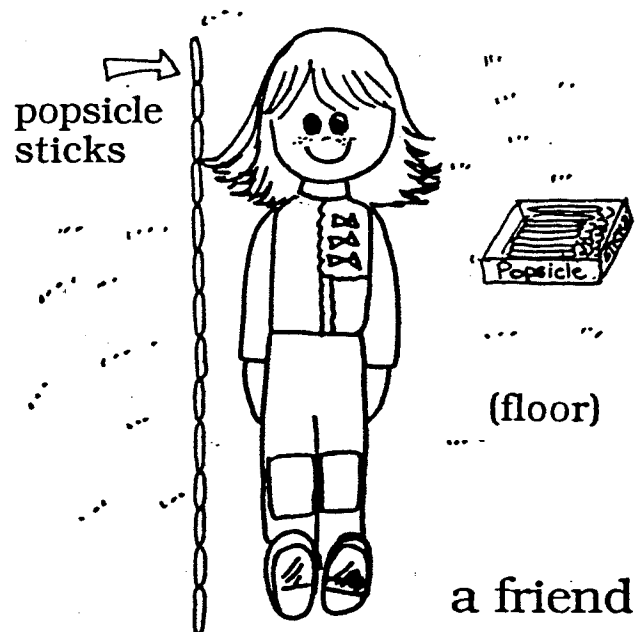
a coat



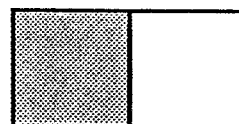
guess



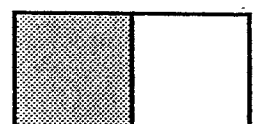
check



a friend



guess



check

# How L—O—N—G Is It? Measuring with Tiles

Name \_\_\_\_\_

guess



's

check



's

guess



's

check



's

guess



's

check



's

Which is longest? \_\_\_\_\_

Which is shortest? \_\_\_\_\_

## Weighing Things With Tiles

Name \_\_\_\_\_

guess



's

check



's

guess



's

check



's

guess



's

check



's

Which is heaviest? \_\_\_\_\_

Which is lightest? \_\_\_\_\_

# The Balance Scale

Name \_\_\_\_\_

guess



check



guess



check



guess



check



Which is heaviest? \_\_\_\_\_

Which is lightest? \_\_\_\_\_

# The Pan Balance

Name \_\_\_\_\_

guess



check



guess



check



guess



check



Which is heaviest? \_\_\_\_\_

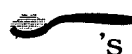
Which is lightest? \_\_\_\_\_

# Rice Spoonfuls

Name \_\_\_\_\_

Jar

guess



check



Jar

guess



check



Jar

guess



check



Which jar holds the most? \_\_\_\_\_

Which jar holds the least? \_\_\_\_\_

# How BIG Is It?

Name \_\_\_\_\_

guess

's

check

's

guess

's

check

's

guess

's

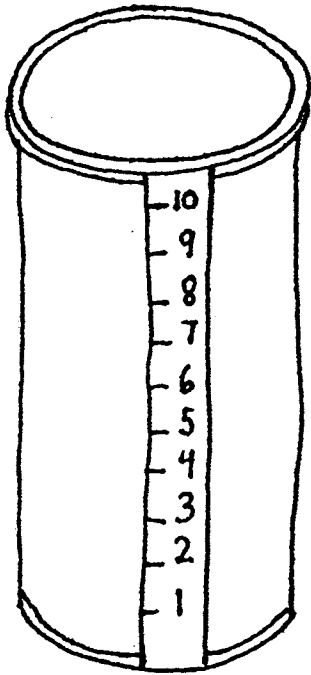
check

's

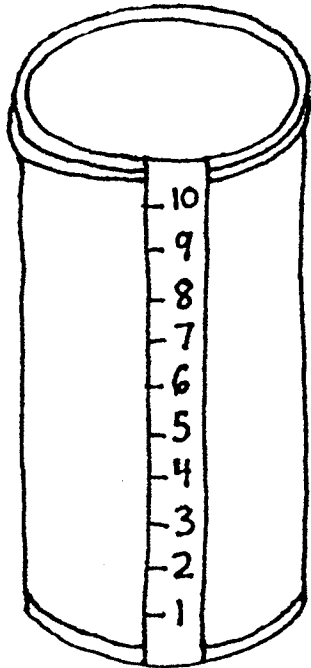
Which is biggest? \_\_\_\_\_

Which is smallest? \_\_\_\_\_

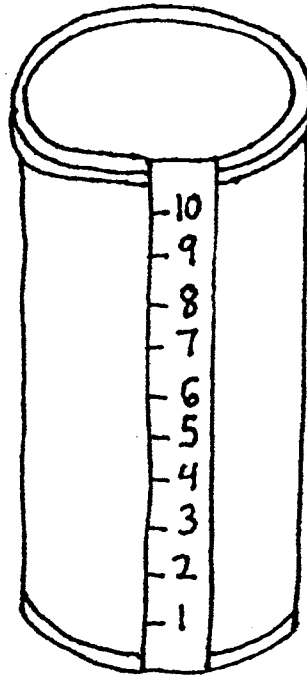
# Calibrated Jar



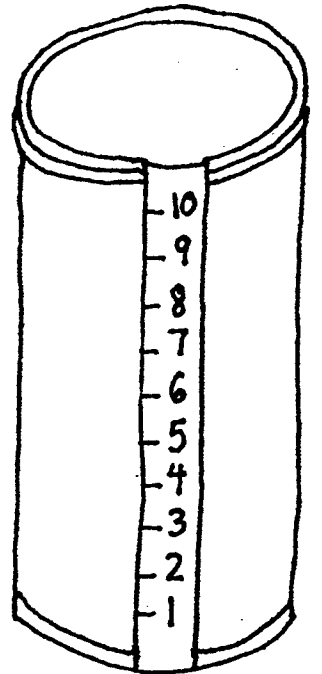
My  
Guess



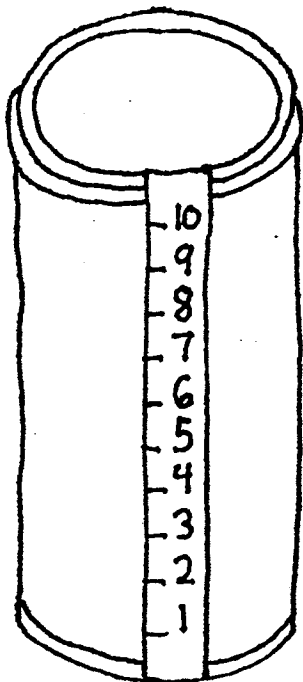
What Really  
Happened



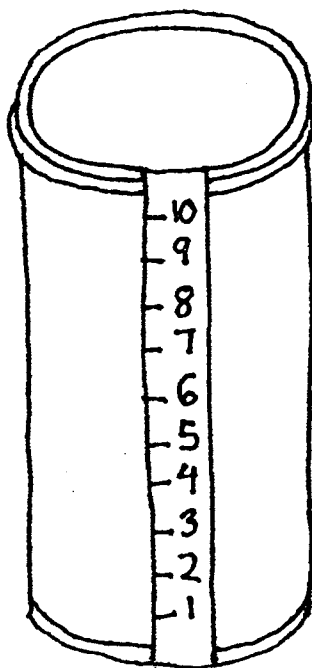
My  
Guess



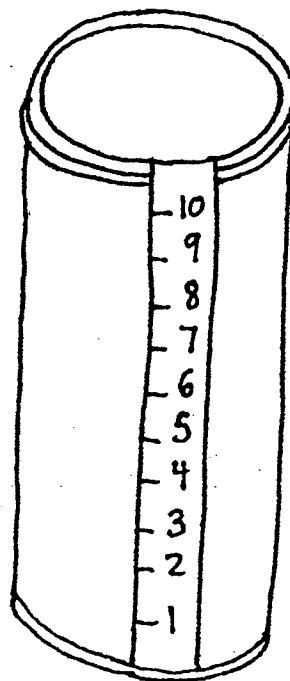
What Really  
Happened



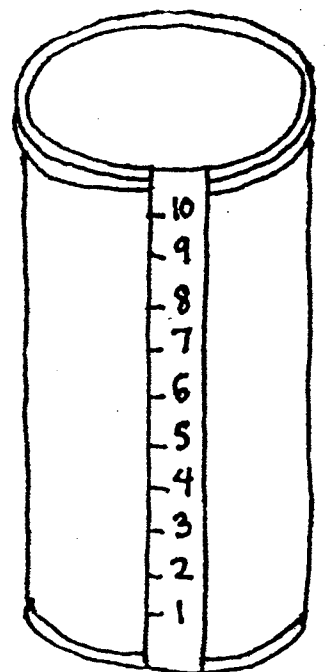
My  
Guess



What Really  
Happened



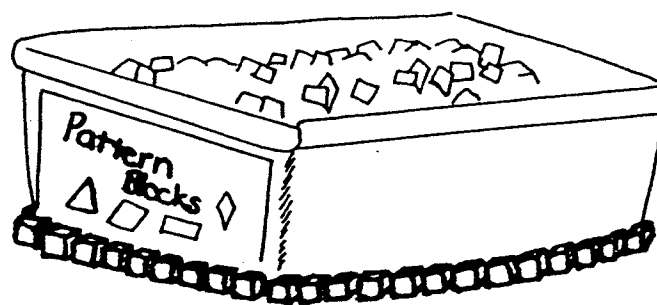
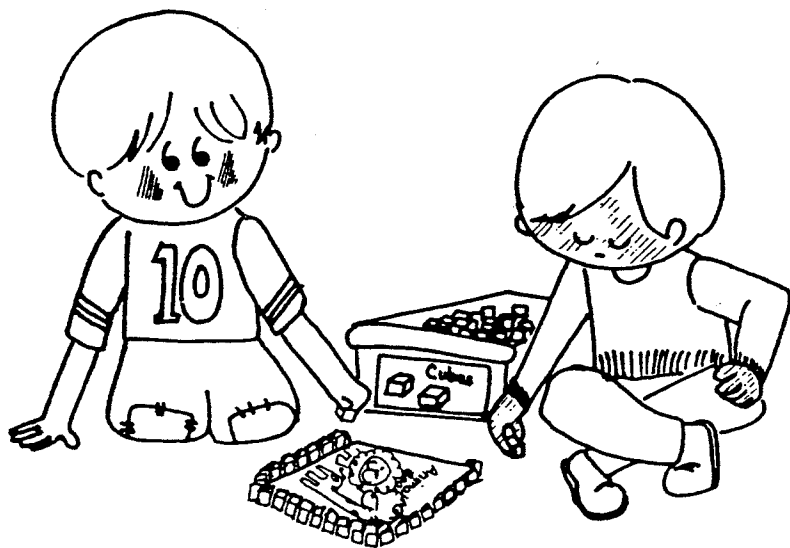
My  
Guess



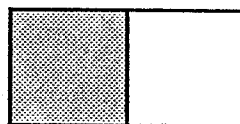
What Really  
Happened

# Perimeters

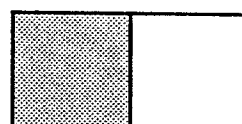
by \_\_\_\_\_



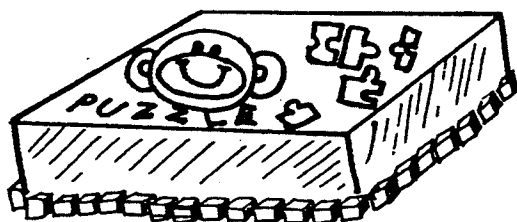
a math tub



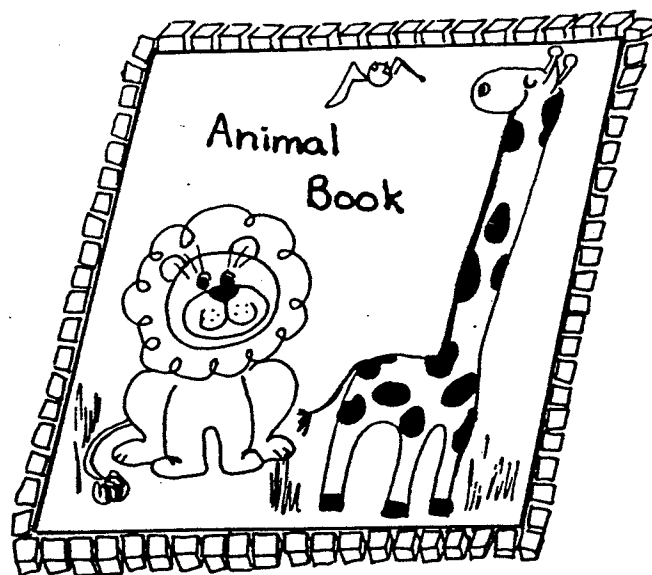
guess



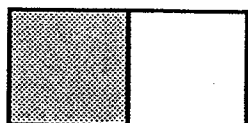
check



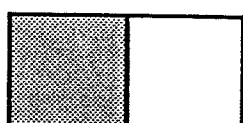
a puzzle box



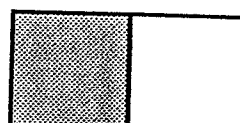
a book



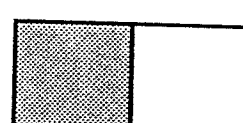
guess



check

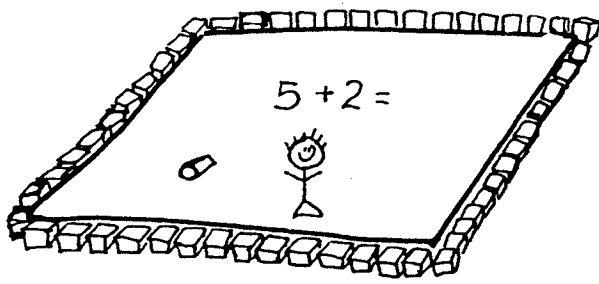


guess

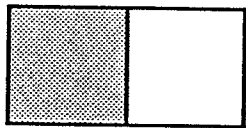


check

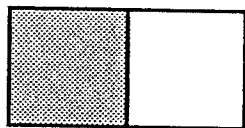
# Perimeters



a chalkboard



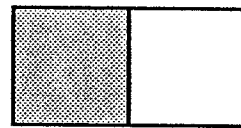
guess



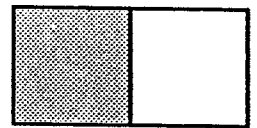
check



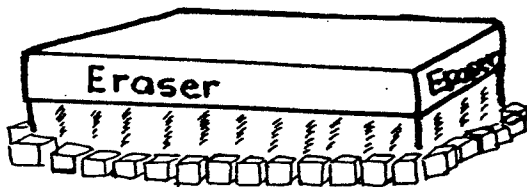
a welcome mat



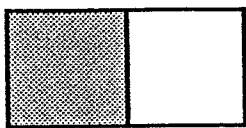
guess



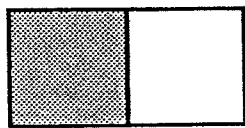
check



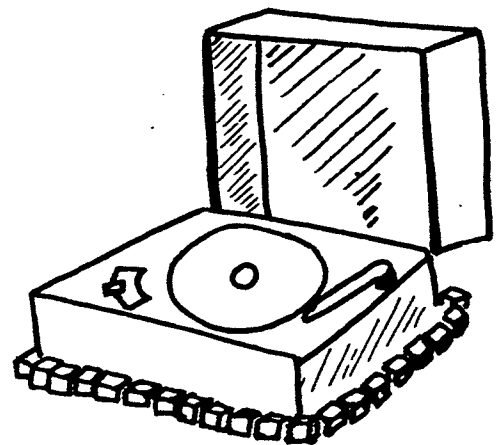
an eraser



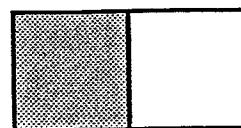
guess



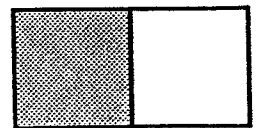
check



a record player



guess

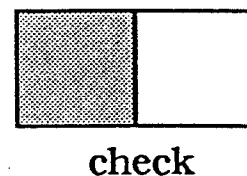
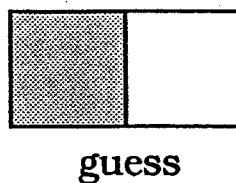
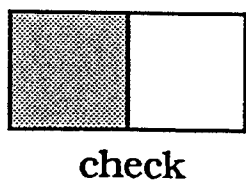
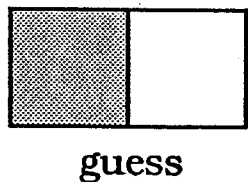
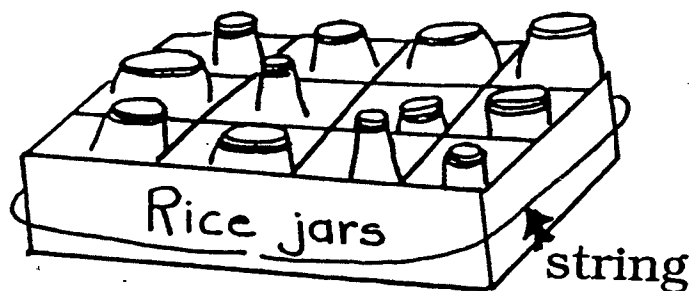
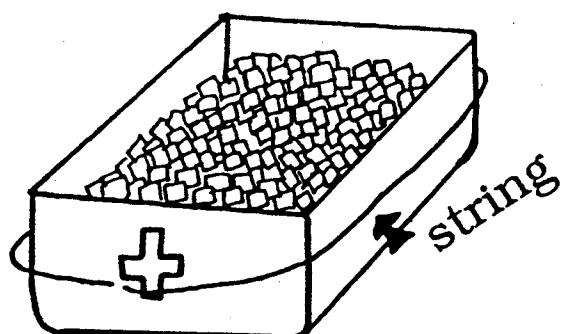
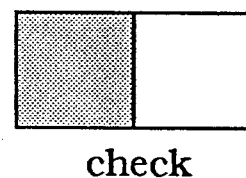
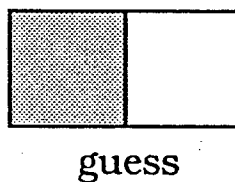
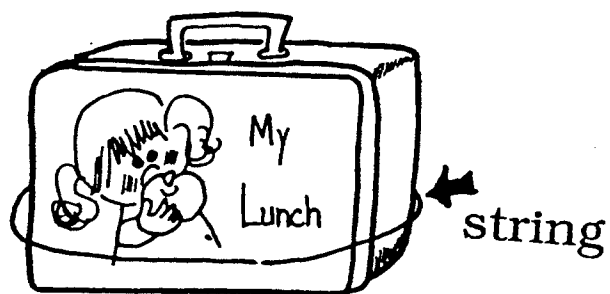


check

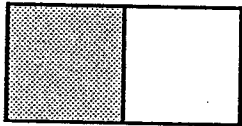
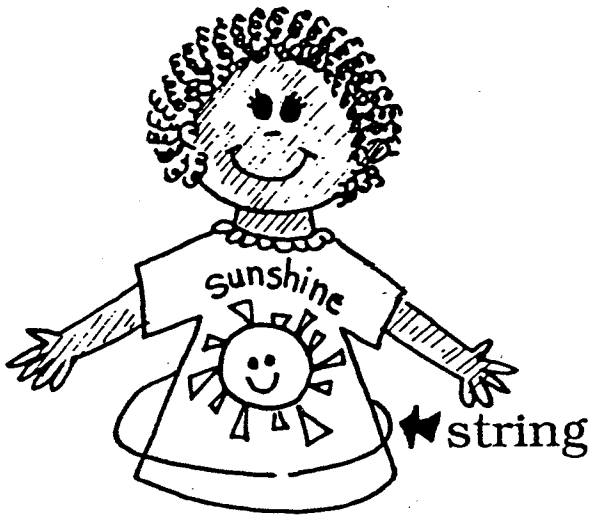


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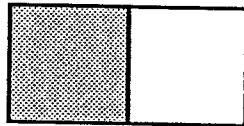
by \_\_\_\_\_



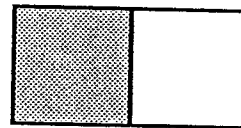
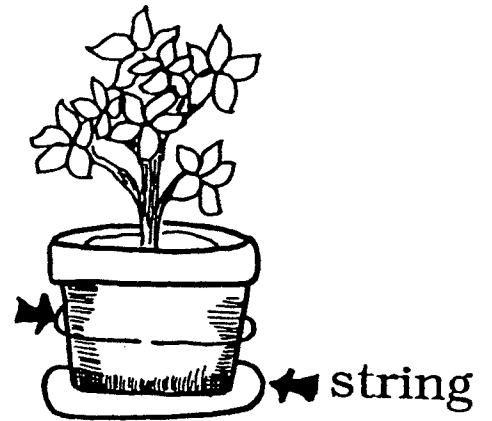
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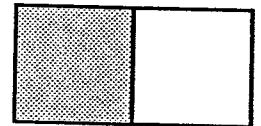
guess



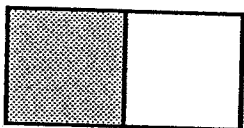
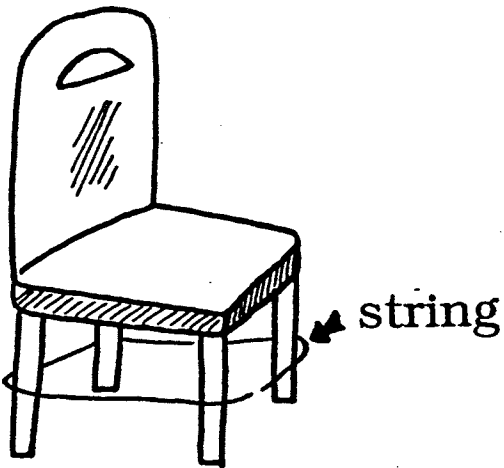
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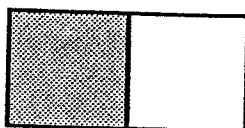
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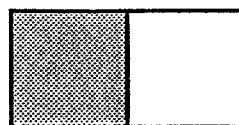
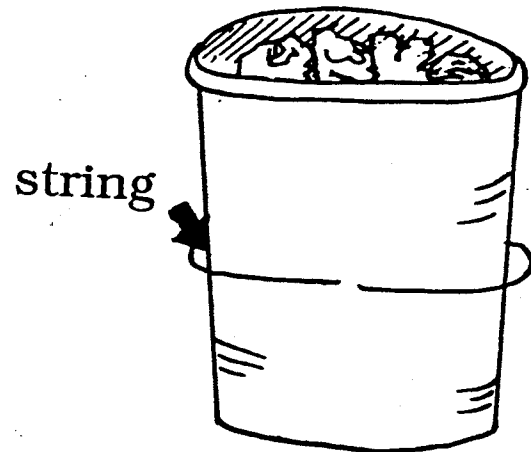
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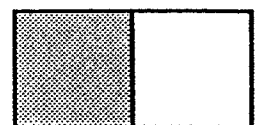
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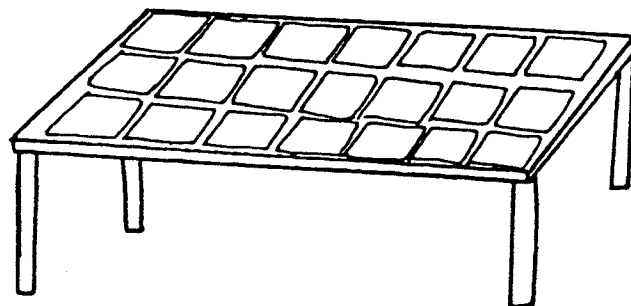


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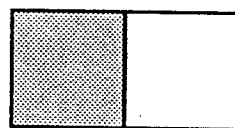


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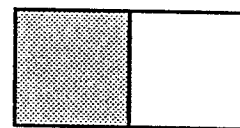
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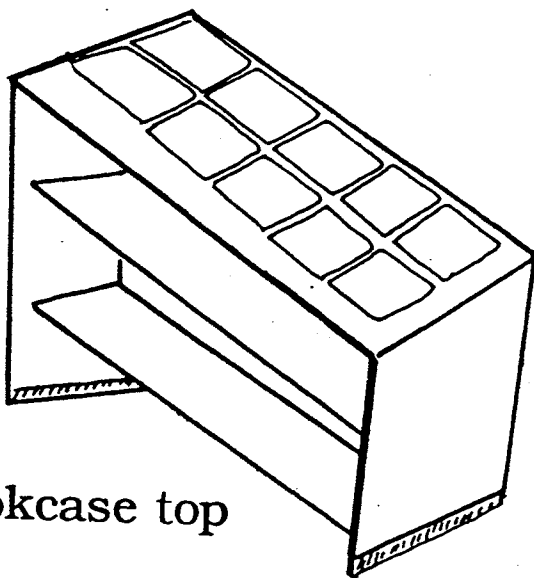
a table top



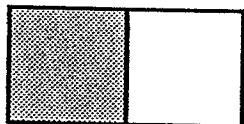
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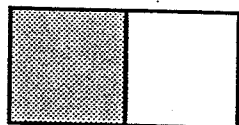
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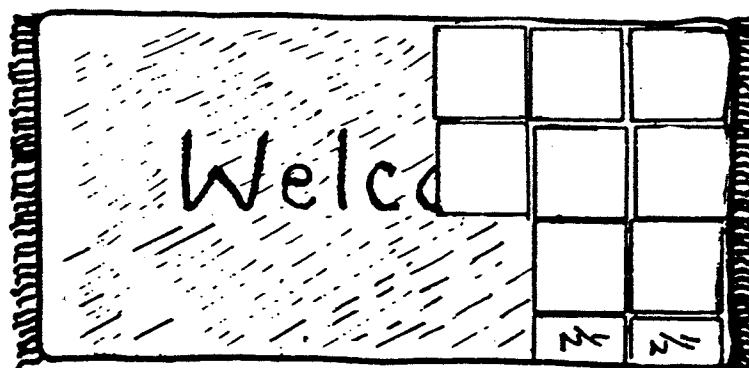
a bookcase top



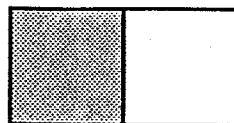
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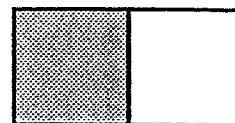
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the door mat

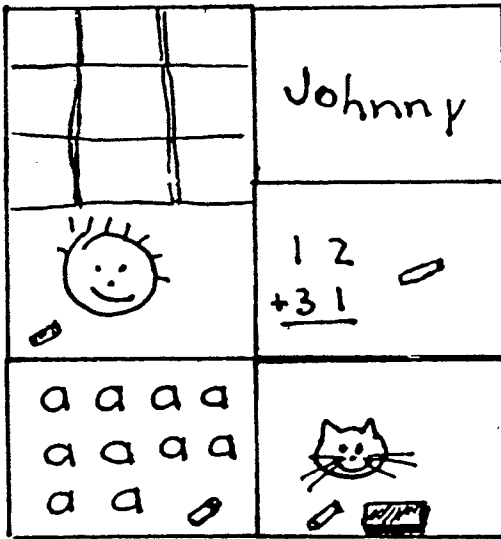


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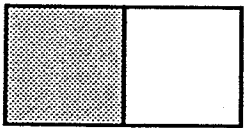


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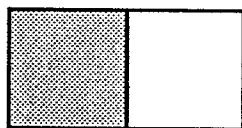
# How Big Is It? (large areas)



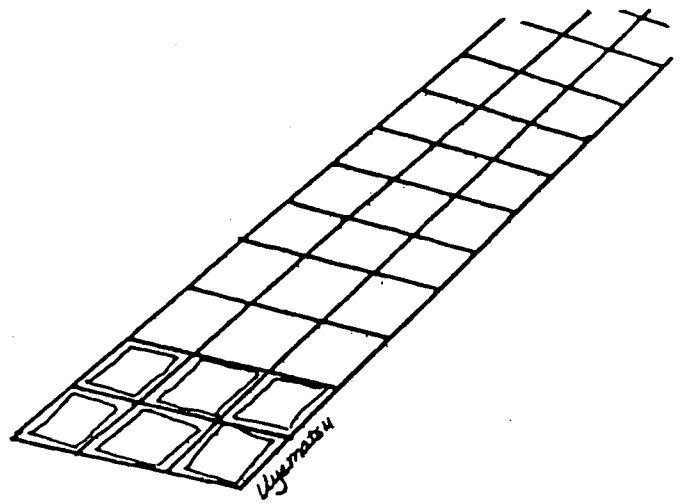
6 student chalkboards



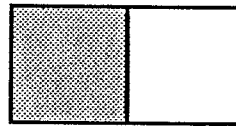
guess



check



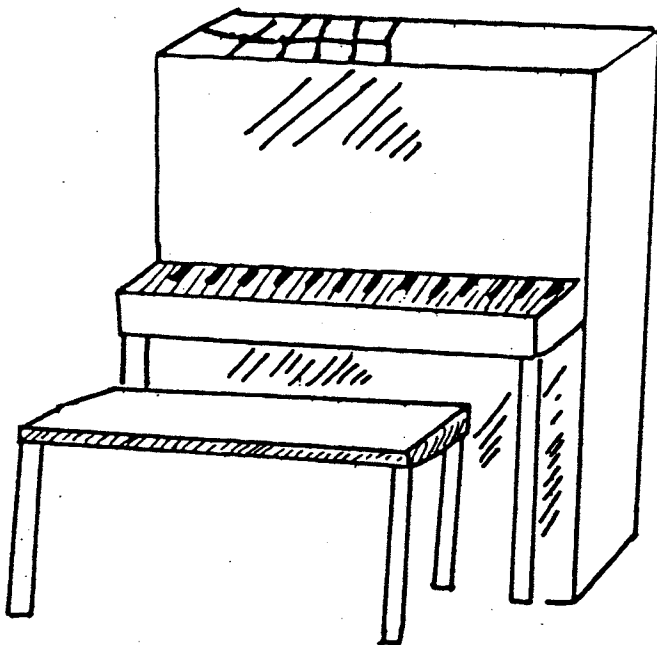
a vinyl graph



guess



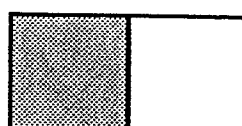
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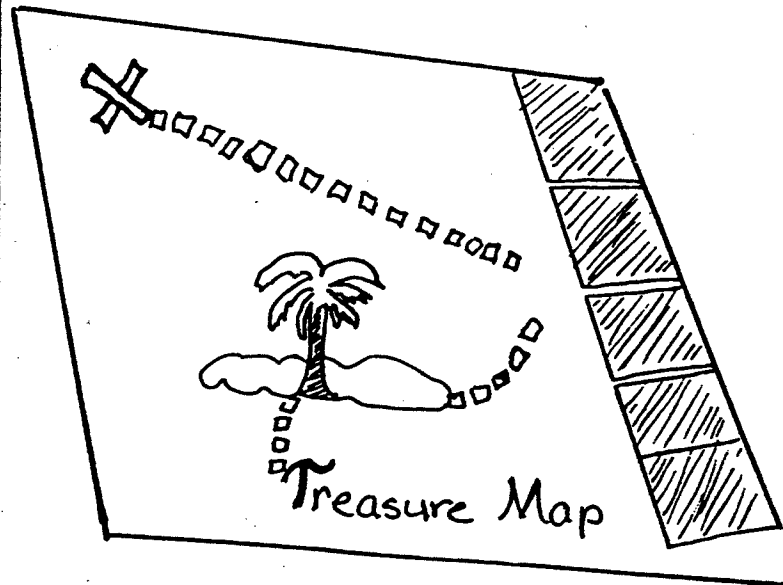
the piano top



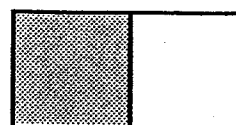
guess



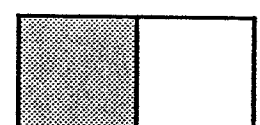
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a map

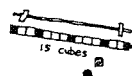


guess



check

Apply the appropriate labels on both ends of each box lid. Either run the labels on full-sheet Avery Labels No. 5165, cut apart and attach; or simply cut apart these pages and glue or tape on.



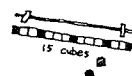
**How Long is It?**  
measuring with unifix cubes

**A PRACTICE & ENRICHMENT BOX**



**How Long is It?**  
measuring with popsicle sticks

**A PRACTICE & ENRICHMENT BOX**



**How Long is It?**  
measuring with tiles

**A PRACTICE & ENRICHMENT BOX**



**Weighing Things with Tiles**

**A PRACTICE & ENRICHMENT BOX**



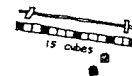
**The Balance Scale**

**A PRACTICE & ENRICHMENT BOX**



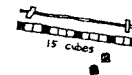
**The Pan Balance**

**A PRACTICE & ENRICHMENT BOX**



**Calibrated Scale**

**A PRACTICE & ENRICHMENT BOX**



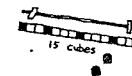
**Rice Spoonfuls**

**A PRACTICE & ENRICHMENT BOX**



**Calibrated Jar**

**A PRACTICE & ENRICHMENT BOX**



**Perimeters**

**A PRACTICE & ENRICHMENT BOX**



**Circumference**

**A PRACTICE & ENRICHMENT BOX**



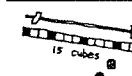
**How Big Around?**

**A PRACTICE & ENRICHMENT BOX**



**Area**

**A PRACTICE & ENRICHMENT BOX**



**How Big Is It?**  
small areas

**A PRACTICE & ENRICHMENT BOX**



**How Long is It?**  
measuring with unifix cubes

**A PRACTICE & ENRICHMENT BOX**



**How Long is It?**  
measuring with popsicle sticks

**A PRACTICE & ENRICHMENT BOX**



**How Long is It?**  
measuring with tiles

**A PRACTICE & ENRICHMENT BOX**



**Weighing Things with Tiles**

**A PRACTICE & ENRICHMENT BOX**



**The Balance Scale**

**A PRACTICE & ENRICHMENT BOX**



**The Pan Balance**

**A PRACTICE & ENRICHMENT BOX**



**Calibrated Scale**

**A PRACTICE & ENRICHMENT BOX**



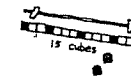
**Rice Spoonfuls**

**A PRACTICE & ENRICHMENT BOX**



**Calibrated Jar**

**A PRACTICE & ENRICHMENT BOX**



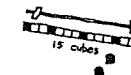
**Perimeters**

**A PRACTICE & ENRICHMENT BOX**



**Circumference**

**A PRACTICE & ENRICHMENT BOX**



**How Big Around?**

**A PRACTICE & ENRICHMENT BOX**



**Area**

**A PRACTICE & ENRICHMENT BOX**



**How Big Is It?**  
small areas

**A PRACTICE & ENRICHMENT BOX**



**How Big Is It?**  
large areas

**A PRACTICE & ENRICHMENT BOX**



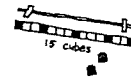
**Sinkers**

**A PRACTICE & ENRICHMENT BOX**



**How Big Is It?**  
large areas

**A PRACTICE & ENRICHMENT BOX**



**Sinkers**

**A PRACTICE & ENRICHMENT BOX**

# Money



## BOX IT OR BAG IT MATHEMATICS

Practice & Enrichment Boxes

**Donna Burk • Allyn Snider  
Paula Symonds**

Published by The Math Learning Center

**Box It or Bag It Mathematics, Practice & Enrichment Box:  
Money**

Box It or Bag It Mathematics consists of:

Teachers Resource Guide and Blackline Masters, Kindergarten  
Teachers Resource Guide and Blackline Masters, 1st and 2nd Grade

Practice & Enrichment Boxes:

Shapes  
Introduction to Measuring  
Understanding Measuring  
Reading, Writing & Understanding Numerals 0–10  
Pattern  
Arithmetic  
Money  
Place Value Counting  
Place Value Addition & Subtraction

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# Getting Started

*Once you've introduced Money through a variety of group lessons (be sure to see Box It or Bag It Mathematics Teachers Resource Guide, Money,) you will want children to practice and extend their understanding using the activities that follow in this packet. Here are a few things we've found helpful to remember for a successful Independent Practice Time.*

*Provide no more than 8-12 boxed activities at one time for a class of 30. Too many activities create more than tolerable chaos.*

*Model each activity thoroughly until children can tell you what to do, step by step. You'll find "box ingredients" and "playing instructions" for each activity in this packet. We use clear contact paper to put them in our box lids so WE can remember what goes in each box and how each game is played. Reading the directions would be too difficult for most primary children.*

*Resist the temptation to put out all your challenging Boxes at once—provide an equal balance of easy and hard. (If you set out too many difficult Boxes, all the children will need you at once and the noise level will be almost unbearable as your children try to cope with the stress of too many difficult tasks.)*

*As you construct these Practice and Enrichment Boxes, cover your box tops with the same design contact paper. That way, you'll be able to pull your Money Boxes off the shelf easily, even if they've gotten mixed in with other boxes. (Boxes can be ordered from The Math Learning Center in three sizes: standard (9" X 12" X 2"), half size (9" X 6" X 1-7/8") and junk (4" X 7" X 1-1/8").) See the Box It or Bag It Mathematics Teachers Resource Guide, MATERIALS INDEX, for additional ordering and making information.*

*Remember the Boxes themselves can be used for group instruction. They are ideal for use by an aide or parent with small groups. Some of them can be easily adapted for use with your whole group.*

*During Independent Practice Time, it's critical that you be available and in circulation to make sure things go smoothly. Once routines even out, you'll have opportunities to observe individuals which are not afforded when you conduct group instruction. You can really spot children with problems or understandings beyond your predictions. See the next page for some observation guidelines.*

Money Observation Sheet	Counting Patterns				Names Coins				Knows Coin Values				Counts Money				Counts Mixed Coins				Makes Change	Writes & Solves Simple Word Problems	
	by ones	by fives	by tens	by twenty-fives	penny	nickel	dime	quarter	half dollar	penny	nickel	dime	quarter	half dollar	pennies to:	nickels to:	dimes to:	quarters to:	pennies and nickels to:	pennies, nickels and dimes to:			pennies, nickels, dimes and quarters to:
NAMES																							

## Some General Making Instructions

*Many of the Boxes have similar game parts. Rather than repeat the making instructions for these every time, we've included them in this section. Many of the gameboards, spinner tops, and cards have been printed for you and are among the blacklines and cardstock included in this packet. We'll always indicate if game materials are in the packet.*

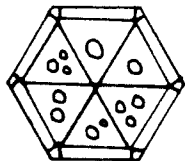
### SPINNERS

For each spinner you'll need:

- spinner top from blacklines
- two 6 X 6 squares poster or matte board, white or any light color
- two 1 X 1 squares poster or matte board (scraps work just as well as 1" squares and save a great deal of board)
- one regular-sized paper clip
- filament (strapping) tape
- an assortment of pennies, nickels, dimes, and quarters
- clear contact paper

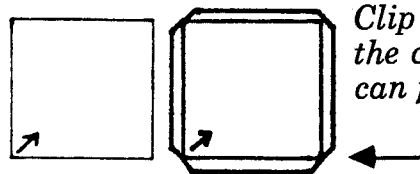
#### To Do:

1. Glue printed spinner top to one of the 6 X 6 pieces of posterboard. Cut it out. Place real coins over printed coins—no need to glue. (Many teachers have found that matte board is sturdier and lasts longer. Also, rather than cutting out a 6" square for the spinner top, a great deal of board can be saved by gluing all the spinner tops to a large piece of board and then cutting them out.



← *Snip the edges of the contact paper so you can fold it under.*

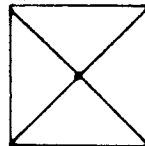
2. Cut a piece of clear contact paper somewhat larger than the spinner top. Place the contact paper over the top and smooth it down around the coins; it will hold them in place. Snip the edges of the contact paper and turn them under the spinner top.



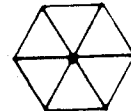
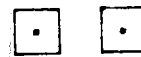
*Clip contact paper at the corners so you can fold it under.*

3. Draw a small arrow at the corner of the other 6 X 6 piece of railroad board. Cover the square with clear contact paper, turning the edges under.

*Draw lines diagonally across the back*

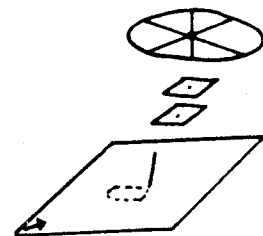


*of the 6 X 6 square to locate midpoint*



4. To assemble spinner, poke holes through the center of the 6 X 6 square, the two 1 X 1 "washer" pieces, and the center of the spinner top.

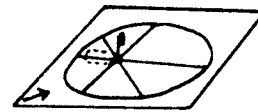
Unfold a paper clip by pulling out the middle section and bending it upwards.



Poke it upward through the squares, the two washers, and the spinner top.



*spinner back*



*spinner front*

Tape the paper clip with an "X" of filament tape to the back of the 6 X 6 square to hold the spinner together. Bend down the top point of the paper



clip in front and wrap it with a small piece of filament to prevent injury. Be sure to label each spinner with the name of the game. Otherwise, cleanup can be challenging.

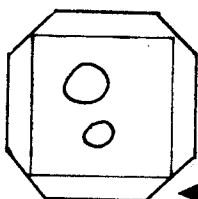
## COIN CARDS

You will need:

- 4 X 4 railroad board squares
- an assortment of pennies, nickels, dimes and quarters
- 5-1/2 X 5-1/2 squares of clear contact paper (i.e., enough contact paper to overlap the edges of the cards)

**To Do:**

1. Although the coins you'll put on cards will vary from game to game, the instructions are the same. Place required coin(s) on 4 X 4 square—no need to glue them down.
2. Put clear contact paper over 4 X 4 square, smoothing down around coin(s). Turn edges under.



*Clip contact paper at the corners so you can fold it under*

## COLORING

Be sure to color (silver or copper) all printed coins on gameboards, spinner tops, and cards unless you're using real coins. Colored coins

are a thousand times easier than uncolored coins to identify.

## REAL MONEY

Use real money to make games, wherever called for. We've found it makes games far more magical and understandable to kindergartners, first and second graders alike.

## COIN TUBES

Coin tubes for pennies, nickels, and dimes are called for in several games. You can get them at dime stores and coin stores. For little fingers, it works well to put your dimes in penny tubes, pennies in nickel tubes, and nickels in quarter tubes. That way they don't get stuck! To help insure that all the coins are put back each time, mark tubes to the level of the coins with a Sanford Sharpie fine tip permanent marker.

## COIN STAMPS GAME STORAGE

Coin stamps are widely available. They can also be ordered from The Math Learning Center. As you construct these Independent Practice Boxes, cover your box tops with the same design contact paper. That way you'll be able to pull your Money Boxes off the shelf easily, even if they've gotten mixed in with other boxes. (Boxes can be ordered from The Math Learning Center in three sizes: standard (9 X 12 X 2), half size (9 X 6 X 1-7/8), and junk (4 X 7 X 1-1/8). See the Box It or Bag It Mathematics Teachers Resource Guide, MATERIALS INDEX, for additional ordering and making information.

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## Coin Graphs— Grades K and 1 (1-4 children)

---

See Box It or Bag It Mathematics Teachers Resource Guide, MONEY, Coin Graphs, for group introduction to this activity.

**Box ingredients→** coin stamps (8) and stamp pads (1 or 2)  
spinners (2) record sheets  
grey and brown crayons

### PLAYING INSTRUCTIONS—Easy

1. Spin the spinner. Read the amount spun.
2. Color in the appropriate box on your graph. Work from bottom to top.
3. Continue spinning, reading, and recording until at least one column is filled.

### PLAYING INSTRUCTIONS—Mid-Level

1. Spin the spinner. Read the amount spun.
2. Use a coin stamp to show the coin you spun on your graph. Color in the coin you stamped if you like. Work from bottom to top.
3. Continue spinning, reading, and stamping coins until at least one column is filled.

### PLAYING INSTRUCTIONS—Challenging

1. Spin the spinner. Read the amount spun.
2. Record the numerical amount on your graph. Don't forget the cents sign. Work from bottom to top.

3. Continue spinning, reading, and recording until at least one column is filled.

### MAKING INSTRUCTIONS

#### Coin Stamps (8) and Stamp Pads

You'll need two penny stamps, two nickel stamps, two dime stamps, and two quarter stamps. These are available through The Math Learning Center. We have glued real coins on each of our coin stamps so the children can easily recognize each stamp. Get stamp pads from your school office or any other source of business supplies.

#### Spinners (2)

Locate Coin Graph spinner tops in blacklines. Assemble as directed in the Getting Started section of this packet.

#### Record Sheets

Locate Coin Graph record sheet in blacklines. Run copies. Store record sheets, spinners, coin stamps, and crayons in standard box.

---

## Money March— Grades K and 1 (2-4 children)

---

See Box It or Bag It Mathematics Teachers Resource Guide, MONEY, Money March, for group introduction to this activity.

**Box ingredients→**    gameboard                      game markers (4)  
                                 Spinner (easy, challenging, or both)  
                                 standard box for storage

### **PLAYING INSTRUCTIONS—Easy and Challenging**

1. Take turns. Spin the spinner. Move your marker the correct number of spaces.
2. The first player to reach the Pot of Gold is the winner.

### **MAKING INSTRUCTIONS**

#### **Gameboard**

Locate Money March gameboard in the cardstock portion of this packet. Color with waterbase markers if you wish. Laminate.

#### **Spinners**

Locate Money March spinner tops in the blacklines. Make one or both, depending on the needs of your children. See Getting Started for assembly directions.

#### **Game Markers (4)**

Use unifix cubes in four different colors, or any other small colored counters. Store game markers, spinner(s), and gameboard in a standard box.

---

## Spin a Half Dollar— Grades K and 1 (2-4 children)

---

See Box It or Bag It Mathematics Teachers Resource Guide, MONEY, Spin a Half Dollar, for group introduction to this activity.

**Box ingredients→**    record sheets                      spinners (3)  
                                 pencils (4)                              standard box for storage

### **PLAYING INSTRUCTIONS**

1. Choose a spinner to use for your entire game.
2. Take turns. Spin the spinner. Cross out

- appropriate number of pennies to equal the amount shown on the spinner.
3. The first player to cross out all the coins on his/her sheet wins.



## MAKING INSTRUCTIONS

### Record Sheet

Locate Spin a Half Dollar record sheet in blacklines. Run copies.

### Spinners (3)

Locate three Spin a Half Dollar spinner tops in blacklines. Make two, or all three, depending on the needs of your children. See Getting Started for assembly directions. Store spinners, pencils, and record sheets in a standard box.

---

## Spin Two Dollars— Grades 1 and 2 (2-4 children)

---

**Box ingredients→**    record sheets                      spinner  
                                 pencils (4)                      standard box for storage

### PLAYING INSTRUCTIONS

1. Take turns. Spin the spinner. Cross out appropriate coins to equal the amount shown on the spinner.
2. The first player to cross out all the coins wins.

### MAKING INSTRUCTIONS

#### Record Sheets

Locate Spin Two Dollars record sheet in the blacklines. Run copies.

#### Spinner

Locate Spin Two Dollars spinner top in blacklines. Assemble as directed in Getting Started. Store spinner, pencils, and record sheets in standard box.

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## Roll Twenty-Five Cents— Grades K and 1 (2-4 children)

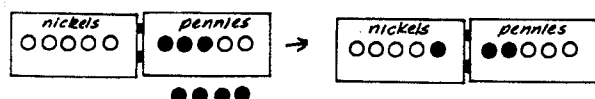
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See Box It or Bag It Mathematics Teachers Resource Guide, MONEY, Roll Twenty-Five Cents, for group introduction to this activity.

**Box ingredients→**    trading boards (4)  
                                 pennies in a coin tube (20)  
                                 nickels in a coin tube (20)  
                                 die                                      junk box for storage

### PLAYING INSTRUCTIONS

1. Roll die to determine who starts. Highest roll begins.
2. Take turns. Roll die. Set out the number of pennies indicated by the die below the pennies side of your trading board. Once you have them counted out, move them up and make any needed trades.



"I rolled 3 on my first turn. This time I rolled 4. So I set out 4 below my pennies side. Now I'll have to move them up, trade in 5 for a nickel...."

3. Continue playing until one player reaches 25 cents.

### MAKING INSTRUCTIONS

#### Trading Boards (4)

Locate Roll Twenty-five Cents trading boards in the cardstock portion of this packet. Color in coins. Laminate. Cut apart. Hinge one pennies and one nickels section at the back with two strips of filament tape to make each board.

leave 1/8" space between boards



#### Pennies and Nickels in Coin Tubes

Put twenty pennies in a nickel tube and twenty nickels in a quarter tube. Mark each tube with a permanent marking pen to the appropriate level when filled. This makes it easy to see if all the coins have been returned at cleanup time.

#### Die

Use a plain wooden cube or foam cube, available from The Math Learning Center. Mark the numbers 1-6 on your die with a permanent black marker. Store the die, coins in coin tubes, and trading boards in a junk box.

---

## Money Trading Game— Grades 1 and 2 (2-4 children)

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**Box ingredients→**      dice (2)                      trading boards (4)

                                 pennies in a marked coin tube (40)

                                 dimes in a marked coin tube (40)

                                 half box for storage

### PLAYING INSTRUCTIONS—Easy

1. Take turns. Roll the dice. Take the number of pennies rolled. Place them on the pennies side of the scorecard.
2. Each time you get ten pennies, trade for a dime and place the dime on the dime side of your scorecard.
3. The first player to get ten dimes wins.

trading a dime for ten pennies and then taking the amount rolled away.

3. The first player to get back to .00 wins the game.

### MAKING INSTRUCTIONS

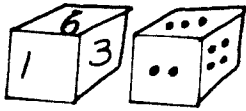
#### Dice

You can provide different sets of dice, depending on the needs of your children. The first set we've used is one dotted dice, 0-6, and one numbered dice, 0-6. A dotted and a numbered dice encourages children to count on; the children say the number and count the dots on.

### PLAYING INSTRUCTIONS—Challenging

1. Take turns. Start with ten dimes on the dime side of the scorecard. Roll the dice.
2. Remove that amount from your scorecard by

"Six, seven, eight, nine!"



Other possibilities for dice are:

one numbered 6-11; one dotted 6-11  
both numbered 4-9

one dice numbered 10, 20, 30, 10, 20, 30; one  
numbered 0-6  
one dice numbered 9, 9, 9, 10, 10, 10; one  
numbered 4-9

#### Trading Boards (4)

Locate the Money Trading Game trading boards in the cardstock portion of this packet. Assemble as directed in Roll Twenty-five Cents. Store trading boards, coins in marked coin tubes, and dice in half box.

---

## Money Sock Boxes— Grades K, 1 and 2 (2-4 children)

---

**Box ingredients→** money sock boxes with coins inside (4)

spinner(s) (1-4)

standard box for storage

#### PLAYING INSTRUCTIONS—Easy, mid-level, and challenging

1. Choose a spinner. Game can be easy or more challenging depending on which you choose.
2. One player spins the spinner.
3. Everyone reaches into his or her sock box and tries to pull out the correct coin(s).
4. Once everyone has coin(s) out and counted, put them all back. Pass the spinner to someone else and play again.

4 children's stretchy socks  
4 pennies, 4 nickels, 4 dimes, and 4 quarters

1. If noise bothers you, glue a circle of felt in the bottom of each can.
2. Pull one stretchy sock over each can.
3. Put one penny, one nickel, one dime, and one quarter in each can.



#### MAKING INSTRUCTIONS

##### Money Sock Boxes (4)

You'll need:

4 tuna or cat food cans with sharp edge taped at top

##### Spinners (1-4)

Locate Money Sock Boxes spinner tops in blacklines. Choose the spinner(s) most appropriate to your children's needs. Assemble as directed in Getting Started. Store spinner(s) and sock boxes in standard box.

---

## Money Puzzles— Grades K, 1 and 2 (1-4 children)

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**Box ingredients→** money puzzles (25)

half box for storage

#### PLAYING INSTRUCTIONS

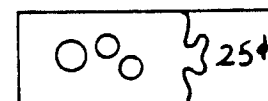
1. Put the money puzzles together.
2. Count the money on each puzzle to a friend or teacher.

#### MAKING INSTRUCTIONS

##### Money Puzzles

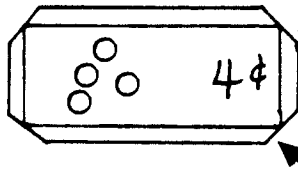
You'll need:

25 3 X 8 pieces of  
railroad board



assortment of pennies, nickels, dimes, and quarters  
clear contact paper

1. Place coin(s) on the left-hand side of the card—no need to glue them down.
2. Write money amount on right-hand side.
3. Cover the card with clear contact paper. Smooth paper down around the coins. Turn edges under.



*Snip the edges of the contact paper so you can fold it under.*

4. Cut puzzle apart in the middle, using some form of puzzle cut.



Kindergarten teachers will probably want to limit coins and coin sums to ten cents and below. First and second grade teachers may go to fifty cents or higher, whatever you can afford.

Store money puzzles in a half box.

---

## Count, Tell, Spin, and Win— Grades K, 1 and 2 (2 children)

---

**Box ingredients→**    one “more” card                      one “less” card  
                                 more or less spinner                      coin cards (14-20)  
                                 half box for storage

### PLAYING INSTRUCTIONS

1. Put all the coin cards face down in a pile.
2. Each player takes a card.
3. Each player counts money on card.
4. Label cards with “more” and “less” card.
5. Spin the spinner to see who wins.
6. Player who wins takes both cards.
7. When all the coin cards have been used, each player counts cards.
8. Label winnings piles with “more” or “less” cards
9. Spin to see who wins the game.

### MAKING INSTRUCTIONS

#### More and Less Cards

Find the more and less cards in blacklines. Cut, color, mount on tag, and cover with clear contact paper or laminate.

#### Spinner

Find spinner top in blacklines. Color. Assemble as directed in Getting Started.

#### Coin Cards (14-20)

Make a set of 14-20 different coin cards (see Getting Started for directions) with sums appropriate to the needs of your children.

Easy—varying sums of pennies, all less than ten cents and/or pennies and nickels to ten cents.

Mid-level—pennies, nickels, and dimes, varying sums to twenty-five cents.

Challenging—pennies, nickels, dimes, and quarters, varying sums to \$1.00.

Store coin cards, more and less cards, and spinner in half box.

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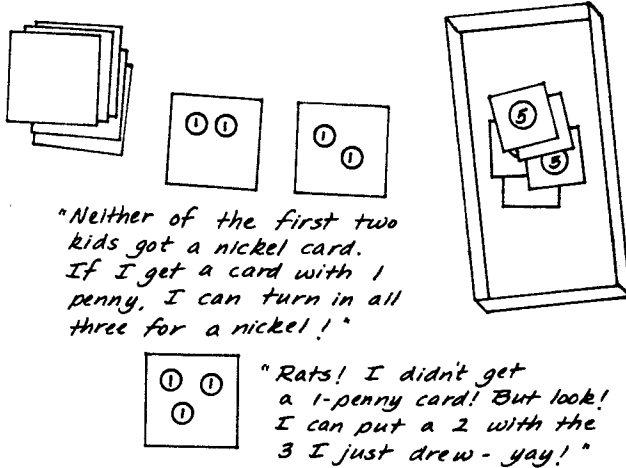
## Earn A Nickel— Grades K and 1 (2-4 children)

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**Box ingredients→** pennies cards (22)      nickel cards (10)  
half box for storage

### PLAYING INSTRUCTIONS

1. Place the pennies cards face down in a pile.
2. Put nickel cards in the box lids—this is the “bank”.
3. Turn one pennies card face up. If it has five pennies on it, you can turn it in to the bank for a nickel. If it's less than five, leave it face up in the middle. It's now community property.
4. Let your partner or the person to your left turn another pennies card up. Can he or she add the two cards to make exactly five cents? If so, he/she can turn the two cards in to the bank for a nickel card. If not, play passes to the next person.



5. Continue around the circle, or with your partner, drawing cards, placing them in the middle and making trades to the bank for nickels when you can. The game is over when all the cards have been turned up and no more trades can be made. There may be a few pennies cards left—that's O.K. The player with the most nickel cards at the end wins.

### MAKING INSTRUCTIONS

#### Coin Cards

You'll need:

- 10 nickels
- 58 pennies
- 10 pieces 2 X 2 poster board for nickel cards
- 22 pieces 4 X 4 poster board, in a different color
- clear contact paper

#### Make:

- 10 nickel cards
- 8 cards with 1 cents
- 4 cards with 3 cents
- 4 cards with 3 cents
- 4 cards with 4 cents
- 2 cards with 5 cents

See Getting Started for assembly directions.  
Store coin cards in half box.

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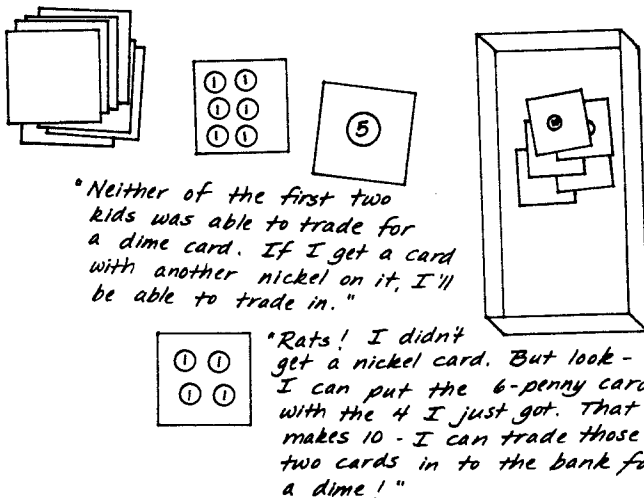
## Earn A Dime— Grades 1 and 2 (2-4 children)

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**Box ingredients→** pennies cards (20)                      nickel cards (3)  
dime cards (10)                      half box for storage

### PLAYING INSTRUCTIONS

1. Place the pennies and nickel cards face down in a pile.
2. Put dime cards in the box lid. This is "the bank".
3. Turn one pennies or nickel card face up. Leave it in the middle. It's now community property.
4. Let your partner or the person to your left turn another card up. Can he or she add the two cards to make exactly ten cents? If so, he/she can trade the two cards in to the bank for a dime card. If not, play passes to the next person.



5. Continue around the circle or with your partner, drawing cards, placing them in the middle and making trades to the bank for dimes when you can. The game is over when all the cards have been turned up and no more trades can be made. There may be a few cards left in the middle—that's O.K. The player with the most dime cards at the end wins.

### MAKING INSTRUCTIONS

#### Coin Cards

You'll need:

- 10 dimes
- 3 nickels
- 66 pennies
- 10 pieces 2 X 2 poster board for dime cards
- 23 pieces 4 X 4 poster board, in a different color, for other coin cards
- clear contact paper

#### Make:

- 10 dime cards
- 4 cards with one cents
- 4 cards with two cents
- 4 cards with three cents
- 3 cards with four cents
- 2 cards with five cents
- 3 nickel cards
- 2 cards with six cents
- 1 card with eight cents

See Getting Started for assembly directions.  
Store coin cards in half box.

---

## The Store— Grades K, 1 and 2 (1-4 children)

---

**Box ingredients→** store items (16-20)

coins in marked coin tubes (amount and type will vary with grade level)

standard box for storage

### PLAYING INSTRUCTIONS—Easy

1. Take ten pennies.
2. Choose something to buy from the store.
3. Lay out the correct amount of money beside it.
4. Continue choosing until you no longer can buy anything.
5. Take your ten pennies back and start again.

### PLAYING INSTRUCTIONS—Challenging

1. Take ten dimes.
2. Choose something to buy from the store.
3. Lay out the correct amount of money beside it.
4. Continue choosing until you no longer can buy anything.

### MAKING INSTRUCTIONS

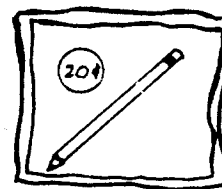
#### Coins in Marked Tubes

You'll need 40 pennies in a tube for the easy game. For the challenging version, you'll need 40 dimes, 20 nickels, and 30 pennies in marked coin tubes. (The nickels and pennies are for making change.)

### Toys

You'll need:

16-20 small toys or stationery items, each priced under \$.60, if possible. Balloons, toy scissors, an eraser, a small tablet, two barrettes, a pencil, a plastic toy car, are all possibilities. (If you're making the easy version of The Store, you'll want to disregard and probably remove the items' real prices and mark amounts of one cent-6 cents on each.)



filament (strapping) tape  
small ziplock bags

Bag each toy and edge with filament tape. Mark each bag with the item's price unless the item itself is clearly marked.

Lenore Rukasin, of Los Angeles, brought a wonderful machine to class that heat sealed plastic bags in no time at all. If you know anyone who has one for preparing freezer foods, borrow it. It would save so much time.

Store coins in marked coin tubes and store items in a standard box.

---

## Top Draw— Grades K, 1 and 2 (2-4 children)

---

**Box ingredients→** coin cards (20-30)

half box for storage

### PLAYING INSTRUCTIONS

1. Put all the coin cards face down in a pile.
2. Take turns taking a card and counting the money on your card.

3. The person with the most money captures every players' card.
4. If two players draw cards with the same value, each player draws one more card.

5. The player with the most cards at game's end wins.

## MAKING INSTRUCTIONS

## Coin Cards

**Assemble coin cards as directed in Getting Started. Kindergarten teachers should limit**

the coins and sums of coins to ten cents and below. First and second grade teachers can include sums as high as they can afford (ours go up to \$.40 on some cards). Make 20-30 cards in either case.

**Store coin cards in half box.**

## Dig for Buried Treasure— Grades K, 1 and 2 (2-4 children)

See Box It or Bag It Mathematics Teachers Resource Guide, Grades 1 and 2, Chapter 6, Capture the Money, for group introduction to this activity.

**Box ingredients→** gameboard                  money box                  game cards  
standard box for storage

### PLAYING INSTRUCTIONS—Easy, mid-level, and challenging

1. Put all the money out on the gameboard. Match each coin to a printed coin. Mix up the game cards and put them in a pile, face down.
2. Take turns. Draw a card. Find on the board the coordinate the card names. Remove the coin.
3. Play until all the money has been taken off the board. The person with the most money wins.

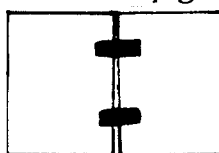
## MAKING INSTRUCTIONS

## Gameboard

**Locate Dig for Buried Treasure** gameboards (2 sheets each) in the cardstock portion of this packet. There are three different versions: easy, mid-level, and challenging. Choose the one most appropriate to your group. (You may even want to make two separately boxed versions for your class. It's a very popular game.)

**Color the coins. Laminate or cover both halves with clear contact paper. Hinge the two halves.**

*back of gameboard*



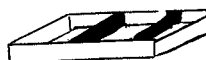
*Leave 1/8" between sections  
when you hinge them so  
gameboard will fold  
easily for storage*

## Game Cards

Locate the game cards in the cardstock portion of this packet. They'll work for any version of the game. Laminate. Cut apart.

## Money Box

Use a junk box to hold coins. Using a hot glue gun or tacky glue, glue cardboard dividers into box to separate coins if you're making the mid-level or challenging version of the game. Label each section by stamping the coin and how many in bottom of box.



17 pennies



12  
nickels



7  
dimes

For the easy version of Dig for Buried Treasure, you'll need 36 pennies. For the mid-level version, you'll need 17 pennies, 12



**Store box of coins, game cards, and gameboard in a standard box.**

**Box ingredients→** gameboard money box  
one penny to push one penny pusher  
money starter cards (4)  
standard box for storage

gamebox. Cover with clear contact paper. Using a hole punch, punch a hole in the side of the box, low and right, in front of the penny for the “penny pusher” to go through.

- ## Penny Pusher

Make the penny pusher by gluing a 1/2 X 1 piece of heavy tag to the end of an unsharpened pencil. Use super tacky glue or a hot glue gun. Or, get a parent to do doweling and wood for you.



## Money Box

Use a junk box to hold coins. It will need to be divided if you're making the challenging version of Penny Push (see Dig for Buried Treasure for directions). The easy version will take 100 pennies. The challenging version will require 20 pennies, 15 nickels, 15 dimes, and 4 quarters.

## Money Starter Cards

## Gameboard

Locate Penny Push gameboard in blacklines. Color. Label each toy on the gameboard with a price. If you're making the easy version, price each toy less than ten cents; toys can be priced up to twenty-five cents for the challenging version. Glue the gameboard to the bottom of the

**Locate Penny Push money starter cards in cardstock portion of this packet. Color, laminate, and cut apart. Store money starter cards, money box, penny pusher, the one penny to push, and gameboard in a standard box.**

---

## Shopping Spree— Grades K, 1 and 2 (2-4 children)

---

**Box ingredients→** gameboard                      one die  
money box                      game markers (4)  
toys (28)                      money starter cards (4)  
standard box for storage

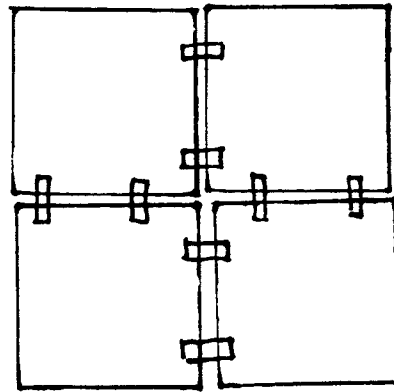
### PLAYING INSTRUCTIONS—Easy and challenging

1. Take a money starter card. Cover it with the appropriate coins. If this is the easy version, each player will start with 25 pennies. If this is the challenging version, you'll be taking 10 dimes to start. (The game can be made still more challenging by having each player start with four quarters.)
2. Then players take turns rolling the die and moving on the gameboard.
3. If a player lands on a space with instructions, he/she follows the instructions.
4. If a player lands on a toy, he/she decides whether or not to buy.
5. Play continues this way until all players reach the end.
6. If a player goes bankrupt before reaching the end of the game, he/she begins again at start.
7. The player with least amount of money at the end of the game wins.

### MAKING INSTRUCTIONS

#### Game Boards

1. Color the coins on the game board in appropriate colors.
2. Contact or laminate each board separately. You may want to do front and back for extra sturdiness!
3. Lay the sheets down matching A to A, B to B, and then joining in center.
4. Tape the sheets together with filament tape on the back side, leaving 1/8" space between taped sheets to insure easy folding.



#### Die

Label a plain wooden or foam cube with numerals 1-6. Use a permanent black marking pen.

#### Toys (28)

Package and price 28 tiny toys. (See The Store for packaging instructions.) If you're making the easy version, price toys ten cents and under; price up to thirty cents for challenging version.

#### Game Markers (4)

Use unifix cubes in four different colors or other small colored markers.

#### Money Box

Use a junk box to hold coins. It will need to be divided if you're making the challenging version of Shopping Spree (see Dig for Buried Treasure for directions). The easy version will take 100 pennies. The challenging version will require 40 dimes, 20 nickels, and 20 pennies. If you're planning to have players start with four quarters each, your money box should contain 16 quarters, 20 dimes, 20 nickels, and 20 pennies.

### Money Starter Cards

Locate Shopping Spree money starter cards in cardstock portion of this packet. Color,

laminate, and cut apart. Store money starter cards, money box, game markers, toys, die, and gameboard in a standard box.

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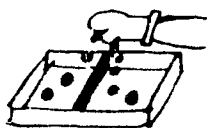
## Drop the Money— Grades 1 and 2 (1-4 children)

---

**Box ingredients→** money drop boxes (6)                      record sheets  
standard box for storage

### PLAYING INSTRUCTIONS

1. Drop the money.



2. Write down what happened.

$$\boxed{17} + \boxed{8} = \boxed{25¢}$$

### MAKING INSTRUCTIONS

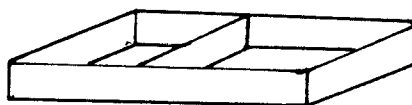
#### Drop Boxes (6)

You'll need:

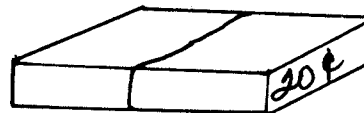
- 6 junk boxes with tops
- 6 pieces of heavy cardboard, 4 X 1
- heavy craft glue or hot glue gun
- patterned contact paper and elastic for each box, if desired
- pennies, nickels, dimes, and quarters

1. Construct junk boxes.

2. Glue cardboard pieces into bottoms of junk boxes, using generous amounts of glue.



3. Cover junk box tops with patterned contact paper and band with elastic, if desired.
4. Put a different sum of money in each box.  
First grade teachers may want to put a different number of pennies in each box to start, then mixtures of pennies, nickels, and dimes later. Second grade teachers may want to include nickels, dimes, and quarters, creating larger sums in each box. In any case, label each box with the amount you put in.



#### Record Sheets

Locate Drop the Money record sheet in blacklines. Run copies. Store record sheets and money drop boxes in standard box.

---

## Stamp the Price— Grades 1 and 2 (1-4 children)

---

**Box ingredients→**    small toy items (16-20)  
                                 coin stamps (8) and stamp pads (1 or 2)  
                                 record sheets            standard box for storage

### PLAYING INSTRUCTIONS

1. Choose something to buy.
2. Write the name and price of your item.
3. Stamp the price.
4. Repeat steps 1-3 until your record sheet is filled.

### MAKING INSTRUCTIONS

#### Small Toy Items (16-20)

See The Store making instructions for toy ideas and packaging/labeling directions.

#### Coin Stamps (8)

You'll need two penny stamps, two nickel stamps, two dime stamps, and two quarter stamps. These are available through The Math Learning Center. We have glued real coins on each of our coin stamps so the children can easily recognize each stamp. Get stamp pads from your school office or any other source of business supplies.

#### Record Sheets

Locate Stamp the Price record sheet in black-lines. Run copies. Store record sheets, coin stamps, stamp pads, and small toys in standard box.

---

## Stamp the Price Twice— Grades 1 and 2 (1-4 children)

---

**Box ingredients→**    small toy items (16-20)  
                                 coin stamps (8) and stamp pads (1 or 2)  
                                 record sheets            standard box for storage

### PLAYING INSTRUCTIONS

1. Choose an item to buy.
2. Stamp the price.
3. Find other ways to stamp the price. If you run out of room on the front, turn your paper over.

### MAKING INSTRUCTIONS

See Stamp the Price for making instructions. The only difference between the two games is the record sheets. Many teachers choose to keep both record sheets in the same box rather than making the game twice.

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## Coin Stamp Booklets— Grades 1 and 2 (1-4 children)

---

**Box ingredients→** record sheets  
coin stamps (8) and stamp pads (1 or 2)  
standard box for storage

### PLAYING INSTRUCTIONS

1. Pick out a book page for your coin stamp booklet.
2. Figure out different ways to stamp out the amount of money on the booklet cover using the coin stamps.
3. After you've completed the page, you may cut it apart and staple it to make a small book.

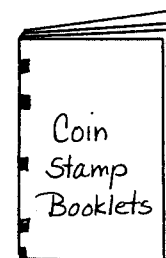
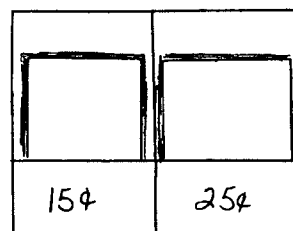
### MAKING INSTRUCTIONS

#### Coin Stamps (8)

You'll need two penny stamps, two nickel stamps, two dime stamps, and two quarter stamps. We glue real coins on each of our coin stamps so the children can easily recognize each stamp. Get stamp pads from your school office or any other source of business supplies.

#### Record Sheets

Locate Coin Stamp Booklet record sheets in blacklines. Run copies of each. You can buy student folders, the kind with the pocket at the bottom, cut them down slightly to fit in your box, and tape them together to hold the record sheets.



Store record sheets, coin stamps, and ink pads in standard box.

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## Shop the Ads— Grades 1 and 2 (1-4 children)

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**Box ingredients→** catalog and newspaper ads  
newsprint, 12 X 18                      gluesticks or paste  
coin stamps (4)                      oversized stamp pad  
dollar stamp, five-dollar stamp, ten-dollar stamp  
standard box for storage

### PLAYING INSTRUCTIONS

1. Choose an ad for something you'd like to buy.
2. Paste your ad on a piece of paper.
3. Use the money stamps to stamp out how much you'd have to pay.

### MAKING INSTRUCTIONS

#### Catalog and Newspaper Ads

Have students or parents cut ads from newspapers or catalogs of things children would be interested in buying: toys, games, bikes, scooters, computer or video equipment, etc. Make sure each ad is clearly labeled with

its real price. It helps to keep all ads in a junk box inside the game box.

#### **Newsprint**

Fold 12 X 18 newsprint in half so it will fit in your box.

#### **Coin Stamps**

You'll need one penny stamp, one nickel stamp, one dime, and one quarter stamp.

#### **Dollar Stamps**

You'll need a dollar stamp, a five-dollar stamp, and a ten-dollar stamp. These can be purchased, along with an oversized ink pad, from Lakeshore or other educational supply outlets. An alternative to stamps is to run copies of the fake bills from the blackline section of Box It or Bag It Mathematics Teachers Resource Guide, Grades 1-2. Cut the bills apart and store them in tag pockets. Children can glue these down. Store fake bills or bill stamps and ink pad, coin stamps, newsprint, and ads in a standard box.

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## **Park and Shop— Grades 1 and 2 (2-4 children)**

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See Box It or Bag It Mathematics Teachers Resource Guide, Grades 1 and 2, MONEY, Park and Shop, for group introduction to this activity.

**Box ingredients→**    die                      gameboard                      game markers (4)  
40 dimes, 20 nickels, and 30 pennies in coin tubes  
money starter cards  
standard box for storage

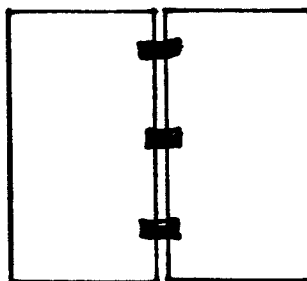
#### **PLAYING INSTRUCTIONS**

1. Take turns. Roll the die. Move your marker correct number of spaces. If you want to buy what's in the space you land on, pay the correct amount. If you don't want to buy it, that's O.K.—just stay there until your next turn. If the space you land on says, "Earn five cents", get five cents. If it says, "Pay five cents", give up five cents. If you land on a space where someone's already bought the item, you can buy it, too—just give up the correct amount.
2. Keep playing until everyone's off the board. The player who spent closest to \$1.00 without going bankrupt wins.

#### **MAKING INSTRUCTIONS**

##### **Gameboards**

Locate Park and Shop gameboard in tag portion of packet. Color and laminate or contact. Hinge on the back with filament tape. This way it will fold to go in your box.



*Leave 1/8" between sections so gameboard will fold easily for storage*

**Game Markers (4)**

Use unifix cubes in four different colors or other brightly colored markers.

**Die**

Use a wooden or foam cube to make one die, dotted or numbered 0-5.

**Money in Coin Tubes**

Put 40 dimes in a penny tube, 20 nickels in a quarter tube, and 30 pennies in a nickel tube. Mark each tube with a permanent marking pen

to the appropriate level when filled. This makes it easy to see if all the coins have been returned at cleanup time.

**Money Starter Cards (4)**

Locate Park and Shop money starter cards in cardstock portion of this packet. Color, laminate and cut apart. Store starter cards, coins in tubes, die, game markers, and gameboard in standard box.

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## Make Change— Grades 1 and 2 (1-4 children)

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See Box It or Bag It Mathematics Teachers Resource Guide, Grades 1 and 2, MONEY, Making Change, for group introduction to this activity.

**Box Ingredients→**

money box

record sheets

spinner

assorted toys (16-20)

standard box for storage

**PLAYING INSTRUCTIONS**

1. Choose a toy to buy.
2. List the item and cost on the record sheet.
3. Spin the game spinner to determine the money you will use to play.
4. Pay and use the money box to figure out how much change you get back.
5. Write the amount of change on record sheet.

**MAKING INSTRUCTIONS****Spinner**

Locate Make Change spinner top in blacklines. Assemble as directed in the Getting Started section of this packet.

**Money Box**

Use a junk box to hold coins. See Dig for Buried Treasure for directions. This box will need to be divided into five compartments; the game requires 20 pennies, 10 nickels, 10 dimes, 4 quarters, and 2 half dollars.

**Assorted Toys (16-20)**

Package and price 16-20 toys under twenty-five cents. See The Store for instructions.

**Record Sheet**

Locate Make Change record sheet in blacklines. Run copies. Store record sheets, toys, money box, and spinner in standard box.

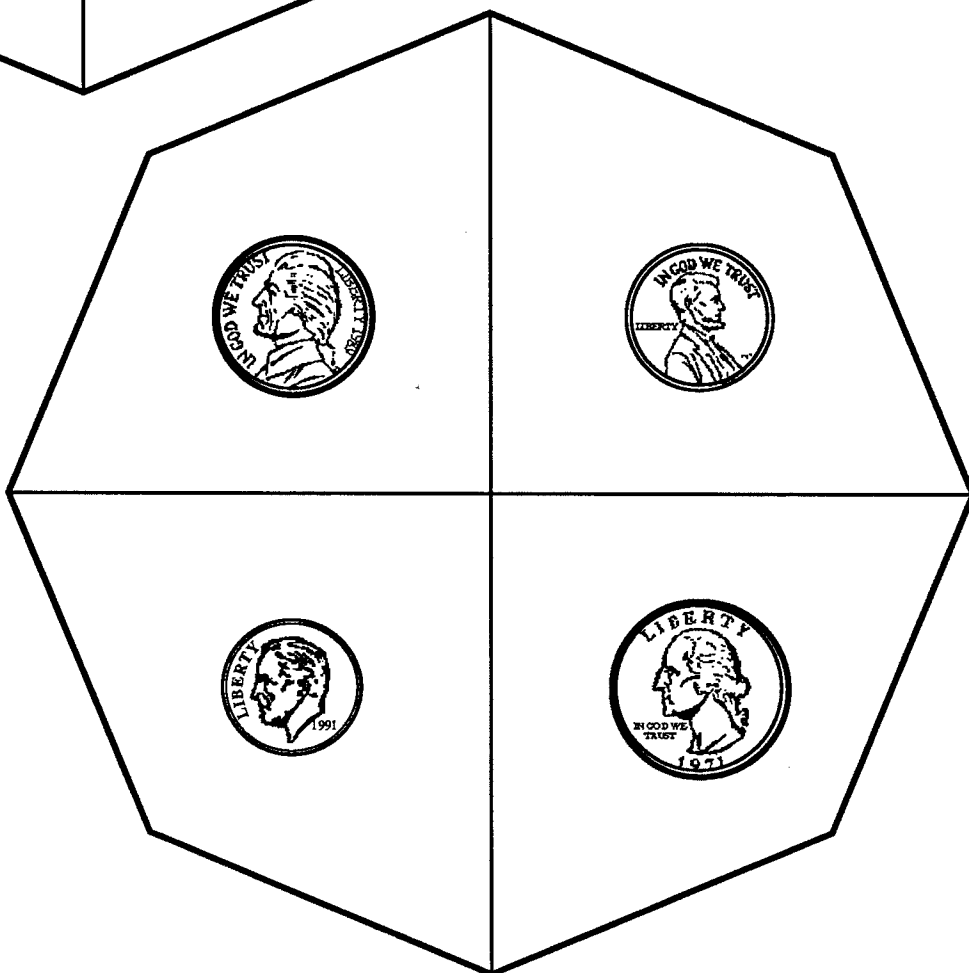
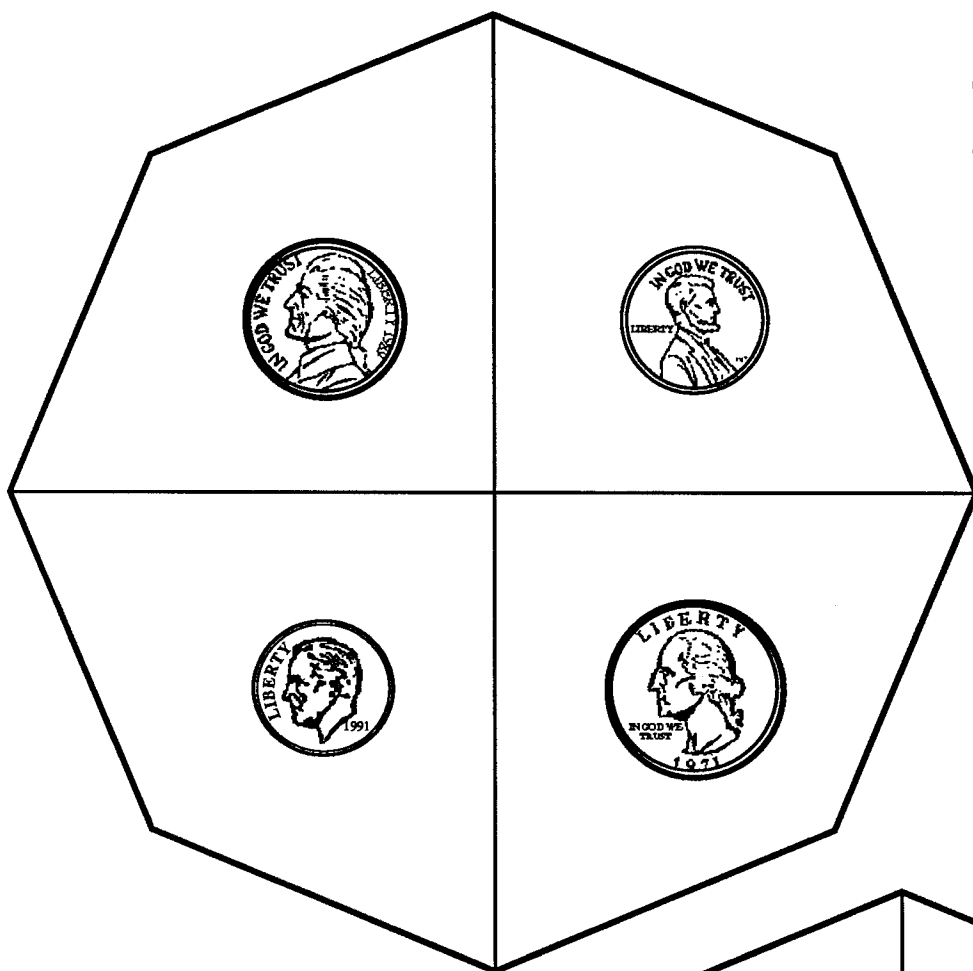
# Blacklines

Patterns, cards, spinners, and other materials you'll make for the  
Practice & Enrichment Boxes described in this packet.







## Coin Graph spinner tops

(Make with real coins)



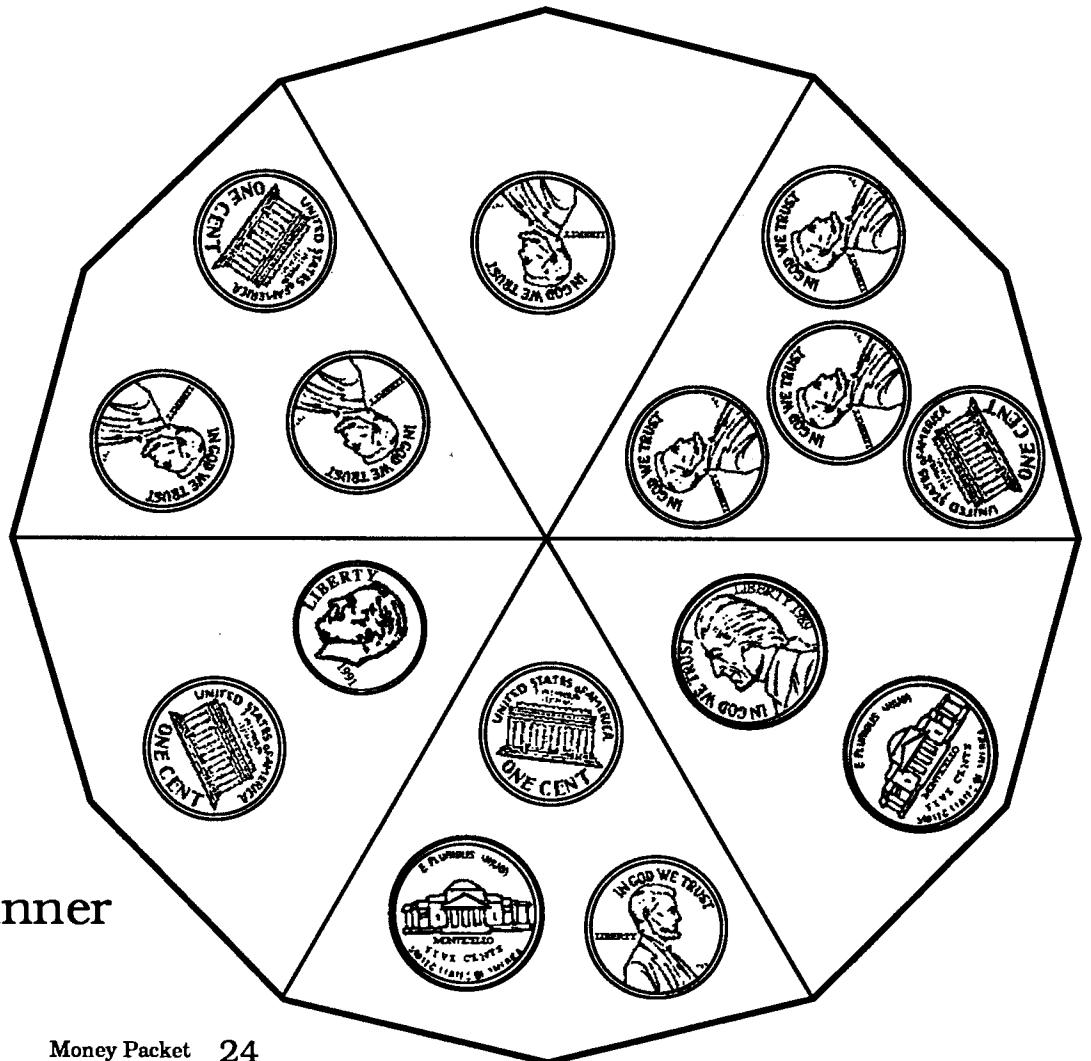
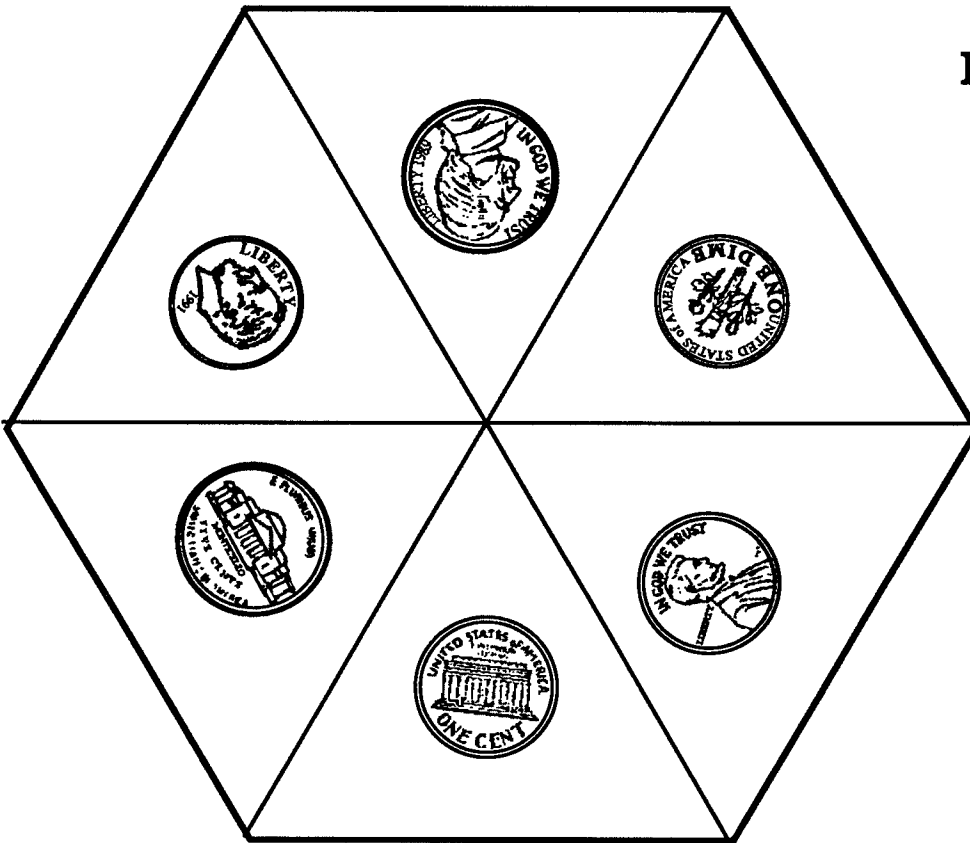
# Coin Graph

name \_\_\_\_\_

 <b>1¢</b>	 <b>5¢</b>	 <b>10¢</b>	 <b>25¢</b>

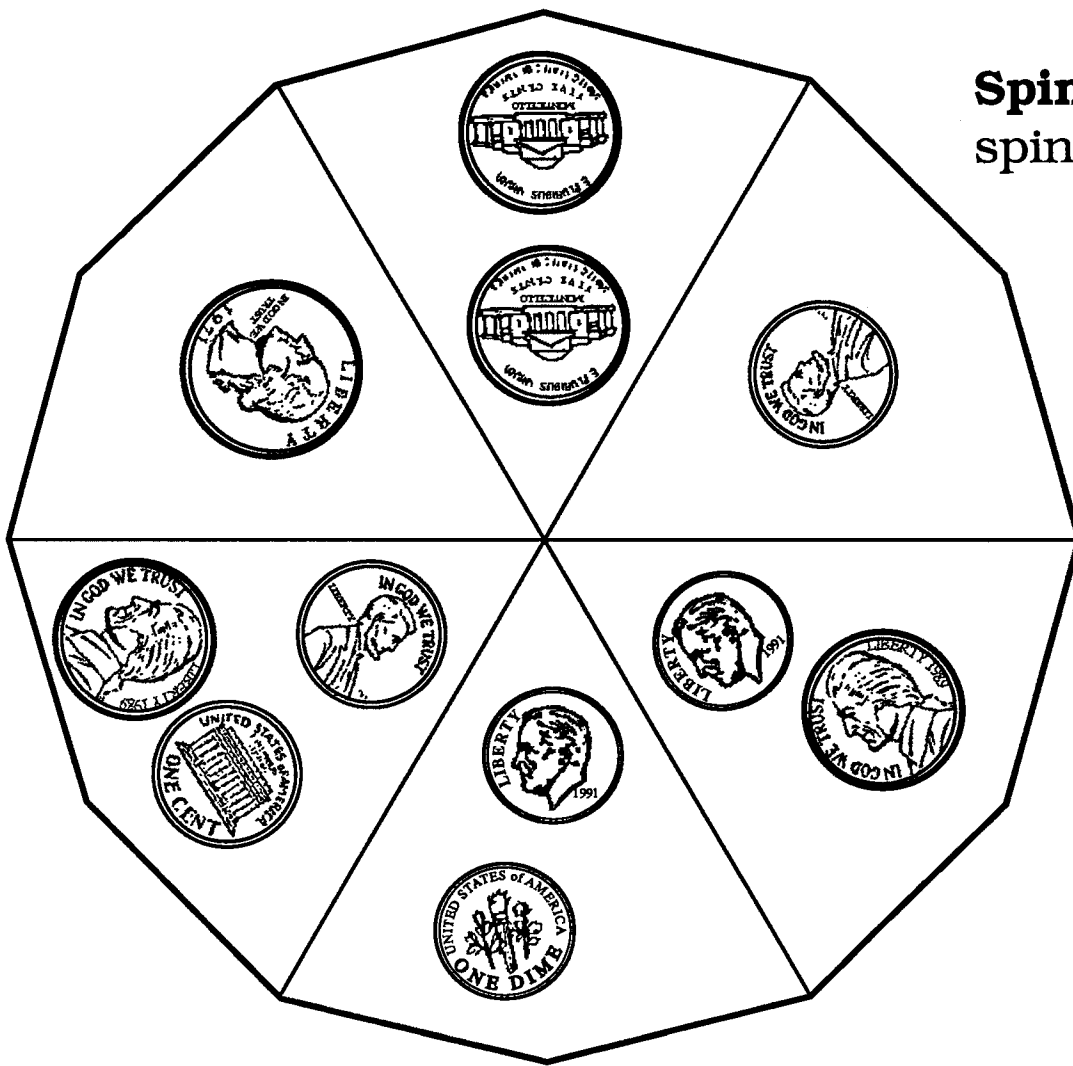
# Money March

easy spinner

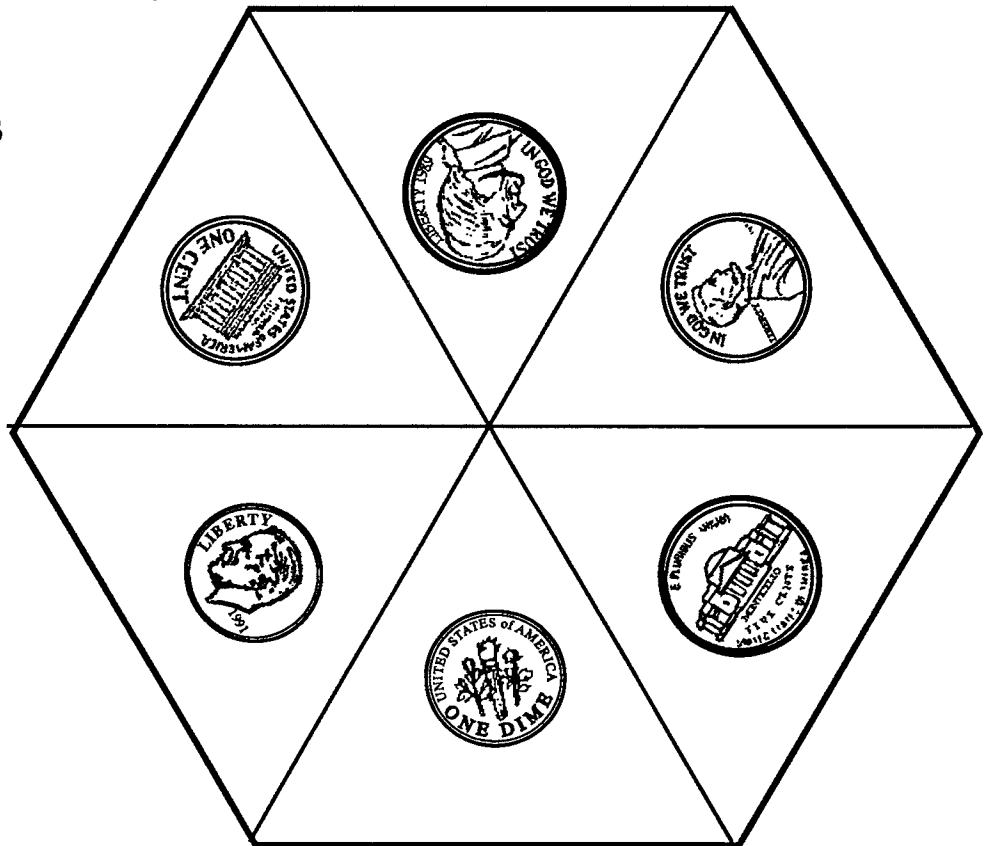


challenging spinner

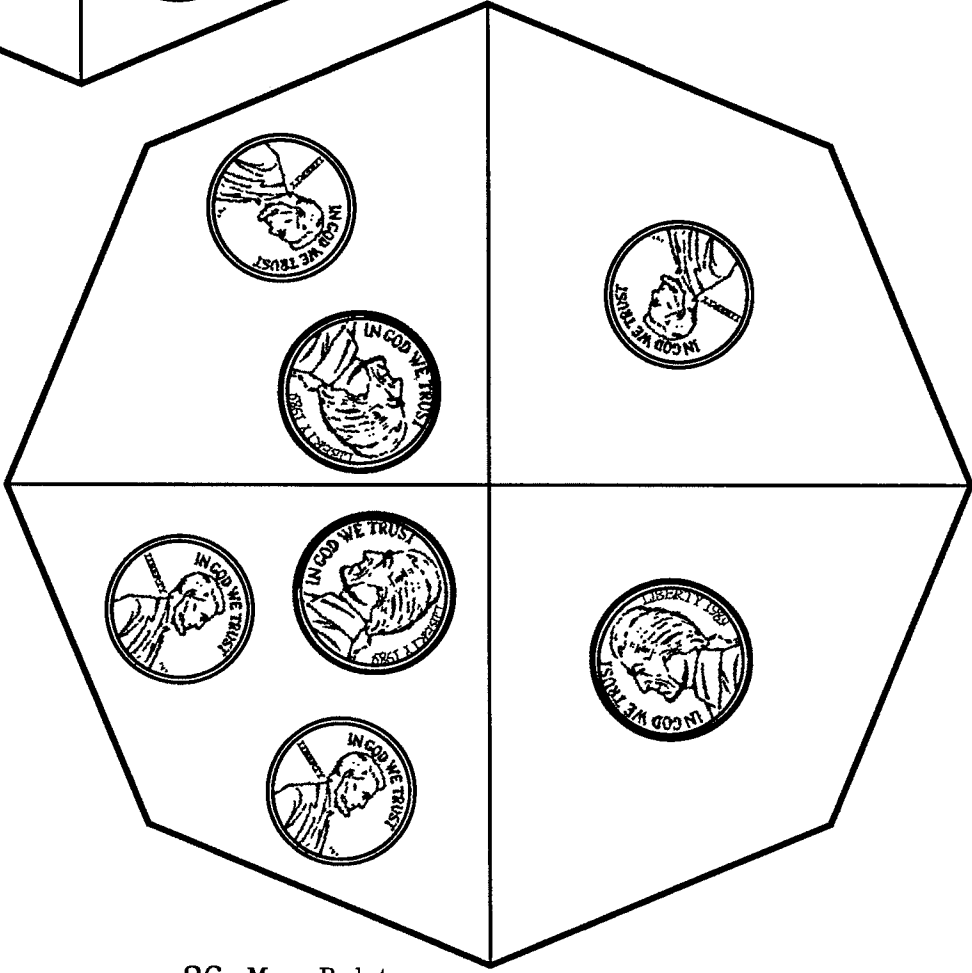
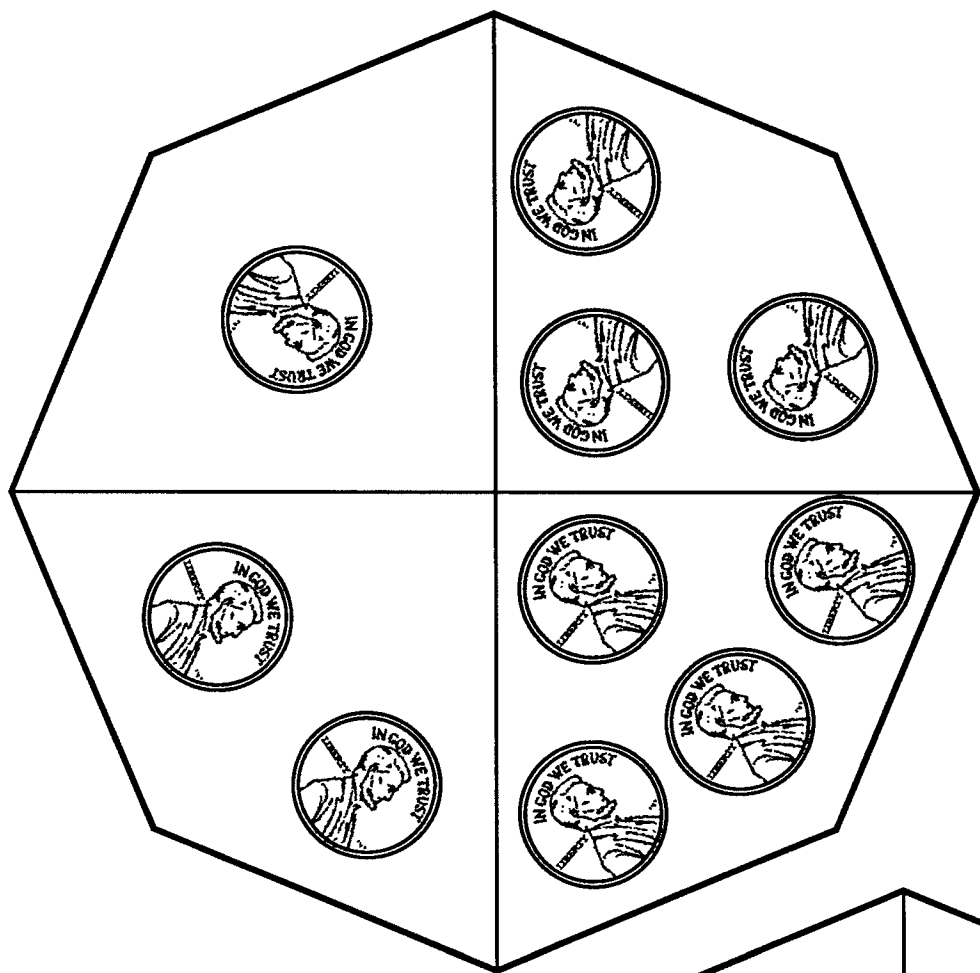
# Spin Two Dollars spinner top



# Spin Fifty Cents spinner top



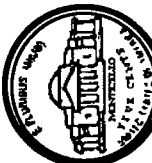
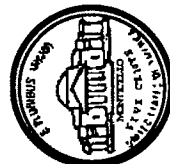
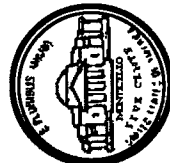
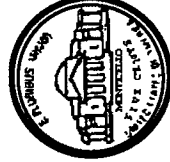
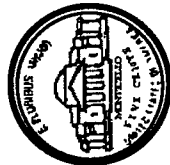
**Spin Fifty Cents**  
optional spinner tops



Spin Fifty Cents

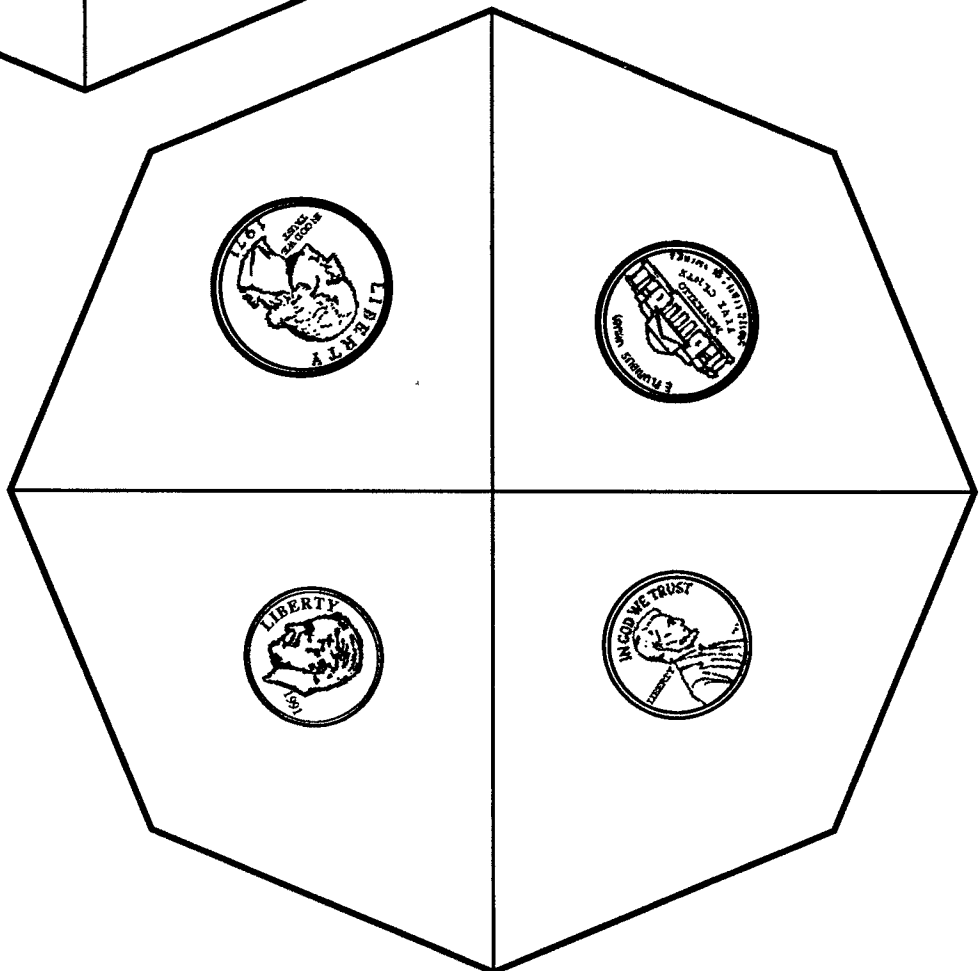
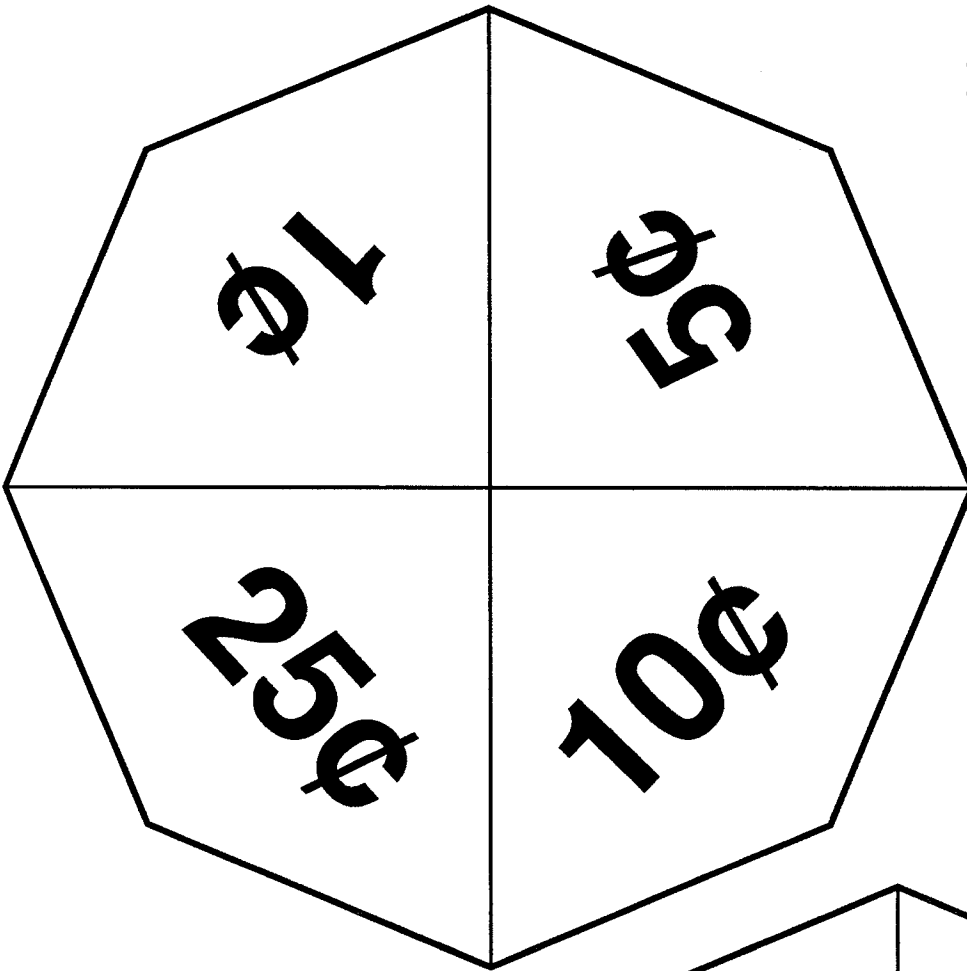


# Spin Two Dollars



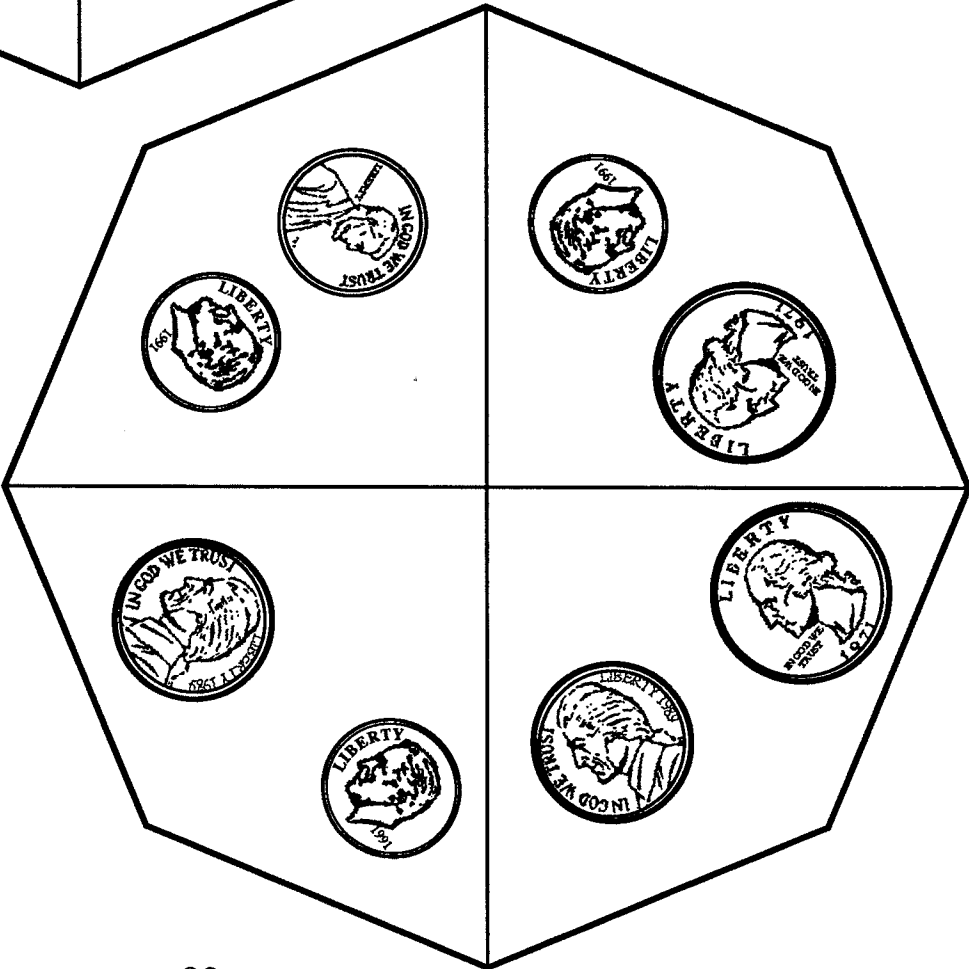
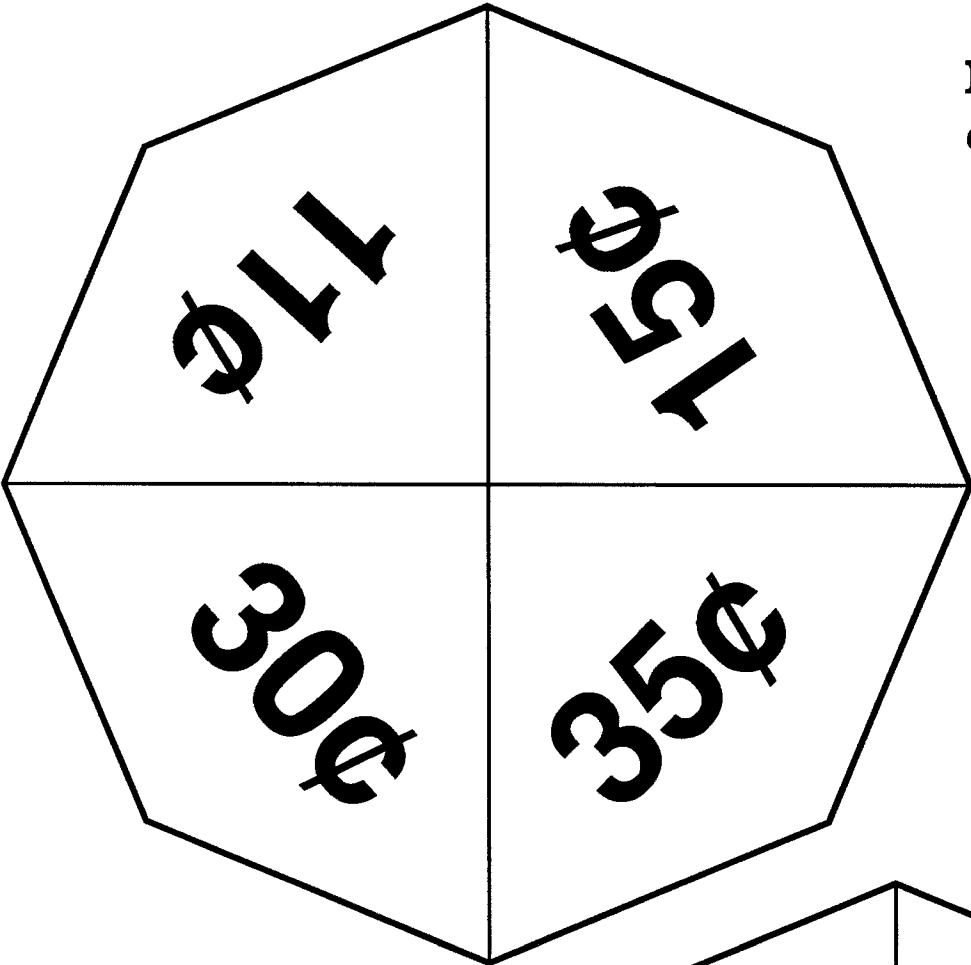
# Money Sock Boxes

easy spinners

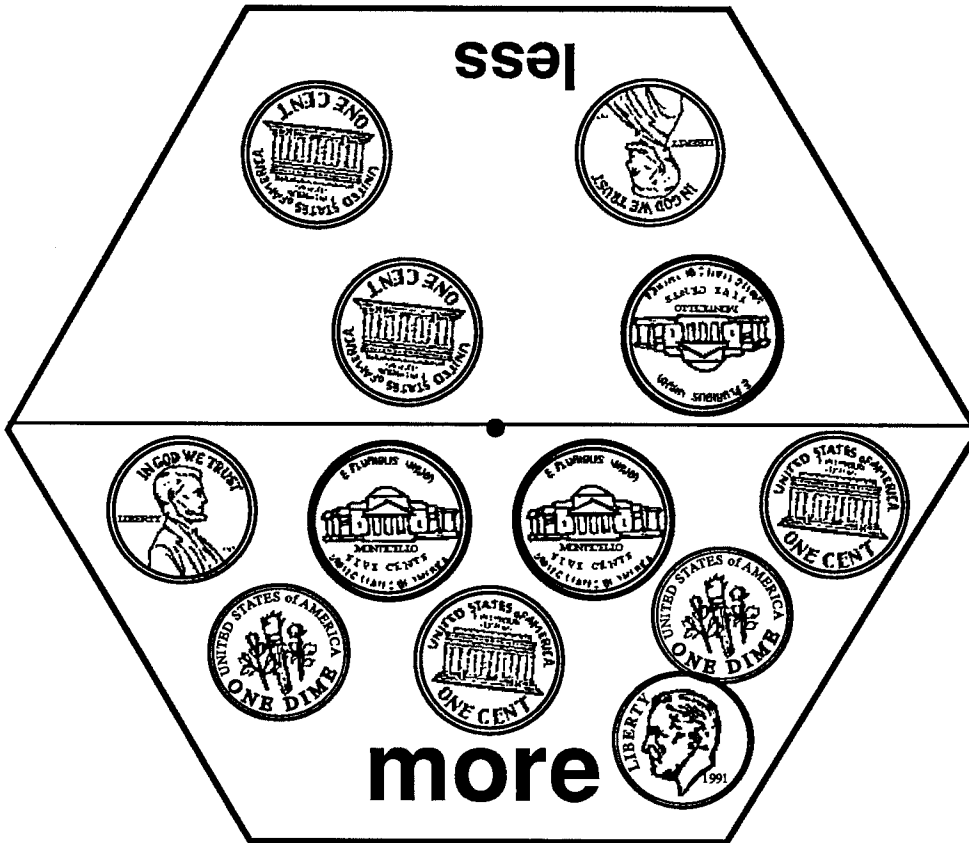




**Money Sock Boxes**  
challenging spinners

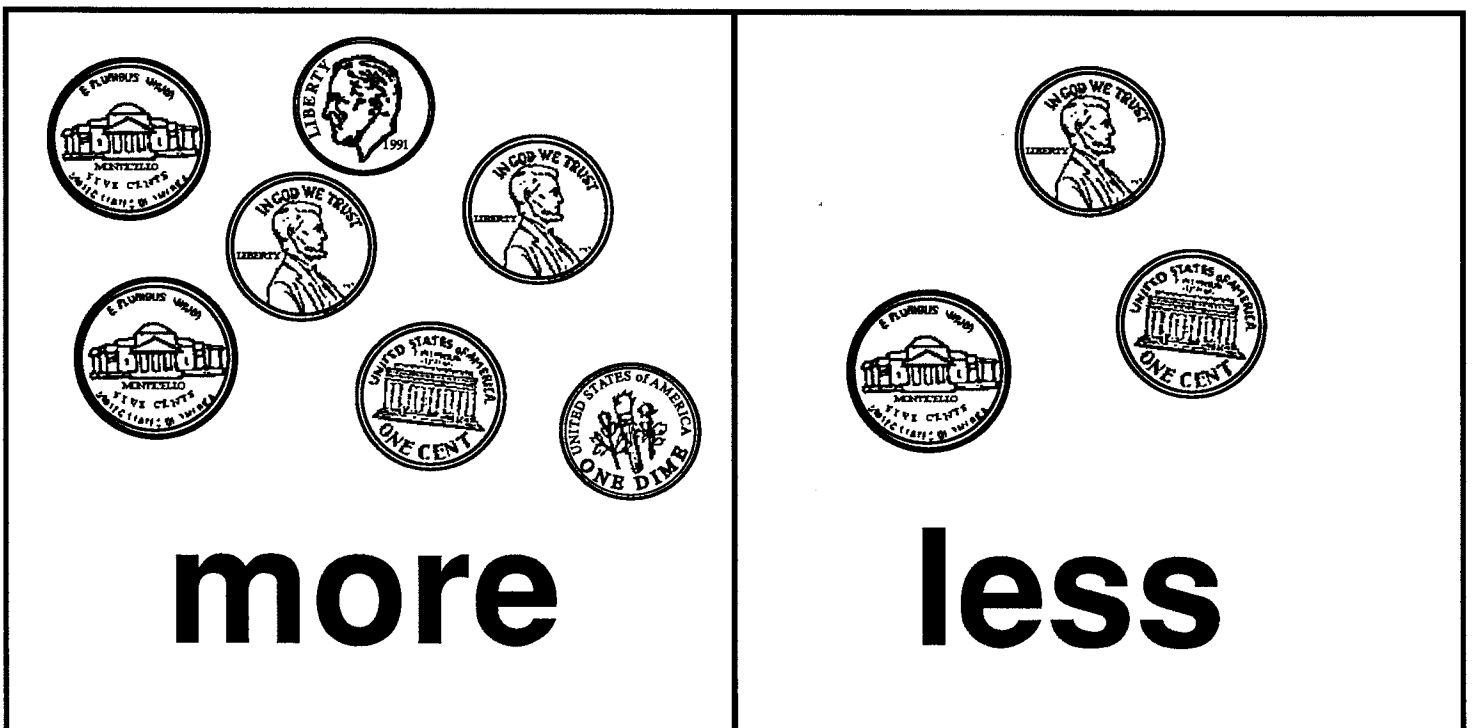


# Count, Tell, Spin and Win

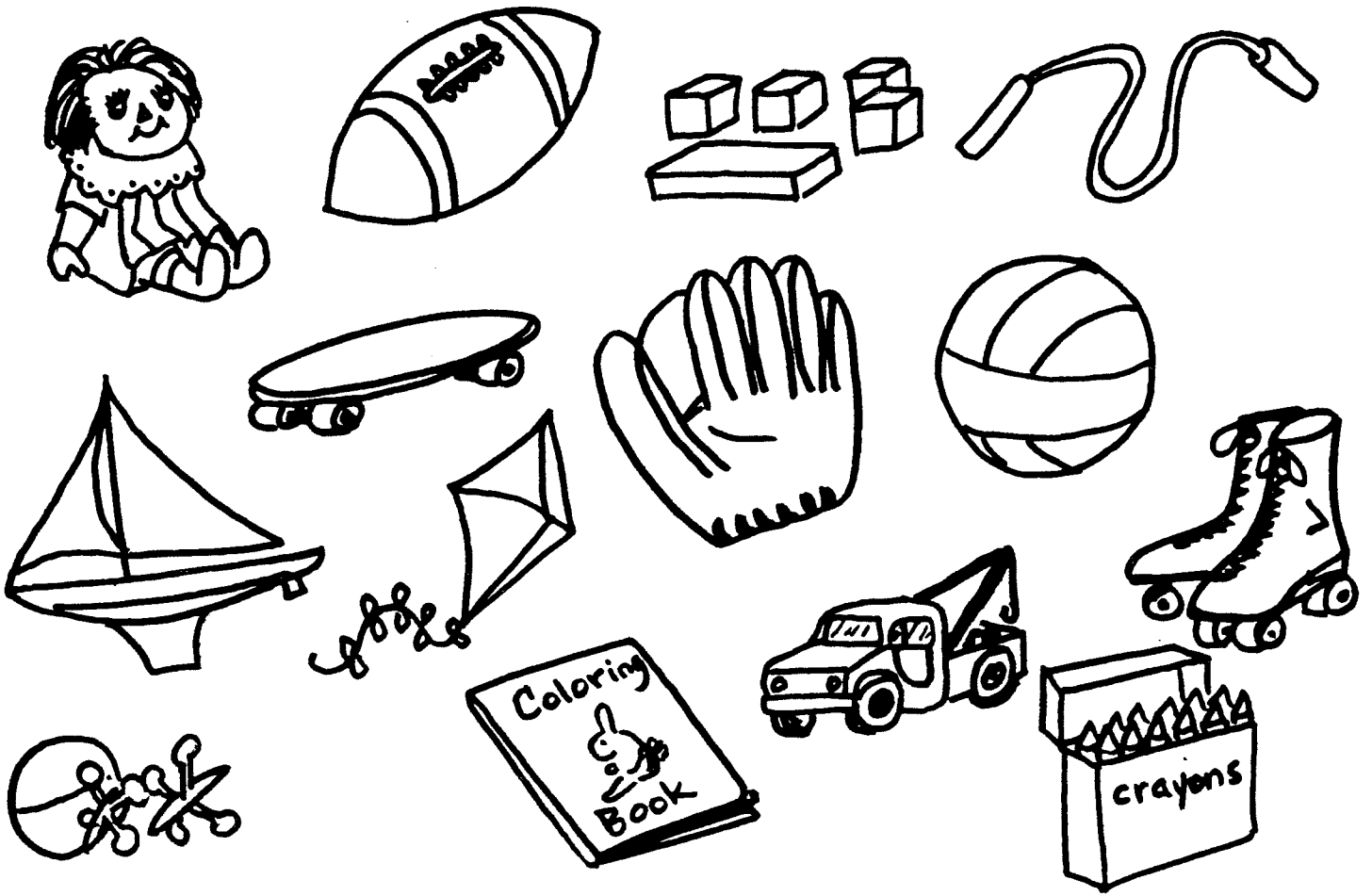


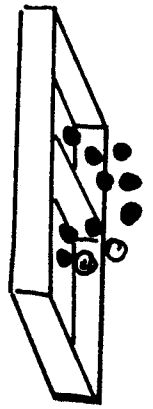
spinner top

marker cards (glue to tag)



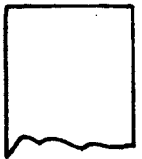
# Penny Push Gameboard



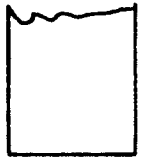


# Drop the Money

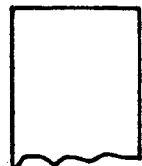
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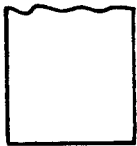
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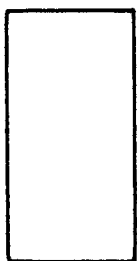
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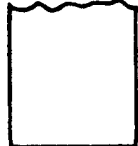
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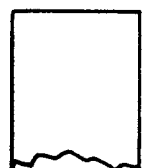
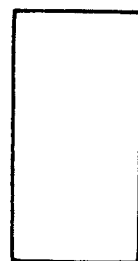
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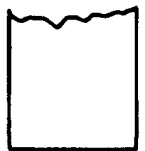
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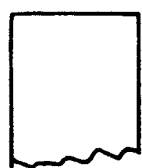
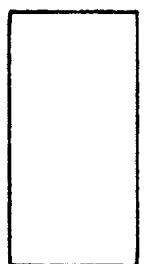
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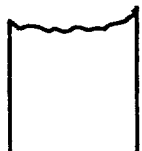
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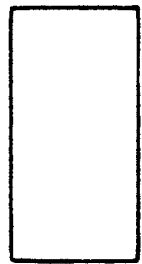
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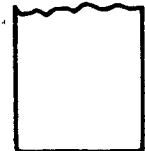
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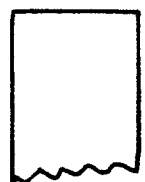
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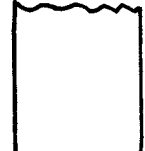
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# Stamp the Price

name \_\_\_\_\_

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Stamp the Price Twice

name \_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Coin Stamp Booklet

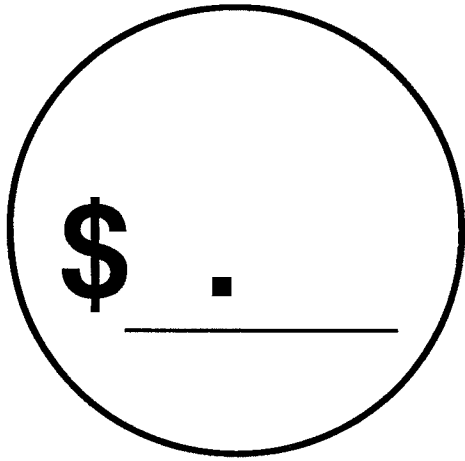
**\$ .15**

name \_\_\_\_\_



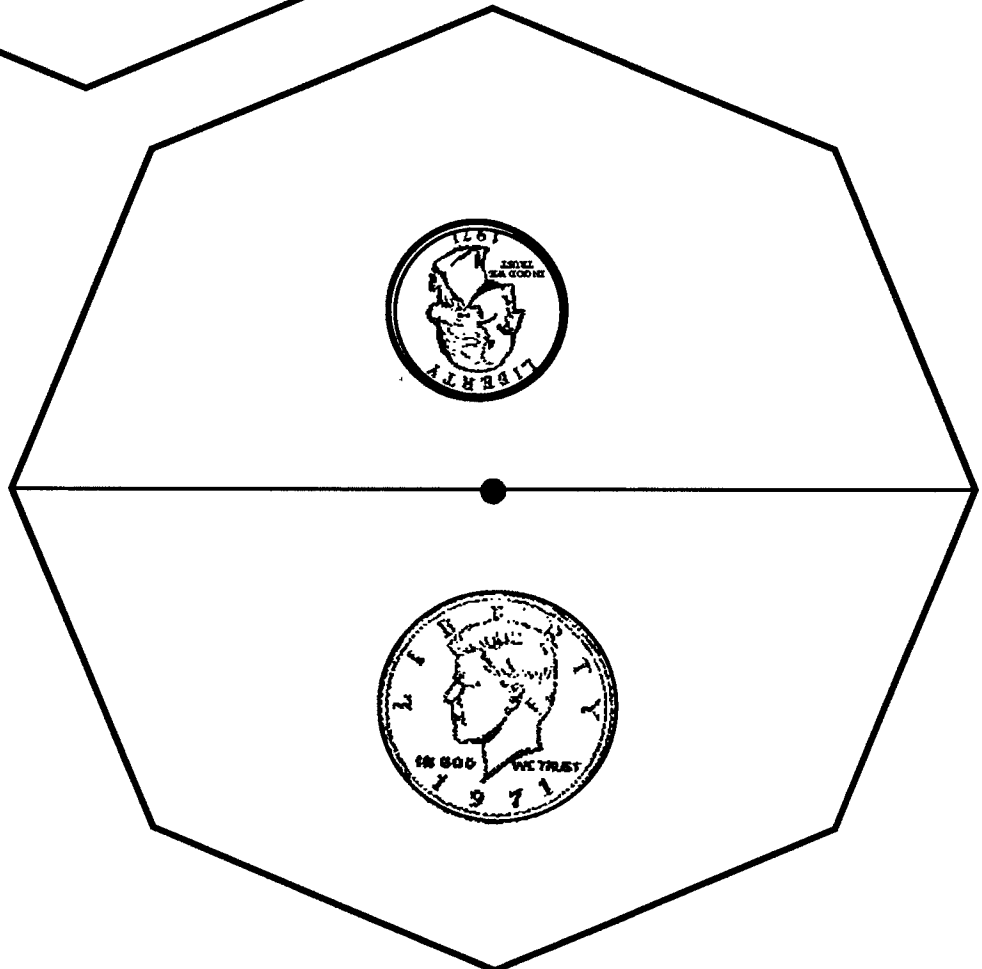
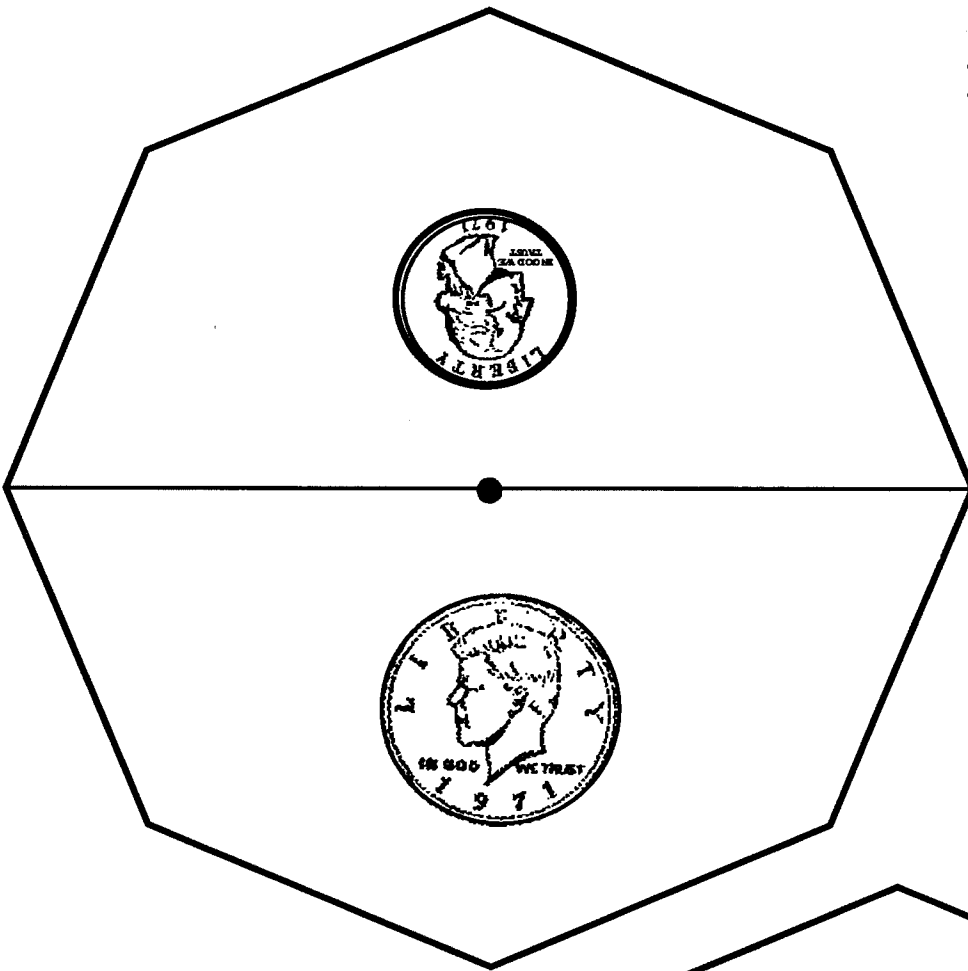
name \_\_\_\_\_





name \_\_\_\_\_

## Make Change spinner tops



# Make Change

**item**

**price**

**amount paid**

**change needed**

**item**

**price**

**amount paid**

**change needed**

**item**

**price**

**amount paid**

**change needed**

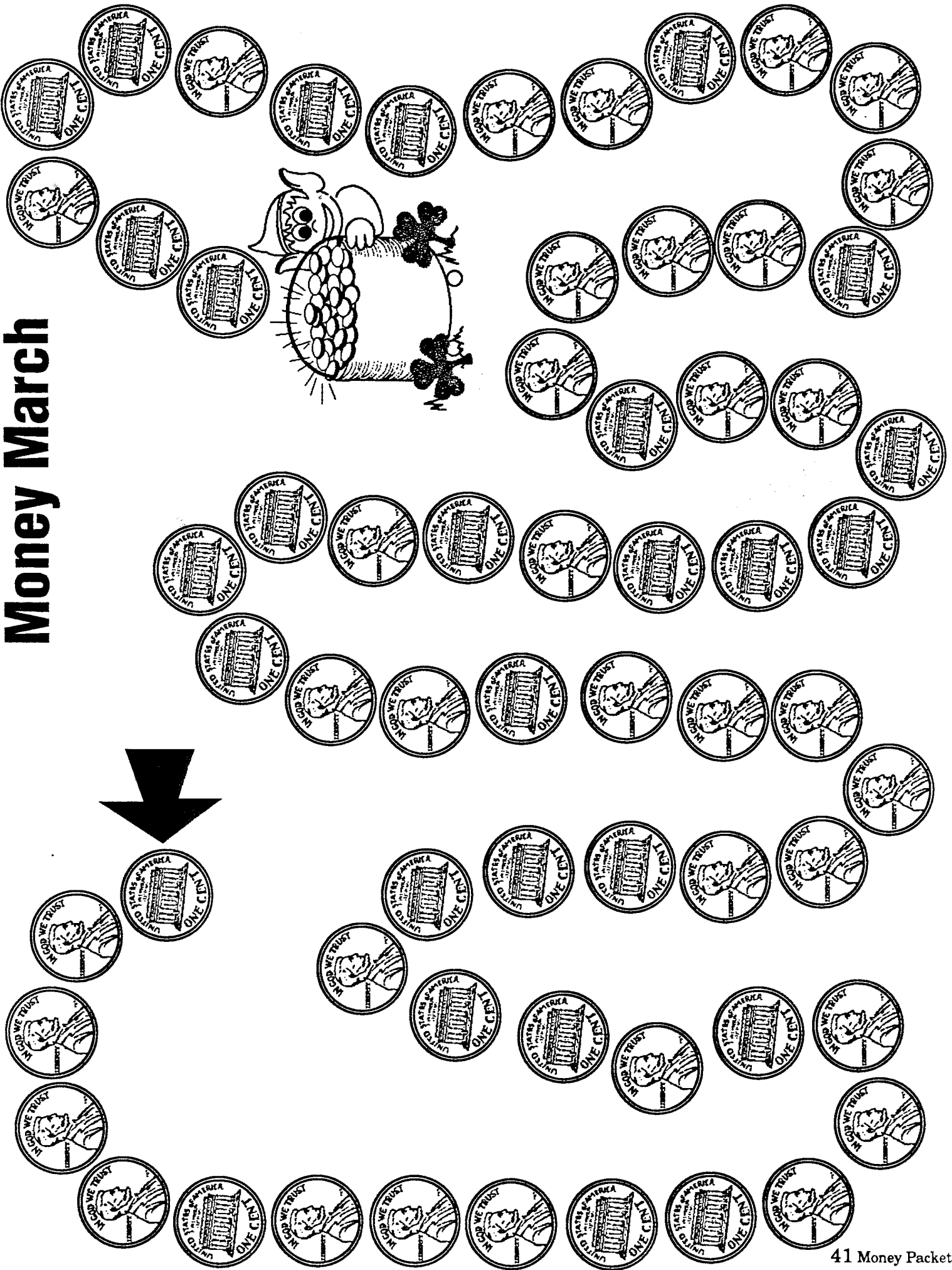
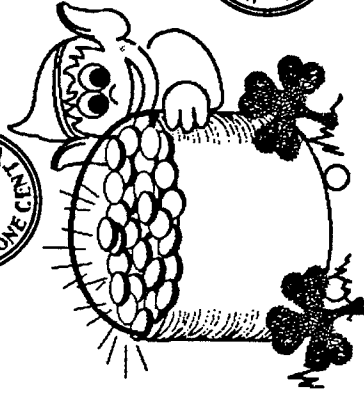
**item**

**price**

**amount paid**

**change needed**

# Money March



# Roll 25 Cents—Trading Boards



nickels



pennies



nickels



pennies



nickels



pennies



nickels



pennies

# Trading Boards—Money Trading Game



pennies



pennies



dimes



dimes



# Trading Boards—Money Trading Game



pennies



pennies



dimes

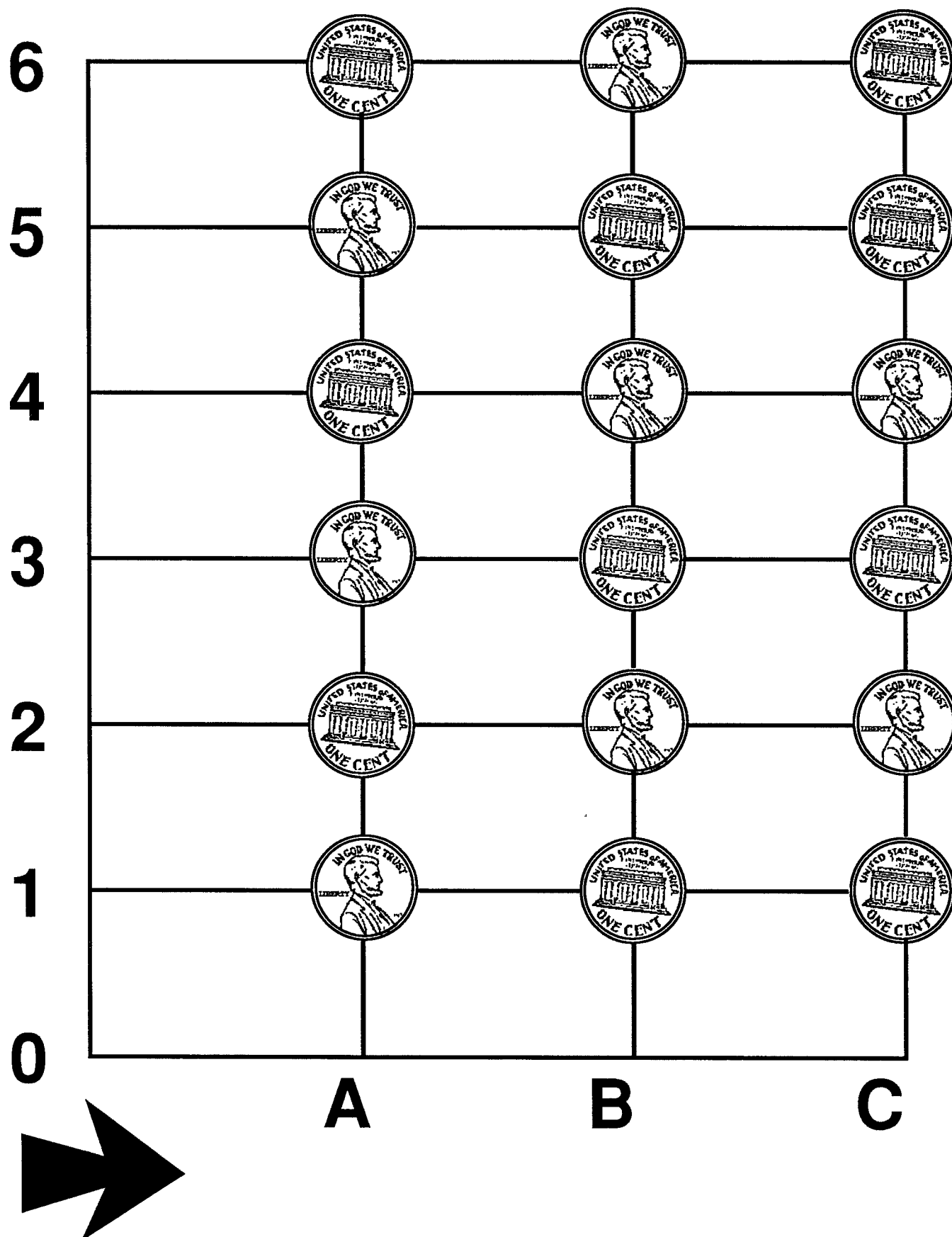


dimes



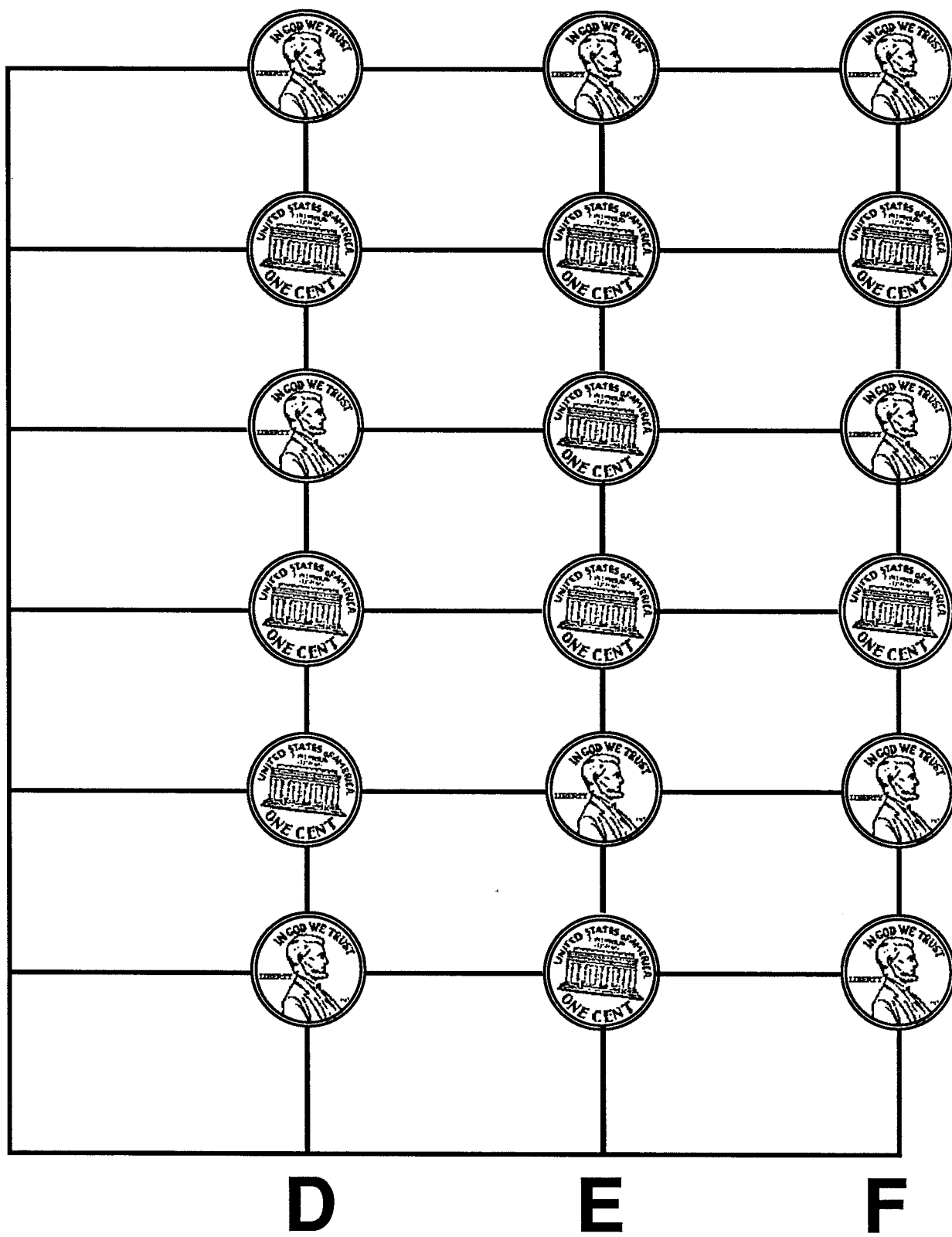
# Dig For Buried Treasure

easy gameboard



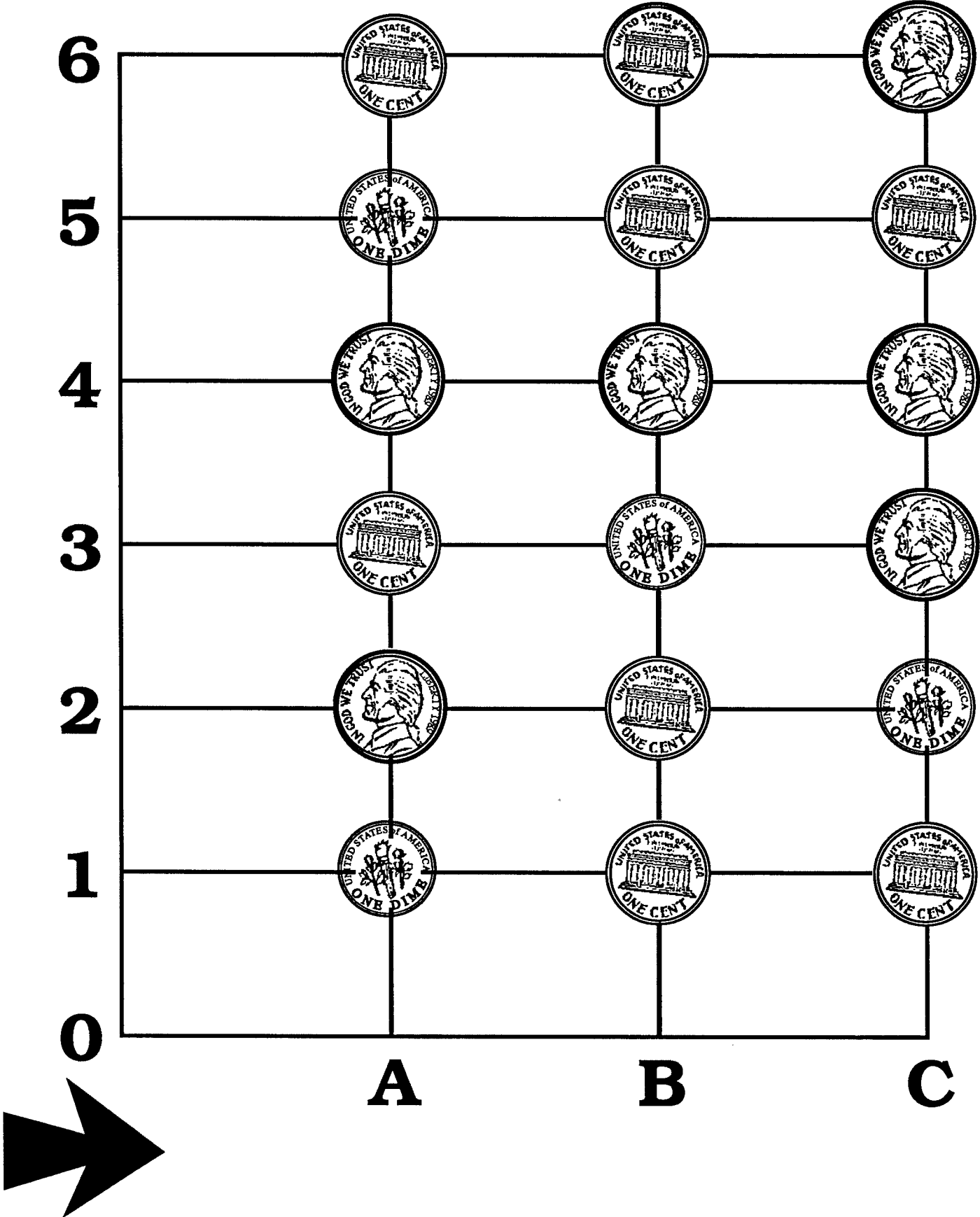


# easy gameboard

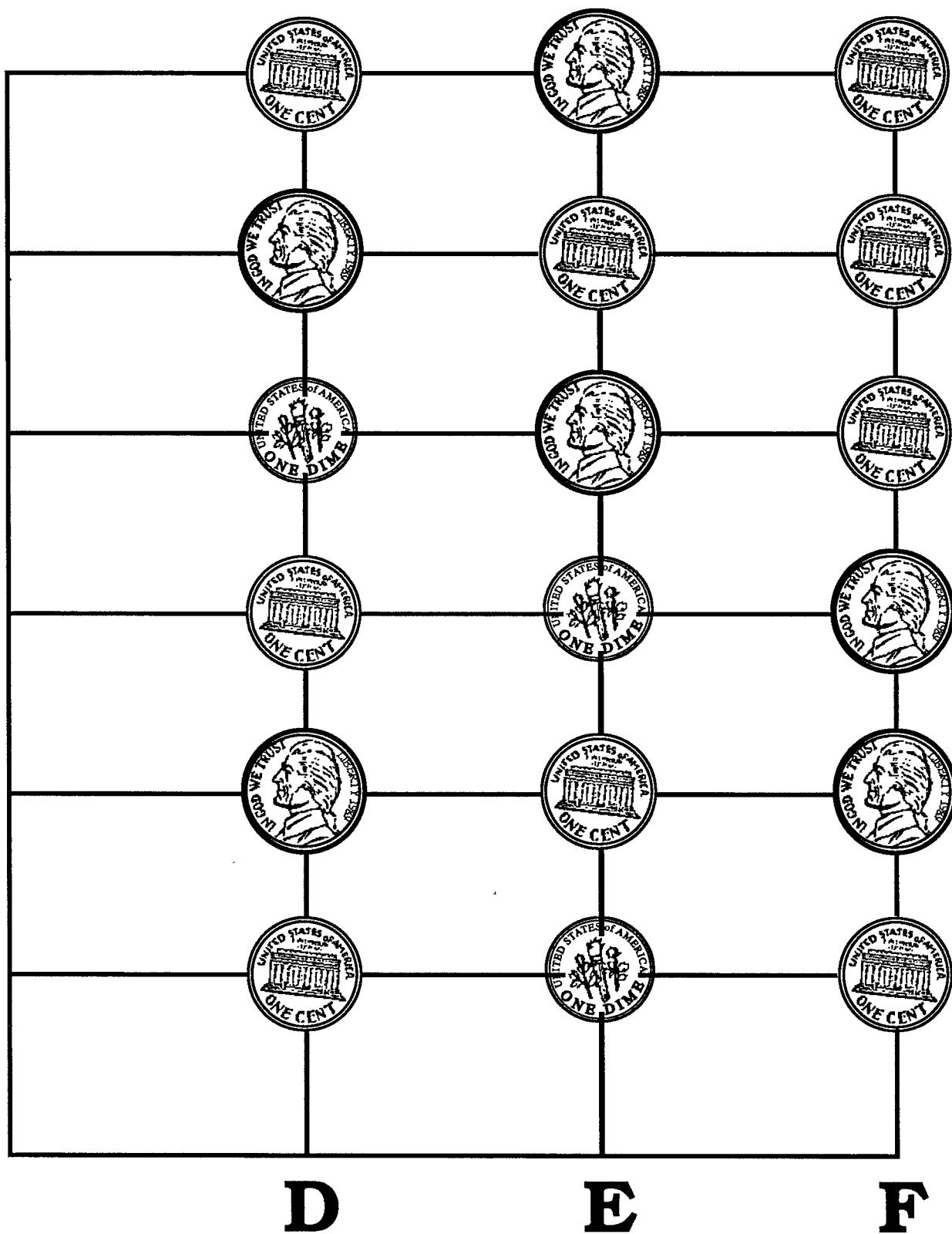


# Dig For Buried Treasure

mid-level gameboard

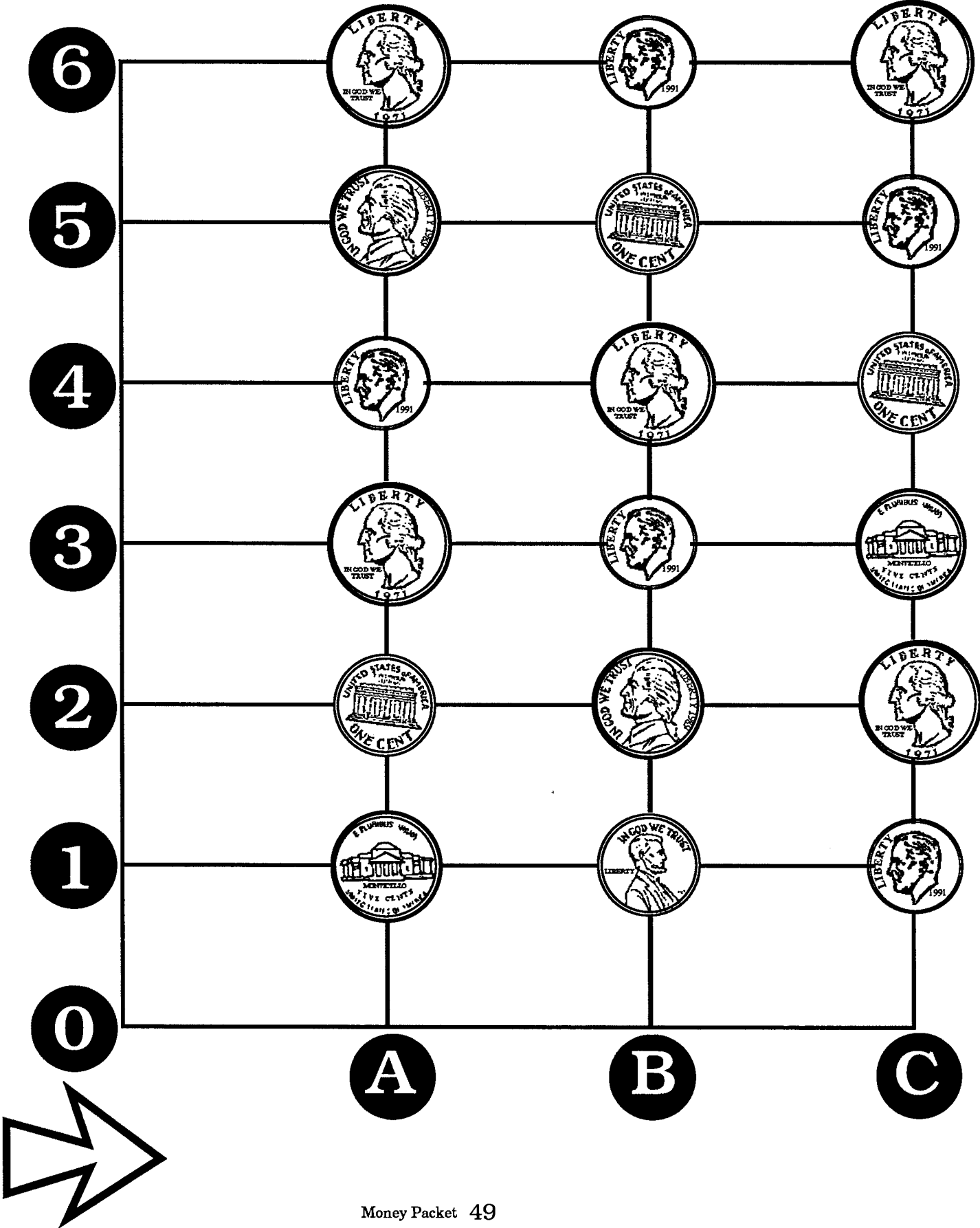


# mid-level gameboard



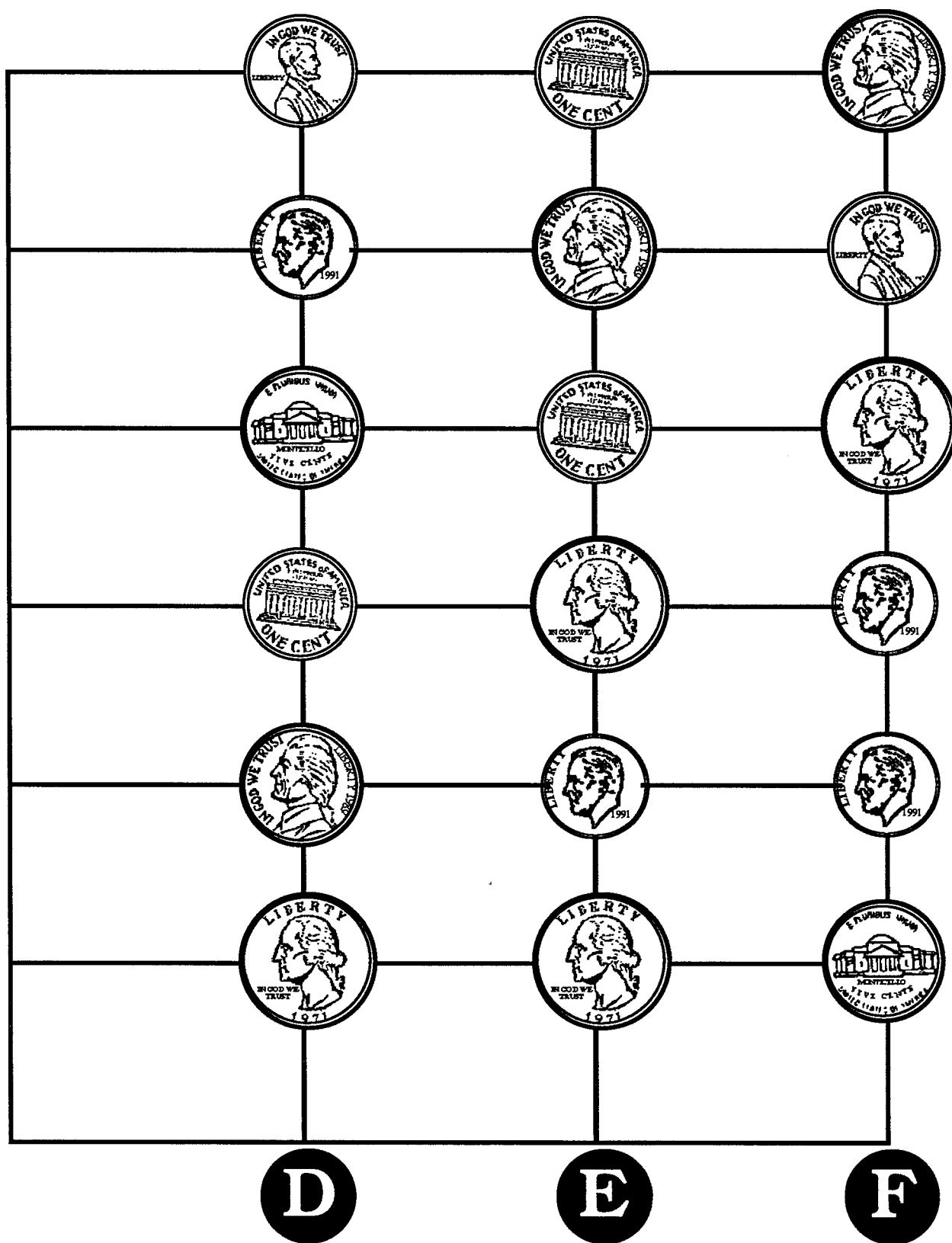
# Dig For Buried Treasure

challenging gameboard



# Dig for Buried Treasure

challenging gameboard



D, 1

D, 2

D, 3

D, 4

D, 5

D, 6

E, 1

E, 2

E, 3

E, 4

E, 5

E, 6

F, 1

F, 2

F, 3

F, 4

F, 5

F, 6

A,1

A,2

A,3

A,4

A,5

A,6

B,1

B,2

B,3

B,4

B,5

B,6

C,1

C,2

C,3

C,4

C,5

C,6

# Easy Money Starter Cards



Penny Push



Penny Push



# Easy Money Starter Cards

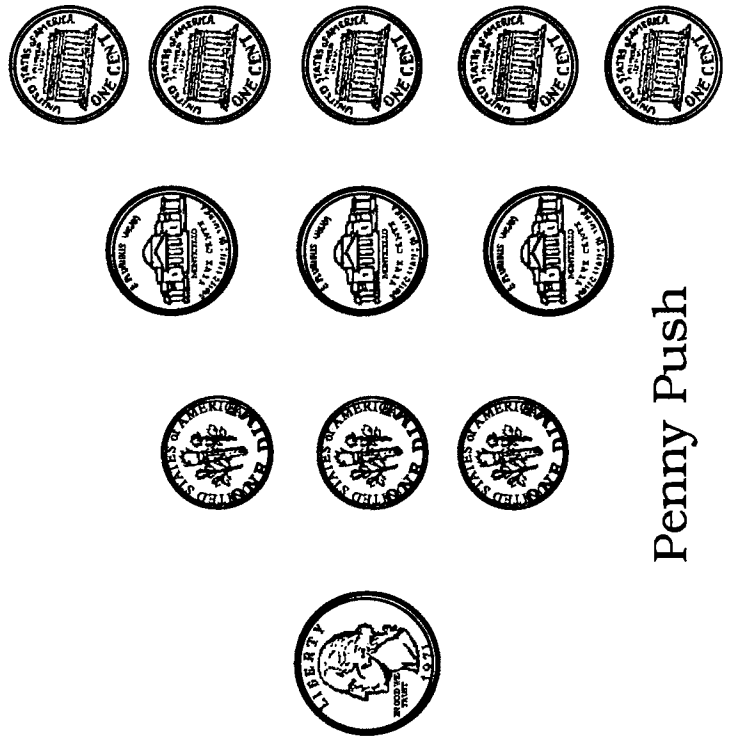
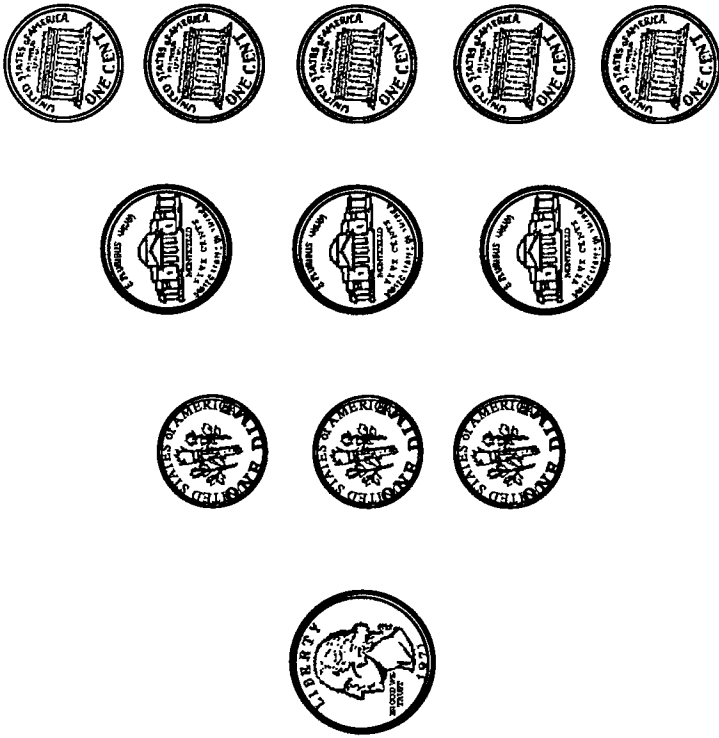


Penny Push

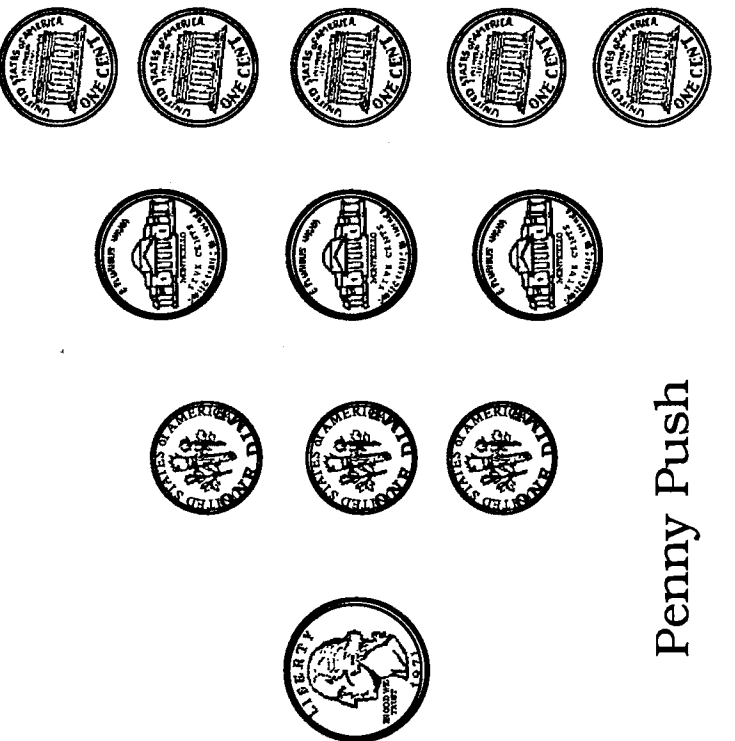
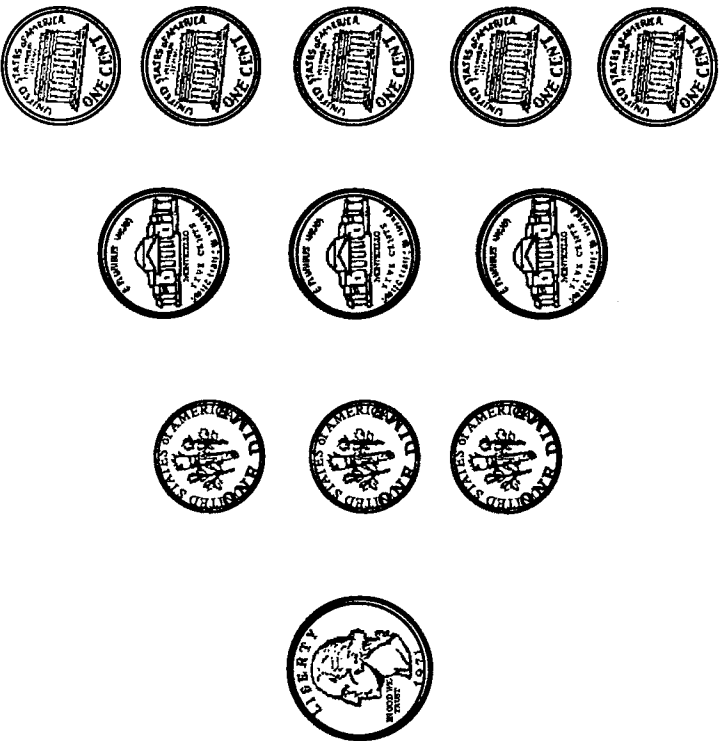


Penny Push

# Challenging Money Starter Cards

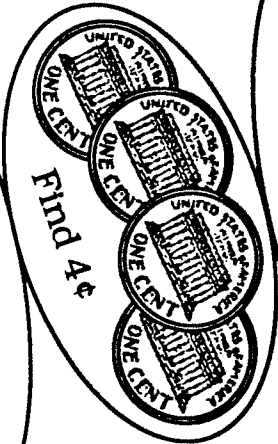
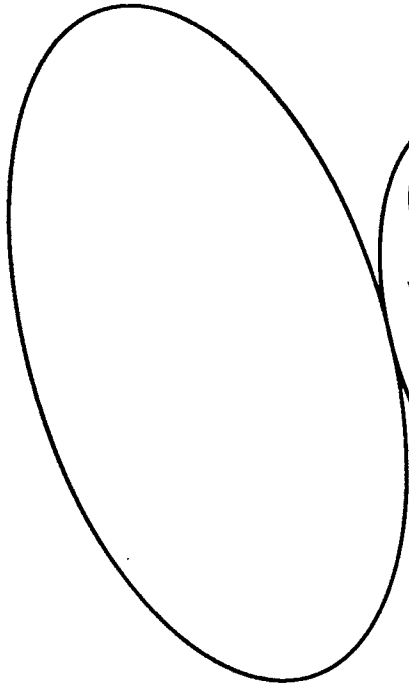


Penny Push

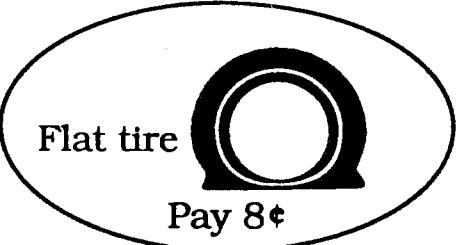
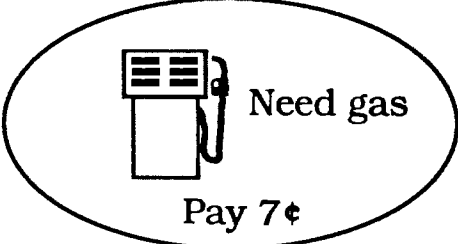
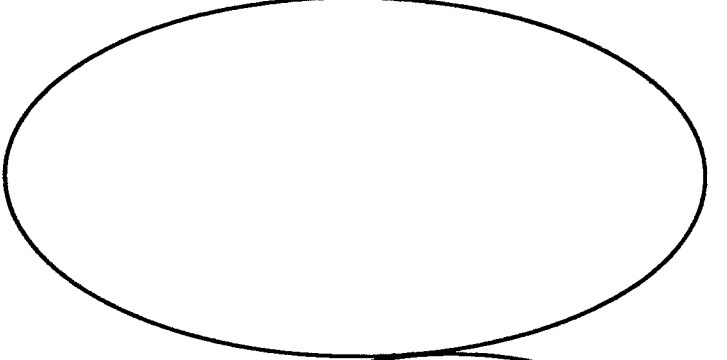
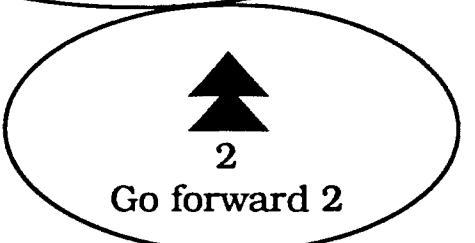
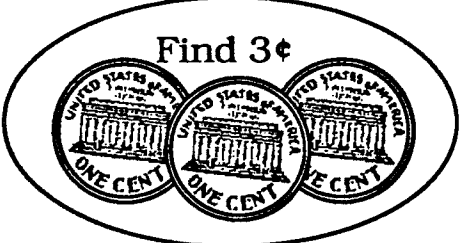


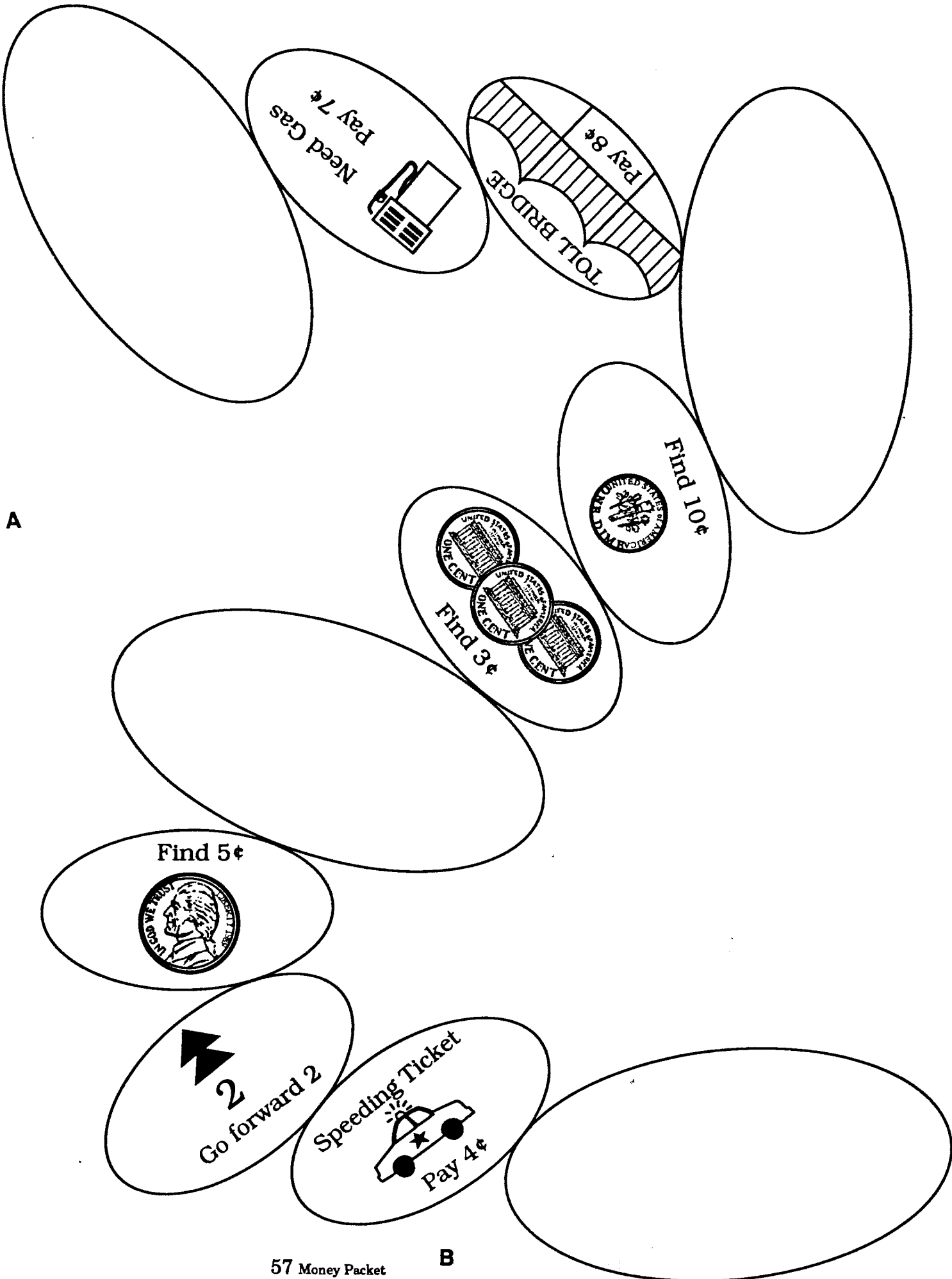
Penny Push

# Shopping Spree



The End

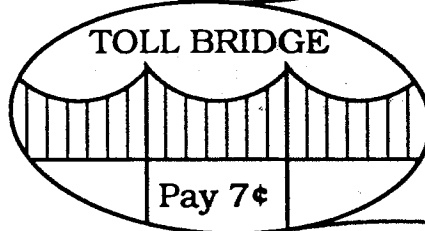
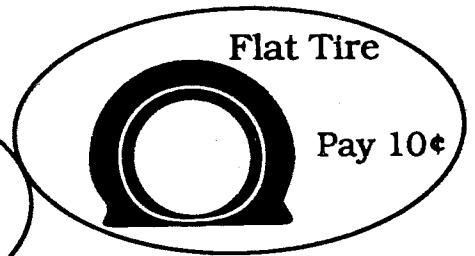
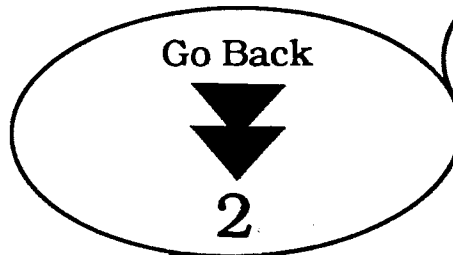




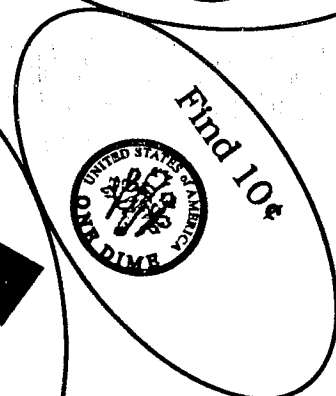
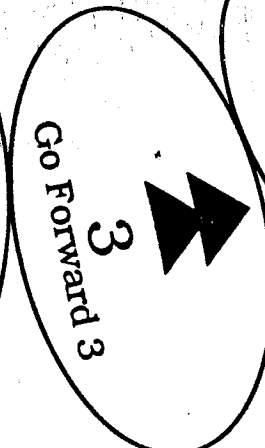
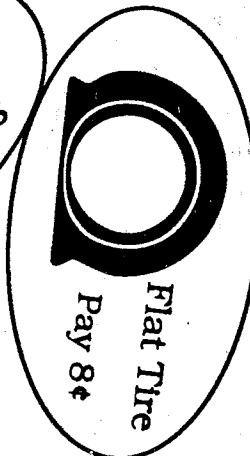
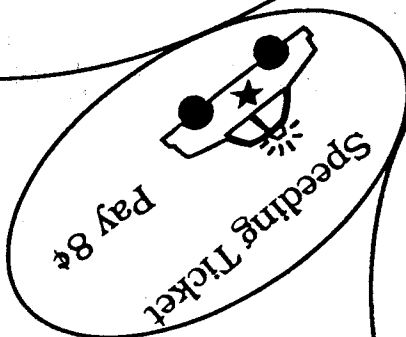
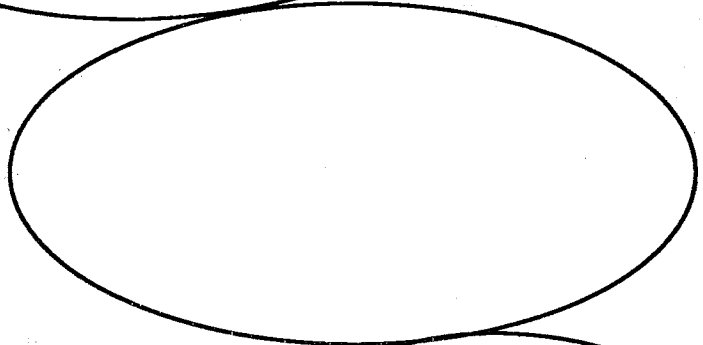
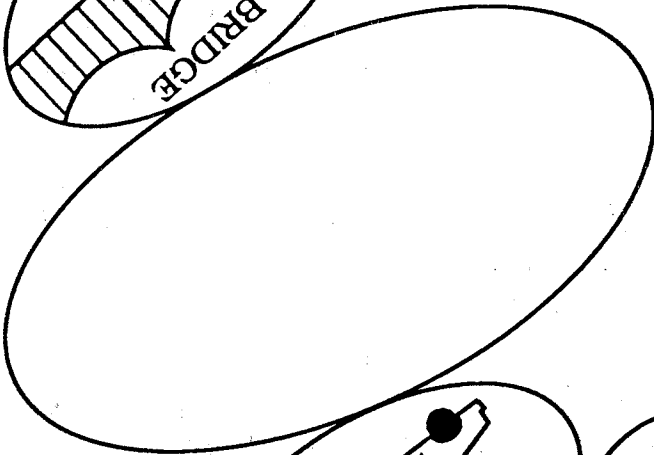
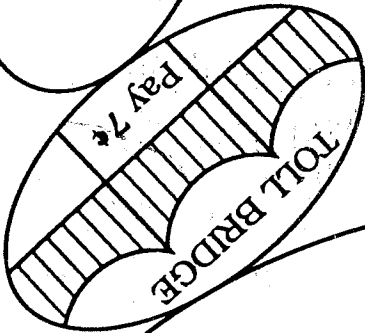
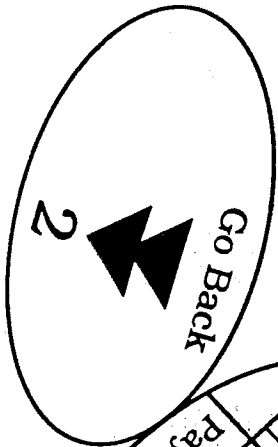
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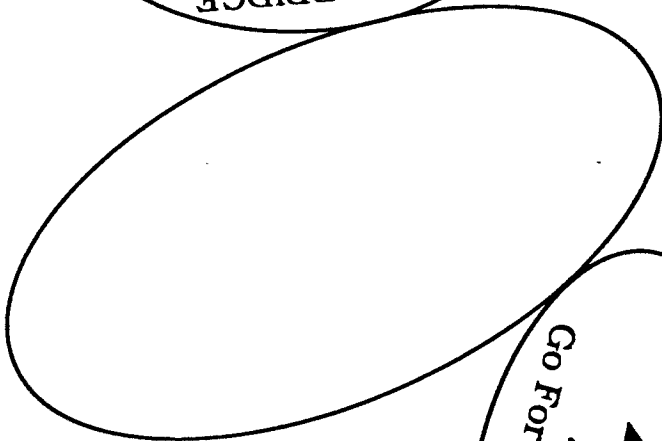
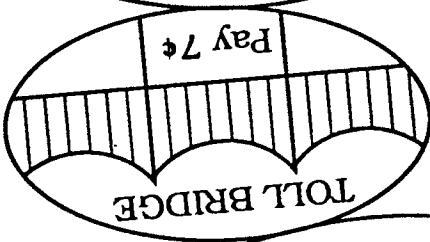
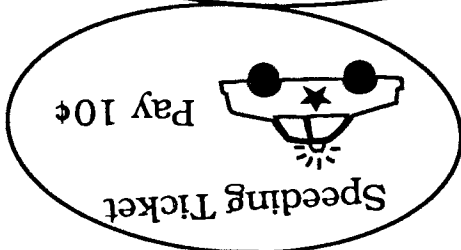
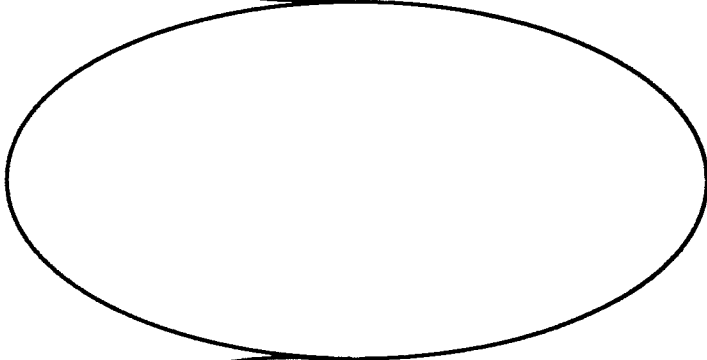
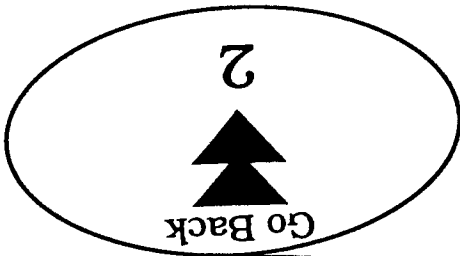
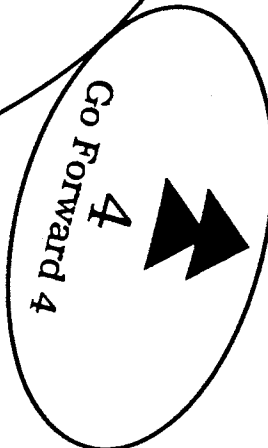
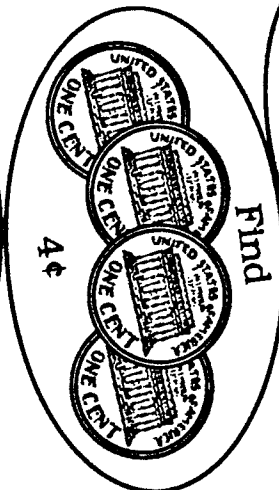
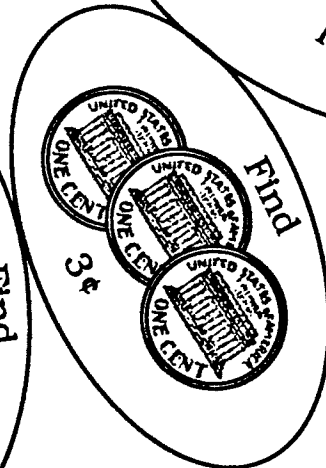
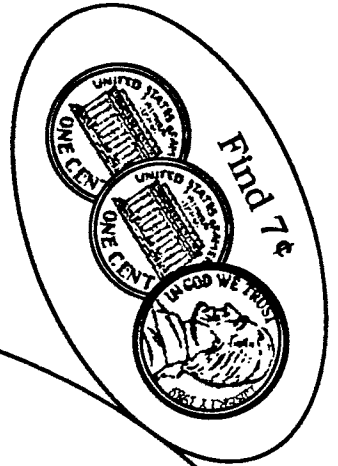


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# Money Starter Cards-Easy



## Shopping Spree



# Shopping Spree

## Money Starter Cards-Easy



## Shopping Spree



# Shopping Spree



# Challenging Money Starter Cards



Shopping Spree



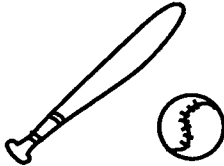


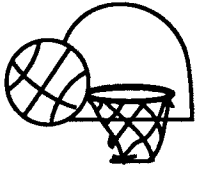
Shopping Spree

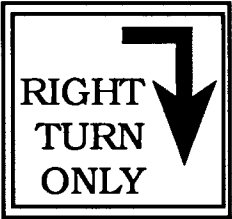



Shopping Spree


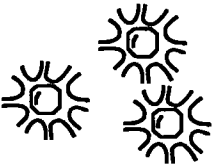
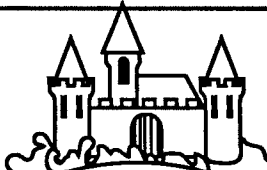




Shopping Spree

<b>Earn</b> <b>5¢</b>	 <b>27¢</b>	 <b>32¢</b>	 <b>8¢</b>	 <b>16¢</b>
--------------------------	-------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------




<b>BUY</b>  <b>Pay 5¢</b>
--------------------------------------------------------------------------------------------------------------------


 <b>Igloo Ice Cream</b>	 <b>Charlotte's Dazzles</b>
 <b>Sandra's Fantasy World</b>	 <b>MUSIC</b>

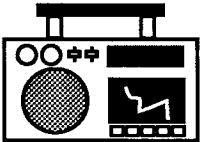



<b>18¢</b> 
---------------------------------------------------------------------------------------------------

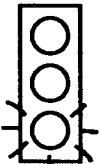


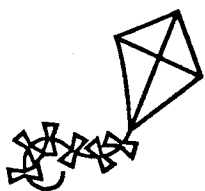

<b>5¢</b> 
---------------------------------------------------------------------------------------------------

<b>15¢</b> 
-----------------------------------------------------------------------------------------------------



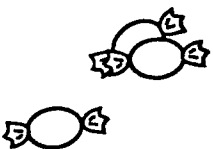

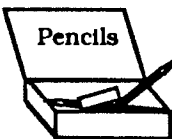


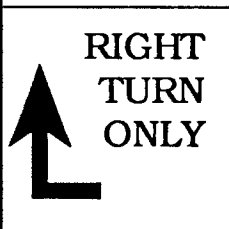
<b>32¢</b> 
-----------------------------------------------------------------------------------------------------

 <b>23¢</b>	<b>26¢</b> 	 <b>5¢</b>	 <b>16¢</b>	<b>EARN</b> <b>5¢</b>
---------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------	--------------------------

 <b>GO</b>	 <b>24¢</b>	 <b>9¢</b>	 <b>22¢</b>	 <b>19¢</b>
------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------





 <b>STOP</b>
 <b>1¢</b>
 <b>2¢</b>
Parking  <b>PAY 5¢</b>
 <b>27¢</b>



**PARK and SHOP MALL**  
**SPORTS CITY**

**Nicki's**  
 Bears,  
 Penguins,  
 and ♥  
 to go...

**Mac Nesbit's**  


  
*Clothes by Jeanette*

# Challenging Money Starter Cards



Park and Shop



Park and Shop



Park and Shop



Park and Shop

Apply the appropriate labels on both ends of each box lid. Either run the labels on full-sheet Avery Labels No. 5165, cut apart and attach; or simply cut apart these pages and glue or tape on.



## Coin Graphs

6 9

**A PRACTICE & ENRICHMENT BOX**



## Money March

6 9

**A PRACTICE & ENRICHMENT BOX**



## Spin a Half Dollar

6 9

**A PRACTICE & ENRICHMENT BOX**



## Spin Two Dollars

6 9

**A PRACTICE & ENRICHMENT BOX**



## Roll Twenty-Five Cents

6 9

**A PRACTICE & ENRICHMENT BOX**



## Money Trading Game

6 9

**A PRACTICE & ENRICHMENT BOX**



## Money Socks Boxes

6 9

**A PRACTICE & ENRICHMENT BOX**



## Money Puzzles

6 9

**A PRACTICE & ENRICHMENT BOX**



## Count, Tell, Spin and Win

6 9

**A PRACTICE & ENRICHMENT BOX**



## Earn a Nickel

6 9

**A PRACTICE & ENRICHMENT BOX**



## Earn a Dime

6 9

**A PRACTICE & ENRICHMENT BOX**



## Top Draw

6 9

**A PRACTICE & ENRICHMENT BOX**



## Dig for Buried Treasure

6 9

**A PRACTICE & ENRICHMENT BOX**



## Penny Push

6 9

**A PRACTICE & ENRICHMENT BOX**



## Coin Graphs

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**A PRACTICE & ENRICHMENT BOX**



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**A PRACTICE & ENRICHMENT BOX**



## Dig for Buried Treasure

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**A PRACTICE & ENRICHMENT BOX**



## Penny Push

6 9

**A PRACTICE & ENRICHMENT BOX**



## Shopping Spree

6 9

**A PRACTICE & ENRICHMENT BOX**



## Drop the Money

6 9

**A PRACTICE & ENRICHMENT BOX**



## Stamp the Price

6 9

**A PRACTICE & ENRICHMENT BOX**



## Stamp the Price Twice

6 9

**A PRACTICE & ENRICHMENT BOX**



## Coin Stamp Booklets

6 9

**A PRACTICE & ENRICHMENT BOX**



## Shop the Ads

6 9

**A PRACTICE & ENRICHMENT BOX**



## Park and Shop

6 9

**A PRACTICE & ENRICHMENT BOX**



## Make Change

6 9

**A PRACTICE & ENRICHMENT BOX**



## Shopping Spree

6 9

**A PRACTICE & ENRICHMENT BOX**



## Drop the Money

6 9

**A PRACTICE & ENRICHMENT BOX**



## Stamp the Price

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**A PRACTICE & ENRICHMENT BOX**



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## Coin Stamp Booklets

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**A PRACTICE & ENRICHMENT BOX**



## Shop the Ads

6 9

**A PRACTICE & ENRICHMENT BOX**



## Park and Shop

6 9

**A PRACTICE & ENRICHMENT BOX**



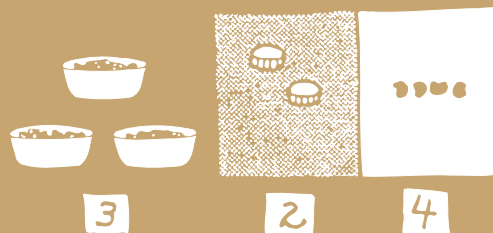
## Make Change

6 9

**A PRACTICE & ENRICHMENT BOX**

# Place Value

## counting



# BOX IT OR BAG IT

## MATHEMATICS

Practice & Enrichment Boxes

**Donna Burk • Allyn Snider**  
**Paula Symonds**

Published by The Math Learning Center

**Box It or Bag It Mathematics, Practice & Enrichment Box:  
Place Value Counting**

Box It or Bag It Mathematics consists of:

Teachers Resource Guide and Blackline Masters, Kindergarten  
Teachers Resource Guide and Blackline Masters, 1st and 2nd Grade  
Practice & Enrichment Boxes:

Shapes  
Introduction to Measuring  
Understanding Measuring  
Reading, Writing & Understanding Numerals 0–10  
Pattern  
Arithmetic  
Money  
Place Value Counting  
Place Value Addition & Subtraction

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# Getting Started

*Once you've introduced Place Value through a variety of group lessons, (be sure to see Box It or Bag It Mathematics Teachers Resource Guide, PLACE VALUE COUNTING), you will want children to practice and extend their understanding using the activities in this packet. Here are a few things we've found helpful for a successful Independent Practice Time.*

*Provide no more than 8–12 boxed activities at one time for a class of 30. Too many activities create more than tolerable chaos. Each Box is designed to be used by 1–4 children.*

*Model each activity thoroughly until children can tell you what to do, step by step. You'll find "box ingredients" and "playing instructions" for each activity in this packet. We use clear Contact paper to put them in our box lids so WE can remember what goes in each Box and how each game is played! Reading the directions would be too difficult for most primary children.*

*Resist the temptation to put out all your challenging Boxes at once—provide a balance of easy and hard. (If you set out too many difficult Boxes, all the children will need you at once and the noise level will be almost unbearable as your children try to cope with the stress of too many difficult tasks.)*

*As you construct these Practice and Enrichment Boxes, cover your box tops with the same design Contact paper. That way, you'll be able to pull your Place Value Counting Boxes off the shelf easily, even if they've gotten mixed in with other boxes. (Boxes can be ordered from The Math Learning Center in four sizes: standard (9 X 12 X 2), half size (9 X 6 X 1-7/8), junk (4 X 7 X 1-1/8), and mini (3-1/2 X 4 X 1-1/8). See the Box It or Bag It Mathematics Teachers Resource Guide, MATERIALS INDEX, for additional ordering and making information.*

*Remember the Boxes themselves can be used for group instruction. They are ideal for use by an aide or parent with small groups. Some of them can be easily adapted for use with your whole group.*

*During Independent Practice Time, it's critical that you be available and in circulation to make sure things go smoothly. Once routines even out, you'll have opportunities to observe individuals which are not afforded when you conduct group instruction. You can spot children with problems and see children with understandings beyond your predictions. See the next page for some observation guidelines.*

*Be sure to see the Box It or Bag It Mathematics Teachers Resource Guide, INTRODUCTION, for more implementation strategies.*

❖

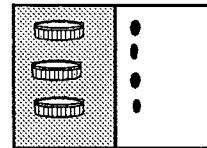
# Place Value Counting Assessments

*Circulating among your students as they work on the Base Ten Project Strips and the Independent Practice Boxes gives a good picture of what the children know. Here are some assessments to use in addition to the observation and questioning you do each day. The first five are individual; the last one can be done with your entire group. We usually assess after most of our children have finished the Base Ten Project. This helps target certain children for extra help as they use the Place Value Counting Boxes.*

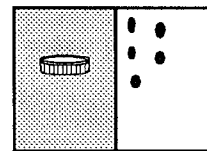
*You may also choose to use the first two assessments in the fall with second graders, bearing in mind that even if most of them pass, you'll still need to devote a fair amount of time to place value counting. Their understanding of tens and ones is often fragile coming out of first grade; their understanding of hundreds, tens, and ones even more tenuous.*

## Counting by Tens

Ask the child to count to 100 by tens; to 200 by tens.



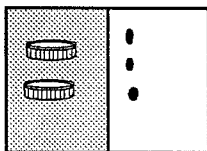
**Child:** Thirty-four.



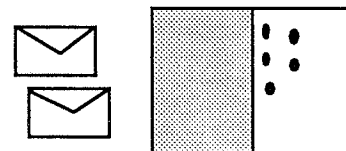
**Child:** Ten, eleven, twelve, thirteen, fourteen, fifteen.

Be sure to include several teen numbers. This is often a point of confusion for children.

If a child is able to read tens and ones with ease, you may wish to check her on hundreds, tens, and ones. Use the same procedure out-lined above, using sealed envelopes of 100 for the hundreds.



**Child:** Ten, twenty, twenty-one, twenty-two, twenty-three.



**Child:** Two hundred five.

Be sure to include numbers with ones and zeros in the tens and ones places, such as 413, 203, 120, 381. These are a frequent source of confusion.

**Building a Model for  
Hundreds, Tens, and Ones**

Same procedure as above, except the child builds various numbers as you say them or hold them up on a card.

**Teacher:** *Build 25.*

**Teacher:** *I'm going to hold up a card with the number I want you to build. Ready?*

**Reading Numbers:**

Check the child to make sure he can read a variety of numbers, first 2-digit, then 3-digit. An assortment might include:

13	31	40	87	15
137	249	450	306	213
609	710	530		

**Writing Numbers From Dictation**

Ask child to write various numbers from dictation, first 2-digit, then 3-digit, if you wish. An assortment might include numbers like the ones above.

# Place Value Counting Observation and Assessment Sheet

														Children's Names
														Child is able to share materials and work cooperatively.
														Child is able to rote count by tens to _____.
														Child is able to count a set of objects by tens and ones.
														Child tries estimating quantities.
														Child is able to establish and maintain order in their work.
														Child is able to compare quantities.
														Child is able to record data accurately.
														Child is able to "read" a model for tens and ones; for hundreds, tens and ones.
														Child is able to "build" a model for tens and ones; for hundreds, tens and ones.
														Child is able to read 2- and 3-digit numbers.
														Child is able to read 2- and 3-digit numbers.

---

# Place Value Counting Activities

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See *Box It or Bag It Mathematics Teachers Resource Guide*, PLACE VALUE COUNTING, "Guess and Check" and "Counting Jars," for group introductions to these Boxes.

## COUNTING JARS (1–4 Children)

**Box ingredients**→ 10–15 counting jars      record sheets  
standard box for storage

Keep margarine tubs and portion cups available on your general math materials shelf.

### PLAYING INSTRUCTIONS

1. Pick a jar and write down its name on record sheet.
2. Guess how many objects and record.
3. Dump it out and count the objects into tens and ones. Get portion cups and margarine tubs from the general materials shelf if you need them to hold your groups of ten.
4. Record the amount.
5. Continue working until page is filled. Cut apart the sections to make a book, if you wish.

### MAKING INSTRUCTIONS

#### Counting Jars

1. Gather at least ten tiny jars with lids. Your housemates will forgive you for all the olives, capers, sauces, gourmet jellies, etc., you feed them. Don't forget that your class is a great source for such things. Send a note!
2. Fill each jar with 15–100 or more counters. Here are some possibilities: colored macaroni

(use a bit of rubbing alcohol and food coloring to dye), lima beans (even more fun when spray-painted a bright, glossy color), shells, plastic cake decorations, keys, plastic fruits, macrame beads, buttons, nuts and bolts, etc.



3. Label each jar with the name of the items.

#### Record Sheets

Locate Counting Jars record sheet in the blacklines. Run copies and store in standard box along with counting jars. NOTE: If your jars are heavy, search out a very sturdy box.

#### Portion Cups

You can purchase 1-ounce shallow paper souffle cups in boxes of 250 from MLC Materials, or a local restaurant supply store. One or two boxes ought to be adequate for all the activities in this packet.

## **FILL AND COUNT (1–4 Children)**

**Box ingredients→** many small jars of various shapes, each labeled with an alphabet letter

beans (spray-painted lima beans are wonderful but any kind is OK)

scoops (to fill jars)                      record sheets

standard box for storage

Keep margarine tubs and portion cups available on your general math materials shelf.

### **PLAYING INSTRUCTIONS**

1. Pick a jar and fill it with beans.
2. Dump it out and count the beans, using portion cups to group the tens. Regroup tens into hundreds in margarine tubs when necessary.
3. Record the amount.
4. Continue working until page is filled.

### **MAKING INSTRUCTIONS**

#### **Record Sheets**

Locate Fill and Count record sheet in the blacklines. Run copies and store in standard box along with jars and beans.

## **JUNK BOX COUNTING (1–4 Children)**

**Activity ingredients→** junk boxes                      record sheets

one Duo-Tang folder with pockets at the bottom for storage

Keep margarine tubs and portion cups available on your general math materials shelf.

### **PLAYING INSTRUCTIONS**

1. Choose a junk box and write its name on the record sheet.
2. Study its contents carefully and guess how many. Record your guess.
3. Count out the items into ones, tens, and hundreds, making all needed regroupings. (Get portion cups and margarine tubs from the general materials shelf to group your tens and hundreds if you need them.)
4. Record your findings.
5. Continue working until the paper is finished.

### **MAKING INSTRUCTIONS**

#### **Record Sheets**

Locate Junk Box Counting record sheet in blacklines. Run copies and store in Duo-Tang folder covered with the same Contact paper you use on Place Value Boxes. Label the folder. Keep junk boxes on your general math materials shelf and have children get them as needed.



## GENERAL MATERIALS COUNTING

**Activity ingredients** → your classroom collection of pattern blocks, plain wooden cubes, unifix cubes, and tiles

record sheets

one Duo-Tang folder with pockets at the bottom for storage

Keep margarine tubs and baskets available on your general math materials shelf.

### PLAYING INSTRUCTIONS

1. Choose a tub of general materials.
2. Study its contents and guess how many.
3. Record your guess.
4. Count out the items and record your amount.  
(Get margarine tubs and larger tubs or baskets from the general math materials shelf to hold your tens and hundreds if you need them.)
5. Continue working until record sheet is finished.

**NOTE:** Our children love to count everything in the room; however, they may not want to do all

the things on the record sheet. We suggest they share responsibilities and turn in a record sheet as a group rather than individually. It's also fine to only do part of a sheet!

### MAKING INSTRUCTIONS

#### Record Sheets

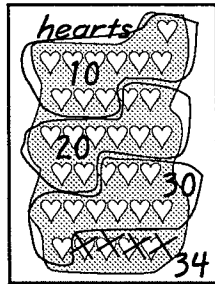
Locate General Materials Counting record sheet in blacklines. Run copies and store in Duo-Tang folder covered with the same Contact paper you use on Place Value Boxes. Label the folder. Keep pattern blocks, plain wooden cubes, unifix cubes and tiles on your general math materials shelf and have children get them as needed.

## GIFT WRAP COUNTING (1-4 Children)

**Box ingredients**→ gift wrap cards                      record sheets  
 Vis-a-vis or overhead projector pens  
 standard box for storage  
 provide slightly dampened cloths or paper towels for cleanup

### PLAYING INSTRUCTIONS

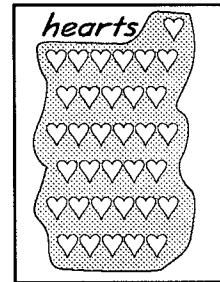
1. Estimate how many items are on your gift wrap card. Record your estimate.
2. Use pen to count off groups of ten and loop them. When no more tens can be looped, "X" the ones. Write the numbers.
3. Record the total on your record sheet.
4. Use pen to count off groups of ten and loop them. When no more tens can be looped, "X" the ones. Write the numbers.
5. Record the total on your record sheet.
6. Continue until your paper is filled. Cut your page apart and staple it into a small booklet, if you wish.



### MAKING INSTRUCTIONS

#### Gift Wrap Cards

1. Gather a variety of gift wraps with countable designs.
2. Mount pieces of wrap on 8-1/2 X 11 tag cards. (Some teachers like to "free form" the edges of their wrap a bit—eliminating the half and quarter items.) Label each card with the item's name.
3. Laminate.



#### Record Sheets

Locate Gift Wrap Counting record sheet in blacklines. Run copies and store in a standard box along with Gift Wrap cards and pens.

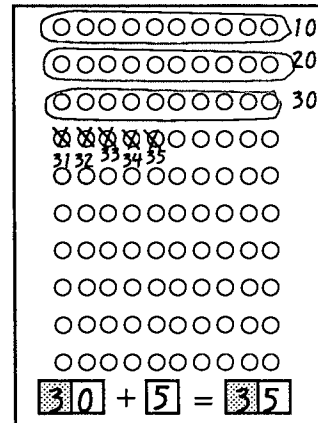
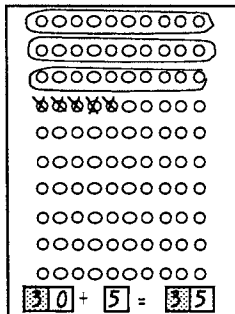
## SPIN, COUNT, AND MAKE A BOOK (1-4 Children)

**Activity ingredients**→ double spinner                      record sheets  
 colored construction paper for book covers  
 taped folder for storage

### PLAYING INSTRUCTIONS

1. Spin both sides of the double spinner and carefully record number on chosen paper.
2. Loop the tens and "X" the ones for the number you spun.

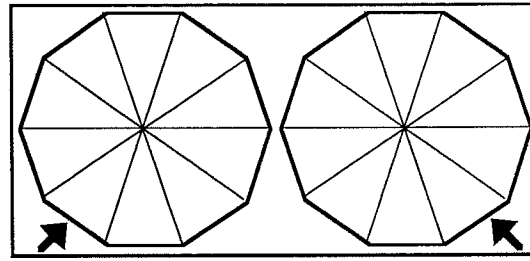
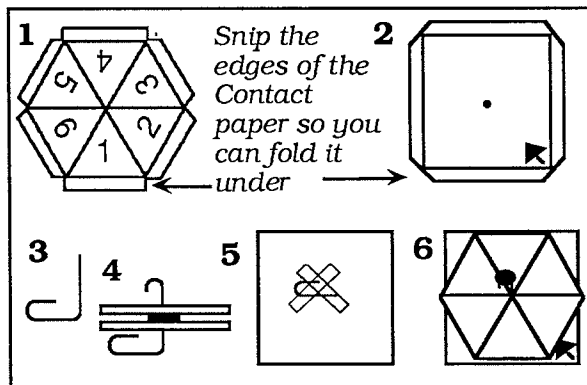
NOTE: It is very nice to write your counting patterns after you've looped your tens and marked your ones.



## MAKING INSTRUCTIONS

### Double Spinner

1. Locate spinner tops in blacklines. Glue tops to poster or matte board. Cut around glued spinner tops and cover the top sides with clear Contact paper, overlapping edges to the underside. Use a school compass to poke a hole in the center of each spinner top.
2. Cut a base from poster or matte board that will hold spinner tops and still fit into your game box. Cover with clear Contact paper. Set spinner tops on base to determine placement. Mark the center of each top on base. Poke a hole in base with your compass for each of your spinner tops.
3. Get #1 paper clips, one for each spinner top, straighten one side as shown in diagram.
4. Cut a 1"-square washer from poster or matte board for each spinner. Use a compass to poke a hole in the center. Assemble spinner top, washer, and base on paper clip as shown. Bend opened clip over.
5. Tape clip on underside of base.
6. Tape top part of paper clip for safety. Use a permanent pen to draw arrows on base.



### Record Sheets

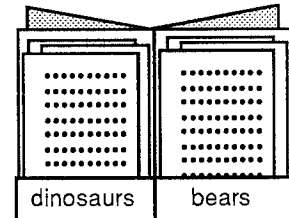
Locate Spin, Count, and Make a Book record sheets in blacklines. Run copies of each.

### Book Covers

Cut colored newsprint or construction paper 8-1/2 X 11 for book covers. (Our children have loved using a front and back cover and writing their own book title. They often have very unusual ways of stapling it together!) Store paper for book covers, along with record sheets, in taped folder described below.

### Taped Folder

Purchase four Duo-Tang folders (same color) with pockets at bottom. Tape together with filament tape at back and edges. Cover folder with the same Contact paper as your Place Value Boxes and label.



# Trading Games

See *Box It or Bag It Mathematics Teachers Resource Guide*, PLACE VALUE COUNTING, To 50 and Back, for group introduction to these Boxes.

## BEACHCOMBER TRADING (Forward Trading Game—2 Children)

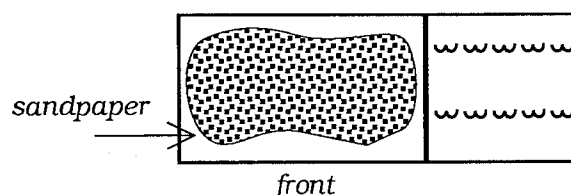
**Box ingredients→** shells in minibox                      one die, 4–9  
                                          two gameboards                      20 “sandbuckets”  
                                          half box for storage

### PLAYING INSTRUCTIONS

Take turns:

1. Roll the die.
2. Take the number of shells indicated.
3. Place them on the “wave” side of your gameboard.
4. Each time you get ten shells, put them in a sandbucket and move the bucket to the “beach” side of your gameboard.
5. The first player to get ten sandbuckets filled—100 shells—wins.

3. Draw ten wavelets on the short side. Cut the sand to resemble a beach and glue it on the long side.



### MAKING INSTRUCTIONS

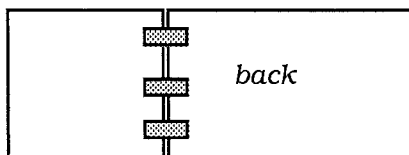
#### Shells (about 220)

Use tiny real shells or macaroni shells.

#### Gameboards (2)

For each gameboard:

1. Cut two pieces of blue poster board, one 5 X 4, one 5 X 8, and one piece of sandpaper, 5 X 8.
2. Hinge the pieces of posterboard on the underside with filament tape.



#### Sandbuckets (20)

Use small plastic or paper cups for buckets. Handles aren't necessary but it's nice to have two different colors—ten of each. Nut cups (used for parties and showers) work fine and can be purchased in stationery and paper supply stores.

#### Die

Use a foam or wooden cube to make a die numbered 4–9.

Store all materials in a half box.



## THE EASTER EGG FACTORY (Forward Trading Game—2 Children)

**Box ingredients→** lima bean “eggs” in mini box  
two gameboards twelve “Easter” baskets  
one die numbered 4–9  
half or standard box for storage (size of box depends upon the size of your Easter baskets)

### PLAYING INSTRUCTIONS

Take turns:

1. Roll the die to find out how many eggs will be in the hens’ nests.
2. Take the number of eggs indicated.
3. Place them on the nest side of your gameboard, one egg per nest.
4. Each time you get ten eggs, put them in an Easter basket and move the basket to the “delivery area” (the white side of the board) to go to the coloring factory.
5. The first player to get six Easter baskets filled—60 eggs—wins.

### MAKING INSTRUCTIONS

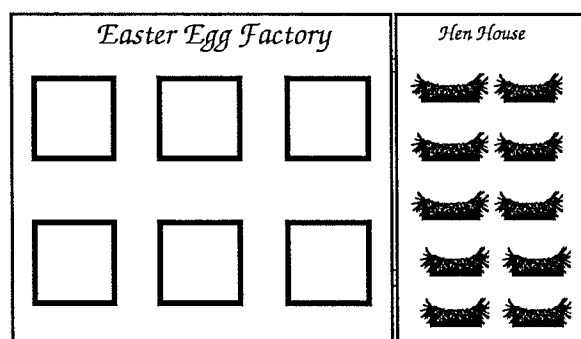
#### Eggs (about 150)

Buy a small bag of baby lima beans. You’ll have enough to share with several friends.

#### Gameboards (2)

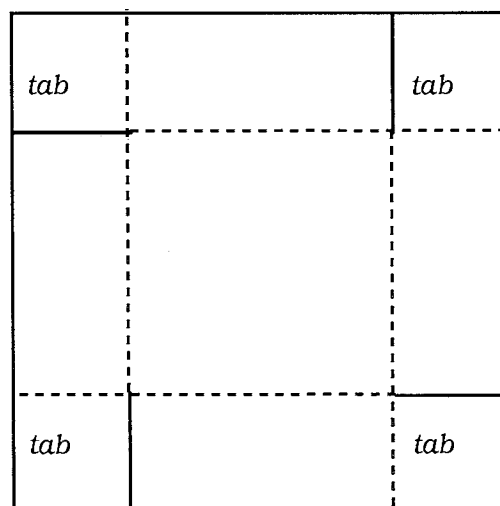
For each gameboard:

1. Locate Easter Egg Factory boards in card-stock portion of packet. Laminate and cut apart.
2. Hinge boards on the underside with short pieces of filament tape. (See Beachcomber Trading for diagram.)



#### Easter Baskets (12)

You can either buy tiny commercial Easter baskets (some craft stores sell tiny colored straw baskets) or make them if you’re feeling ambitious. If you have a parent volunteer who is “crafty,” you can make a set with two fabrics (such as pin dot) ironed to construction paper using Stitch Witchery. (Don’t use a damp cloth when using Stitch Witchery with paper.) The baskets could also be made with Contact paper on construction paper. Cut and fold your baskets as below:



1. Cut on all solid lines to create a paper pattern.
2. Cut baskets from bonded fabric/paper or Contact-covered paper.
3. Fold up sides on dotted lines.
4. Glue tabs to finish basket.

#### Die

Use foam or wooden cube to make a die numbered 4–9.

Store all materials in a half or standard box.

## SPACESHIP FACTORY (Forward Trading Game—2 Children)

**Box ingredients→** 80 green triangles from your pattern blocks  
two gameboards one die, 4–9  
standard box for storage

### PLAYING INSTRUCTIONS

Take turns:

1. Roll the die.
2. Take the number of triangles indicated. These triangles are spaceship components. It takes ten to complete a spaceship. Put them on the component side of your gameboard.
3. Each time you get ten triangles, move them to the spaceship side of your board and assemble a spaceship.
4. The first player to get four spaceships assembled wins.

### MAKING INSTRUCTIONS

#### Gameboards (2)

Locate gameboards in the cardstock portion of this packet. Laminate.

#### Die

Use foam or wooden cube to make a die numbered 4–9.

Store gameboards, die, and pattern blocks in a standard box.

## GO FOR BROKE (Challenging Backward Trading Game—2 Children)

**Box ingredients→** 20 dimes in coin tube 20 pennies in coin tube  
two gameboards spinner  
half box for storage

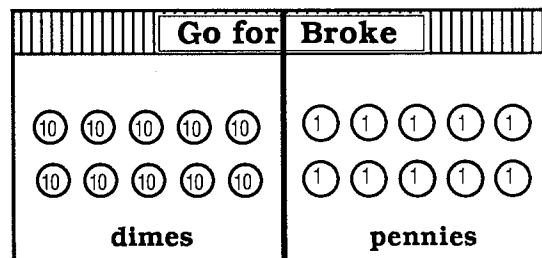
### PLAYING INSTRUCTIONS

1. Set out dimes and pennies to cover all the coins on your gameboard.
2. Spin to determine who will be first (person spinning higher amount starts).
3. Take turns spinning and removing coins from your boards until no more plays are possible.
4. Player with least amount of money at the end wins.

### MAKING INSTRUCTIONS

#### Gameboards (2)

1. Locate gameboards in cardstock section of this packet. Cut apart.
2. Laminate.
3. Hinge each board on the backside with short pieces of filament tape.



#### Spinner

Locate spinner top in blacklines. See Spin, Count, and Make a Book for assembly directions, but *be sure* to glue real coins to the top before you cover with clear Contact paper.

Store gameboards, spinner, and coins in coin tubes in half box.

## GIVE IT AWAY (Backward Trading Game—2 Children)

**Box ingredients→** 120 safety pins, clipped into sets of tens  
two gameboards spinner  
half box for storage

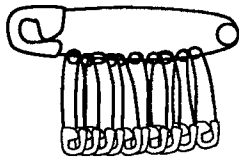
### PLAYING INSTRUCTIONS

1. Set six sets of safety pins on the tens side of your gameboard.
2. Take turns. Spin to find out how many pins to take off your board each time it's your turn.
3. Winner is the person who first gets closest to zero with no other possible plays left.

### MAKING INSTRUCTIONS

#### Safety Pins

Get 12 large safety pins and 108 smaller safety pins. To make each set of ten pins, slide nine small pins onto the larger pin and fasten. Make twelve sets.



#### Gameboards (2)

1. Locate gameboards in cardstock section of this packet. Cut apart.
2. Laminate.
3. Hinge each board on the back side with short pieces of filament tape.

Give It			Away				
			x	x	x	x	x
			x	x	x	x	x
		tens					ones

#### Spinner

Locate spinner top in blacklines. See Spin, Count, and Make a Book for assembly directions.

Store gameboards, spinner and safety pins (in a small box of their own) in a half box.

## 200 (Challenging Forward Trading Game—2 Children)

**Box ingredients→** double spinner two gameboards  
counters (ones, tens, hundreds)  
standard box for storage

### PLAYING INSTRUCTIONS

1. Each player takes a turn to spin each side of the double spinner (for example,  $10 + 6$ ).
2. They build the appropriate amount with counters.
3. Play continues until one player reaches 200.

### MAKING INSTRUCTIONS

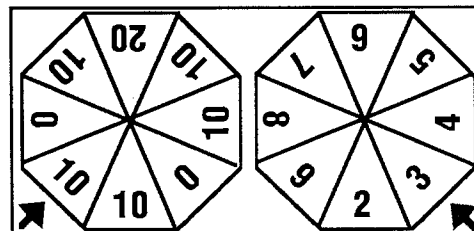
#### Counters

Look around your school storerooms to see if any of the following are stashed away: Cuisenaire Rods (only 10s and 1s), Unifix cubes, Nuefeld Number Blox, Multi-Link blocks or other similar material that is designed to represent ones, tens, and hundreds. Beansticks would also work well, but have some parents or your own

children do the glue work. To make beansticks, glue ten beans on each popsicle stick or tongue depressor. The hundreds are made by using three sticks as the foundation and gluing ten beansticks to them.

#### Double Spinner

Locate spinner tops in blacklines. See Spin, Count, and Make a Book for assembly directions.

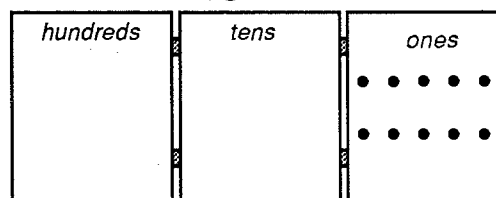


## Gameboards (2)

The dimensions of these will depend upon the counters you've chosen. They need to have three sections: hundreds, tens, ones.

Store spinner, gameboards, and counters in a standard box.

## Trading Boards



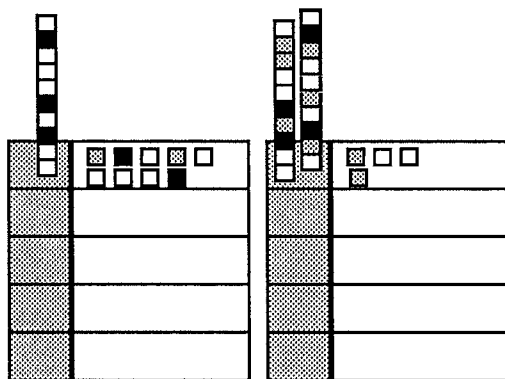
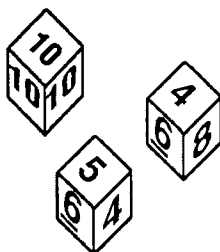
*back hinged with filament tape*

## UNIFIX STACKS (Column Addition Trading Game—2 Children)

- Box ingredients→**
- record sheets
  - more/less spinner
  - two gameboards
  - unifix cubes
  - two dice numbered 4–9 (use wooden or foam cubes)
  - two dice numbered with 10 on all sides
  - standard box for storage

### PLAYING INSTRUCTIONS

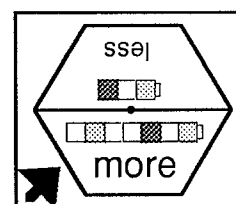
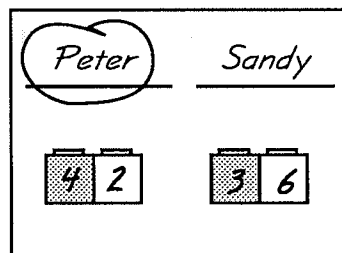
1. The players decide how many dice will be used for the game (2, 3, or 4).
2. The first player rolls the dice and adds (for example:  $4 + 5 + 10 = 19$ ). He or she then sets out that many cubes (grouped by tens and ones) on the first row of the gameboard.



3. Play continues until both players have filled their gameboards.
4. Each player then determines his or her total by pulling all the ones down to the very bottom, making any possible groups of ten, moving the groups of ten up to the top of the

lavender side, and pulling down all the tens. Total is written on the record sheet.

5. The more/less spinner is then spun to determine the winner. Children circle the winner on their record sheets.



### MAKING INSTRUCTIONS

#### Gameboards

You need two each 8 X 10 tag and 1-1/2 X 10 lavender construction paper. Glue lavender strip down left sides. Divide boards into five equal sections.

#### More/less Spinner

1. Cut an appropriately-sized base and a 1"-square washer from sturdy mat or poster board.
2. Use Unifix Stacks more/less spinner from blacklines for spinner top.
3. Follow construction directions from Spin, Count, and Make a Book.



### Record Sheets

Locate Unifix Stacks record sheet in blackline masters. Run copies and cut apart. Make a tag pocket for the small sheets. Store the tag pocket

of sheets in a standard box with dice, gameboards, and spinner. Keep the unifix cubes on your general math materials shelf.

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## Working with Higher Numbers

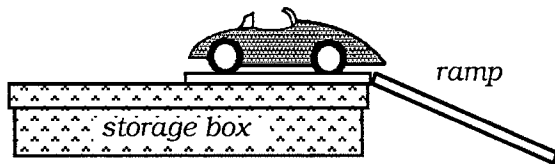
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### GRAND PRIX (2 Children)

**Box ingredients→** two or more small, heavy cars  
centimeter or sewing measuring tape  
record sheets  
more/less spinner  
race ramp  
half box for storage

### PLAYING INSTRUCTIONS

1. Set up your race ramp on the box as pictured below.



2. Place your car on the start arrow and give it a slight tap to start it down the ramp.
3. Have your partner help you use the measuring tape to determine how far it traveled.
4. Write the number for the distance measured on your record sheet.
5. Let your partner have a turn. Measure and record.
6. After your record sheet is completed, spin the more/less spinner to determine the winner.
7. Repeat several times. Staple your booklets together and show them to a grown-up.

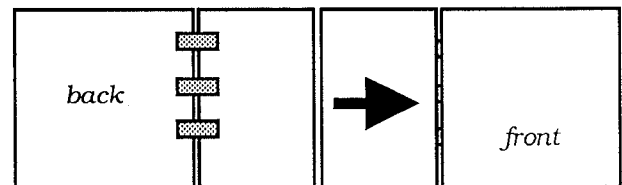
### MAKING INSTRUCTIONS

#### Spinner

Locate the spinner top in the packet blacklines. Assemble as directed in Spin, Count, and Make a Book.

### Starting Ramp

1. Cut two pieces of matte board, one 4 X 6 and one 6 X 6.
2. Hinge on the underside with short pieces of filament tape.
3. Draw a "go" arrow on the short section.



### Measuring Tape

Locate a centimeter measuring tape in your school supplies or purchase a measuring tape for sewing from a fabric store.

### Cars

Gather two or more cars (such as Hot Wheels or Matchbox—the heavy kind).

### Record Sheets

Locate Grand Prix record sheets in blacklines. Make copies, cut apart and store in a half box with cars, ramp, more/less spinner, and measuring tape.

**NOTE:** It seems to help the children stay on task better if they each take a few trial runs before they begin to measure and record.

## ROLL, ROLL, ROLL FOR BEANS (2 Children)

**Box ingredients**→ two game boards                      one die (0–5)  
                                          record sheets                      more/less spinner  
                                          beans in hundreds, tens and ones  
                                          zero card                      standard box for storage

### PLAYING INSTRUCTIONS

1. Get record sheets for you and your partner.  
Write your names.
2. Spin the more/less spinner to determine whether “more” or “less” will win your first game. Circle “more” or “less” on your record sheet in the first section.
3. Roll the die. Decide whether your first roll will be used for hundreds, tens, or ones. Choose carefully—each turn counts and you *can't* change your mind! Set your chosen beans on your gameboard.

Roll, Roll, Roll for Beans			
<div> <div></div> <div>more</div> </div> <div> <div></div> <div>less</div> </div>		<div>Maria</div> <div> <div></div> <div>more</div> </div> <div> <div></div> <div>less</div> </div>	
<div> <div></div> <div>more</div> </div> <div> <div></div> <div>less</div> </div>		<div> <div></div> <div>more</div> </div> <div> <div></div> <div>less</div> </div>	

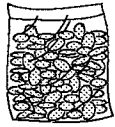
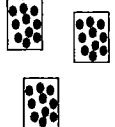

4. Give your partner a turn. He or she needs to decide whether to choose hundreds, tens, or ones for the number rolled and then set the appropriate quantity of beans on the gameboard.
5. Each of you rolls again for two more turns choosing how to set up the number rolled each time.
6. When each of you has taken all three turns, look at your boards and count your beans together by hundreds, tens, and ones. Decide who has more and who has less.
7. Record the number of beans on each of your boards. Decide who won. Mark the winning number.

<div>Martin</div> <div> <div>420</div> <div>more</div> </div>	<div>Cecil</div> <div> <div>045</div> <div>less</div> </div>
---------------------------------------------------------------	--------------------------------------------------------------

8. Repeat the game three more times. Show a grown-up your paper.

### MAKING INSTRUCTIONS

#### Gameboards

Roll, hundreds	Roll, tens	Roll, ones
		

Locate the three sheets of gameboards in card-stock portion of packet. Laminate. Cut the sections apart and hinge on the backside with tape.

#### Beans

Buy a bag of small beans. Use pint-sized zip-lock bags to count out hundreds—they can be cut down and taped shut with filament tape. Make ten bags. Glue sets of ten beans on small poster board cards—tacky glue or a glue gun holds them best. You need ten cards, each with ten beans. Put a handful of loose beans in the box and your beans are ready.

#### Die

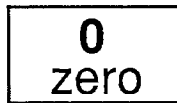
Locate pattern for die in blacklines. Use it to cut and score a matte board die. Write the numerals 0–5 on your die. You could also use a wooden or foam cube for your die.

#### Record Sheets

Locate the record sheet in the blacklines and run copies.

### Zero Card

Holding an empty place can be hard. You might want to make a zero card.



### More/Less Spinner

Locate spinner top in blacklines and assemble as directed in Spin, Count, and Make a Book. Store beans, record sheet, gameboards, spinner, die and card in a standard box.

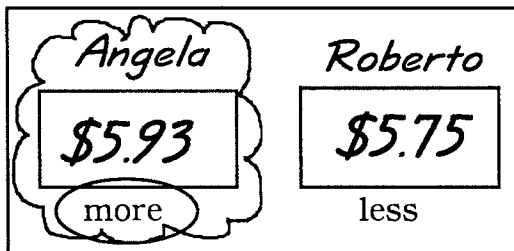
## RAGS OR RICHES (2 Children)

**Box ingredients→** two gameboards  
one game spinner  
record sheets

one more/less spinner  
“dollars,” dimes, pennies  
half box for storage

### PLAYING INSTRUCTIONS

1. Get record sheets for you and your partner. Write your names.
2. Spin the more/less spinner to determine whether “more” or “less” will win your first game. Circle “more” or “less” on your record sheet in the first section.
3. Spin the spinner. Decide whether your first spin will be used for dollars, dimes or pennies. Choose carefully—each turn counts and you *can't* change your mind! Set your chosen money on your gameboard.
4. Give your partner a turn. He or she needs to decide whether to choose dollars, dimes, or pennies for the number spun and then set the appropriate money on the gameboard.
5. Each of you spins again for two more turns, choosing how to set up the number spun each time.
6. When you've each finished your three turns, look at your boards and count your money together. Decide who has more, who has less.
7. Write the amount of money you each counted in the appropriate spaces of your record sheets.



8. Repeat the game three more times. Show a grown-up your paper.

### MAKING INSTRUCTIONS

#### Gameboards

Locate the gameboard sheet in cardstock portion of the packet. Laminate and cut the sections apart. Hinge each set with tape on the back.

RAGS		or RICHES	
dollars		dimes	pennies

#### Money

Locate the blackline for dollar bills and run two copies on green paper. (You'll need 18 for box.) Purchase coin tubes (available at any hobby shop) to store 18 dimes and 18 pennies. (We buy a nickel size tube for pennies, a penny size for dimes so they can slip in and out easily.) Use a Sanford Sharpie pen to mark the height of coins in each tube for accountability.

#### Spinners

Locate the game spinner top and the more/less spinner top for Rags or Riches in blacklines. Assemble as directed in Spin, Count, and Make a Book.

#### Record Sheets

Locate the record sheet in blacklines and run copies.

Store money, record sheets, spinners, and gameboards in half box.

## **MATRIX MADNESS (2 Children)**

**Box ingredients→** record sheets  
playing cards

matrix card  
standard box for storage

### **PLAYING INSTRUCTIONS**

1. You each need a copy of the record sheet.
2. Write your names on your record sheets.
3. Set out the large matrix card to help you.
4. Mix up the tiny cards and put them in a pile face down.
5. Draw a card from the pile. Figure out the number and tell your partner. If your partner agrees, write the number on your record sheet in the correct box. The first person to get ten in a row wins (across, up and down, or diagonally).
6. Take turns until someone wins.

### **MAKING INSTRUCTIONS**

#### **Record Sheets**

Locate record sheet in blacklines and run copies.

#### **Matrix Card**

Locate matrix card in cardstock portion of the packet and laminate.

#### **Playing Cards**

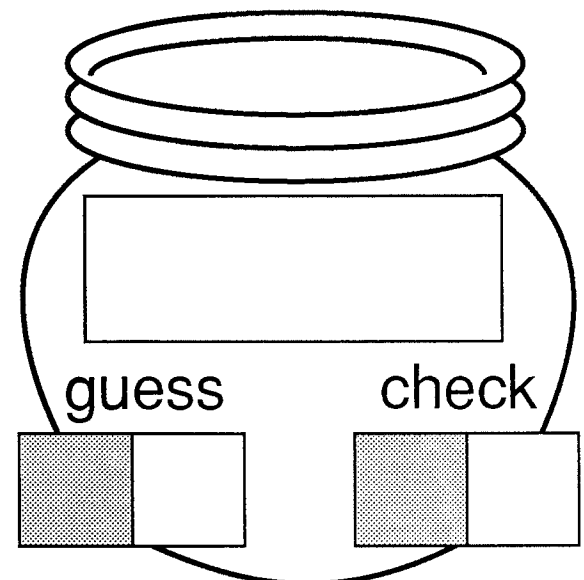
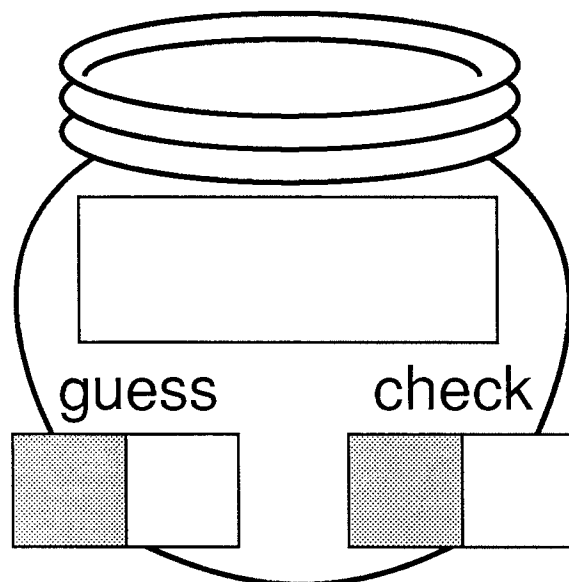
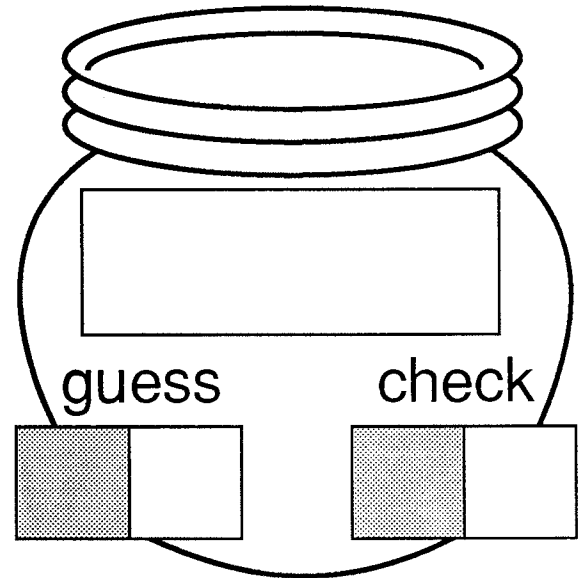
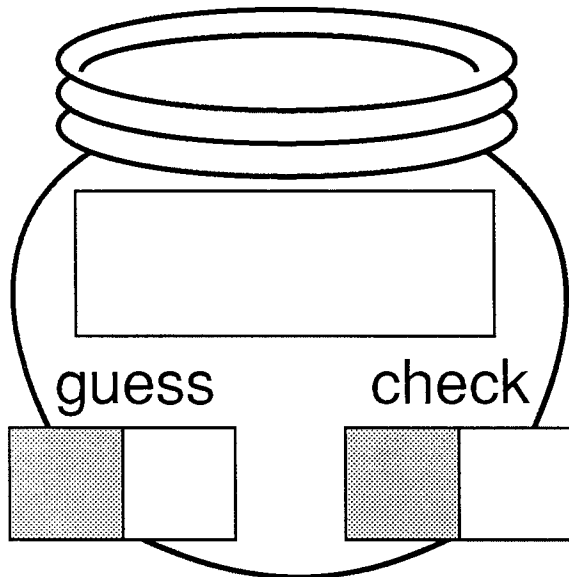
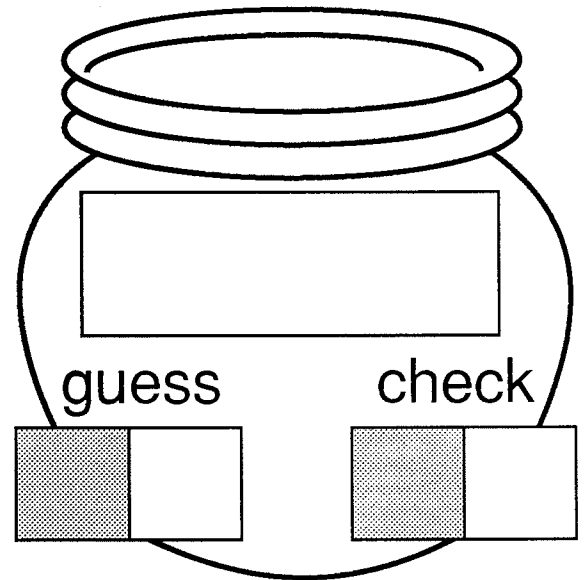
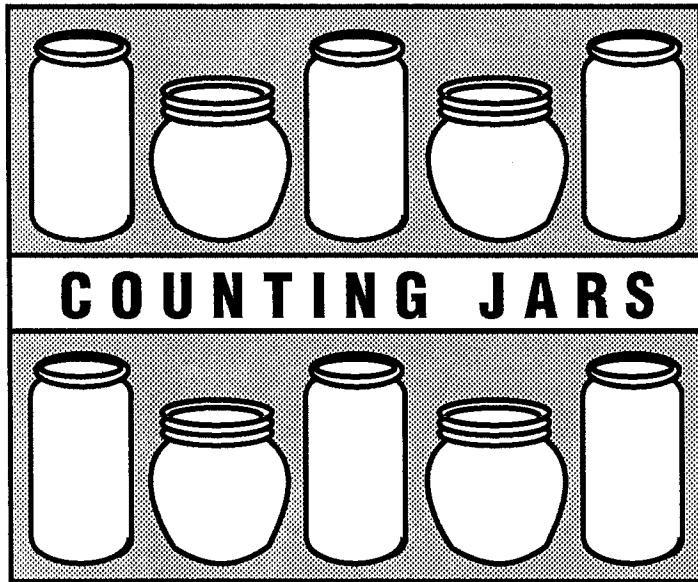
Locate sheets of playing cards in cardstock portion of the packet. Laminate and cut apart.

Store record sheets, matrix card, and playing cards in a standard box.

# Blacklines

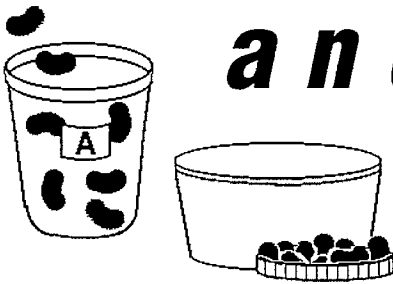
Patterns, cards, spinners, and other materials you'll make for the  
Practice & Enrichment Boxes described in this packet.

name: \_\_\_\_\_



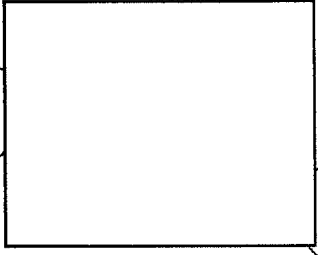
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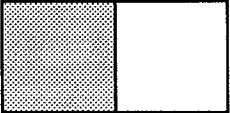
**FILL**



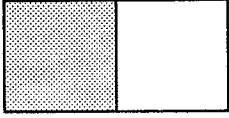
*and*

**COUNT**

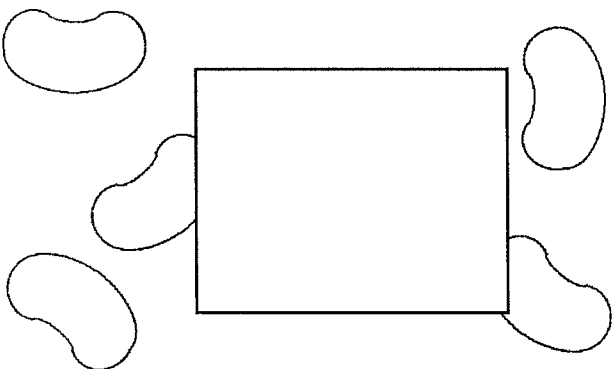





guess




check

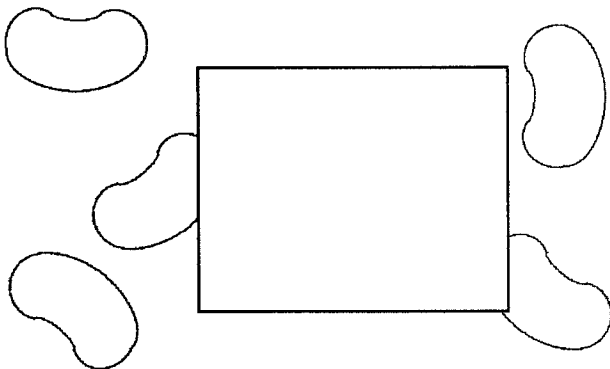


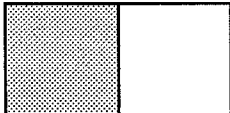


guess

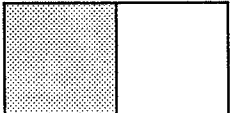


check

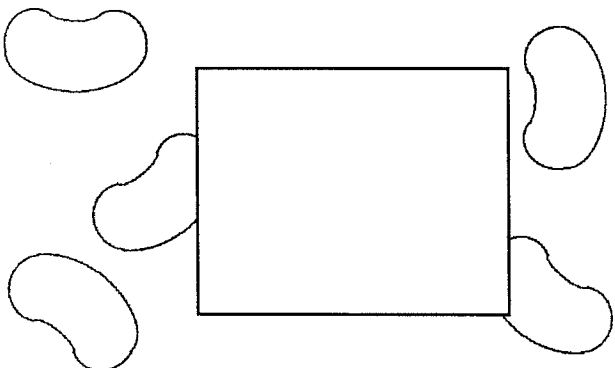


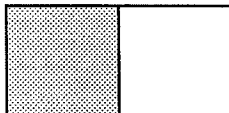


guess

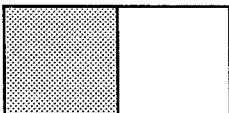


check

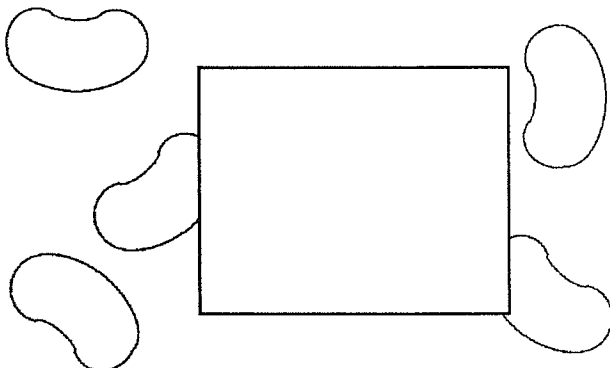


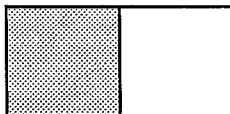


guess

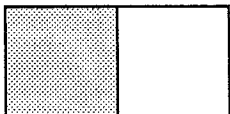


check



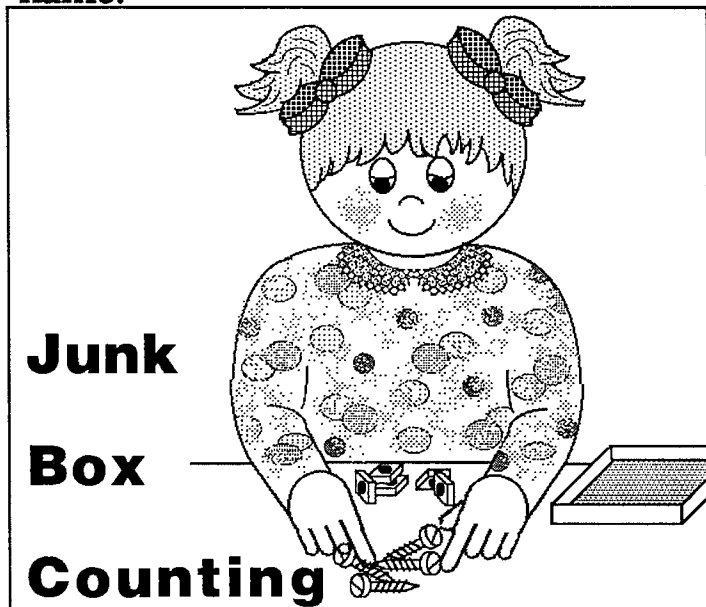


guess



check

name: \_\_\_\_\_



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guess

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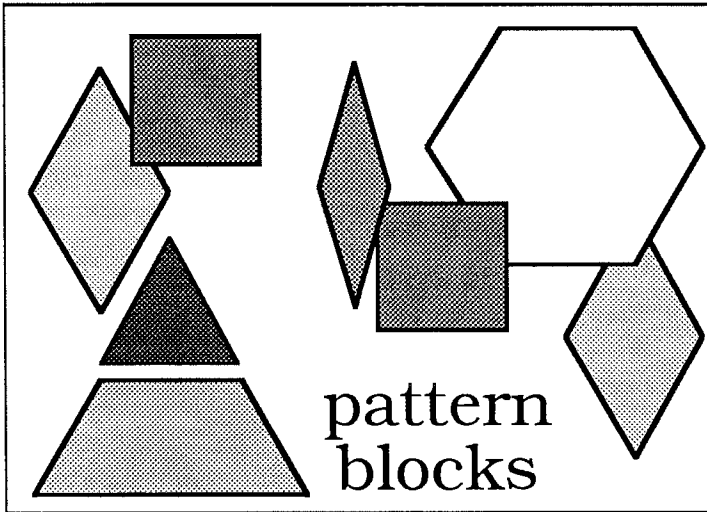
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guess

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check



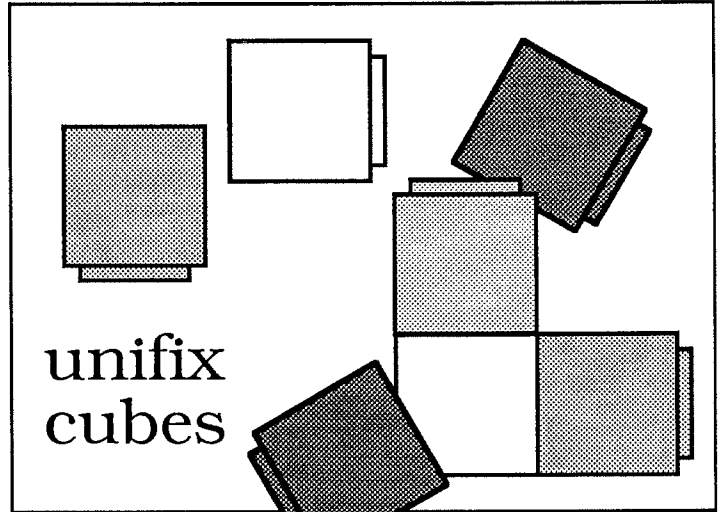


guess

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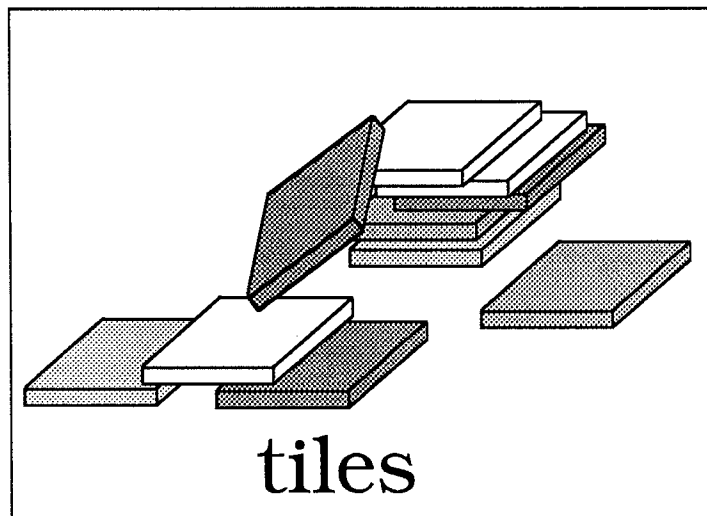


guess

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check

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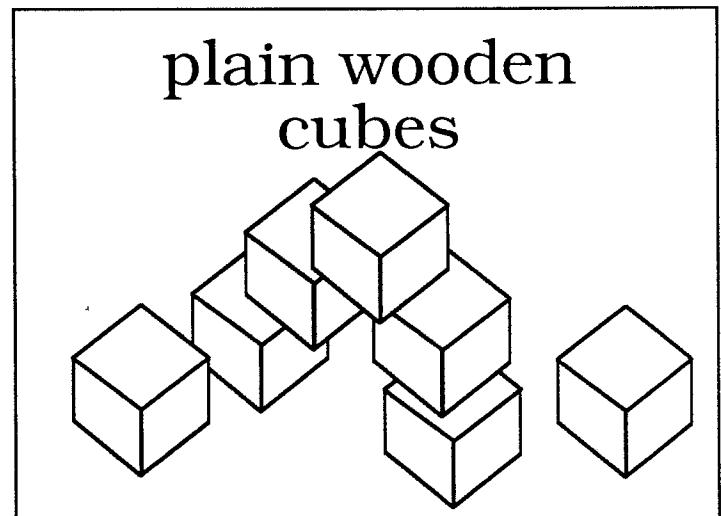


guess

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check

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guess

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check

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name:



guess

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check

guess

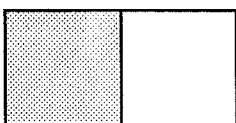
check

guess

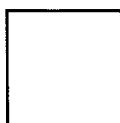
check

guess

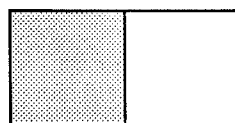
check

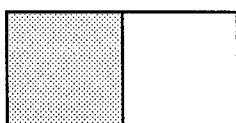
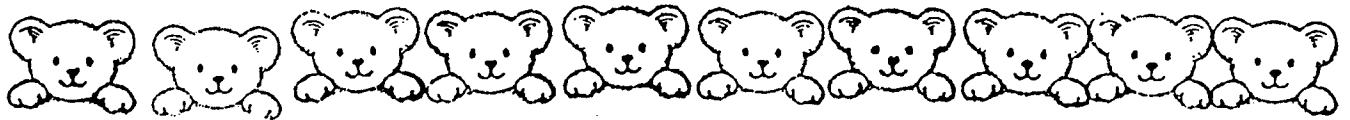
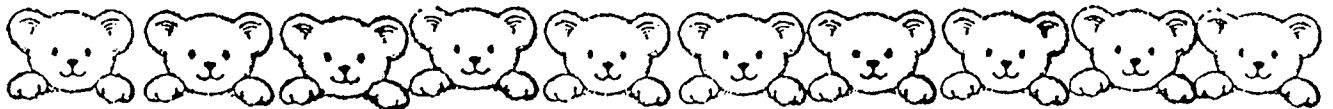
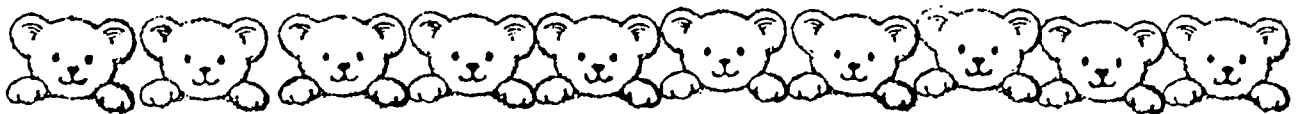


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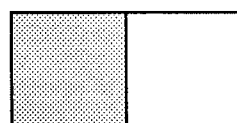


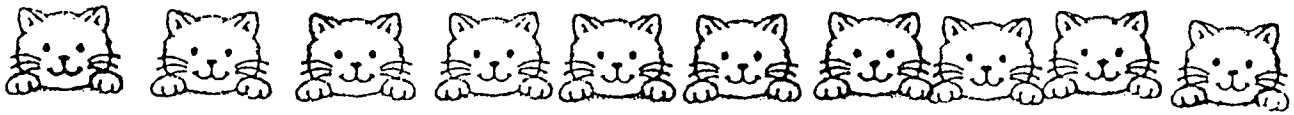
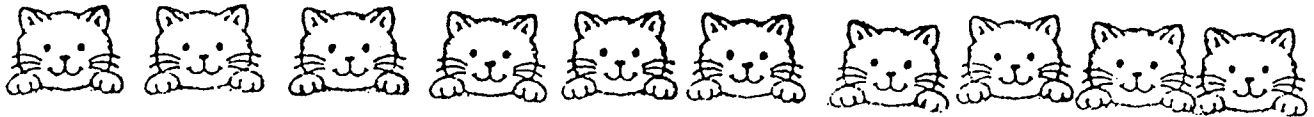
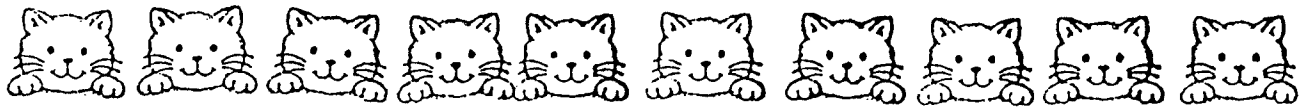
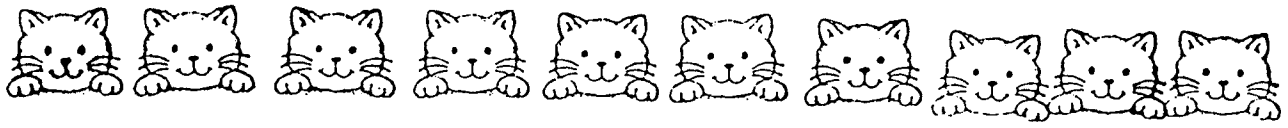


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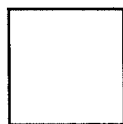


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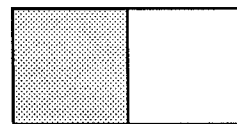


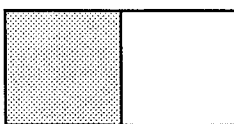
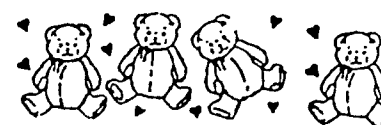


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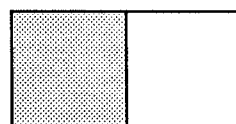


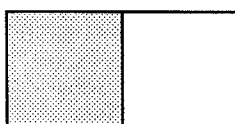
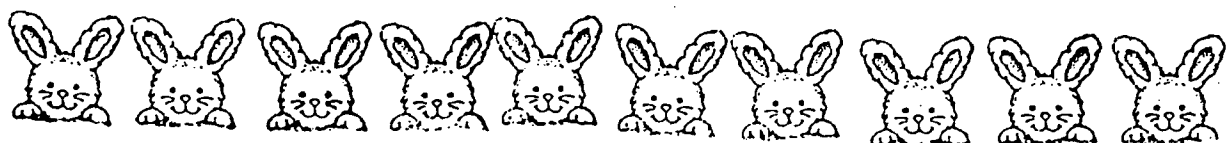
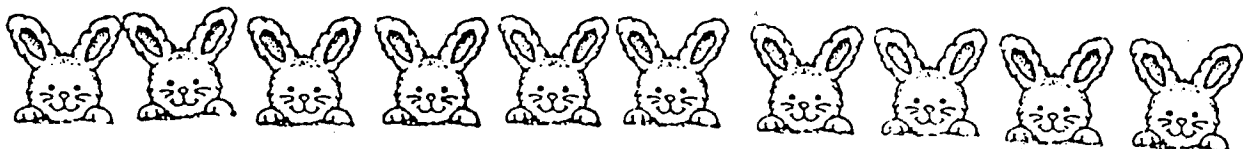
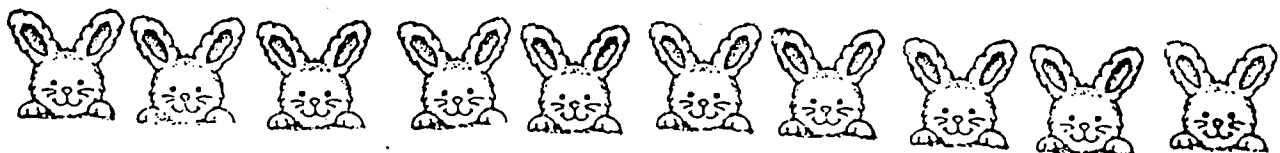
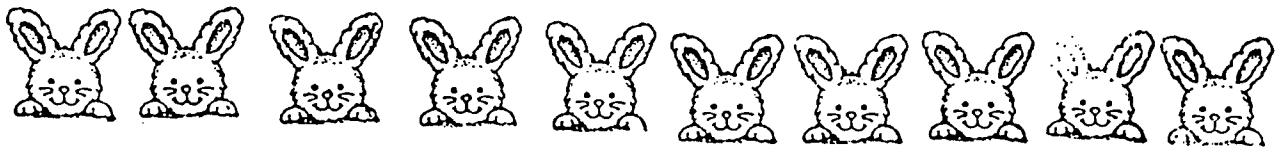
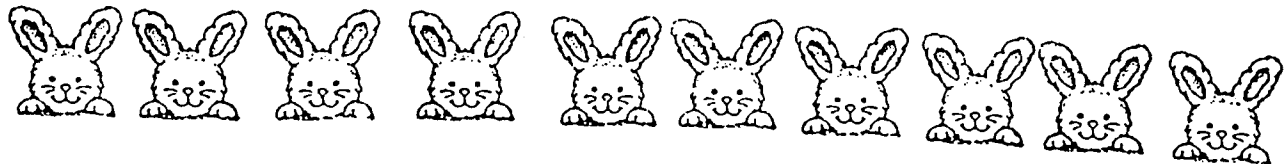
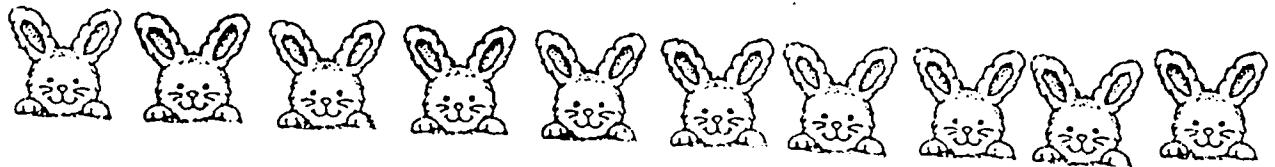
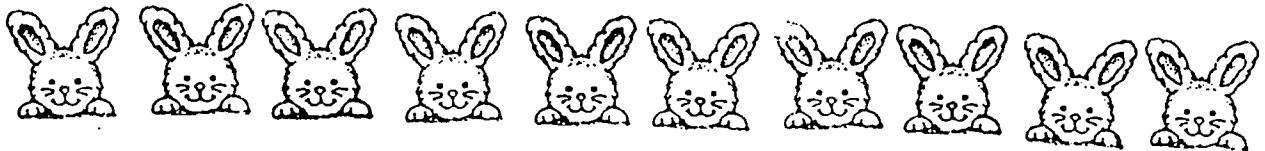
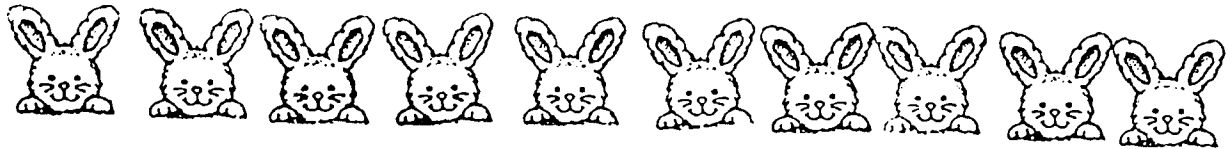


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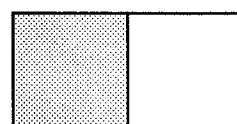




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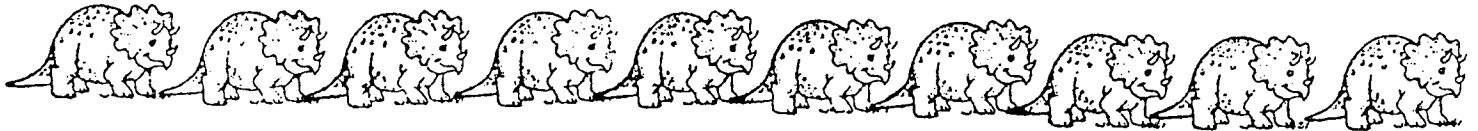
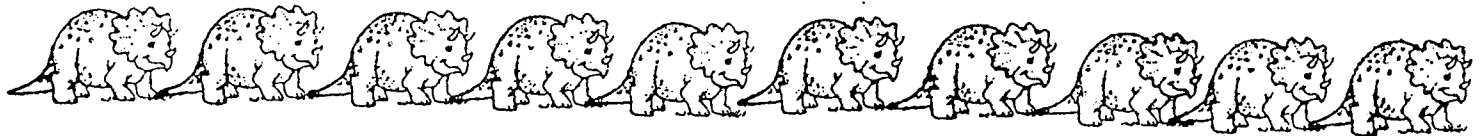
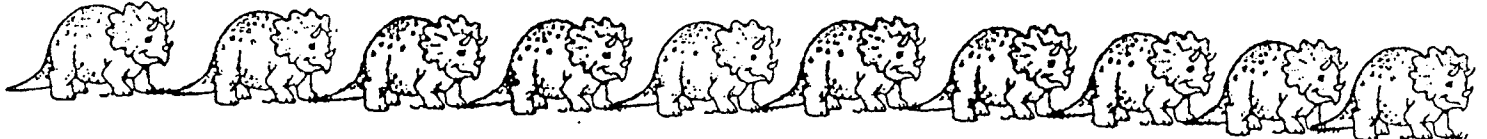
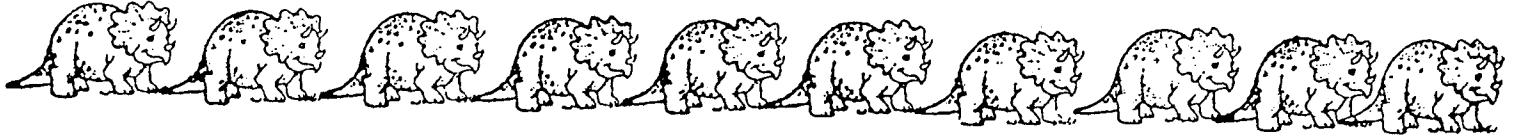
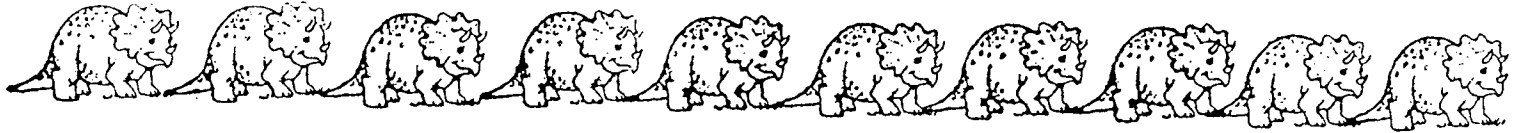
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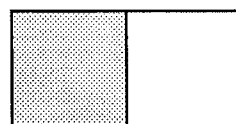




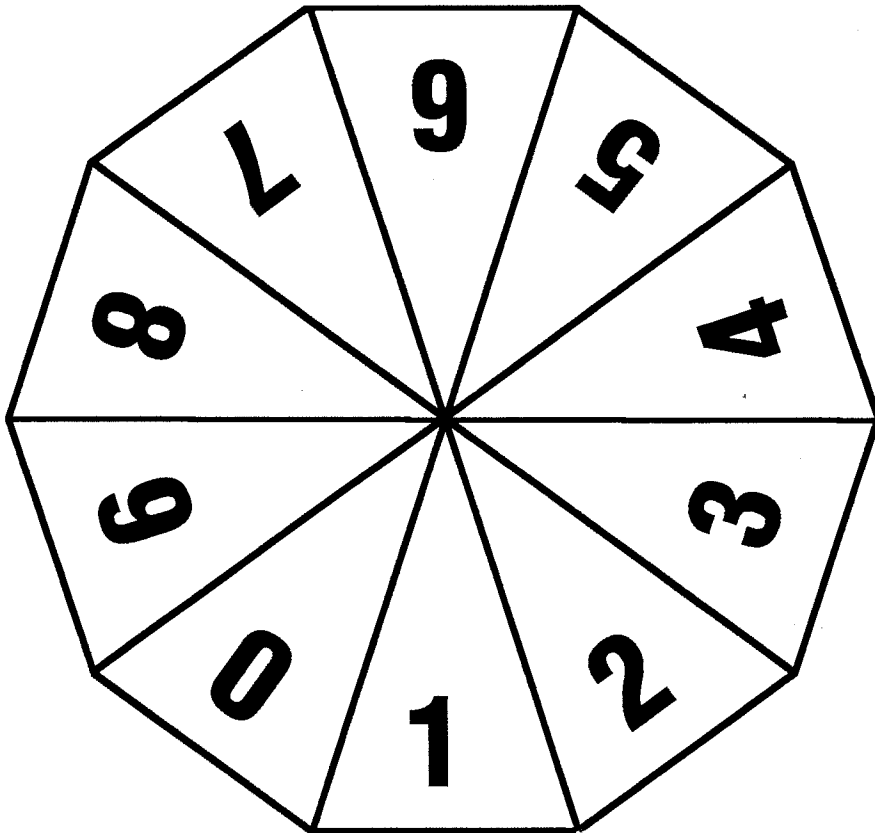
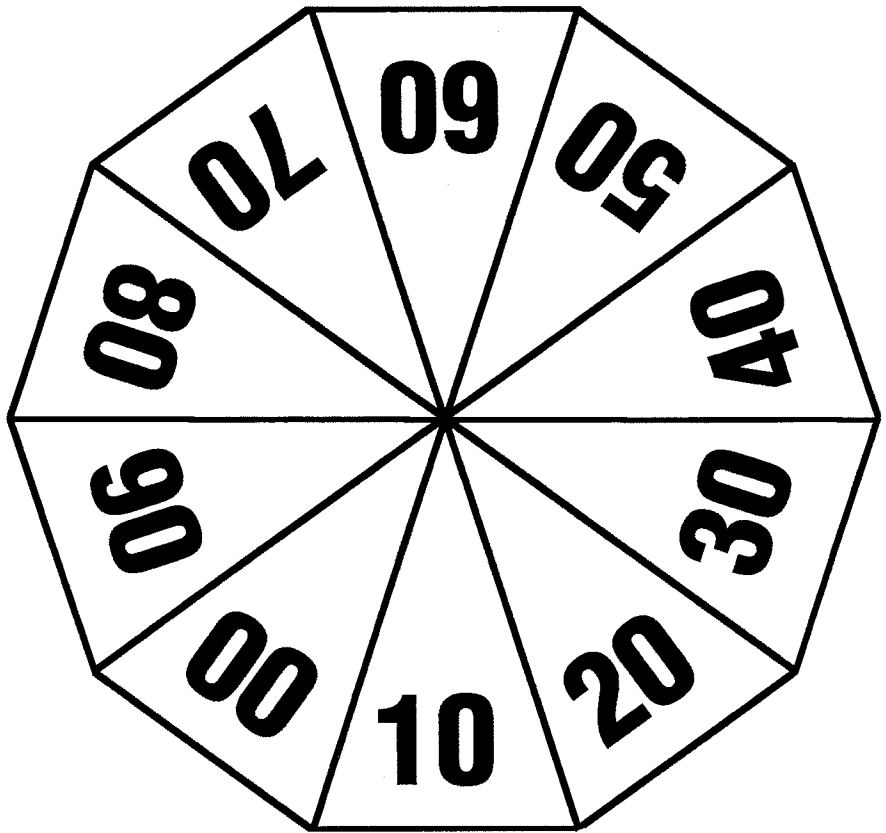
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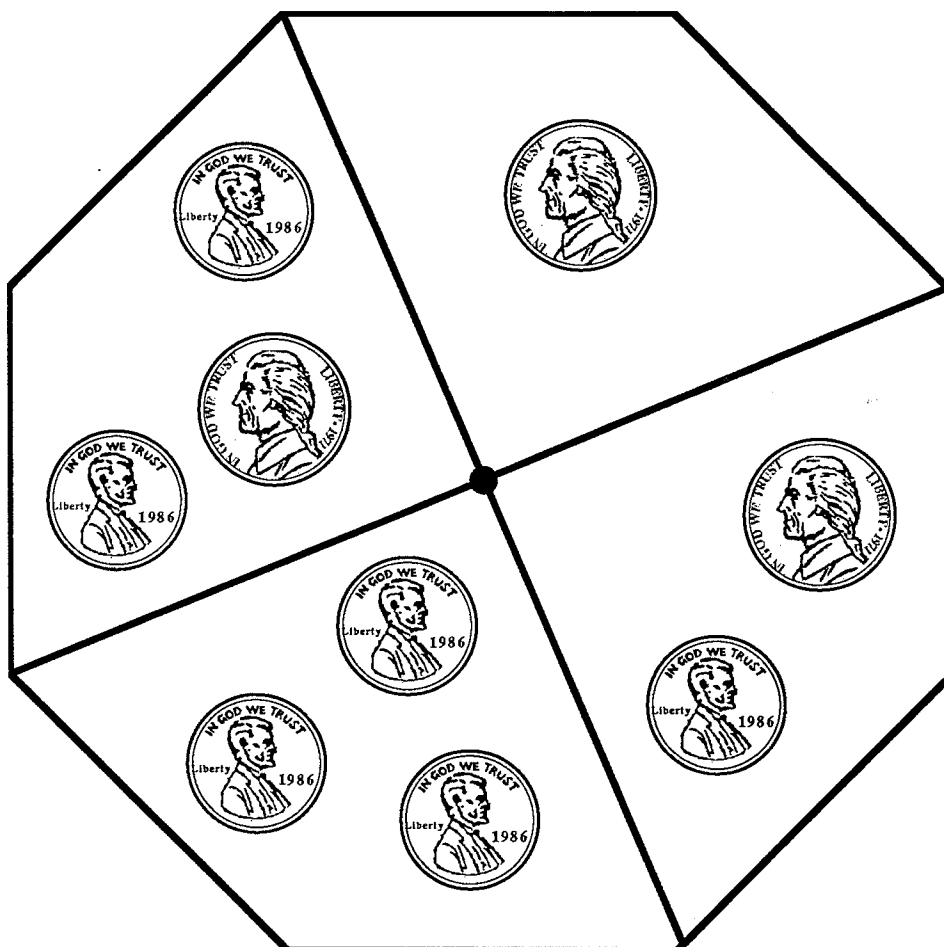
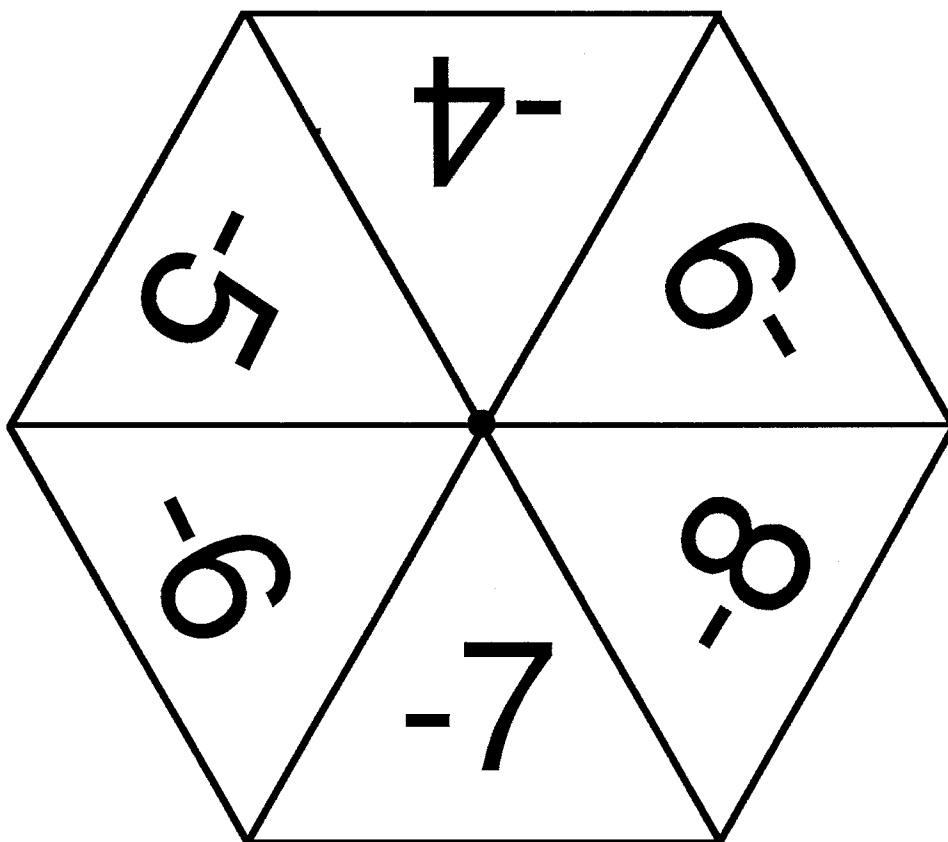
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**Spin, Count and  
Make a Book  
Spinners**

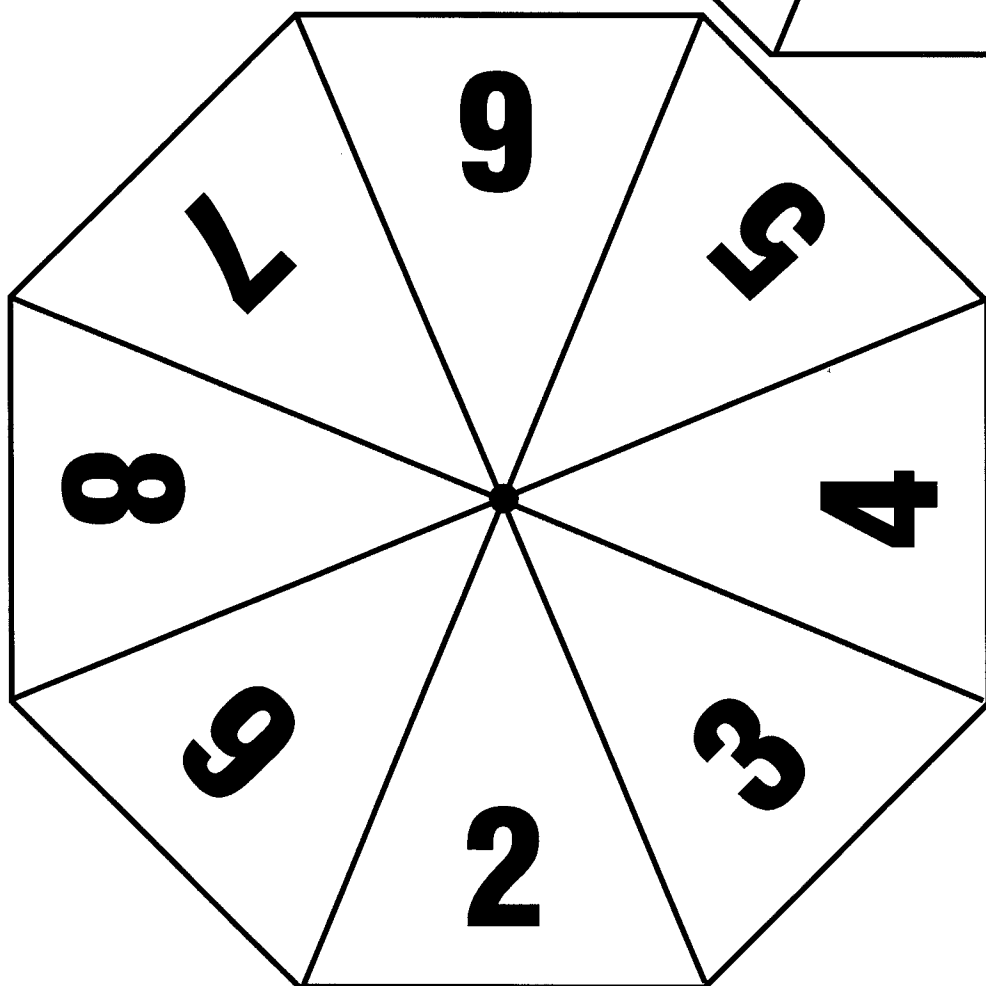
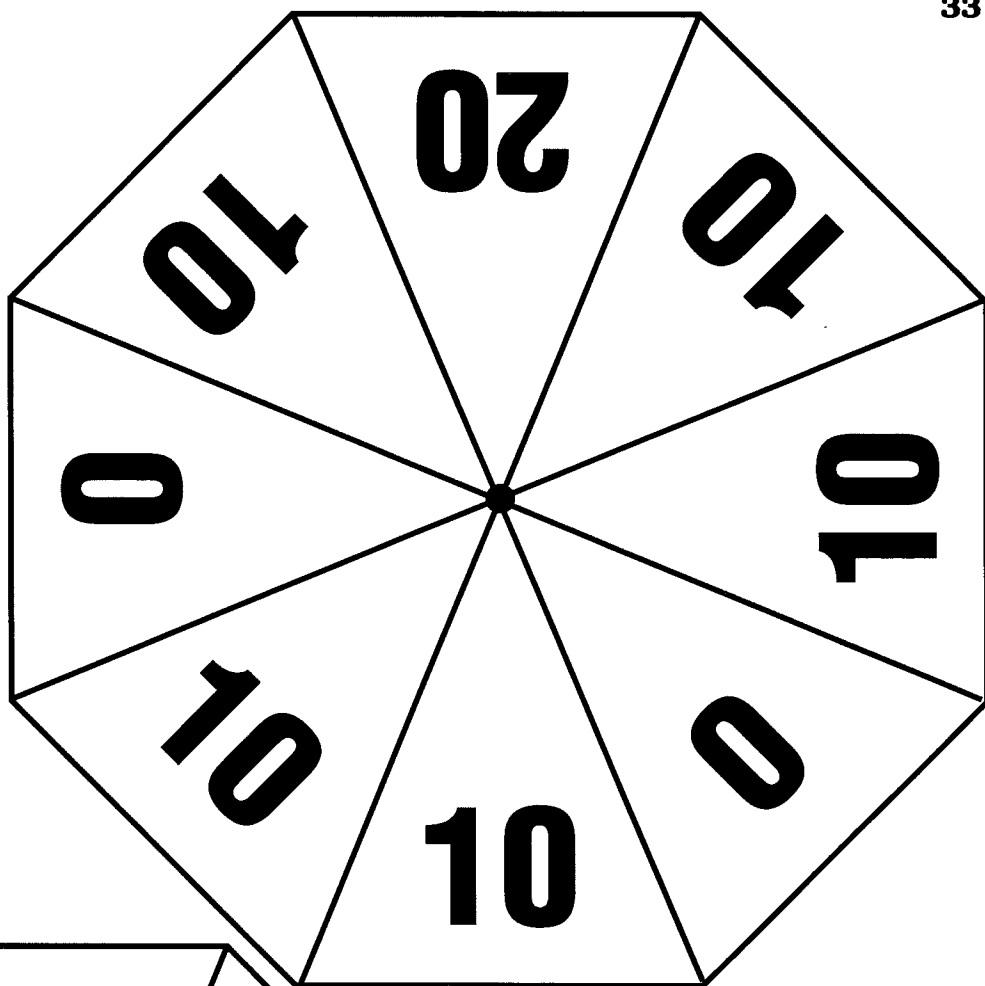


**Give It Away  
Spinner**



**Go for Broke  
Spinner**

# 200 Spinners



U

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X

S

T

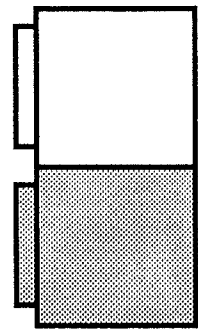
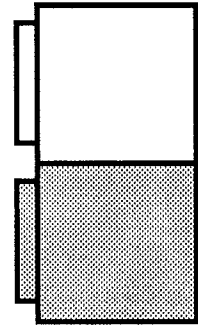
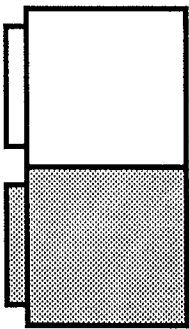
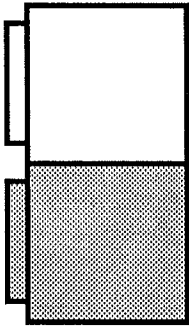
A

C

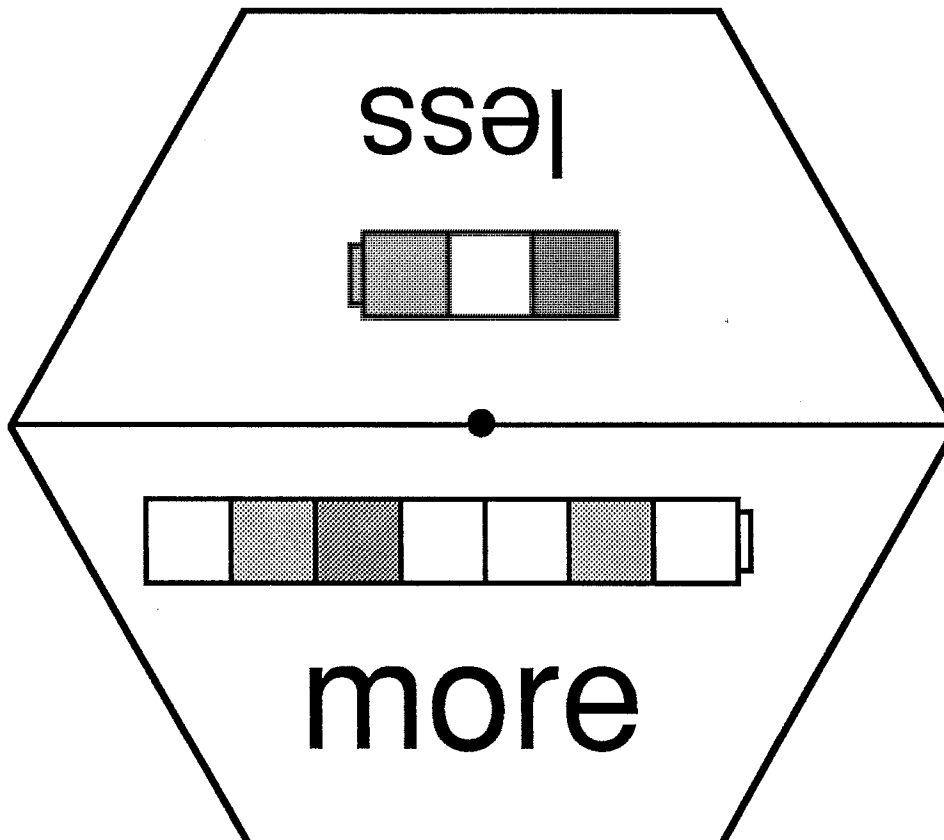
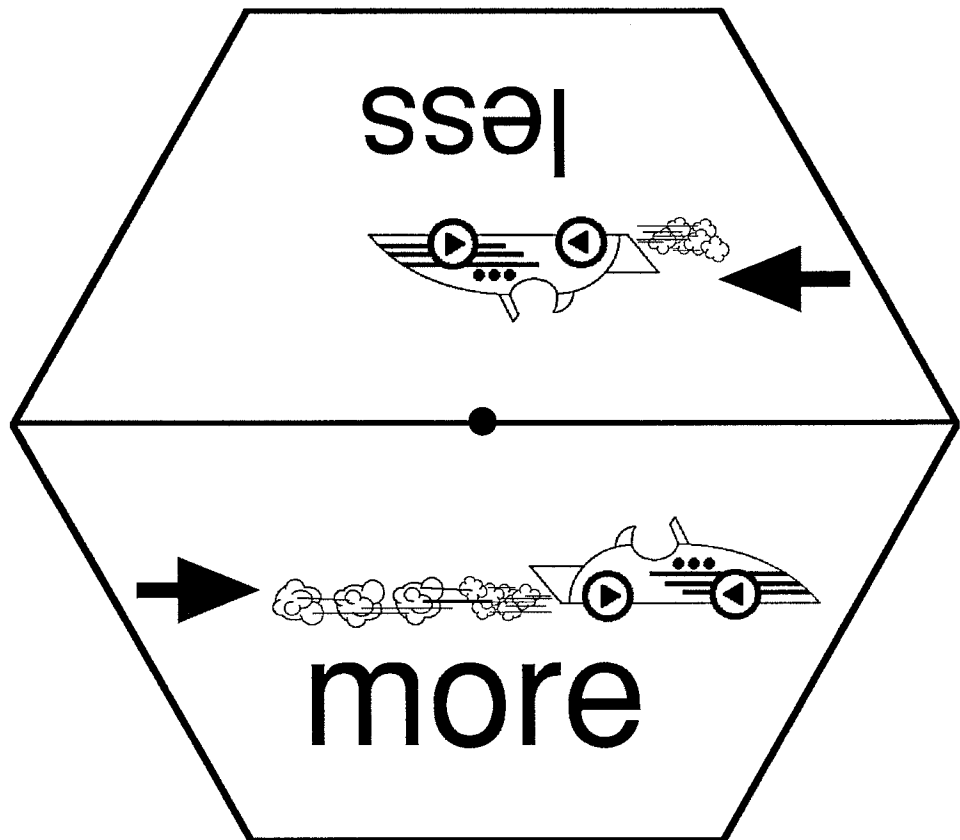
K

S

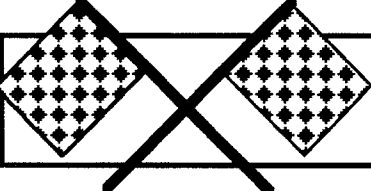
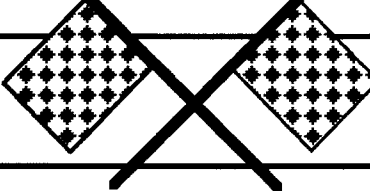

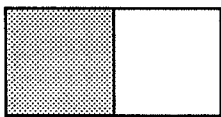



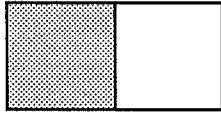

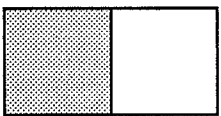
name \_\_\_\_\_


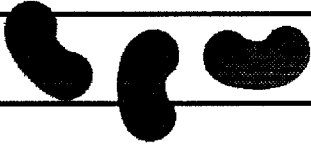


**Grand Prix  
Spinner**



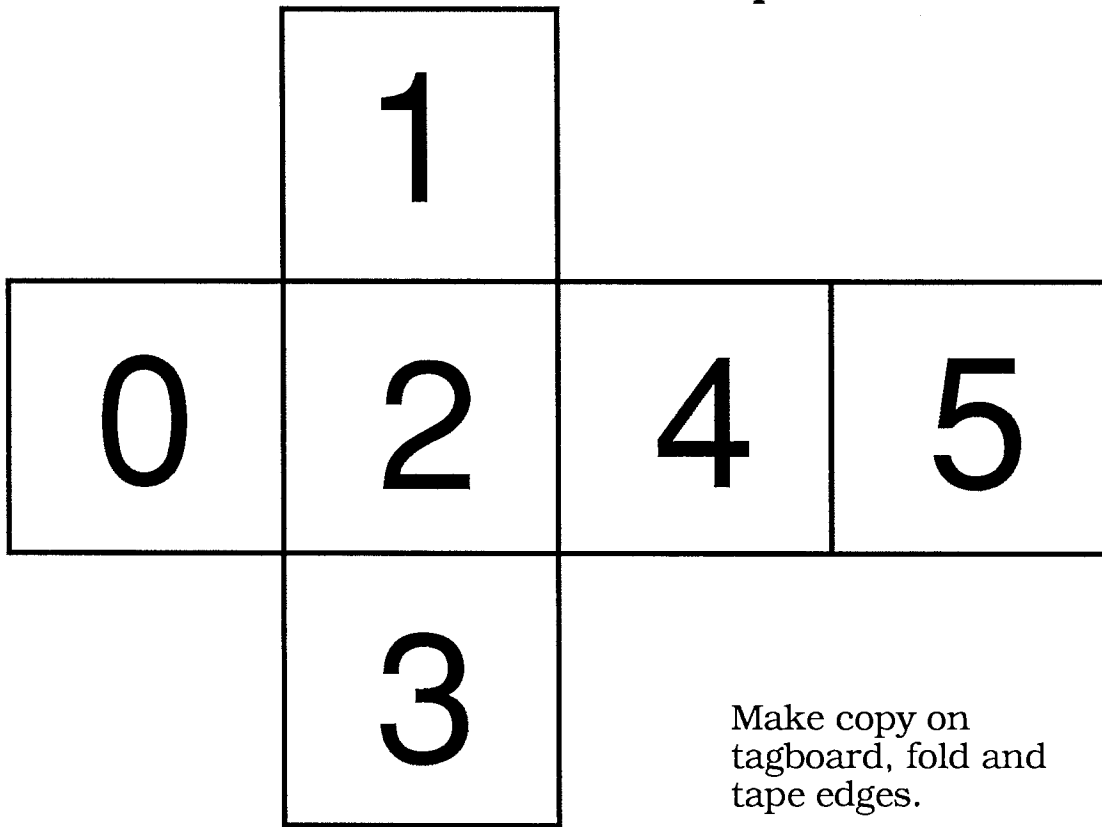
**Unifix Stacks  
Spinner**

 <i>Grand Prix</i>	 <i>Grand Prix</i>
 	 
 	 

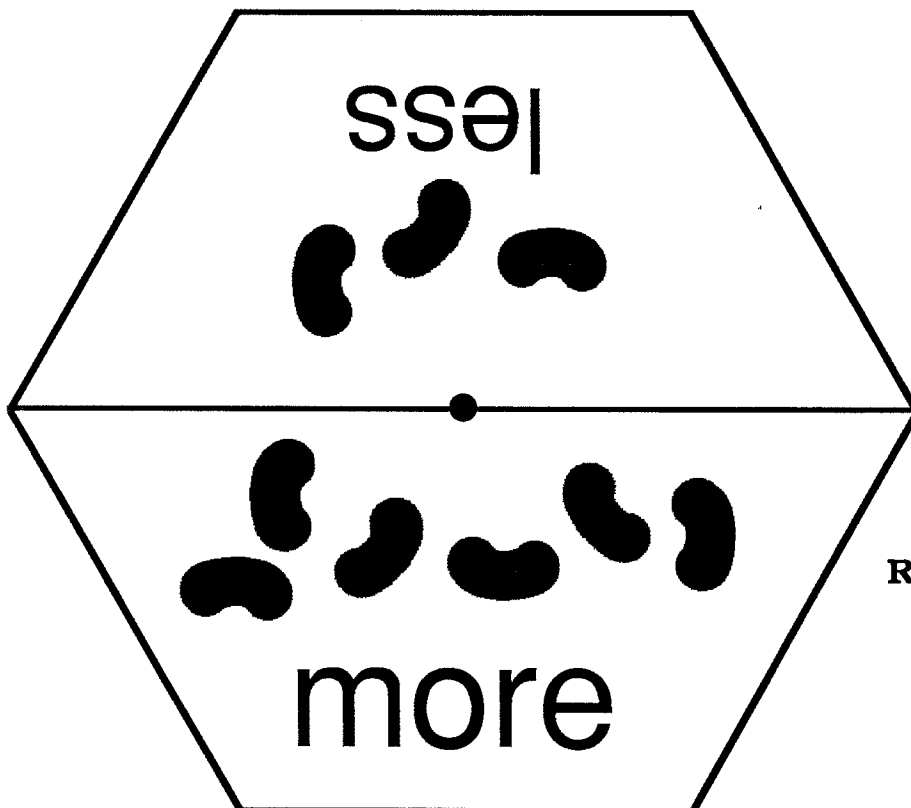
 <b>Roll, Roll, Roll for Beans</b> 			
		name _____	
<div style="border: 1px solid black; width: 150px; height: 50px; margin: 0 auto;"></div> <p>more</p>	<div style="border: 1px solid black; width: 150px; height: 50px; margin: 0 auto;"></div> <p>less</p>	<div style="border: 1px solid black; width: 150px; height: 50px; margin: 0 auto;"></div> <p>more</p>	<div style="border: 1px solid black; width: 150px; height: 50px; margin: 0 auto;"></div> <p>less</p>
<div style="border: 1px solid black; width: 150px; height: 50px; margin: 0 auto;"></div> <p>more</p>	<div style="border: 1px solid black; width: 150px; height: 50px; margin: 0 auto;"></div> <p>less</p>	<div style="border: 1px solid black; width: 150px; height: 50px; margin: 0 auto;"></div> <p>more</p>	<div style="border: 1px solid black; width: 150px; height: 50px; margin: 0 auto;"></div> <p>less</p>

**Roll, Roll, Roll for Beans  
die pattern**

**37**



Make copy on  
tagboard, fold and  
tape edges.



**Roll, Roll, Roll for Beans  
spinner**



name \_\_\_\_\_

38

**RAGS or RICHES?**

**RAGS or RICHES?**

more

less

more

less

more

less

more

less

name \_\_\_\_\_

**RAGS or RICHES?**

**RAGS or RICHES?**

more

less

more

less

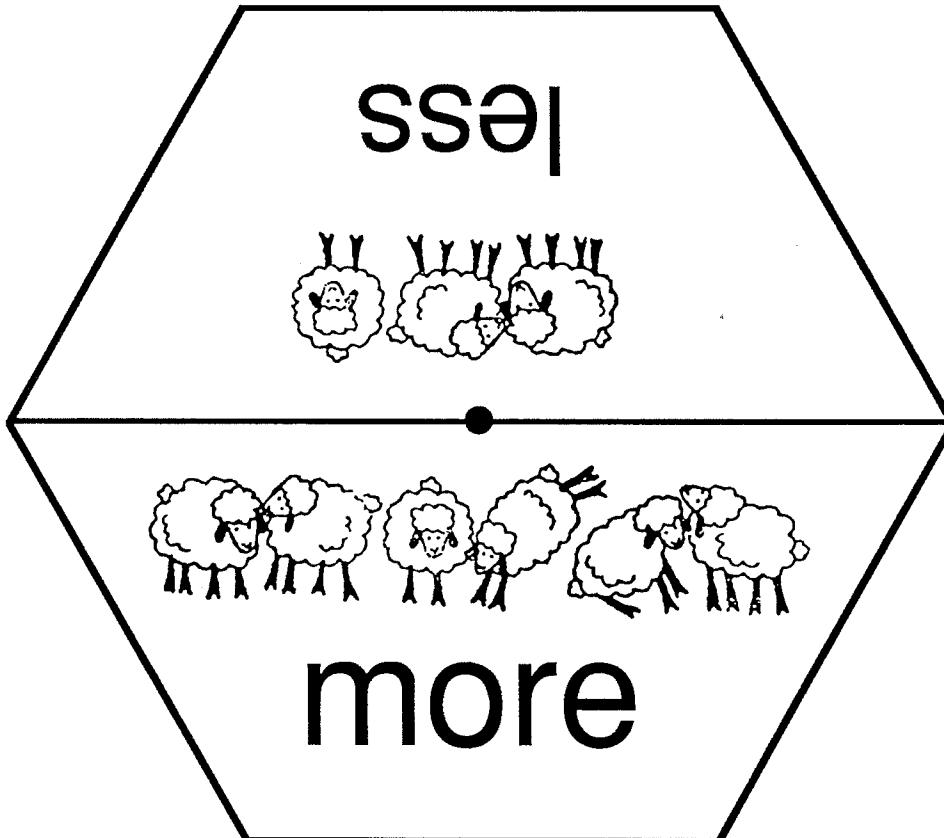
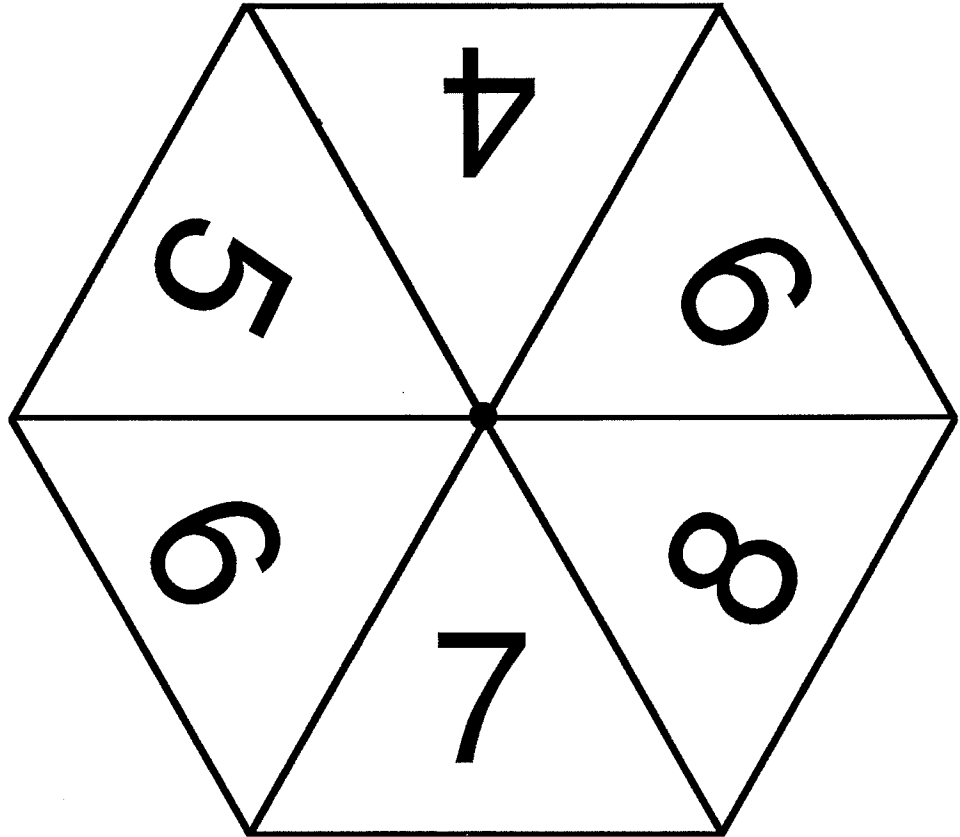
more

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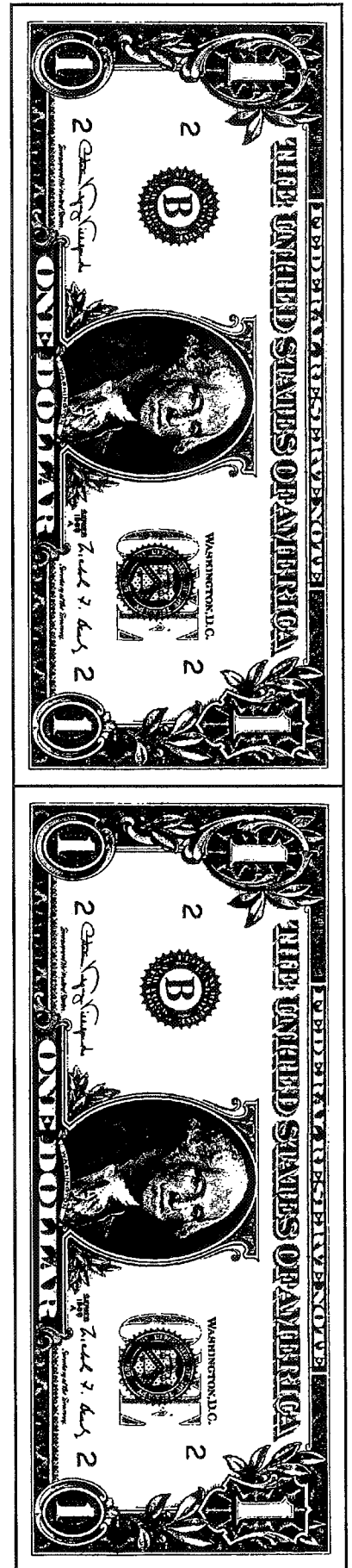
more

less

**Rags or Riches?  
Spinner**



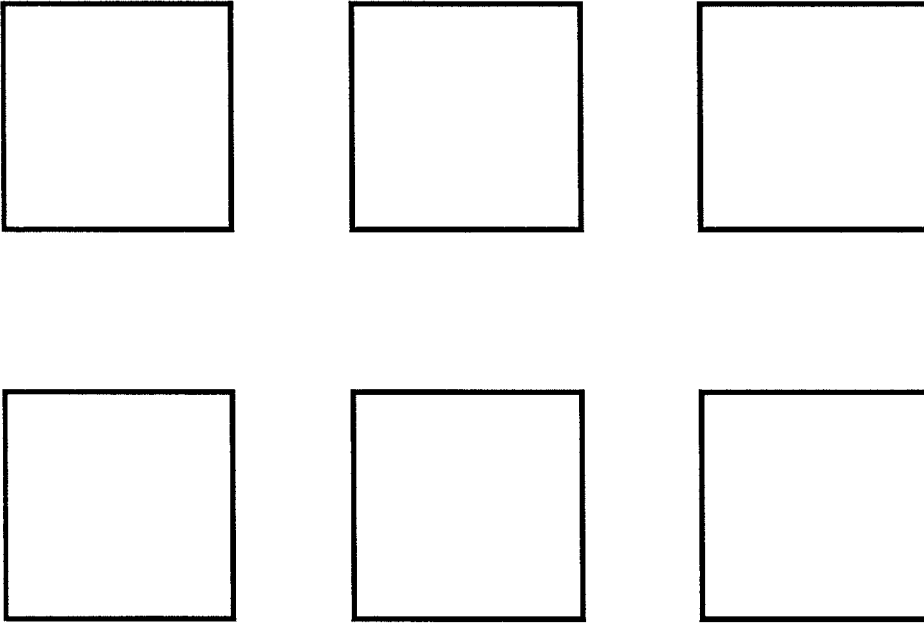
**Rags or Riches?  
Spinner**



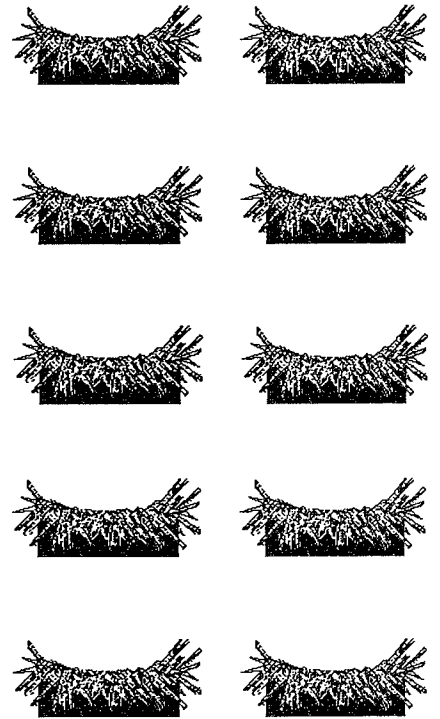
# MATRIX MADNESS

1						7			10
		13		15				19	
	22				26				30
31			34				38		
				45		47			50
51					56			59	
		63		65		67			
71			74					79	
	82			85			88		
91			94						100

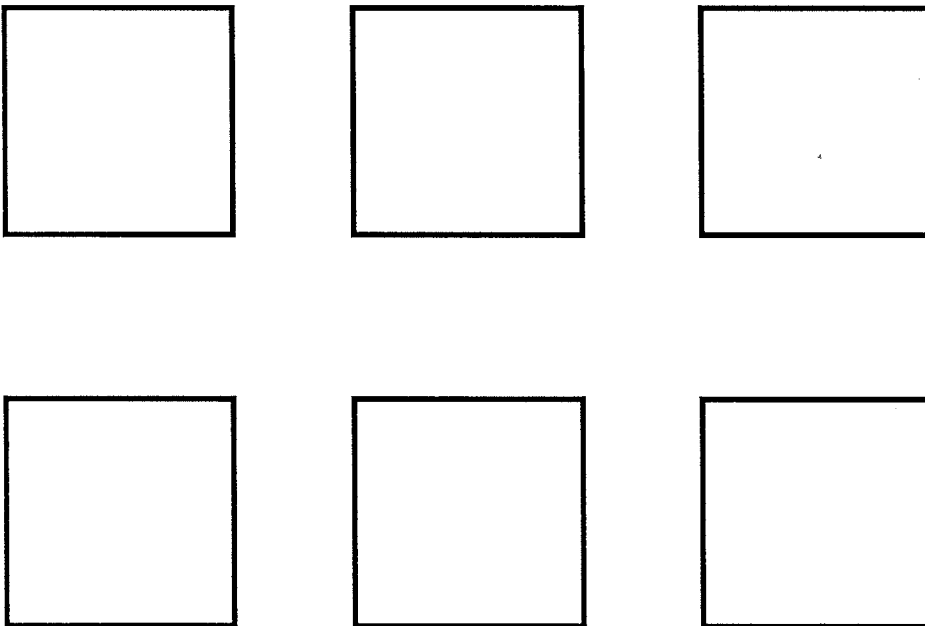
# *Easter Egg Factory*



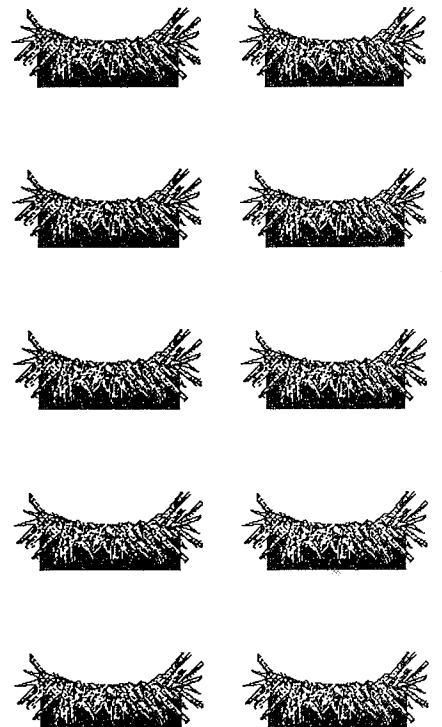
## *Hen House*



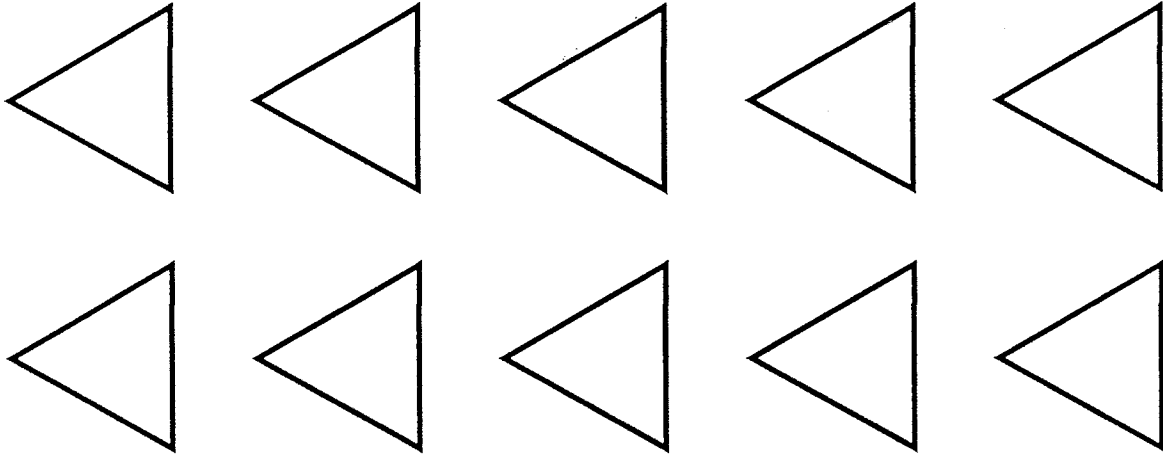
# *Easter Egg Factory*



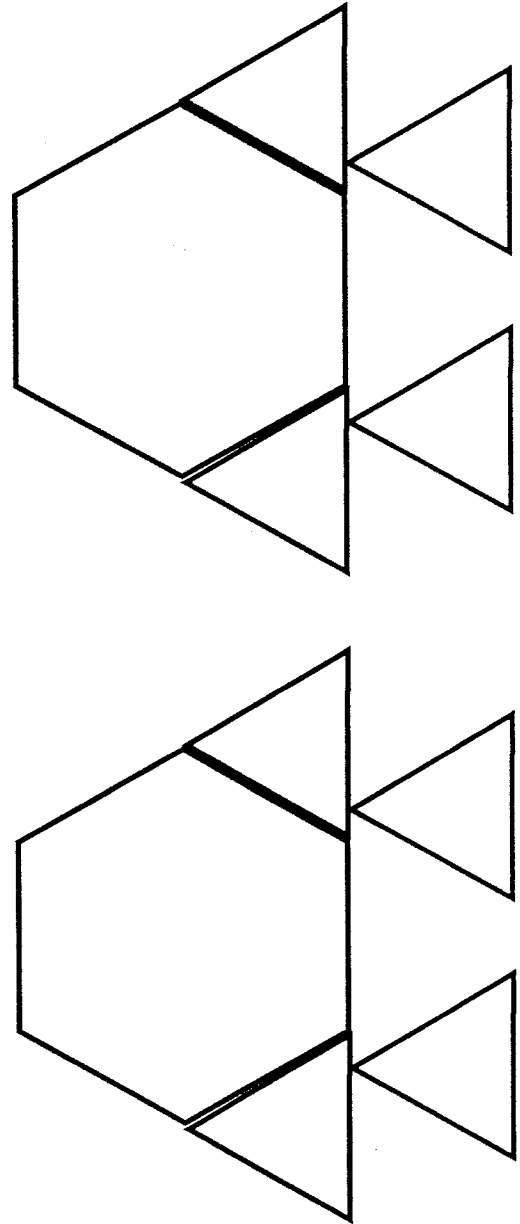
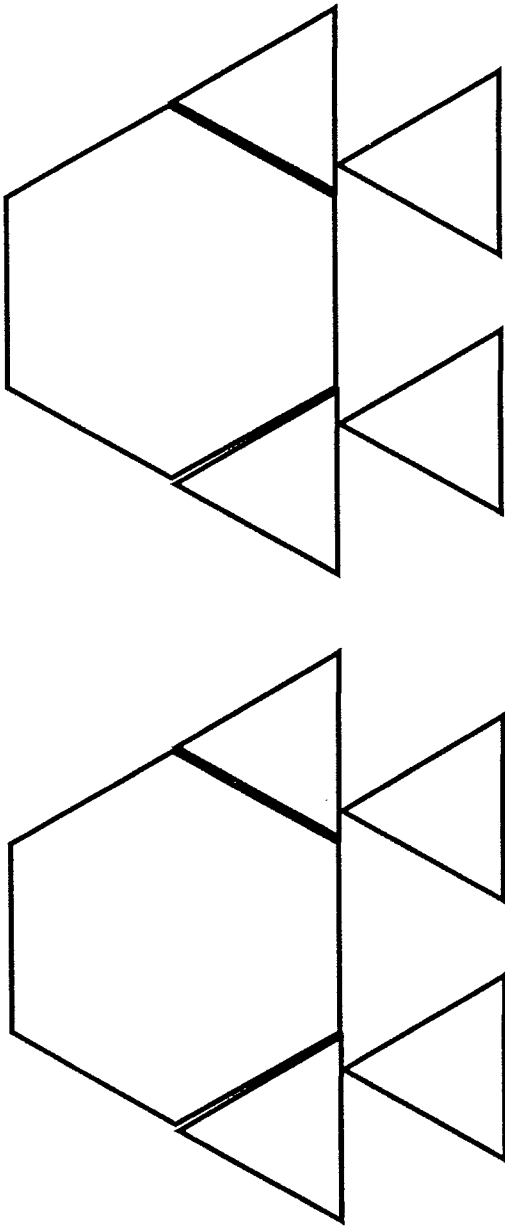
## *Hen House*



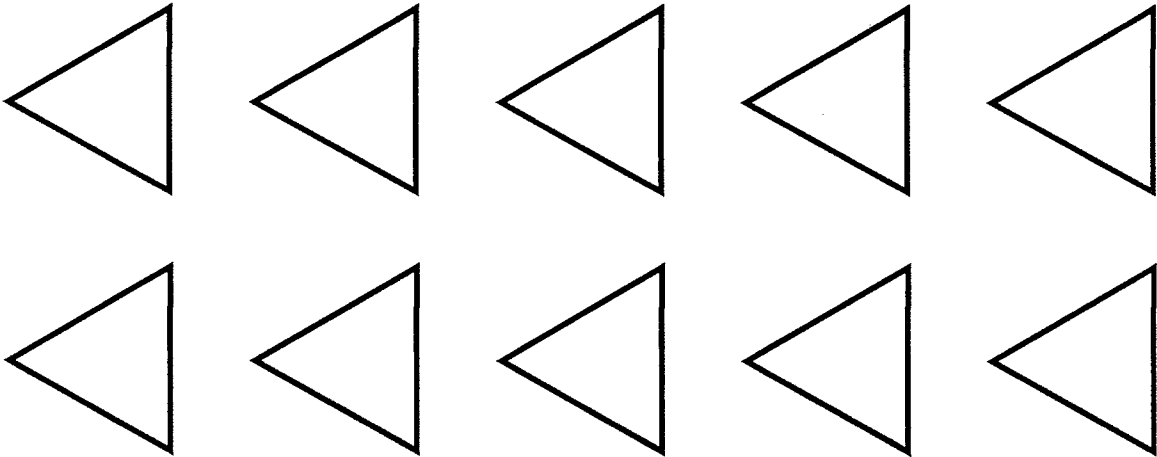
Components



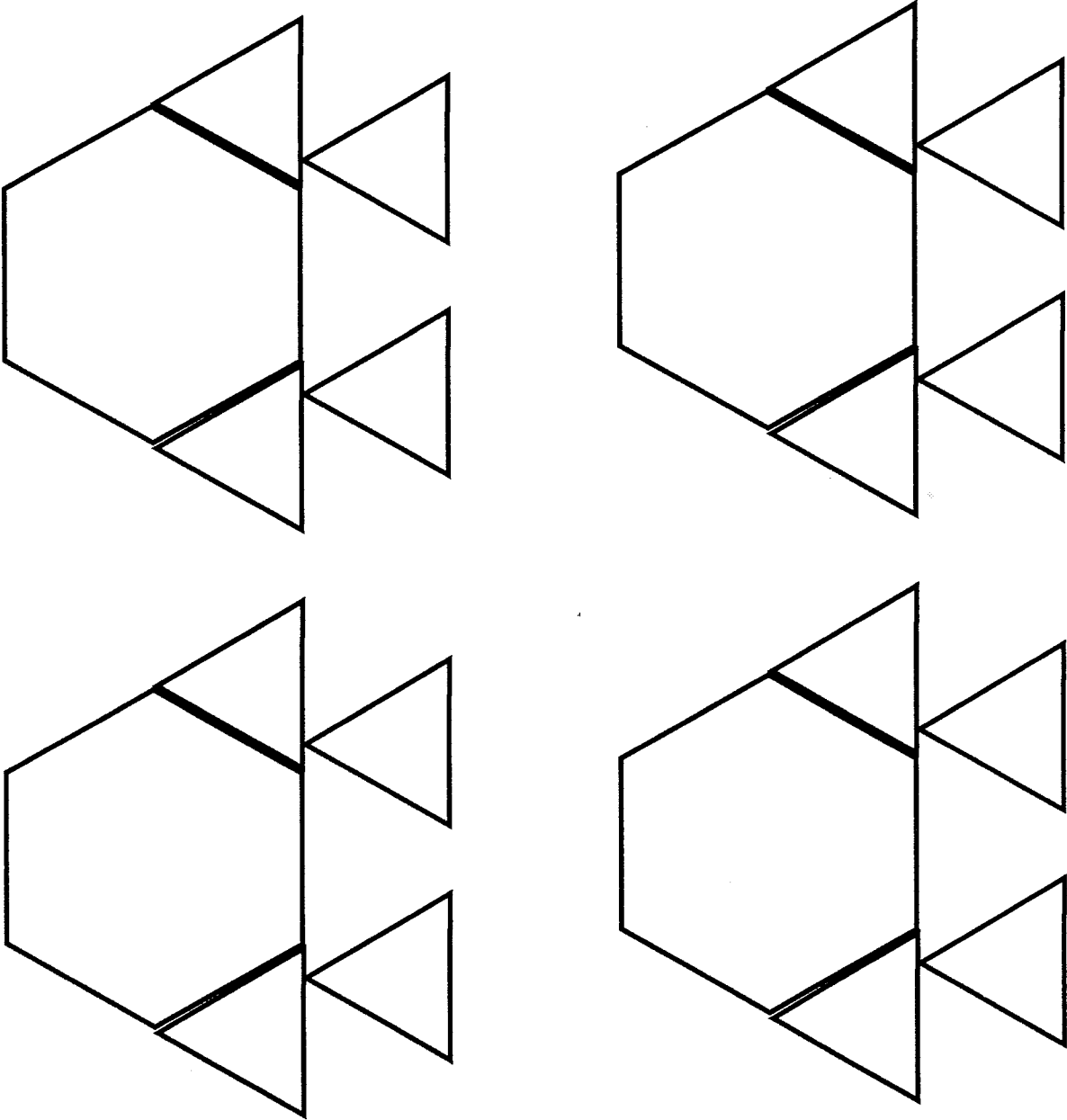
Spaceships



Components



Spaceships



# Go for Broke



dimes



pennies

# Go for Broke



dimes



pennies




	Away					
				X		
				X		
				X		
				X		
				X		
tens				X		
				X		
				X		
				X		
				X		
ones				X		


	Give It	Away
tens		x x x x x
ones		x x x x x
45		

# Roll, Roll, Roll for

<i>hundreds</i>	<i>tens</i>

**Beans** 

*ones*

 **Roll,**

*hundreds*

**Roll, Roll for**

**Beans**



**tens**

**ones**

<b>RAGS</b>	<b>or</b>	<b>RICHS</b>
<b>dollars</b>	<b>dimes</b>	<b>pennies</b>

<b>RAGS</b>	<b>or</b>	<b>RICHES</b>
<b>dollars</b>	<b>dimes</b>	<b>pennies</b>



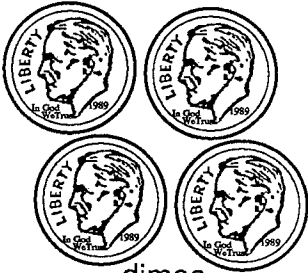
dimes



dimes



pennies



dimes



dimes

pennies



dimes

penny



dime

pennies



dime

penny

50, 60,  
70, —

6

70

68

50, 60, 70,  
80, —

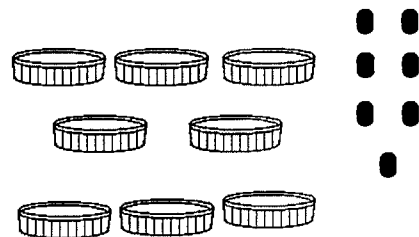
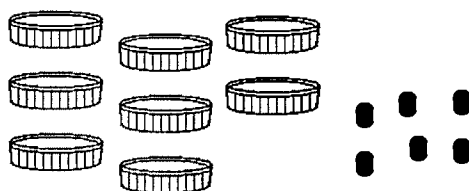
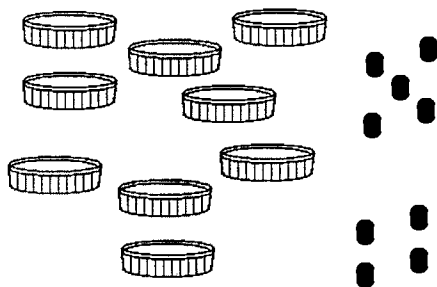
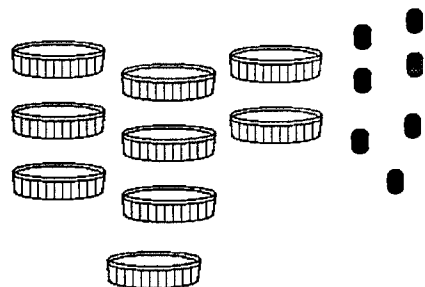
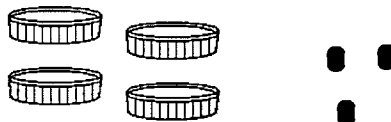
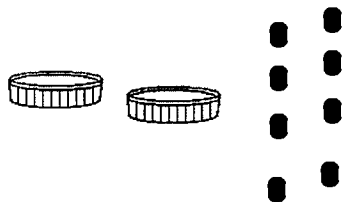
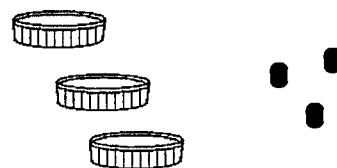
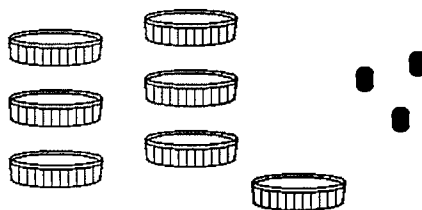
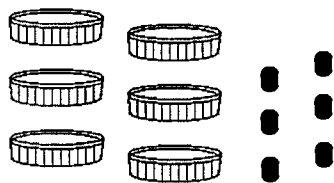
80, 85,  
90, —

40, 45,  
50, —

25, 30, —

2, 3, 4, —

14, 15,  
16, —



4

8

24

28

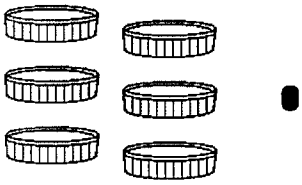
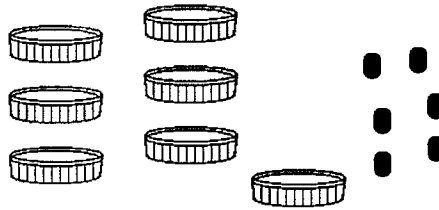
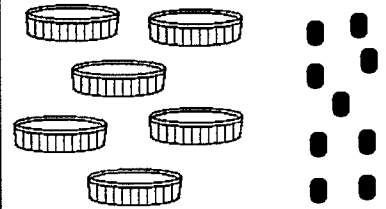
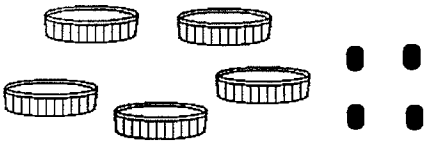
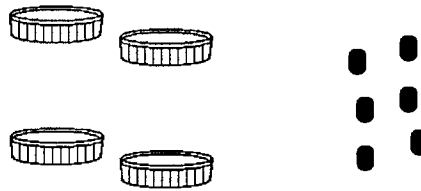
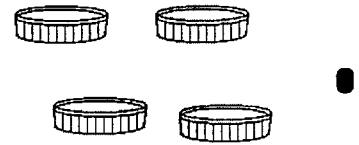
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37

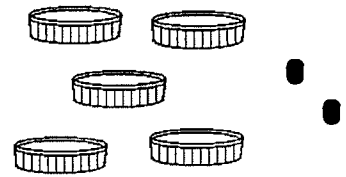
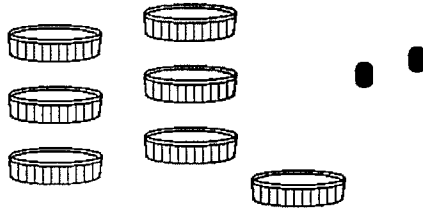
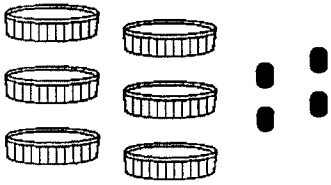
42

48

58

**12****96****92****3****84****83****81****16****25****39****49****57**





77

78

23

$$97 + 1 = \square$$

$$94 - 1 = \square$$

$$88 + 1 = \square$$

9

18

26

36

44

53

62

75

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# MATRIX MADNESS

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1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Apply the appropriate labels on both ends of each box lid. Either run the labels on full-sheet Avery Labels No. 5165, cut apart and attach; or simply cut apart these pages and glue or tape on.



## Counting Jars

**A PRACTICE & ENRICHMENT BOX**



## Fill and Count

**A PRACTICE & ENRICHMENT BOX**



## Junk Box Counting

**A PRACTICE & ENRICHMENT BOX**



## General Materials Counting

**A PRACTICE & ENRICHMENT BOX**



## Gift Wrap Counting

**A PRACTICE & ENRICHMENT BOX**



## Spin, Count, and Make A Book

**A PRACTICE & ENRICHMENT BOX**



## Beachcomber Trading

**A PRACTICE & ENRICHMENT BOX**



## The Easter Egg Factory

**A PRACTICE & ENRICHMENT BOX**



## Spaceship Factory

**A PRACTICE & ENRICHMENT BOX**



## Go For Broke

**A PRACTICE & ENRICHMENT BOX**



## Give It Away

**A PRACTICE & ENRICHMENT BOX**



200

**A PRACTICE & ENRICHMENT BOX**



## Unifix Stacks

**A PRACTICE & ENRICHMENT BOX**



## Grand Prix

**A PRACTICE & ENRICHMENT BOX**



## Counting Jars

**A PRACTICE & ENRICHMENT BOX**



## Fill and Count

**A PRACTICE & ENRICHMENT BOX**



## Junk Box Counting

**A PRACTICE & ENRICHMENT BOX**



## General Materials Counting

**A PRACTICE & ENRICHMENT BOX**



## Gift Wrap Counting

**A PRACTICE & ENRICHMENT BOX**



## Spin, Count, and Make A Book

**A PRACTICE & ENRICHMENT BOX**



## Beachcomber Trading

**A PRACTICE & ENRICHMENT BOX**



## The Easter Egg Factory

**A PRACTICE & ENRICHMENT BOX**



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## Go For Broke

**A PRACTICE & ENRICHMENT BOX**



## Give It Away

**A PRACTICE & ENRICHMENT BOX**



200

**A PRACTICE & ENRICHMENT BOX**



## Unifix Stacks

**A PRACTICE & ENRICHMENT BOX**



## Grand Prix

**A PRACTICE & ENRICHMENT BOX**



**Roll, Roll, Roll for Beans**

**A PRACTICE & ENRICHMENT BOX**



**Rags or Riches?**

**A PRACTICE & ENRICHMENT BOX**



**Matrix Madness**

**A PRACTICE & ENRICHMENT BOX**



**Roll, Roll, Roll for Beans**

**A PRACTICE & ENRICHMENT BOX**



**Rags or Riches?**

**A PRACTICE & ENRICHMENT BOX**



**Matrix Madness**

**A PRACTICE & ENRICHMENT BOX**