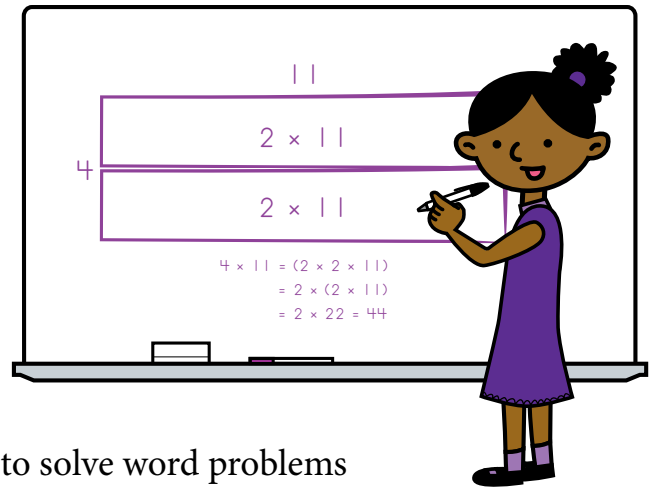**Bridges in Mathematics**
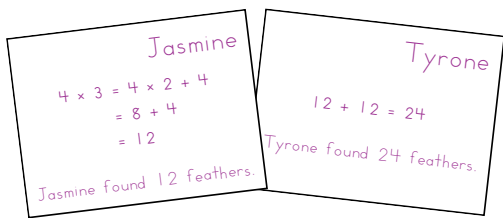**Grade 4 Unit 1**

Multiplicative Thinking

In this unit your student will:

- Fluently multiply and divide within 100

- Apply properties of operations as strategies to multiply and divide

- Use multiplication and division within 100 to solve word problems involving equal groups, arrays, and measurement quantities

- Find the area of a rectangle

Your student will practice these skills by solving problems such as these:

PROBLEM	COMMENTS
	Students use the number line to model multiplication. In this example, they see that 2×8 is twice as much as 2×4. The number line shows multiplication as repeated addition or jumps of equal sizes. It helps students see the relationships among multiplication facts. Understanding those relationships builds computational fluency.
	The array is another important model for multiplication. In this model, the side lengths are the numbers being multiplied. The area (the number of squares) is the product. In this example, students multiply 4 and 11. They can use the array to show a variety of strategies for multiplying. Students could break up the array into 4-by-10 and 4-by-1 rectangles. They could also divide the array into two equal parts of 2-by-11. 4×11 $= (2 \times 2 \times 11)$ $= 2 \times (2 \times 11)$ $= 2 \times 22$ $= 44$

PROBLEM	COMMENTS
Alexa found 4 feathers. Her sister Jasmine found 3 times as many feathers as Alexa. Their brother Tyrone found twice as many feathers as Jasmine. How many feathers did Jasmine find? How many feathers did Tyrone find? Jasmine $4 \times 3 = 4 \times 2 + 4$ $= 8 + 4$ $= 12$ Jasmine found 12 feathers. Tyrone $12 + 12 = 24$ Tyrone found 24 feathers.	Many word problems invite students to think about multiplication and division as equal groups. For example, if three siblings each ate 2 grapes, they ate 6 grapes in all. Students also use multiplication and division to solve problems involving comparisons, for example, "3 times as many" or "one-third as many." We want students to appreciate that a variety of situations (equal groups, area, comparisons) call for multiplication and division, and there are many ways to represent these situations.

For additional support, you can use the Math Vocabulary Cards app at apps.mathlearningcenter.org.

Frequently Asked Questions About Unit 1

Q: Why do some of these activities look like what my student did in third grade?

A: This unit reviews mathematical concepts while introducing and establishing models and strategies that will be used in fourth grade. This review helps teachers assess students' skill level and plan lessons in the days and months to come. Students also deepen their experiences with multiplication and division. They investigate multiplicative comparisons, write expressions and equations to represent multiplication situations, and solve contextual problems. Another element that is new to fourth grade is an investigation of factors, multiples, and prime and composite numbers.

Q: How can I support my student's learning?

A: To support your student in learning mathematics, you can:

- Challenge your student to look for multiplicative relationships. For instance, 6 photos in each picture frame is 6 times as many photos as picture frames. Point out these relationships when you see them, and ask your student to describe them in words: "There are 6 times as many photos as picture frames." Also ask them to write an equation. For example, if there are 3 picture frames, there are: 18 photos: $6 \times 3 = 18$.
- Visit mathathome.mathlearningcenter.org, and work together through some or all of the activities in Grade 4: Set 1. These activities complement the learning taking place in the classroom during Unit 1 and provide fun ways to engage everyone at home in mathematical thinking. This set also includes digital versions of familiar games, such as Cover Up and Products Four in a Row, and printable versions, such as Multiplication Bingo and Division Capture. Your student might be excited to teach you how to play these games.
- If your student would enjoy learning about math concepts through literature, consider looking for math-related books at your local library. Encourage your student to read to you and point out the mathematical relationships they see. Some suggestions include:
  » *Dim Sum for Everyone!* by Grace Lin
    Ask your student to describe the number of pieces of food on the plates in each illustration using a multiplication expression and then find how many.
  » *Numbed!* by David Lubar
  » *The Number Devil: A Mathematical Adventure* by Hans Magnus Enzensberger, illustrated by Rotraut Susanne Berner