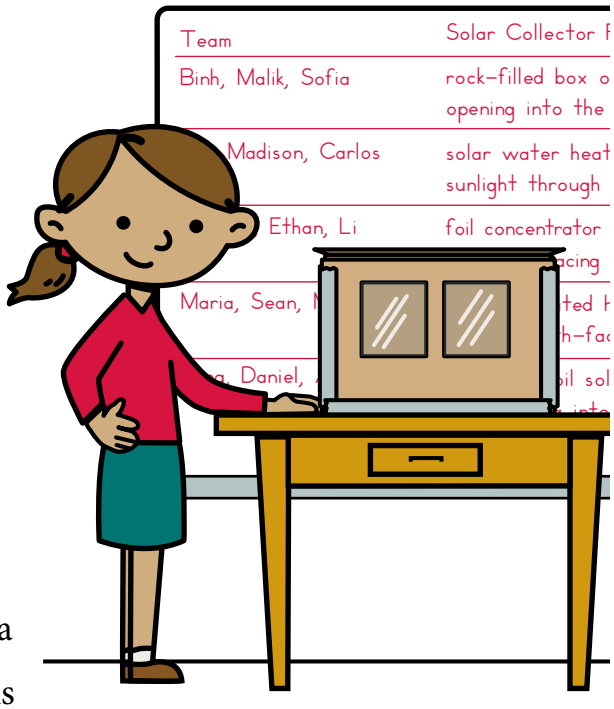
Bridges in Mathematics
Grade 5 Unit 8

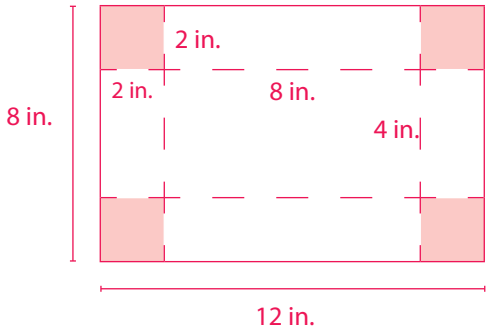
Solar Design

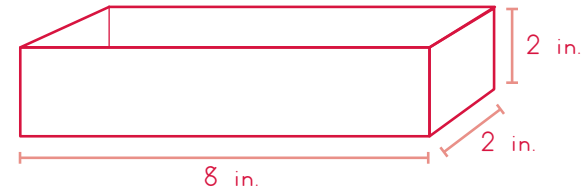
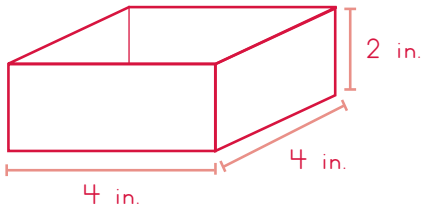


In this unit, your student will:

- Learn about solar home design and thermal energy transfer through reading, research, and experiments
- Use mathematics to design and build model houses to meet specific criteria and constraints
- Collect, graph, and analyze experimental data
- Work with scaled drawings and dimensions
- Practice math skills developed earlier this year, especially those involving volume measurement, multiplication, division, decimals, fractions, and geometry

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

PROBLEM	COMMENTS
Sketch and label a model for measuring and cutting a piece of cardboard that could be made into a box (without a lid) with a volume of 64 cubic inches.  You have to cut out the colored-in parts, then fold up the flaps.	In many problems during this unit, students are given a set of constraints and asked to provide a solution within those constraints. In these cases, there are often multiple solutions. For this problem, students might instead choose to illustrate a box with different dimensions, such as $2 \times 2 \times 16$ or $1 \times 8 \times 8$. This particular problem reinforces the idea of volume as the amount of matter an object can contain and reinforces the meaning of the formula for finding the volume of a rectangular prism ($V = l \times w \times h$).

PROBLEM	COMMENTS
List all the sets of dimensions (length, width, and height) a box with a volume of 32 cubic inches could have.  8 × 2 × 2 32 cubic inches  4 × 4 × 2 32 cubic inches	Problems in this unit often ask questions to help students practice skills that will come in handy as they design and construct model houses later in the unit. In this case, students might find it helpful to draw a sketch of each box. Students should notice that the dimensions and shape of each box is different, even as the volume remains 32 cubic inches.

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

Frequently Asked Questions About Unit 8

Q: Some of the work in this unit doesn't seem like math at all. Why is my student asked to, for example, learn about solar energy and then build a model of a home?

A: Early assignments in Unit 8 ask students to explore solar energy and heat transfer independently or with your help. The information they gather will help them think of ideas for their solar energy experiments and house models later in the unit. These assignments also help students develop research skills that will enable them to apply mathematics concepts that they know in order to solve problems.

Q: Why is this unit so different from the others?

A: At this point in the school year, fifth graders have studied the mathematical skills they'll need to progress into sixth grade. This unit gives students the opportunity to apply many of the skills they developed over the course of the year. The skills introduced in this unit involve research, experimental data collection and analysis, and model design. Applying mathematical skills to novel problems and new contexts is a process that challenges students to apply their mathematical skills and understandings in authentic contexts.

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

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

- Visit mathathome.mathlearningcenter.org and work through some or all of the activities in Grade 5: Spring Medley and Summer Medley together. These activities review the year's work and provide fun ways to engage children in mathematical thinking.
- If your home uses solar energy in any way, or if someone you know is knowledgeable about solar energy, share what you know with your student.
- If your student would enjoy learning about math concepts through literature, consider looking for math-related books at your local library. Some suggestions include:
  - *The Kids' Solar Energy Book* by Tilly Spetgang and Malcom Wells