

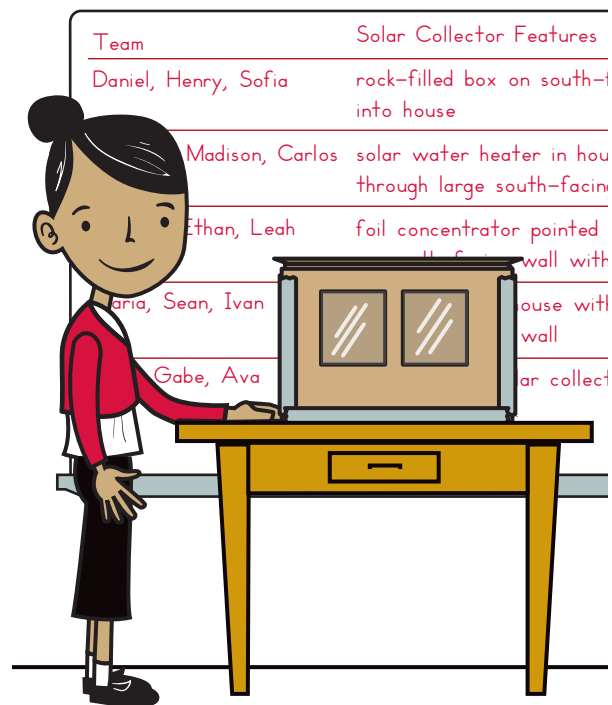
Bridges in Mathematics

Grade 5 Unit 8

Solar Design

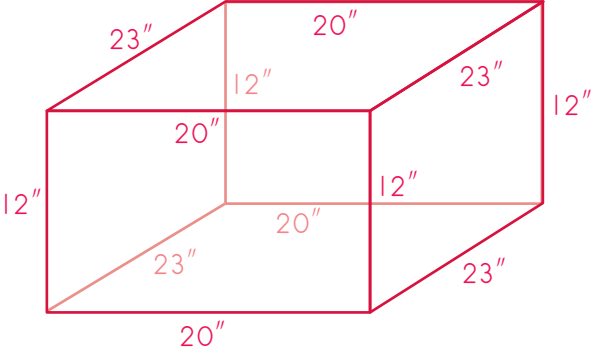
In this unit your child will:

- Learn about solar home design and thermal energy transfer through reading, research, and experiments
- 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 measurement, multiplication and division, decimals and fractions, and geometry



In the work for this unit, your child will research solar energy and practice math skills by solving problems like those shown below.

| PROBLEM | COMMENTS |
|---|---|
| <p>Sketch and label a model that would help someone know how to measure and cut a piece of cardboard that could be made into a box (without a lid) with a volume of 64 cubic inches. Include instructions if you like.</p> <p>You have to cut out the colored-in parts, then fold up the flaps.</p> | <p>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. In this case, students might instead choose to illustrate a box with different dimensions, such as $2 \times 2 \times 16$ or $1 \times 8 \times 8$.</p> <p>This particular problem reinforces the idea of volume as the amount of matter an object can contain as well as the formula for volume (base \times width \times height).</p> |

| PROBLEM | COMMENTS |
|--|--|
| <p>Jeremy made a model house that was 23" wide, 20" long, and 12" tall. Jeremy used his brother's roll of tape to tape all along the edges of the house. His brother said that Jeremy used most of the 20-foot roll of tape. Did Jeremy really use most of the tape?</p>  $12'' \times 4 = 48''$ $20'' \times 4 = 80''$ $23'' \times 4 = \frac{100''}{220''}$ <p>$220'' = 18 \text{ feet } 4 \text{ inches}$</p> <p>That's very close to 20 feet, so Jeremy used most of the tape.</p> | <p>Problems in this unit often ask practical questions to help students practice skills that will come in handy as they design and construct models later in the unit. In this case, students may find it helpful to draw a picture of Jeremy's model house or to make a list of all of its edges. Students might also conclude that a box has 4 edges that measure each dimension, and so multiply each dimension by 4. Then they must convert units to compare inches to inches (or feet to feet).</p> |

FREQUENTLY ASKED QUESTIONS ABOUT UNIT 8

Q: Some of the work in this unit doesn't seem like math at all. Why is my child asked to, for example, gather or examine examples of solar energy use or count light bulbs in our 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 come up with ideas for their solar energy experiments and house models later in the unit. These assignments also help students develop real-world research skills that will help them in many subjects in the future.

Q: Why is so much of the work for this unit review?

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