Bridges in Mathematics
Grade 3 Unit 8

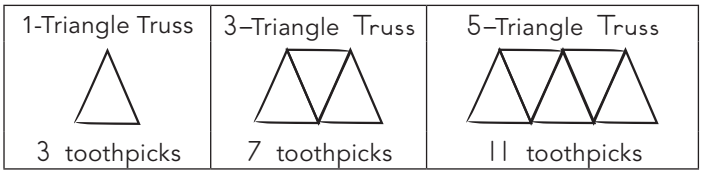
Bridge Design & Construction: Data Collection & Analysis

In this unit your child will:

- Research bridge engineering and design
- Design and build model bridges to meet specific criteria and constraints
- Plan and carry out tests to find failure points and make improvements to their model bridges
- Practice math skills developed earlier this year, including work with fractions, time and measurement, estimation, geometry, and multiplication

In Home Connections for this unit, your child will gather data for the bridge projects and practice math skills by solving problems like those shown below.

PROBLEM	COMMENTS
A bowling ball has a mass of 9 kg, and a basketball has a mass of 600 g. What is the difference in mass between the bowling ball and the basketball? 9,000 g − 600 g = 8,400 g	Students review the relationships among metric units and work with large numbers to determine the answer to this problem. Invite your child to think about how many grams are in a kilogram.
While working at the garden store, Casey had 27 cans of plant food to put on three empty shelves, so he put an equal number of cans on each shelf. That day, Tammy bought 2 cans from the bottom shelf. Shane bought 6 cans—3 from the top shelf and 3 from the middle shelf. Michael bought 2 cans, 1 from the top shelf and 1 from the bottom shelf. How many cans of plant food were left on each shelf at the end of the day?  5 cans are on the top shelf. 6 cans are on the second and third shelves.	While this problem looks complex, it can be approached very easily with a sketch. Invite your child to make a drawing of how the shelves at the store looked when Casey was done stocking the plant food, and then start crossing off cans of plant food for each purchase that happened through the day.

PROBLEM	COMMENTS
Jameson built some tiny truss bridges using toothpicks. He made sketches of his bridges like those below.  How many toothpicks will it take to build a truss bridge with 15 triangles? Explain your answer. (triangles x 2) + 1 = toothpicks (15 x 2) + 1 = 31	Students practice algebraic thinking in observing the relationship between the number of triangles and the number of toothpicks in each bridge. Your child may determine that each bridge has twice as many toothpicks as the number of triangles, plus 1. Students can use a different approach to discover the answer by using a ratio table later in the same assignment.

FREQUENTLY ASKED QUESTIONS ABOUT UNIT 8

Q: Some of the homework in this unit doesn't seem like math at all. Why is my child asked to, for example, gather examples of real-life bridges?

A: Assignments like this one help students develop real-world research skills that will help them in many subjects in the future. In this unit specifically, observing real-life bridges will inspire and inform students' model bridge designs.

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

A: At this point in the school year, third graders have studied all of the mathematical skills they'll need to progress into fourth grade successfully. Most of the skills introduced in this unit involve model design and testing, data collection, and analysis. Students will use their existing math strategies to help develop new skills in these areas.

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.