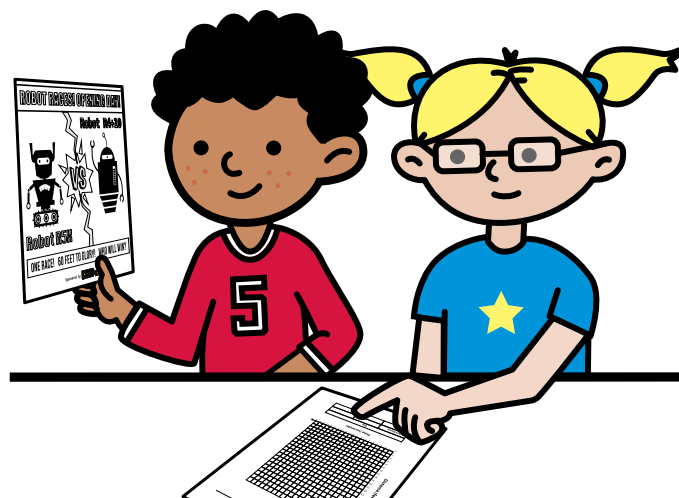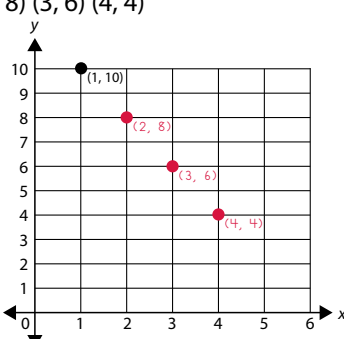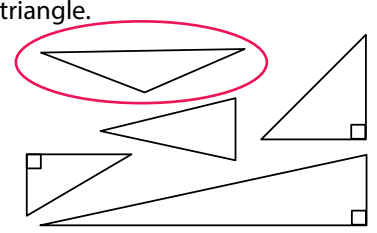**Bridges in Mathematics**
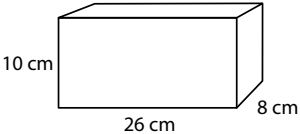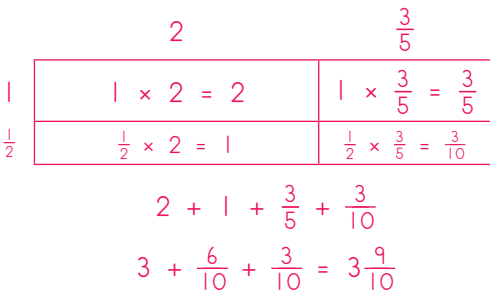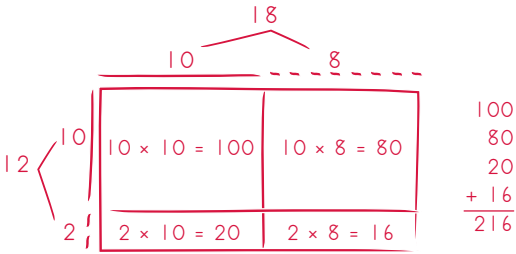**Grade 5 Unit 6**

Graphing, Geometry & Volume

In this unit, your student will:

- Calculate the volume of a rectangular prism using formulas and other strategies

- Graph points in the coordinate plane and describe the meaning of the values of coordinate points based on the context of a problem or situation

- Sort and classify triangles and quadrilaterals within a hierarchy based on properties

- Multiply a mixed number by a whole number and by another mixed number

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

PROBLEM	COMMENTS
Plot and label these points on the coordinate plane below. The first one has been done as an example. What situation could this data represent? (1, 10) (2, 8) (3, 6) (4, 4) What would be the next point if the pattern continued? (5, 2) As the number of students eating oranges during snack time (x-coordinate) goes up, the number of oranges (y-coordinate) goes down.	Students consistently link the data plotted on the coordinate plane to a problem context and relate the value of each value in an ordered pair to the context the data represents. The first number in each ordered pair identifies the x-coordinate, and the second identifies the y-coordinate. Students locate each point on the coordinate plane by moving left or right to locate the x-coordinate and then up or down to locate the y-coordinate. They will use these graphing skills to graph number patterns and use the information to solve problems. For example, they will use this reasoning to determine the winner of some robot races later in the unit.
Circle the isosceles triangle that is also an obtuse triangle. 	Students categorize triangles by their side lengths and angle measures. They use logic, reasoning and hierarchies of categories to determine which shape categories overlap and which do not. One way to think about the geometric reasoning students do is to practice assigning categories to something familiar. For example, every cat is an animal, but not every animal is a cat. Every rectangle is a quadrilateral, but not every quadrilateral is a rectangle.

PROBLEM	COMMENTS
What is the volume of the box? 10 cm · 26 cm · 8 cm $26 \times 8 = (20 \times 8) + (6 \times 8) = 160 + 48 = 208$ $208 \times 10 = 2{,}080$ The volume is 2,080 cubic centimeters	Students can apply one of two formulas to find the volume of a rectangular prism during this unit. $V = l \times w \times h$ (length × width × height) $V = B \times h$ (area of the base × height)
Make a labeled sketch that shows $1\frac{1}{2} \times 2\frac{3}{5}$. Then use your sketch to find the product. (area model sketch) 	2	$\frac{3}{5}$	 1	$1 \times 2 = 2$	$1 \times \frac{3}{5} = \frac{3}{5}$	 $\frac{1}{2}$	$\frac{1}{2} \times 2 = 1$	$\frac{1}{2} \times \frac{3}{5} = \frac{3}{10}$	 $2 + 1 + \frac{3}{5} + \frac{3}{10}$ $3 + \frac{6}{10} + \frac{3}{10} = 3\frac{9}{10}$	Students use partial products and the area model to multiply mixed numbers in the same way they use the area model to multiply multidigit whole numbers. (area model sketch) 18 = 10 + 8 12 = 10 + 2 $10 \times 10 = 100$ $10 \times 8 = 80$ $2 \times 10 = 20$ $2 \times 8 = 16$ 100 / 80 / 20 / + 16 / 216 For fraction multiplication, the dimensions are broken into whole number and fractional parts rather than by place value.
Use doubling and halving to find the product. $3\frac{1}{2} \times 18$ $3\frac{1}{2} \times 18$ $= (3\frac{1}{2} \times 2) \times (18 \times \frac{1}{2})$ $= 7 \times 9$ $= 63$	Students have used the strategy of doubling and halving to multiply whole numbers, and now they apply it to multiplying fractions and mixed numbers. Doubling one of the factors while halving the other factor can produce an expression that is friendlier to work with yet still has the same product.

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

Frequently Asked Questions About Unit 6

Q: There's a lot of geometry vocabulary. What can I do to refresh my memory of it?

A: You can use the Word Resource Cards app or consult any number of online math glossaries for children. Your student will also have a one-page set of geometry vocabulary cards to use as reference. You can use any of these resources to discuss key vocabulary terms.

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: Set 6 together. These activities complement the learning that takes place in the classroom and provide fun ways to engage children in mathematical thinking. This set also includes digital versions of games that your student has learned at school, such as Dragon's Treasure and Polygon Search.
- Work with your student to measure the dimensions of various rectangular prisms (boxes, closets, and so on) to the nearest whole unit (inches, centimeters, feet, or meters) and determine the volume of those rectangular prisms using the $V = l \times w \times h$ or $V = B \times h$ formulas for finding volume.
- If your student would enjoy learning about math concepts through literature, consider looking for math-related books at your local library. Some suggestions include:
  - » *Look, Grandma! Ni, Elisi!* by Art Coulson, illustrated by Madelyn Goodnight
  - » *Maryam's Magic: The Story of Mathematician Maryam Mirzakhani* by Megan Reid, illustrations by Aaliya Jaleel