Eureka Math Parent Guide

A GUIDE TO SUPPORT PARENTS AS THEY WORK WITH THEIR STUDENTS IN MATH.

GRADE 6
MODULE 5

GRADE FOCUS

Sixth grade mathematics is about (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) dividing more complex fractions and extending idea of rational numbers to include negative numbers; (3) writing, interpreting, and using expressions and equations; and (4) developing understanding of statistical thinking.

- Module 1: Ratios and Unit Rates
- Module 2: Arithmetic Operations Including Dividing by a Fraction
- Module 3: Rational Numbers
- Module 4: Expressions and Equations
- » **Module 5: Area, Surface Area, and Volume Problems**
- Module 6: Statistics

LET'S CHECK IT OUT!

MODULE 5 FOCUS

In module 5, students use their previous experiences in shape composition (putting together) and decomposition (taking apart) in order to understand and develop formulas for area, volume, and surface area.

MORE SPECIFICALLY, CHILDREN WILL LEARN HOW TO:

- Find the area of right triangles, other triangles, special quadrilaterals, and polygons by putting shapes together to form rectangles or taking them apart to form triangles.
- Find the volume of a right rectangular prism using unit cubes and the formulas V = l x w x h and V = b x h.
- Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side.
- Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

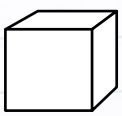
TOPIC OVERVIEW

Topics are the lessons within a module that help children master the skills above. Here are the lessons that will guide your child through Module 5:

- Topic A: Relationships of the Operations
- Topic B: Special Notations of Operations
- Topic C: Replacing Letters and Numbers
- Topic D: Expanding, Factoring, and Distributing Expressions
- Topic E: Expressing Operations in Algebraic Form
- Topic F: Writing and Evaluating Expressions and Formulas
- Topic G: Solving Equations
- Topic H: Applications of Equations

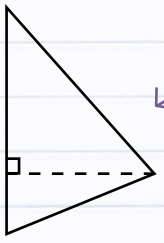
WORDS TO KNOW

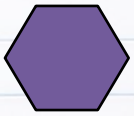
- **Triangular Region**: A *triangular region* is the union of the triangle and its interior.
- **Altitude and Base of a Triangle**: An *altitude* of a triangle is a perpendicular segment from a vertex of a triangle to the line containing the opposite side. The opposite side is called the *base*. For every triangle, there are three choices for the altitude, and hence there are three base-altitude pairs. The *height* of a triangle is the length of the altitude. These terms can mislead students: base suggests the bottom, while *height* usually refers to vertical distances. Do not reinforce these impressions by consistently displaying all triangles with horizontal bases. A dashed line shows the altitude of the triangle in the image.
- **Pentagon**: a five-sided polygon.
- **Hexagon**: a six-sided polygon.
- **Parallel Planes**: Two planes are *parallel* if they do not intersect.
- **Right Rectangular Prwism**: a three dimensional shape made of six rectangular sides (faces): 2 base faces and 2 lateral faces that are at right angles to one another. All faces intersect along segments called *edges* (base and lateral edges).
- **Cube**: A *cube* is a right rectangular prism all of whose edges are of equal length. Here is an example of a cube.
- **Surface of a Prism**: The *surface* of a *prism* is the union of all of its faces (the base faces and lateral faces).



Cube

Pentagon





Hexagon

Right Rectangular Prism

SAMPLE PROBLEMS

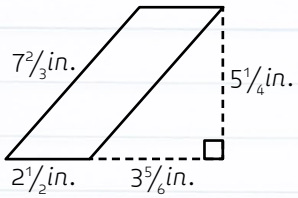
SAMPLE 1: AREA OF PARALLELOGRAMS

Solution:

$A = bh$

$= 13cm\ (6cm)$

$= 78\ cm^2$



Solution:

$A = bh$

$= 2\frac{1}{2}in.\ (5\frac{1}{4}in.)$

$= \frac{5}{2}in.\ (\frac{21}{4}in.)$

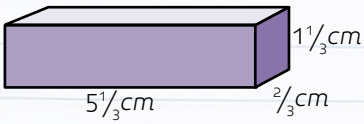
$= \frac{105}{8}in.^2$

$= 13\frac{1}{8}in.^2$

SAMPLE 2

If you have to fill the prism with cubes whose side lengths are less than 1 cm, what size would be best?

Solution: The best choice would be a cube with side lengths of 1/3 cm.



Solution:

$V = lwh$

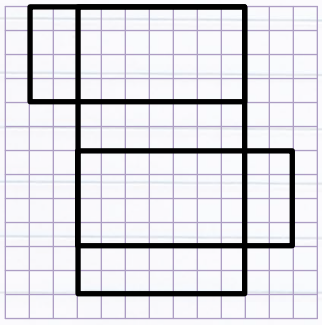
$V = (5\frac{1}{3}cm)(\frac{2}{3}cm)\ (1\frac{1}{3}cm)$

$V = \frac{16}{3}cm \times \frac{2}{3}cm \times \frac{4}{3}cm$

$V = \frac{128}{27}cm^3$

SAMPLE 3

Calculate the surface area of the rectangular prism. Assume each box in the grid represents a 1ft x 1ft square.



Solution:

(2ft x 4ft) + (2ft x 4ft) + (4ft x 7ft) + (4ft x 7ft) + (7ft x 2ft) + (7ft x 2ft) =

2(2ft x 4ft) + 2(4ft x 7ft) + 2(7ft x 2ft) =

$16ft^2 + 56ft^2 + 28ft^2 = 100ft^2$

HOW YOU CAN HELP AT HOME

- Every day, ask your child what they learned in school and ask them to show you an example.
- Ask your child to explain the relationship between a parallelogram and a rectangle.
- Ask your child to explain the relationship between a triangle and a rectangle.
- Challenge your child to determine possible dimensions for a right rectangular prism with a volume of 34 cubic centimeters. At least one measurement must be a fraction or decimal. (One possible solution: 6 4/5 cm x 2 1/2 cm x 2 cm)