

Eureka Math Parent Guide

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

GRADE 5
MODULE 5

GRADE FOCUS

Fifth grade mathematics is about (1) developing fluency with addition and subtraction of fractions, (2) understanding multiplication and division of fractions in limited cases, (3) extending division to two-digit divisors, (4) developing fluency with whole number and decimal operations to the hundredths, and (5) developing understanding of volume.

- Module 1: Place Value and Decimal Fractions
- Module 2: Multi-Digit Whole Number and Decimal Fraction Operations
- Module 3: Addition and Subtraction of Fractions
- Module 4: Multiplication and Division of Fractions and Decimal Fractions
- » **Module 5: Addition and Multiplication with Volume and Area**
- Module 6: Problem Solving with the Coordinate Plane

LET'S CHECK IT OUT!

MODULE 5 FOCUS

In Module 5, students begin by reasoning about and working with three-dimensional shapes. They explore cubic units and move toward calculations of volumes of rectangular prisms. Students also extend their two-dimensional work with area to figures with fractional side lengths. This module bridges the Grade 4 work on area with the Grade 6 work on volume and area to come.

MORE SPECIFICALLY, CHILDREN WILL LEARN HOW TO:

- Multiply a fraction or whole number by a fraction.
- Solve real world problems involving multiplication of fractions and mixed numbers.
- Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
- Measure volumes by counting unit cubes of various units.
- Relate volume to the operations of multiplication and addition.
- Understand that attributes belonging to a category of figures also belong to all subcategories of that category (e.g. the attributes of a rectangle also apply to a square)

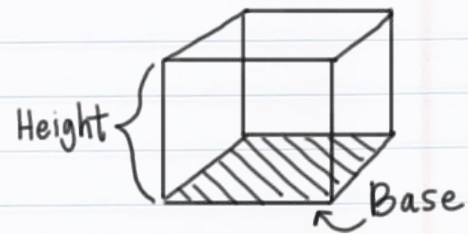
TOPIC OVERVIEW

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: Concepts of Volume
- Topic B: Volume and the Operations of Multiplication and Addition
- Topic C: Area of Rectangular Figures with Fractional Side Lengths
- Topic D: Drawing, Analysis, and Classification of Two-Dimensional Shape

WORDS TO KNOW

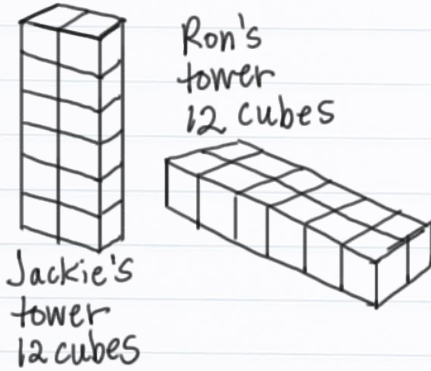
- **Base:** one face of a three-dimensional solid— often thought of as the surface upon which the solid rests
- **Bisect:** divide into two equal parts
- **Cubic units:** cubes of the same size used for measuring
- **Height:** adjacent layers of the base that form a rectangular prism
- **Hierarchy:** series of ordered groupings of shapes
- **Unit cube:** cube whose sides all measure 1 unit
- **Volume of a solid:** measurement of space or capacity



SAMPLE PROBLEMS

SAMPLE 1

Two orientations of 12 unit cubes



An area calculation for $3\frac{1}{2} \times 1\frac{1}{4}$

	3 in	$\frac{1}{2}$ in	
1 in	3 in^2	$\frac{1}{2} \text{ in}^2$	
$\frac{1}{4}$ in	$\frac{3}{4} \text{ in}^2$	$\frac{1}{8} \text{ in}^2$	

$$3 + \frac{1}{2} + \frac{3}{4} + \frac{1}{8} =$$

$$3 + \frac{4}{8} + \frac{6}{8} + \frac{1}{8} =$$

$$3 + \frac{11}{8} =$$

$$4\frac{3}{8} \text{ in}^2$$

SAMPLE 2

Earlier in Grade 5, we moved beyond using the area model for multiplication of whole numbers and begin to use this powerful model to illustrate mathematical operations on fractions. Now, we move a step further and use the area model in various real world problems, e.g., finding the area of a wall minus the space for two windows, or finding the area of a mat surrounding a picture in a frame.

The numbers we use in our area models now are often mixed whole numbers and fractions, giving students a chance to demonstrate their understanding in diagrams in which they show the multiplication of both the whole number and fractional parts of the problem.

$$(1 \times 3) + (\frac{1}{3} \times 3)$$

$$= 3 + 1$$

$$= 4$$

$$(1 \times \frac{3}{4}) + (\frac{1}{3} \times \frac{3}{4})$$

$$\frac{3}{4} + \frac{1}{4}$$

$$= 1$$

$$4 + 1 = 5$$

$$A = 5 \text{ square inches}$$

SAMPLE 3

Note that in the area problem above, the numbers are first decomposed and drawn as whole number and fractional parts, and then they are multiplied: 1×3 , $\frac{1}{3} \times 3$, $1 \times \frac{3}{4}$, $\frac{1}{3} \times \frac{3}{4}$. Each of these products is then added together to find the total area of the rectangle.

How many 2-inch cubes are needed to build a rectangular prism that measures 10 inches by 6 inches by 14 inches?

$$3 \times 5 \times 7 = 105 \text{ OR}$$

$$\text{Volume: } 10 \text{ in} \times 6 \text{ in} \times 14 \text{ in} = 840 \text{ in}^3$$

$$\text{volume of cube: } 2 \text{ in} \times 2 \text{ in} \times 2 \text{ in} = 8 \text{ in}^3$$

$$\frac{840}{8} = 105 \text{ cubes}$$

105 cubes to build the prism.

Note that the student here shows two ways to solve the problem!

HOW YOU CAN HELP AT HOME

- Begin to discuss and notice the volume of various household containers—this is also a good opportunity to talk about what units are often used to measure volume.
- Keep practicing those multiplication and division facts, especially as problems become more complex.