Eureka Math Parent Guide

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

GRADE 7
MODULE 4

GRADE FOCUS

Seventh grade mathematics is about (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

- Module 1: Ratios and Proportional Relationships
- Module 2: Rational Numbers
- Module 3: Expressions and Equations
- » **Module 4: Percent and Proportional Relationships**
- Module 5: Statistics and Probability
- Module 6: Geometry

LET'S CHECK IT OUT!

MODULE 4 FOCUS

In this 18-lesson module, students deepen their understanding of ratios and proportional relationships as they explore a variety of percent problems. They convert between fractions, decimals, and percents to further develop a conceptual understanding of percent and use algebraic expressions, equations and other models such as tape diagrams and double number line diagrams to solve multi-step percent problems.

MORE SPECIFICALLY, CHILDREN WILL LEARN HOW TO:

- Analyze proportional relationships and use them to solve real-world and mathematical problems involving ratios and percents.
- Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
- Recognize and represent proportional relationships between quantities.
- Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals). Apply properties of operations to calculate with numbers in any form, convert between forms as appropriate, and assess the reasonableness of answers using mental computation and estimation strategies.
- Draw, construct, and describe geometrical figures and describe the relationships between them.
- Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

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 4:

- Topic A: Finding the Whole
- Topic B: Percent Problems Including More Than One Whole
- Topic C: Scale Drawings
- Topic D: Population, Mixture, and Counting Problems Involving Percents

WORDS TO KNOW

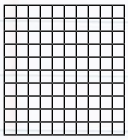
- **Percent**: Percent (%) means "per hundred." Percent is the same as P/100. Usually there are three ways to write a number: a percent, a fraction, and a decimal. Fractions and decimals are related to the ratio of a number to 100.
- **Absolute Error**: The absolute value of the approximate amount minus the exact amount ($|a - x|$). For example, if you estimate that a grocery store is 2 miles away and it's actually 2.2 miles away, the absolute error would be $|2 - 2.2| = |-0.2| = 0.2$ mile.
- **Percent Error:** The percent error lets us know how much of an error in measurement there is with regard to the size of the given quantity. To find the percent error, you follow the same steps as above, but then divide your answer by the absolute value of the exact amount and then multiply by 100 to convert to a percent ($|a - x|/|x| * 100$. Here is how you would find the percent error in the mileage example above: $|2 - 2.2|/|2.2| = |-0.2|/|2.2| = 0.2/2.2 = 0.09 = 9\%$. This tells you the approximation of 2 miles was off by 9%. An absolute error of 0.2 miles might be acceptable on 1000-mile measurement, but is completely unacceptable on a 1-mile measurement.

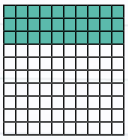
SAMPLE PROBLEMS

SAMPLE 1

Color in the grid to represent the fraction below.

Fraction: 30/100

Grid: 

Solution: 

Historically, fractions, decimals and percents have been taught in isolation from each other, which leaves students struggling to see the connection between these concepts. Having students shade in various quantities on 100-square grids is a great way to help them see the connection between these three forms. In this example, students can see how shading 30/100 boxes means they've shaded 30 per 100, or 30%, of the boxes. They can also see how 30/100 is thirty one-hundredths or 0.30. So 30/100 = 30% = 0.30.

SAMPLE 2

Part of a Whole as a Percent

Brad put 10 crickets in his pet lizard's cage. After one day, Brad's lizard had eaten 20% of the crickets he had put in the cage. By the end of the next day, the lizard had eaten 25% of the remaining crickets. How many crickets were left in the cage at the end of the second day?

Day 1 Solution:

$n = 0.2(10)$
$n = 2$

At the end of the first day, Brad's lizard had eaten 2 of the crickets.

Day 2:

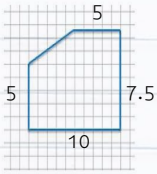
$n = 0.75(10-2)$
$n = 0.75(8)$
$n = 6$

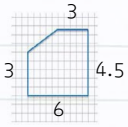
At the end of the second day, Brad's lizard had eaten a total of 4 crickets leaving 6 crickets in the cage.

Notice that for Day 1, we chose to find the number of crickets eaten (2) and subtract that from the original amount (10). For Day 2, we chose to find the number of crickets **remaining** by multiplying the Day 1 crickets by 75% (the lizard ate 25% leaving 75% remaining.)

SAMPLE 3

Create a scale drawing of the picture to the right using a scale factor of 60%. Write three equations that show how you determined the lengths of three different parts of the resulting picture.

Picture: 

Scale Drawing: 

Solution:

Equations:

Left Vertical Distance:	5 x 0.60 = 3
Right Vertical Distance:	7.5 x 0.60 = 4.5
Top Horizontal Distance:	5 x 0.60 = 3
Bottom Horizontal Distance:	10 x 0.60 = 6

Scale Factor: **60% = 60/100 = 3/5**

Left Vertical Distance:	5(3/5) = 3
Right Vertical Distance:	7 1/2(3/5) = 15/2(3/5) = 9/2 = 4.5
Top Horizontal Distance:	5(3/5) = 3
Bottom Horizontal Distance:	10(3/5) = 6

HOW YOU CAN HELP AT HOME

- Every day, ask your child what they learned in school and ask them to show you an example.
- If your child struggles with a particular concept in math, be their cheerleader! Be supportive and encourage your child to persevere. They can do well in math!
- Ask your child to calculate the sales prices on items when you are shopping. First have them estimate what the final price would be. Then have them use the calculator on your phone or theirs to calculate the exact sales price. Discuss with them how close their estimate was and how they can get closer next time.
- When you go out shopping or out to eat, ask your child to calculate the sales tax (approximately 9% in most Louisiana parishes) or gratuity.