# Eureka Math™ Tips for Parents

**Grade 7**
**Module 4**

## Key Words

### Absolute Error

Given the exact value $x$ of a quantity and an approximate value $a$ of it, the absolute error is $|a - x|$.

### 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. It is the percent the absolute error is of the exact value: $\frac{|a-x|}{|x|} \cdot 100\%$, where $x$ is the exact value of the quantity and $a$ is an approximate value of the quantity. For example, $\frac{3}{4}$ inch absolute error might be acceptable on a 5-mile measurement, but is completely unacceptable on a 1-inch measurement.

*Percent* means "per hundred". $P$ percent is the same as $\frac{P}{100}$.
Write % as short for percent.
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.

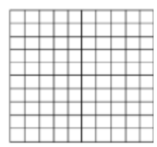
## Percent and Proportional Relationships

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.

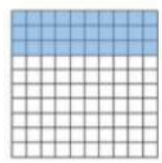
Color in the grid to represent the fraction below.

Fraction: Grid:

$\frac{30}{100}$



Solution:



## What Came Before this Module:

Students used equivalent expressions to apply the properties of operations in order to write expressions in both standard form and in factored form. They also used linear equations to solve unknown angle problems. Students used the number line to understand the properties of inequality and interpret solutions within the context of problems. Students will work with expressions and equations to solve problems involving area of a circle and composite area in the plane, as well as volume and surface area of right prisms.

## What Comes After this Module:

Students will begin their study of probability and learn how to interpret and compute probabilities in simple settings. They will also learn how to estimate probabilities empirically. Additionally, students will build on their knowledge of data distributions that they studied in Grade 6, compare data distributions of two or more populations, and will be introduced to the idea of drawing informal inferences based on data from random samples.

## How can you help at home?

- ✓ Every day, ask your child what they learned in school and ask them to show you an example.
- ✓ If you 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 price on an item when you are out shopping.
- ✓ When shopping or going out to eat, ask your child to estimate the sales tax or gratuity.

## Key Common Core Standards:

**Analyze proportional relationships and use them to solve real-world and mathematical problems.**

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.

Use proportional relationships to solve multistep ratio and percent problems.

**Solve real-life and mathematical problems using numerical and algebraic expressions and equations.**

Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. 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.

# What is the whole unit in each scenario?

*The number or quantity that another number or quantity ***is being compared to*** is called the ***whole***.*

| Scenario | Whole Unit |
|---|---|
| 15 is what percent of 90? | |
| What number is 10% of 56? | |
| 90% of a number is 180. | |
| A bag of candy contains 300 pieces and 25% of the pieces in the bag are red. | |
| Seventy percent (70%) of the students earned a B on the test. | |
| The 20 girls in the class represented 55% of the students in the class. | |

Solution:

| Scenario | Whole Unit |
|---|---|
| 15 is what percent of 90? | *The number* 90 |
| What number is 10% of 56? | *The number* 56 |
| 90% of a number is 180. | *The unknown number* |
| A bag of candy contains 300 pieces, and 25% of the pieces in the bag are red. | *The* 300 *pieces of candy* |
| Seventy percent (70%) of the students earned a B on the test. | *All the students in the class* |
| The 20 girls in the class represented 55% of the students in the class. | *All the students in the class* |

## 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?

Solution:

*Day 1:*

$n = 0.2(10)$

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

*Day 2:*

$n = 0.75(10 - 2)$

$n = 0.75(8)$

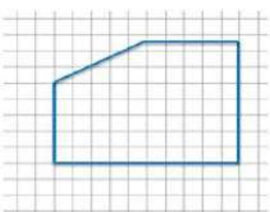
$n = 6$ *At the end of the second day, Brad's lizard had eaten a total of* **4** *crickets leaving* **6** *crickets in the cage.*

Consider this: If you tried this problem and got an answer of 6 1/2 crickets, does your answer make sense? Explain.

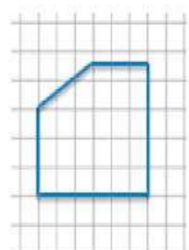
Create a scale drawing of the picture to the right using a scale factor of 60%. Write three equations that show how you determined the lengths of three different parts of the resulting picture.

For a review of scale drawings, refer to Module 1 topic D.

Picture→



*Scale Drawing:*



Solution:

*Scale Factor:* $60\% = \frac{60}{100} = \frac{3}{5}$

*Horizontal Distances:* $10\left(\frac{3}{5}\right) = 6$

$5\left(\frac{3}{5}\right) = 3$

*Vertical Distances:* $5\left(\frac{3}{5}\right) = 3$

$7\frac{1}{2}\left(\frac{3}{5}\right) = \frac{15}{2}\left(\frac{3}{5}\right) = \frac{9}{2} = 4.5$

*Equations:*

*Left Vertical Distance:* $5 \times 0.60 = 3$

*Right Vertical Distance:* $7.5 \times 0.60 = 4.5$

*Top Horizontal Distance:* $5 \times 0.60 = 3$

*Bottom Horizontal Distance:* $10 \times 0.60 = 6$