

# Eureka Math Parent Guide

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

GRADE 7  
MODULE 1

## 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 1 FOCUS

In this 22-lesson module, students learn how to recognize proportional relationships. They represent proportional relationships in equations that have the form  $y=kx$ . In the latter half of the module, they extend their knowledge to find unit rates of ratios that contain rational numbers (e.g. a speed of  $\frac{1}{2}$  mile per  $\frac{1}{4}$  hour is a rate of 2 miles per hour). The module concludes with students exploring the relationship between the dimensions in scale drawings and recognizing the scale factor as the constant of proportionality studied in the earlier topics of this module. They use this relationship to create scale drawings, create original drawings from a scale drawing, and create scale drawings of various scales from a given scale drawing.

### MORE SPECIFICALLY, CHILDREN WILL LEARN HOW TO:

- Analyze proportional relationships and use them to solve real-world and mathematical problems.
  - » Compute unit rates associated with fractions.
  - » Recognize and represent proportional relationships between quantities.
  - » Use proportional relationships to solve multistep ratio and percent problems.
- Use variables to represent quantities in a problem and construct simple equations and inequalities to solve them.
- Solve problems involving scale drawings of geometric figures.

## 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 1:

- Topic A: Proportional Relationships
- Topic B: Unit Rate and the Constant of Proportionality
- Topic C: Ratios and Rates Involving Fractions
- Topic D: Ratios of Scale Drawings

## WORDS TO KNOW

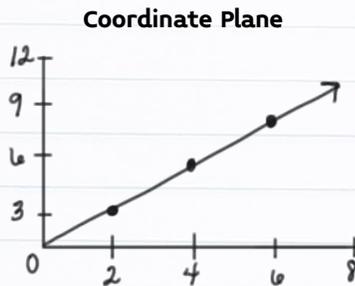
- **Proportional To:** Measures of one type of quantity are proportional to measures of a second type of quantity if there is a number  $k>0$  so that for every measure  $x$  of a quantity of the first type the corresponding measure  $y$  of a quantity of the second type is given by  $kx$ , i.e.  $y=kx$ . The number is called the *constant of proportionality*.
- **One-to-One Correspondence:** Two figures in the plane,  $S$  and  $S1$ , are said to be in one-to-one correspondence if there is a pairing between the points in  $S$  and  $S1$ , so that each point  $P$  of  $S$  is paired with one and only one point  $P1$  in  $S1$ , and likewise, each point  $Q1$  in  $S1$  is paired with one and only one point  $Q$  in  $S$ .
- **Scale Drawing:** A scale drawing refers to a reduced-size or enlarged-size 2-dimensional picture of another 2-dimensional picture.

# SAMPLE PROBLEMS

## SAMPLE 1

One Representation Seen In This Module

Graphical representation of a proportional relationship is a straight line that includes the point  $(0,0)$ .



Another Representation Frequently Used in this Module

**Ratio Table**

Time (h), t	Distance (km), t
0	0
1	10
2	20
3	30

**There are several models used in A Story of Ratios that will foster deep knowledge of important concepts in middle school mathematics.**

In Module 1, there are three commonly used tools and representations that your child will frequently use: ratio tables, coordinate planes, and equations. Ratio tables are frequently used to show an organized list of related ratios. For example, in the ratio table above, your child is able to see how the number of cups of juice is one third of the number of cups of blackberries or if the number of cups of juice is multiplied by 3, the number of cups of blackberries is determined. In Grade 6, students recognized the multiplicative and additive structures that exist within ratio tables. The coordinate plane is another way to represent a relationship and an easy way to determine whether a relationship is proportional. Equations represent information in a clear and concise way so your child is able to quickly solve problems and make predictions. Although each of these tools are different, they all have a similar goal of helping your child develop his/her thinking in a concrete way (manipulating something that physically exists) so he/she experiences a direct connection between the models and math symbols and is able to solve problems abstractly. In A Story of Ratios, your child will use the proportional reasoning skills that he/she develops in this module to propel your child into success in the modules yet to come!

**Below is a problem that shows different representations of the same proportional relationships with a description of how students can recognize it as such.**

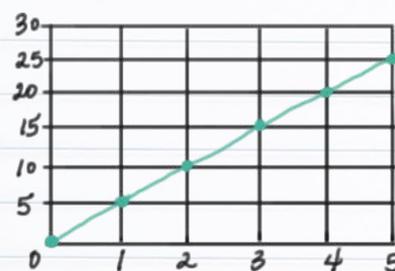
## SAMPLE 2

**Problem:** The school library receives money for every book sold at the school's book fair. Create a table, and then graph and explain if the quantities are proportional to each other.

**Table:**

Number of Books Sold	Donations per Sponsor (\$)
1	5
2	10
3	15
4	20
5	25

**Graph:**



**Explanation:**

The quantities are proportional to each other because the points appear on a line that goes through the origin. Each book sold brings in \$5.00 no matter how many books are sold.

Even though the point  $(0,0)$  does not represent a ratio, interpreting the meaning of the point in the context of the problem helps students understand why it is included, i.e. if the school library does not sell any books, they will not raise any money.

# HOW YOU CAN HELP AT HOME

- Ask your child what they learned in school today and ask them to show you an example.
- In this module, your child learned how to play the Integer Game. Ask them to find the missing value of the card below if the total score equals 0. Have them explain how they determined the missing value.