7th Grade Math Week 1

Dear Parent/Guardian,

During Week 1, we will review and support standards mastery of Proportional Relationships. Your child will learn to recognize and represent proportional relationships and use them in solving equations. Each student task ends with a 'Lesson Summary' section; there, your child can find targeted support for the lesson.

Additionally, students can access the HMH GoMath textbook through ClassLink. The site offers instructional support through links in the online textbook. By selecting embedded links, students can access the Personal Math Trainer for step-by-step examples, Math on the Spot for real-world connections and more examples, and Animated Math to help support conceptual understanding.

We also suggest that students have an experience with math each day. Practicing at home will make a HUGE difference in your child's school success! Make math part of your everyday routine. Choose online sites that match your child's interests. Online math games, when played repeatedly, can encourage strategic mathematical thinking, help develop computational fluency, and deepen their understanding of numbers.

Links for additional resources to support students at home are listed below:
https://www.adaptedmind.com/index.php
https://www.engageny.org/educational-activities-for-parents-and-students
https://www.khanacademy.org/resources/teacher-essentials
https://www.multiplication.com/games/all-games
https://www.prodigygame.com/

Week 1 At A Glance	
Day 1	Unit 2, Lesson 2 – Introducing Proportional Relationships ☐ Student Tasks 2.1, 2.2, 2.3, and 2.4 followed by Lesson 2 Summary ☐ Practice Problems
Day 2	Unit 2, Lesson 3 – More about Constant of Proportionality ☐ Student Tasks 3.1, 3.2, and 3.3 followed by Lesson 3 Summary ☐ Practice Problems
Day 3	Unit 2, Lesson 4 – Proportional Relationships and Equations ☐ Student Tasks 4.1, 4.2, 4.3, and 4.4 followed by Lesson 4 Summary ☐ Practice Problems
Day 4	Unit 2, Lesson 5 – Two Equations for Each Relationship ☐ Student Tasks 5.1, 5.2, 5.3, and 5.4 followed by Lesson 5 Summary ☐ Practice Problems
Day 5	Unit 2, Lesson 6 – Using Equations to Solve Problems ☐ Student Tasks 6.1, 6.2, and 6.3 followed by Lesson 6 Summary ☐ Practice Problems

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Unit 2, Lesson 2

Introducing Proportional Relationships with Tables

Let's solve problems involving proportional relationships using tables.

2.1 Notice and Wonder: Paper Towels by the Case

Here is a table that shows how many rolls of paper towels a store receives when they order different numbers of cases.

	number of cases they order	number of rolls of paper towels	
	1	12	
	3	36	
	5	60	
$\cdot 2$	10	120	$\cdot 2$

What do you notice about the table? What do you wonder?

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2.2 Feeding a Crowd

1. A recipe says that 2 cups of dry rice will serve 6 people. Complete the table as you answer the questions. Be prepared to explain your reasoning.

   a. How many people will 10 cups of rice serve?

   b. How many cups of rice are needed to serve 45 people?

cups of rice	number of people
2	6
3	9
10	
	45

2. A recipe says that 6 spring rolls will serve 3 people. Complete the table.

number of spring rolls	number of people
6	3
30	
40	
	28

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2.3 Making Bread Dough

A bakery uses 8 tablespoons of honey for every 10 cups of flour to make bread dough. Some days they bake bigger batches and some days they bake smaller batches, but they always use the same ratio of honey to flour. Complete the table as you answer the questions. Be prepared to explain your reasoning.

honey (tbsp)	flour (c)
8	10
20	
13	
	20

1. How many cups of flour do they use with 20 tablespoons of honey?
2. How many cups of flour do they use with 13 tablespoons of honey?
3. How many tablespoons of honey do they use with 20 cups of flour?
4. What is the **proportional relationship** represented by this table?

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2.4 Quarters and Dimes

4 quarters are equal in value to 10 dimes.

1. How many dimes equal the value of 6 quarters?

2. How many dimes equal the value of 14 quarters?

3. What value belongs next to the 1 in the table? What does it mean in this context?

number of quarters	number of dimes
1	
4	10
6	
14	

Are you ready for more?

Pennies made before 1982 are 95% copper and weigh about 3.11 grams each. (Pennies made after that date are primarily made of zinc). Some people claim that the value of the copper in one of these pennies is greater than the face value of the penny. Find out how much copper is worth right now, and decide if this claim is true.

Lesson 2 Summary

If the ratios between two corresponding quantities are always equivalent, the relationship between the quantities is called a **proportional relationship**.

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This table shows different amounts of milk and chocolate syrup. The ingredients in each row, when mixed together, would make a different total amount of chocolate milk, but these mixtures would all taste the same.

Notice that each row in the table shows a ratio of tablespoons of chocolate syrup to cups of milk that is equivalent to $4 : 1$.

About the relationship between these quantities, we could say:

tablespoons of chocolate syrup	cups of milk
4	1
6	$1\frac{1}{2}$
8	2
$\frac{1}{2}$	$\frac{1}{8}$
12	3
1	$\frac{1}{4}$

- The relationship between amount of chocolate syrup and amount of milk is proportional.
- The relationship between the amount of chocolate syrup and the amount of milk is a proportional relationship.
- The table represents a proportional relationship between the amount of chocolate syrup and amount of milk.
- The amount of milk is proportional to the amount of chocolate syrup.

We could multiply any value in the chocolate syrup column by $\frac{1}{4}$ to get the value in the milk column. We might call $\frac{1}{4}$ a *unit rate*, because $\frac{1}{4}$ cups of milk are needed for 1 tablespoon of chocolate syrup. We also say that $\frac{1}{4}$ is the **constant of proportionality** for this relationship. It tells us how many cups of milk we would need to mix with 1 tablespoon of chocolate syrup.

Glossary Terms

constant of proportionality

proportional relationship

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Unit 2, Lesson 2
Practice Problems

1. When Han makes chocolate milk, he mixes 2 cups of milk with 3 tablespoons of chocolate syrup. Here is a table that shows how to make batches of different sizes.

cups of milk	tablespoons of chocolate syrup
2	3
8	12
1	$\frac{3}{2}$
10	15

Use the information in the table to complete the statements. Some terms are used more than once.

a. The table shows a proportional relationship between ______________ and ______________.

b. The scale factor shown is ______________.

c. The constant of proportionality for this relationship is ______________.

d. The units for the constant of proportionality are ______________ per ______________.

Bank of Terms: tablespoons of chocolate syrup, 4, cups of milk, cup of milk, $\frac{3}{2}$

2. A certain shade of pink is created by adding 3 cups of red paint to 7 cups of white paint.

a. How many cups of red paint should be added to 1 cup of white paint?

cups of white paint	**cups of red paint**
1	

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cups of white paint	cups of red paint
7	3

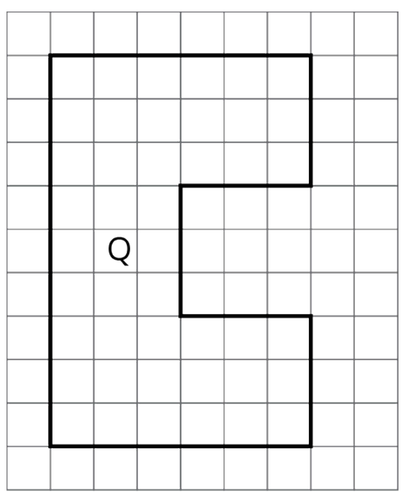
b. What is the constant of proportionality?

3. A map of a rectangular park has a length of 4 inches and a width of 6 inches. It uses a scale of 1 inch for every 30 miles.

   a. What is the actual area of the park? Show how you know.

   b. The map needs to be reproduced at a different scale so that it has an area of 6 square inches and can fit in a brochure. At what scale should the map be reproduced so that it fits on the brochure? Show your reasoning.

4. Noah drew a scaled copy of Polygon P and labeled it Polygon Q.



If the area of Polygon P is 5 square units, what scale factor did Noah apply to Polygon P to create Polygon Q? Explain or show how you know.

5. Select **all** the ratios that are equivalent to each other.

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A. $4 : 7$
B. $8 : 15$
C. $16 : 28$
D. $2 : 3$
E. $20 : 35$

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Unit 2, Lesson 3
More about Constant of Proportionality

Let’s solve more problems involving proportional relationships using tables.

3.1 Equal Measures

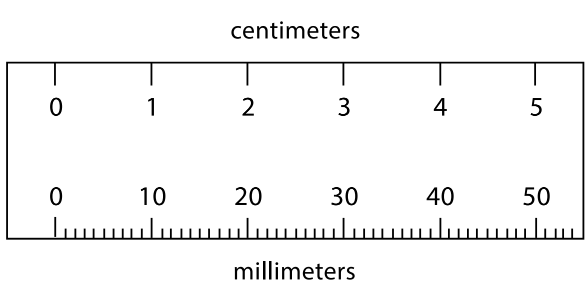
Use the numbers and units from the list to find as many equivalent measurements as you can. For example, you might write “30 minutes is $\frac{1}{2}$ hour.”

You can use the numbers and units more than once.

1	$\frac{1}{2}$	0.3	centimeter
12	40	24	meter
0.4	0.01	$\frac{1}{5}$	hour
60	$3\frac{1}{3}$	6	feet
50	30	2	minute
			inch

3.2 Centimeters and Millimeters

There is a proportional relationship between any length measured in centimeters and the same length measured in millimeters.



There are two ways of thinking about this proportional relationship.

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1. If you know the length of something in centimeters, you can calculate its length in millimeters.

   a. Complete the table.

   b. What is the constant of proportionality?

length (cm)	length (mm)
9	
12.5	
50	
88.49	

2. If you know the length of something in millimeters, you can calculate its length in centimeters.

   a. Complete the table.

   b. What is the constant of proportionality?

length (mm)	length (cm)
70	
245	
4	
699.1	

3. How are these two constants of proportionality related to each other?

4. Complete each sentence:

   a. To convert from centimeters to millimeters, you can multiply by ________.

   b. To convert from millimeters to centimeters, you can divide by ________ *or* multiply by ________.

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Are you ready for more?

1. How many square millimeters are there in a square centimeter?
2. How do you convert square centimeters to square millimeters? How do you convert the other way?

3.3 Pittsburgh to Phoenix

A plane traveling at a constant speed flew over Pittsburgh, Saint Louis, Albuquerque, and Phoenix on its way from New York to San Diego.

Complete the table as you answer the questions. Be prepared to explain your reasoning.

"Map of the path of a plane flying from New York to San Diego" by United States Census Bureau via American Fact Finder. Public Domain.

segment	time	distance	speed
Pittsburgh to Saint Louis	1 hour	550 miles	
Saint Louis to Albuquerque	1 hour 42 minutes		
Albuquerque to Phoenix		330 miles	

1. What is the distance between Saint Louis and Albuquerque?

2. How many minutes did it take to fly between Albuquerque and Phoenix?

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3. What is the proportional relationship represented by this table?

4. Diego says the constant of proportionality is 550. Andre says the constant of proportionality is $9\frac{1}{6}$. Do you agree with either of them? Explain your reasoning.

Lesson 3 Summary

When something is traveling at a constant speed, there is a proportional relationship between the time it takes and the distance traveled. The table shows the distance traveled and elapsed time for a bug crawling on a sidewalk.

distance traveled (cm)	elapsed time (sec)
$\frac{3}{2}$	1
1	$\frac{2}{3}$
3	2
10	$\frac{20}{3}$

$\cdot \frac{2}{3}$

We can multiply any number in the first column by $\frac{2}{3}$ to get the corresponding number in the second column. We can say that the elapsed time is proportional to the distance traveled, and the constant of proportionality is $\frac{2}{3}$. This means that the bug's *pace* is $\frac{2}{3}$ seconds per centimeter.

This table represents the same situation, except the columns are switched.

elapsed time (sec)	distance traveled (cm)
1	$\frac{3}{2}$
$\frac{2}{3}$	1
2	3
$\frac{20}{3}$	10

$\cdot \frac{3}{2}$

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We can multiply any number in the first column by $\frac{3}{2}$ to get the corresponding number in the second column. We can say that the distance traveled is proportional to the elapsed time, and the constant of proportionality is $\frac{3}{2}$. This means that the bug's *speed* is $\frac{3}{2}$ centimeters per second.

Notice that $\frac{3}{2}$ is the reciprocal of $\frac{2}{3}$. When two quantities are in a proportional relationship, there are two constants of proportionality, and they are always reciprocals of each other. When we represent a proportional relationship with a table, we say the quantity in the second column is proportional to the quantity in the first column, and the corresponding constant of proportionality is the number we multiply values in the first column to get the values in the second.

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Unit 2, Lesson 3
Practice Problems

1. Noah is running a portion of a marathon at a constant speed of 6 miles per hour.

   Complete the table to predict how long it would take him to run different distances at that speed, and how far he would run in different time intervals.

time in hours	miles traveled at 6 miles per hour
1	
$\frac{1}{2}$	
$1\frac{1}{3}$	
	$1\frac{1}{2}$
	9
	$4\frac{1}{2}$

2. One kilometer is 1000 meters.

   a. Complete the tables. What is the interpretation of the constant of proportionality in each case?

meters	kilometers
1,000	1
250	
12	
1	

kilometers	meters
1	1,000
5	
20	
0.3	

   The constant of proportionality tells us that:

   The constant of proportionality tells us that:

   b. What is the relationship between the two constants of proportionality?

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3. Jada and Lin are comparing inches and feet. Jada says that the constant of proportionality is 12. Lin says it is $\frac{1}{12}$. Do you agree with either of them? Explain your reasoning.

4. The area of the Mojave desert is 25,000 square miles. A scale drawing of the Mojave desert has an area of 10 square inches. What is the scale of the map?

5. Which of these scales is equivalent to the scale 1 cm to 5 km? Select **all** that apply.

   A. 3 cm to 15 km

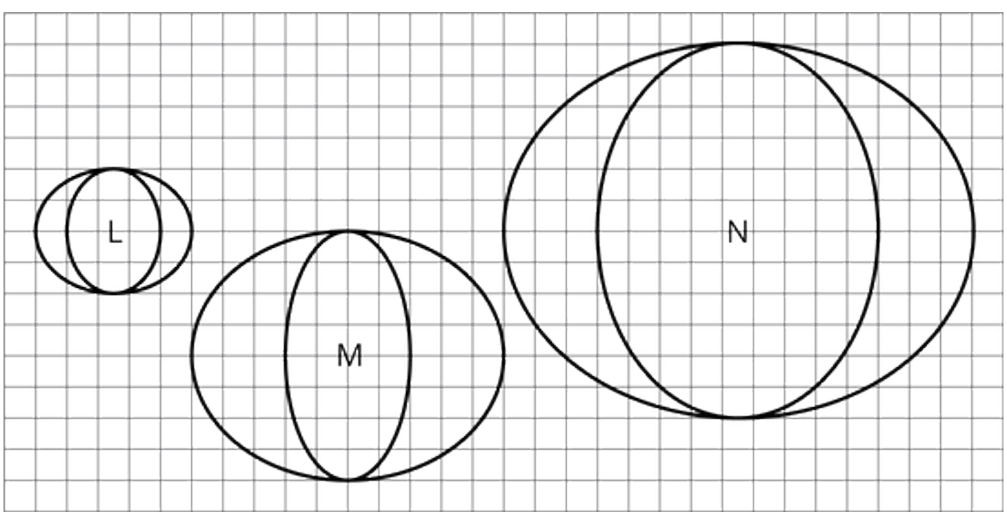
   B. 1 mm to 150 km

   C. 5 cm to 1 km

   D. 5 mm to 2.5 km

   E. 1 mm to 500 m

6. Which one of these pictures is not like the others? Explain what makes it different using ratios.



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Unit 2, Lesson 4
Proportional Relationships and Equations

Let’s write equations describing proportional relationships.

4.1 Number Talk: Division

Find each quotient mentally.

$645 \div 100$

$645 \div 50$

$48.6 \div 30$

$48.6 \div x$

4.2 Feeding a Crowd, Revisited

1. A recipe says that 2 cups of dry rice will serve 6 people. Complete the table as you answer the questions. Be prepared to explain your reasoning.

   a. How many people will 1 cup of rice serve?

   b. How many people will 3 cups of rice serve? 12 cups? 43 cups?

   c. How many people will x cups of rice serve?

cups of dry rice	number of people
1	
2	6
3	
12	
43	
x	

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2. A recipe says that 6 spring rolls will serve 3 people. Complete the table as you answer the questions. Be prepared to explain your reasoning.

   a. How many people will 1 spring roll serve?

   b. How many people will 10 spring rolls serve? 16 spring rolls? 25 spring rolls?

   c. How many people will n spring rolls serve?

number of spring rolls	**number of people**
1	
6	3
10	
16	
25	
n	

3. How was completing this table different from the previous table? How was it the same?

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4.3 Denver to Chicago

A plane flew at a constant speed between Denver and Chicago. It took the plane 1.5 hours to fly 915 miles.

"Map of the midwest from Denver to Chicago" by United States Census Bureau via American Fact Finder. Public Domain.

1. Complete the table.

time (hours)	distance (miles)	speed (miles per hour)
1		
1.5	915	
2		
2.5		
t		

2. How far does the plane fly in one hour?

3. How far would the plane fly in t hours at this speed?

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4. If d represents the distance that the plane flies at this speed for t hours, write an equation that relates t and d.

5. How far would the plane fly in 3 hours at this speed? in 3.5 hours? Explain or show your reasoning.

Are you ready for more?

A rocky planet orbits Proxima Centauri, a star that is about 1.3 parsecs from Earth. This planet is the closest planet outside of our solar system.

1. How long does it take light from Proxima Centauri to reach the Earth? (A parsec is about 3.26 light years. A light year is the distance light travels in one year.)
2. There are two twins. One twin wants to explore the planet near Proxima Centauri and leaves on a spaceship traveling at 90% of the speed of light, while the other twin stays home on Earth. How much does the twin on Earth age while the other twin travels to Proxima Centauri? (Do you think the answer would be the same for the other twin? Consider researching “The Twin Paradox” to learn more.)

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4.4 Revisiting Bread Dough

A bakery uses 8 tablespoons of honey for every 10 cups of flour to make bread dough. Some days they bake bigger batches and some days they bake smaller batches, but they always use the same ratio of honey to flour.

1. Complete the table.

honey (tbsp)	flour (c)
1	
8	10
16	
30	
h	

2. If f is the cups of flour needed for h tablespoons of honey, write an equation that relates f and h.

3. How much flour is needed for 15 tablespoons of honey? 17 tablespoons? Explain or show your reasoning.

Lesson 4 Summary

The table shows the amount of red paint and blue paint needed to make a certain shade of purple paint, called Venusian Sunset.

Note that "parts" can be *any* unit for volume. If we mix 3 cups of red with 12 cups of blue, you will get the same shade as if we mix 3 teaspoons of red with 12 teaspoons of blue.

red paint (parts)	blue paint (parts)
3	12
1	4
7	28
$\frac{1}{4}$	1
r	$4r$

The last row in the table says that if we know the amount of red paint needed, r, we can always multiply it by 4 to find the amount of blue paint needed, b, to mix with it to make Venusian Sunset. We can say this more succinctly with the equation $b = 4r$. So the amount of blue paint is proportional to the amount of red paint and the constant of proportionality is 4.

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We can also look at this relationship the other way around.

If we know the amount of blue paint needed, b, we can always multiply it by $\frac{1}{4}$ to find the amount of red paint needed, r, to mix with it to make Venusian Sunset. So $r = \frac{1}{4}b$. The amount of blue paint is proportional to the amount of red paint and the constant of proportionality $\frac{1}{4}$.

blue paint (parts)	**red paint (parts)**
12	3
4	1
28	7
1	$\frac{1}{4}$
b	$\frac{1}{4}b$

In general, when y is proportional to x, we can always multiply x by the same number k —the constant of proportionality—to get y. We can write this much more succinctly with the equation $y = kx$.

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Unit 2, Lesson 4
Practice Problems

1. A certain ceiling is made up of tiles. Every square meter of ceiling requires 10.75 tiles. Fill in the table with the missing values.

square meters of ceiling	number of tiles
1	
10	
	100
a	

2. On a flight from New York to London, an airplane travels at a constant speed. An equation relating the distance traveled in miles, d, to the number of hours flying, t, is $t = \frac{1}{500}d$. How long will it take the airplane to travel 800 miles?

3. Each table represents a proportional relationship. For each, find the constant of proportionality, and write an equation that represents the relationship.

s	P
2	8
3	12
5	20
10	40

Constant of proportionality:

Equation: $P =$

d	C
2	6.28
3	9.42
5	15.7
10	31.4

Constant of proportionality:

Equation: $C =$

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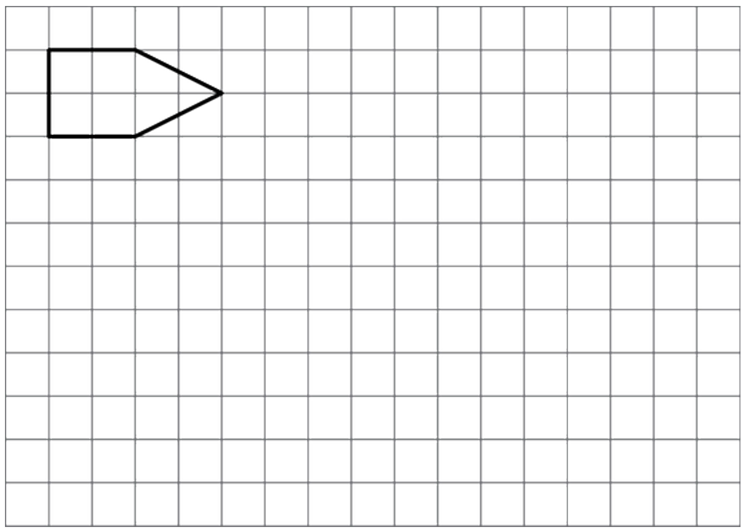
4. A map of Colorado says that the scale is 1 inch to 20 miles or 1 to 1,267,200. Are these two ways of reporting the scale the same? Explain your reasoning.

5. Here is a polygon on a grid.



   a. Draw a scaled copy of the polygon using a scale factor of 3. Label the copy A.
   b. Draw a scaled copy of the polygon with a scale factor $\frac{1}{2}$. Label it B.
   c. Is Polygon A a scaled copy of Polygon B? If so, what is the scale factor that takes B to A?

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Unit 2, Lesson 5
Two Equations for Each Relationship

Let’s investigate the equations that represent proportional relationships.

5.1 Missing Figures

Here are the second and fourth figures in a pattern.

figure 1 figure 2 figure 3 figure 4

1. What do you think the first and third figures in the pattern look like?

2. Describe the 10th figure in the pattern.

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5.2 Meters and Centimeters

There are 100 centimeters (cm) in every meter (m).

length (m)	length (cm)
1	100
0.94	
1.67	
57.24	
x	

length (cm)	length (m)
100	1
250	
78.2	
123.9	
y	

1. Complete each of the tables.

2. For each table, find the constant of proportionality.

3. What is the relationship between these constants of proportionality?

4. For each table, write an equation for the proportional relationship. Let x represent a length measured in meters and y represent the same length measured in centimeters.

Are you ready for more?

1. How many cubic centimeters are there in a cubic meter?
2. How do you convert cubic centimeters to cubic meters?
3. How do you convert the other way?

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5.3 Filling a Water Cooler

It took Priya 5 minutes to fill a cooler with 8 gallons of water from a faucet that was flowing at a steady rate. Let w be the number of gallons of water in the cooler after t minutes.

1. Which of the following equations represent the relationship between w and t? Select **all** that apply.
   a. $w = 1.6t$
   b. $w = 0.625t$
   c. $t = 1.6w$
   d. $t = 0.625w$

2. What does 1.6 tell you about the situation?

3. What does 0.625 tell you about the situation?

4. Priya changed the rate at which water flowed through the faucet. Write an equation that represents the relationship of w and t when it takes 3 minutes to fill the cooler with 1 gallon of water.

5. Was the cooler filling faster before or after Priya changed the rate of water flow? Explain how you know.

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5.4 Feeding Shrimp

At an aquarium, a shrimp is fed $\frac{1}{5}$ gram of food each feeding and is fed 3 times each day.

1. How much food does a shrimp get fed in one day?

2. Complete the table to show how many grams of food the shrimp is fed over different numbers of days.

number of days	food in grams
1	
7	
30	


"Shrimp in aquarium" by uzilday via Pixabay. Public Domain.

3. What is the constant of proportionality? What does it tell us about the situation?

4. If we switched the columns in the table, what would be the constant of proportionality? Explain your reasoning.

5. Use d for number of days and f for amount of food in grams that a shrimp eats to write *two* equations that represent the relationship between d and f.

6. If a tank has 10 shrimp in it, how much food is added to the tank each day?

7. If the aquarium manager has 300 grams of shrimp food for this tank of 10 shrimp, how many days will it last? Explain or show your reasoning.

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Lesson 5 Summary

If Kiran rode his bike at a constant 10 miles per hour, his distance in miles, d, is proportional to the number of hours, t, that he rode. We can write the equation

$$d = 10t$$

With this equation, it is easy to find the distance Kiran rode when we know how long it took because we can just multiply the time by 10.

We can rewrite the equation:

$$\begin{aligned} d &= 10t \\ \left(\frac{1}{10}\right) d &= t \\ t &= \left(\frac{1}{10}\right) d \end{aligned}$$

This version of the equation tells us that the amount of time he rode is proportional to the distance he traveled, and the constant of proportionality is $\frac{1}{10}$. That form is easier to use when we know his distance and want to find how long it took because we can just multiply the distance by $\frac{1}{10}$.

When two quantities x and y are in a proportional relationship, we can write the equation

$$y = kx$$

and say, "y is proportional to x." In this case, the number k is the corresponding constant of proportionality. We can also write the equation

$$x = \frac{1}{k}y$$

and say, "x is proportional to y." In this case, the number $\frac{1}{k}$ is the corresponding constant of proportionality. Each one can be useful depending on the information we have and the quantity we are trying to figure out.

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Unit 2, Lesson 5
Practice Problems

1. The table represents the relationship between a length measured in meters and the same length measured in kilometers.

   a. Complete the table.

   b. Write an equation for converting the number of meters to kilometers. Use x for number of meters and y for number of kilometers.

meters	**kilometers**
1,000	1
3,500	
500	
75	
1	
x	

2. Concrete building blocks weigh 28 pounds each. Using b for the number of concrete blocks and w for the weight, write two equations that relate the two variables. One equation should begin with $w =$ and the other should begin with $b =$.

3. A store sells rope by the meter. The equation $p = 0.8L$ represents the price p (in dollars) of a piece of nylon rope that is L meters long.

   a. How much does the nylon rope cost per meter?

   b. How long is a piece of nylon rope that costs $1.00?

4. The table represents a proportional relationship. Find the constant of proportionality and write an equation to represent the relationship.

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a	y
2	$\frac{2}{3}$
3	1
10	$\frac{10}{3}$
12	4

Constant of proportionality: __________

Equation: $y =$__________

5. On a map of Chicago, 1 cm represents 100 m. Select **all** statements that express the same scale.

   A. 5 cm on the map represents 50 m in Chicago.

   B. 1 mm on the map represents 10 m in Chicago.

   C. 1 km in Chicago is represented by 10 cm the map.

   D. 100 cm in Chicago is represented by 1 m on the map.

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Unit 2, Lesson 6
Using Equations to Solve Problems

Let's use equations to solve problems involving proportional relationships.

6.1 Number Talk: Quotients with Decimal Points

1. Without calculating, order the quotients of these expressions from least to greatest.

   $42.6 \div 0.07$

   $42.6 \div 70$

   $42.6 \div 0.7$

   $426 \div 70$

2. a. Place the decimal point in the appropriate location in the quotient:
   $42.6 \div 7 = 608571.$

   b. Use this answer to find the quotient of *one* of the previous expressions.

6.2 Concert Ticket Sales

A performer expects to sell 5,000 tickets for an upcoming concert. They want to make a total of $311,000 in sales from these tickets.

1. Assuming that all tickets have the same price, what is the price for one ticket?

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2. How much will they make if they sell 7,000 tickets?

3. How much will they make if they sell 10,000 tickets? 50,000? 120,000? a million? x tickets?

4. If they make $379,420, how many tickets have they sold?

5. How many tickets will they have to sell to make $5,000,000?

6.3 Recycling

Aluminum cans can be recycled instead of being thrown in the garbage. The weight of 10 aluminum cans is 0.16 kilograms. The aluminum in 10 cans that are recycled has a value of $0.14.

1. If a family threw away 2.4 kg of aluminum in a month, how many cans did they throw away? Explain or show your reasoning.

2. What would be the recycled value of those same cans? Explain or show your reasoning.

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3. Write an equation to represent the number of cans c given their weight w.

4. Write an equation to represent the recycled value r of c cans.

5. Write an equation to represent the recycled value r of w kilograms of aluminum.

Are you ready for more?

The EPA estimated that in 2013, the average amount of garbage produced in the United States was 4.4 pounds per person per day. At that rate, how long would it take your family to produce a ton of garbage? (A ton is 2,000 pounds.)

Lesson 6 Summary

Remember that if there is a proportional relationship between two quantities, their relationship can be represented by an equation of the form $y = kx$. Sometimes writing an equation is the easiest way to solve a problem.

For example, we know that Denali, the highest mountain peak in North America, is 20,300 feet above sea level. How many miles is that? There are 5,280 feet in 1 mile. This relationship can be represented by the equation

$$f = 5{,}280m$$

where f represents a distance measured in feet and m represents the same distance measured miles. Since we know Denali is 20,310 feet above sea level, we can write

$$20{,}310 = 5{,}280m$$

So $m = \frac{20{,}310}{5{,}280}$, which is approximately 3.85 miles.

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Unit 2, Lesson 6
Practice Problems

1. A car is traveling down a highway at a constant speed, described by the equation $d = 65t$, where d represents the distance, in miles, that the car travels at this speed in t hours.

   a. What does the 65 tell us in this situation?

   b. How many miles does the car travel in 1.5 hours?

   c. How long does it take the car to travel 26 miles at this speed?

2. Elena has some bottles of water that each hold 17 fluid ounces.

   a. Write an equation that relates the number of bottles of water (b) to the total volume of water (w) in fluid ounces.

   b. How much water is in 51 bottles?

   c. How many bottles does it take to hold 51 fluid ounces of water?

3. There are about 1.61 kilometers in 1 mile. Let x represent a distance measured in kilometers and y represent the same distance measured in miles. Write two equations that relate a distance measured in kilometers and the same distance measured in miles.

4. In Canadian coins, 16 quarters is equal in value to 2 toonies.

number of quarters	**number of toonies**
1	
16	2

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number of quarters	number of toonies
20	
24	

a. Fill in the table.

b. What does the value next to 1 mean in this situation?

5. Each table represents a proportional relationship. For each table:

   a. Fill in the missing parts of the table.

   b. Draw a circle around the constant of proportionality.

x	y
2	10
	15
7	
1	

a	b
12	3
20	
	10
1	

m	n
5	3
10	
	18
1	

6. Describe some things you could notice in two polygons that would help you decide that they were not scaled copies.