

Determine Proportional Relationships

Procedural Lesson

Grade 7 • Unit 3 • Lesson 12

MC: 7.RP.2c▲

MPs

✓ Applied MP
* Embedded MP

1	2	3	4	5	6	7	8
*		✓*	✓*		*		*

Problem of the Day

Objective: _____

Vocabulary

Constant of Proportionality: the factor multiplied by the x -value to get the corresponding y -value. The unit rate and constant of proportionality both represent the value of the ratio of $y : x$.

$$y = kx$$

k is the Constant of Proportionality

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

Proportional Equation:

$$y = kx$$

y is directly proportional to x
 k is the Constant of Proportionality

Notes

Steps:

1. Analyze the problem and determine the equation(s)
 - If there are two equations – isolate the variable for both. If both equations have the same solution, the quantities are likely proportional.
2. Decide if the relationship is proportional.
 - If yes, explain the relationship.
 - If not, explain why it is not.
3. If proportional, write the unit rate in $y = kx$ form.

Structured Guided Practice

(A/B Partners Practice)

Directions: Determine if there is a proportional relationship. If so, write in $y = kx$ form.

1. Every month, Julia's cable bill is \$57. How much will Julia spend on cable in c months?

2. Felicity is 5 years old and Bridgette is 10 years old.

Final Check for Understanding

(Teacher Checks Work)

Directions: Determine if there is a proportional relationship. If so, write in $y = kx$ form.

1. Potatoes cost \$11.25 for 5 pounds. Would 9 pounds cost \$20.25?

2. It took 3 painters 18 hours to paint a house. The next house took 4 painters and 15 hours.

Student Practice

Unit 3 · Lesson 12: Determine Proportional Relationships

Name: _____

Date: _____

Directions: Determine if there is a proportional relationship. If so, write in $y = kx$ form.

1. An asteroid travels 1,076 miles in 2 minutes, and 3,497 miles in $6\frac{1}{2}$ minutes.

2. A $\frac{1}{2}$ gallon of paint covers 30 ft^2 . Then, $4\frac{1}{4}$ gallons can cover 255 ft^2 .

3. I bought 3 pairs of shoes for \$87. She bought 4 pairs of shoes for \$112.

4. 5 cups can make $7\frac{1}{4}$ pies. 8 cups can make $11\frac{3}{5}$ pies.

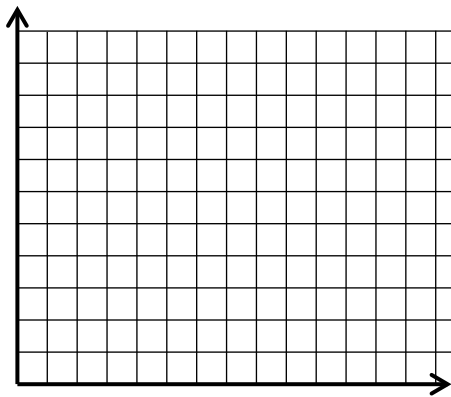
5. Today was 60°F . Every day next week, the temperature is going to increase 5°F every day.

6. A snail moves 2 inches in 4 minutes. Another snail moved 5 inches in 25 minutes.

Challenge Problems

Directions: Read and solve.

1. You can graph any proportional relationship in $y = kx$ form. How does the constant of proportionality, k , affect how the line looks? Use the graph below to explore.



2. Zack went to the supermarket to purchase items for a party. He bought 24 oz. of cheese which priced for \$3.60. Salsa was on sale for 4 bottles for \$7.80. Finally, chips were marked 5 bags for \$9.45. If Zack wants to buy 75 oz. of cheese, 10 bottles of salsa, and 12 bags of chips, how much will he have to pay?

Extension Activity

- * **MP1:** Make sense of the problem and persevere in solving it.
- * **MP4:** Apply mathematics in everyday life.

If $y = kx$ graphs are always straight lines, what would cause a curved line? Explore these relationships and discover a real-life situation where the line would curve. What would the equation look like?

Hint: think of extinction events, interest rates, decay or population explosions.

Closure

Reaching Consensus

**MP3: Do you agree or disagree with your classmate? Why or why not?*

Student Presentations

**MP1: What steps in the process are you most confident about?*

**MP6: Explain how you might show that your solution answers the problem.*

Closure

Recap today's lesson with one or more of the following questions:

✓MP3: How would you explain a proportional relationship to someone?

✓MP4: What visual model can you use to determine a proportional relationship?

