Warm–Up

Directions: Solve for x in each proportion.

1. $\frac{12}{13} = \frac{156}{x}$

2. $\frac{5}{x} = \frac{7}{21}$

3. $\frac{x}{8} = \frac{34}{68}$

4. $\frac{9}{7} = \frac{126}{x}$

5. $\frac{12}{x} = \frac{3}{14}$

Directions: Complete the following SOLVE problem with your teacher. You will only complete the S step.

Sheila makes beaded jewelry to earn extra money. The number of beads she uses depends on the length in centimeters of the piece of jewelry. In the chart below is the number of beads she has used in different pieces of jewelry. What is the constant of proportionality for the number of beads per centimeter?

Centimeters	5	7	8	11
Number of Beads	15	21	24	33

S Underline the question.
This problem is asking me to find _____

_____.

Directions: Complete this page with your teacher and partner.

1. Do you remember what a unit rate is? It is a _____, with one as the denominator that describes a _____ between two quantities.

2. Place two-colored counters in the space below.

3. How many red counters do you have?

4. How many yellow counters do you have?

5. What is the unit rate for red counters to one yellow counter?

6. How many red counters would you have if you had three yellow counters?

Four yellow counters? Five yellow counters?

7. Write all of the ratios for red to yellow counters using the numbers 1 – 5 as the denominators.

8. What do you get if you divide each of the ratios?

9. This number is called the unit rate, but it is also the _____.

LESSON 6: Identifying the Constant of Proportionality

Directions: Complete this page with your teacher and partner.

The constant of proportionality can be found in all proportional relationships, whether they are represented in diagrams, tables, graphs, equations, or verbal descriptions. You will work with your teacher to find the constant of proportionality in all of these situations.

Diagrams

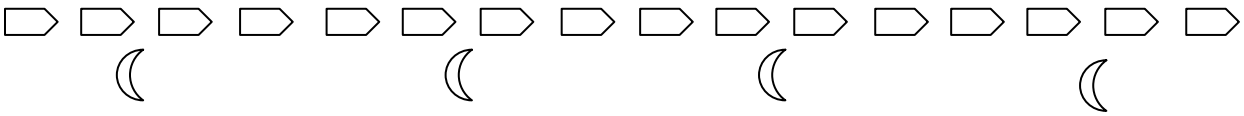
1. 

How many stars? How many hearts?

2. What is the ratio of stars to hearts?

3. What is the unit rate of stars to one heart?

4. This is also called the _____. For every one heart you add, you must add _____ stars to the diagram.

5. 

How many arrows? How many moons?

6. What is the ratio of arrows to moons?

7. What is the unit rate of arrows to one moon?

8. This is also called the _____. For every one moon you add, you must add _____ arrows to the diagram.

Directions: Complete this page with your teacher and partner.

Tables

1. The table shows how many minutes of commercials are within television shows of certain lengths.

TV Show Length	Minutes of Commercials
60	15
90	22.5
120	30
240	60

2. Write ratios of the dependent variable over the independent variable. The dependent variable is the quantity that relies or depends on another quantity. _____ depends on the number of _____, so the number of minutes of commercials is the _____ variable.

3. Find the unit rate, or the constant of proportionality.

4. For every one hour of tv show, there are _____ hours of commercials.

5. The table shows how many minutes math teachers at West High give students to take a test.

Number of Questions	Minutes to Test
10	20
15	30
16	32
20	40

6. Write ratios of the dependent variable over the independent variable.

7. Find the unit rate, or the constant of proportionality.

8. For every one question, there are __ minutes to take the test.

Directions: Complete this page with your teacher and partner.

Graphs

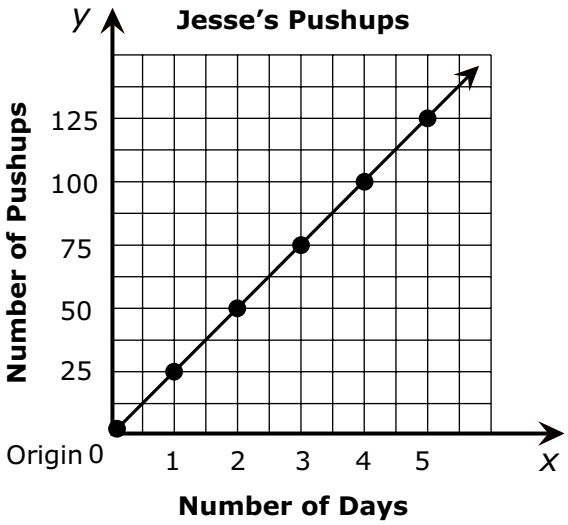
1. The graph shows the total number of pushups that Jesse has done this week.

2. What is the independent variable?

What is the dependent variable?

3. Write ratios of the dependent variable over the independent variable.

4. Change all of the ratios you wrote in Question 3 to unit rates.



5. What do you notice about all of the unit rates?

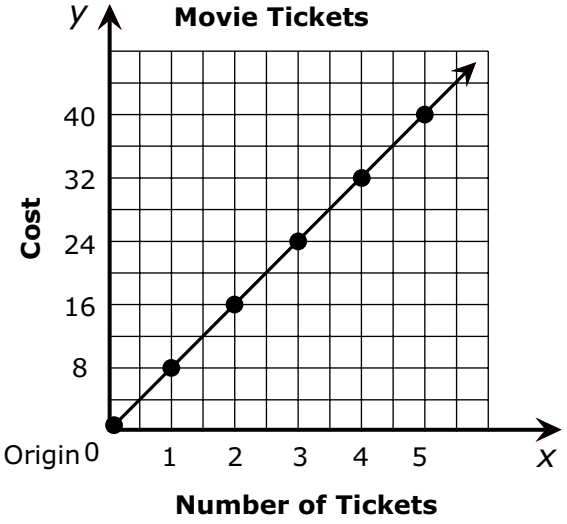
6. In a graph of a proportional relationship, the point that is named by the coordinate pair (1, *y*) gives the constant of proportionality. The constant of proportionality is the value of ___, when *x* is equal to ___.

7. The constant of proportionality is ___ pushups for every day.

8. The graph shows the cost of going to the movies.

9. Write the ratios for cost over the number of tickets.

10. What is the constant of proportionality?



Directions: Complete this page with your teacher and partner.

Equations and Verbal Descriptions

1. Let's look at the table from page S51 about the number of questions on a test, and the number of minutes to test.

Number of Questions	Minutes to test
10	20
15	30
16	32
20	40

2. How many minutes would a student have to test if there are 12 questions?

3. Can you write an equation that relates the number of minutes (y) to the number of questions (x)?

4. Look back at page S51. What is the constant of proportionality for the chart?

5. Do you see the constant of proportionality in the equation we wrote?

6. The equation $y = \$3.5x$ tells the total cost (y) for x number of pounds of grapes at the grocery store. What is the constant of proportionality in the equation?

7. With just a verbal description, you can also find the constant of proportionality. Consider the following: For every five DVD rentals, you receive a free rental. What is the constant of proportionality?

First, write a ratio with the dependent variable over the independent variable.

Then find the unit rate, which is also your constant of proportionality.

8. The equation $y = 12x$ tells how many total eggs (y) you get when you buy x packages of eggs. What is the constant of proportionality?

9. James gets paid $25.00 for every lawn he mows. What is the constant of proportionality?

Directions: Complete the following SOLVE problem with your teacher.

Sheila makes beaded jewelry to make extra money. The number of beads she uses depends on the length in centimeters of the piece of jewelry. In the chart below is the number of beads she has used in different pieces of jewelry. What is the constant of proportionality for the number of beads per centimeter?

Centimeters	5	7	8	11
Number of Beads	15	21	24	33

S Underline the question.
This problem is asking me to find _____

_____.

O Identify the facts.
Eliminate the unnecessary facts.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

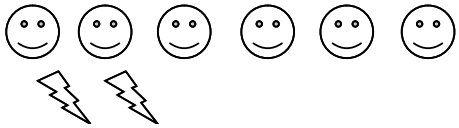
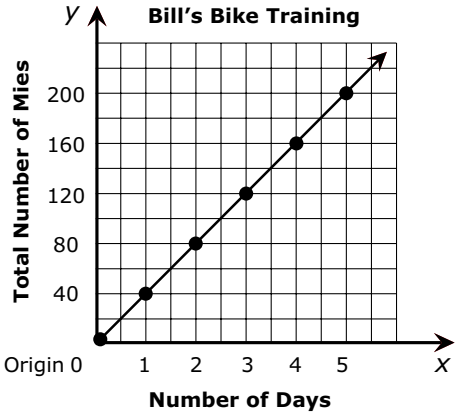
Is your answer reasonable? (Compare your answer to the estimate.)

Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

LESSON 6: Identifying the Constant of Proportionality

Directions: Fill in the chart, using what you have learned about the constant of proportionality.

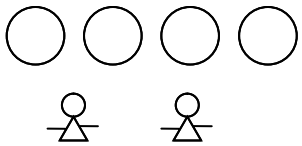
Type of Representation	Example	Steps to Find the Constant of Proportionality
Diagram	 Constant of Proportionality: __	**1.** Write a ratio. **2.** Find the unit rate.
Table	Cups of Popcorn: 3, 6, 10, 11 Calories: 135, 270, 450, 495 Constant of Proportionality: __	**1.** Write a ratio. **2.** Find the unit rate.
Graph	 Constant of Proportionality: ___	**1.** Find the y-value when the *x*-value is _____. ordered pair: _____
Equation	$y = 0.8x$ Constant of Proportionality: ___	**1.** Find the coefficient of *x*.
Verbal Description	Sherry and Will are at the fair. The tickets for the rides all cost the same. They bought 25 tickets for a total cost of $17.50. Constant of Proportionality: ___	**1.** Write a ratio with the _____ variable over the _____ variable. _____ = _____ **2.** Find the unit rate.

Homework

Name _____ **Date** _____

Directions: For each proportional relationship, find the constant of proportionality.

1. Cookies to students



2. Stars to Moons

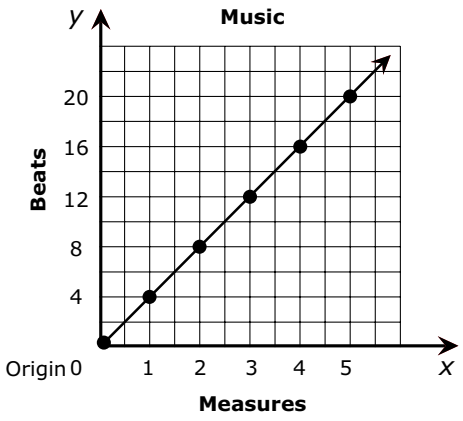
3.

Laps in pool	2	4	6	8
meters	100	200	300	400

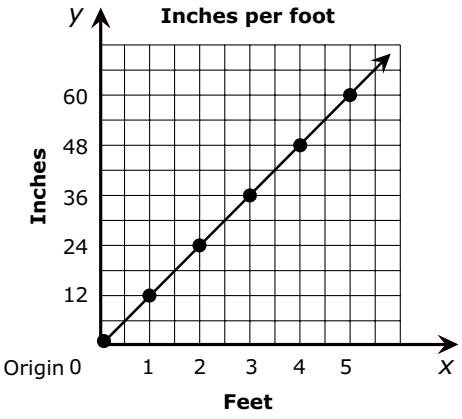
4.

Guests	3	5	8	11
Cost	$9	$15	$24	$33

5.



6.



7. $y = 0.95x$

8. $y = 19x$

9. Janice is having a cartwheel competition. She completed 15 cartwheels in two minutes.

10. For a stage production, 108 light bulbs are needed for 12 posts.