Ratios and Rates

Getting the Idea

A ratio is a comparison of two numbers. Ratios can be written to compare a part to a part, a part to the whole, or the whole to a part. Each number in a ratio is called a term.

You can write a ratio in three ways:
1. in words
2. as a fraction
3. using a colon

Example 1

For a certain shade of green paint, the paint store mixes 3 parts blue paint to 2 parts yellow paint. What is the ratio of blue paint to yellow paint?

Strategy

1. Break down the part mix.
   - blue = 3
   - yellow = 2

2. Write the ratio of blue to yellow three ways.
   - In words
   - As a fraction
   - Using a colon

Solution

The ratio of blue paint to yellow paint is 3 to 2, $\frac{3}{2}$, or 3:2.

A rate is a ratio that compares two quantities that have different units of measure. A unit rate is a rate in which the second quantity in the comparison is 1 unit.

Example 2

Lazo built 30 toy airplanes in 5 hours. What was his unit rate for building the airplanes?

Strategy

1. Divide to find the unit rate.

Solution

Lazo's unit rate was 6 toy airplanes per hour.

Example 3

Jen works for a florist. She worked 15 hours last week and earned $112.50. At that rate, how much will she earn if she works for 10 hours?

Strategy

1. Find the unit rate. Then multiply.

Solution

Jen will earn $75.00 if she works 10 hours.

Example 4

One lap around the path in a park is $\frac{1}{2}$ mile. It takes Andy $\frac{3}{4}$ hour to walk one lap. What is Andy's unit rate around the park?

Strategy

1. Find the unit rate.

Solution

Andy's unit rate is 1.5 miles per hour.
Lesson Practice • Part 1

Choose the correct answer.

1. The cost of a one rental is $160 for 5 days. At this rate, how much does it cost to rent the tent for one day?
   A. $32
   B. $30
   C. $32
   D. $35

2. There are 3 counselors for every 45 students enrolled in a camp. What is the maximum number of students allowed if there are 10 counselors?
   A. 15
   B. 135
   C. 150
   D. 300

3. A recipe for rice pudding calls for \( \frac{3}{4} \) cups of milk. The recipe makes 5 servings. How many cups of milk are needed to make 8 servings?
   A. \( \frac{3}{2} \) cups
   B. 4 cups
   C. \( \frac{4}{3} \) cups
   D. \( \frac{7}{2} \) cups

4. Camille bought 3 pounds of nuts for $10.85. What is the unit price per pound?
   A. $3.55
   B. $4.65
   C. $6.55
   D. $7.55

5. Derek can average 30 miles per gallon. Which is closest to the amount of gas he will use traveling 454.5 miles?
   A. 10 gallons
   B. 12 gallons
   C. 15 gallons
   D. 18 gallons

6. Ms. Canou dove 96 miles in 1.5 hours. What was her speed in miles per hour?
   A. 48 miles per hour
   B. 54 miles per hour
   C. 64 miles per hour
   D. 144 miles per hour

Lesson Practice • Part 2

Choose the correct answer.

1. A recipe calls for \( \frac{1}{3} \) teaspoon of crushed red pepper and \( \frac{2}{3} \) teaspoon of thyme leaves. What is the unit rate of teaspoons of crushed pepper to 1 teaspoon of thyme leaves?
   A. \( \frac{1}{4} \) teaspoon
   B. \( \frac{2}{3} \) teaspoon
   C. \( \frac{3}{4} \) teaspoon
   D. \( \frac{5}{4} \) teaspoon

2. Migrant scored 74 points in his first 5 games this season. How many points has he scored per game?
   A. 13.8
   B. 14.2
   C. 14.8
   D. 15.2

3. Ayden read 84 pages in 2 hours. At that rate, how many pages can he read in 5 hours?
   A. 168
   B. 210
   C. 378
   D. 420

4. Max bought 8 ounces of smoked salmon for $12.24. What is the unit rate per ounce?
   A. $1.53
   B. $4.44
   C. $30.24
   D. $244.48

5. Mrs. Ellis wants to tile a rectangular room that is 16 feet long and 12 feet wide with square tiles. Each square floor tile is 2 feet. The tiles cost $0.84 per tile. What is the cost to tile the room not including labor?
   A. $40.32
   B. $47.04
   C. $60.64
   D. $161.28

6. A 6-pack of bottled water costs $2.40. An 8-pack of bottled water costs $3.20. Which is the better deal?
   A. The 6-pack is the better deal because it is less expensive.
   B. The 8-pack is the better deal because there are more bottles.
   C. The two packages have the same unit price, so neither is the better deal.
   D. The capacities of the bottles are unknown, so it is not possible to determine the better deal.

7. Which of the following shows the least expensive unit price?
   A. 3 oranges for $1.02
   B. 4 oranges for $1.52
   C. 5 oranges for $1.75
   D. 6 oranges for $2.46

8. It takes Edwards \( \frac{3}{4} \) hour to run 2 miles. What is Edwards' unit rate, in miles per hour, when he runs?
   A. 3 miles per hour
   B. 4 miles per hour
   C. 5 miles per hour
   D. 6 miles per hour


B. At this rate, how much will Whitney earn in 30 hours? Show your work.

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7. A set of 3 pens costs $1.68. At this unit price, how much would 10 pens cost?
   A. $5.04
   B. $5.60
   C. $6.16
   D. $6.72

8. It takes Layla \( \frac{1}{2} \) hour to swim 1 mile. What is the unit rate of miles that Layla can swim per hour?
   A. \( \frac{1}{2} \) mile per hour
   B. \( \frac{1}{3} \) mile per hour
   C. \( \frac{1}{4} \) miles per hour
   D. \( \frac{1}{5} \) miles per hour

9. Beyon bought \( \frac{2}{3} \) pounds of veggie burgers for $8.80. How much does the veggie burger cost per pound?
   A. What is the unit price per pound of the veggie burgers? Show your work.
   B. There are 16 ounces in a pound. What is the unit price per ounce of the veggie burgers?
   C. At that unit price, what is the price for \( \frac{1}{2} \) pounds of veggie burgers? Show your work.

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Proportions

Getting the Idea

A proportion is an equation that shows that two ratios are equivalent. For example, \( \frac{3}{4} = \frac{9}{12} \) is a proportion. To tell if two ratios form a proportion, write each ratio in simplest form or use another common denominator. A common denominator can always be found by multiplying the denominators. If the ratios are equal, a proportion is formed.

Example 1

Determine if \( \frac{10}{15} \) and \( \frac{8}{12} \) form a proportion.

Strategy

Write each ratio in simplest form.

\[
\frac{10}{15} = \frac{2}{3}, \quad \frac{8}{12} = \frac{2}{3}
\]

Solution

The ratios \( \frac{2}{3} \) and \( \frac{2}{3} \) do not form a proportion.

A proportion can be solved by writing both ratios with a common denominator. This can be done by multiplying the denominators and then writing equivalent fractions. If one denominator is a factor of the other denominator, simply rename the fraction with the lesser denominator.

Example 2

Solve the proportion by using a common denominator:

\( \frac{5}{6} = \frac{x}{9} \)

Strategy

Write equivalent fractions using like denominators.

Multiply the denominators to find a common denominator.

\( 16 \times 9 = 144 \)

Write equivalent fractions with 144 as the denominator.

\[
\frac{5}{6} \times \frac{9}{9} = \frac{45}{144}, \quad \frac{x}{9} \times \frac{16}{16} = \frac{16x}{144}
\]

Solution

Substituting the value \( x = 9 \) makes the proportion \( \frac{5}{6} = \frac{9}{9} \) true.

Coached Example

What value of \( x \) makes this proportion true?

\( \frac{12}{25} = \frac{x}{5} \)

To cross multiply, multiply the _________ of each fraction by the _________ of the other fraction.

Write the factors for the cross products.

Multiply to find the cross products.

Divide both sides by _________ to solve for \( x \).

\[
x = \frac{12 \times 5}{25} = 1.2
\]

Lesson Practice • Part 1

Choose the correct answer.

1. What value of \( x \) makes this proportion true?

\( \frac{1}{3} = \frac{x}{12} \)

A. \( x = 8 \)
B. \( x = 10 \)
C. \( x = 6 \)
D. \( x = 12 \)

2. What value of \( d \) makes this proportion true?

\( \frac{5}{16} = \frac{d}{12} \)

A. \( d = 2.5 \)
B. \( d = 2.5 \)
C. \( d = 3.5 \)
D. \( d = 4.5 \)

3. What value of \( y \) makes this proportion true?

\( \frac{15}{35} = \frac{y}{112} \)

A. \( y = 56 \)
B. \( y = 96 \)
C. \( y = 48 \)
D. \( y = 90 \)

4. Which pair of ratios does not form a proportion?

A. \( \frac{3}{4} \) and \( \frac{6}{8} \)
B. \( \frac{9}{10} \) and \( \frac{9}{15} \)
C. \( \frac{3}{5} \) and \( \frac{6}{10} \)
D. \( \frac{2}{3} \) and \( \frac{4}{6} \)

5. What value of \( n \) makes this proportion true?

\( \frac{8}{10} = \frac{n}{25} \)

A. \( n = 16 \)
B. \( n = 18 \)
C. \( n = 20 \)
D. \( n = 25 \)

6. What value of \( w \) makes this proportion true?

\( \frac{w}{5} = \frac{2}{10} \)

A. \( w = 0.45 \)
B. \( w = 0.8 \)
C. \( w = 1.6 \)
D. \( w = 3.2 \)
7. Which pair of ratios forms a proportion?
   A. 6:16 and 9:25
   B. 8:18 and 22:50
   C. 9:21 and 15:36
   D. 12:37 and 20:65

8. Solve this proportion.
   \[ \frac{2}{3} = \frac{4}{6} \]
   A. \( r = 0.6 \)
   B. \( r = 1.96 \)
   C. \( r = 2.25 \)
   D. \( r = 2.94 \)

9. Gina wants to solve the following proportion.
   \[ \frac{2}{3} = \frac{4}{x} \]
   A. Explain how to solve the proportion.
   B. Solve the proportion. Show your work.

10. Which value of \( d \) makes this proportion true?
    \[ \frac{d}{3} = \frac{5}{9} \]
    A. \( d = 1.6 \)
    B. \( d = 1.5 \)
    C. \( d = 1.4 \)
    D. \( d = 1.2 \)

11. Which value of \( e \) makes this proportion true?
    \[ \frac{15}{30} = \frac{22}{44} \]
    A. \( e = 90 \)
    B. \( e = 105 \)
    C. \( e = 120 \)
    D. \( e = 135 \)

12. The following proportions were written on the board by Ms. Warren.
    \[ \frac{15}{30} = \frac{15}{30} \]
    A. What is the value of \( f \)? Show your work.
    B. What is the value of \( g \)? Show your work.

13. Which pair of ratios forms a proportion?
    A. 8:14 and 22:45
    B. 10:18 and 25:40
    C. 12:20 and 25:40
    D. 14:30 and 22:45

14. What value of \( x \) makes this proportion true?
    \[ \frac{x}{15} = \frac{27}{45} \]
    A. \( x = 9 \)
    B. \( x = 10 \)
    C. \( x = 11 \)
    D. \( x = 19 \)

15. Which is not a way to determine if two ratios are proportional?
    A. cross multiply to see if the cross products are equal
    B. write each ratio in simplest form to see if the fractions are equal
    C. write equivalent fractions using a common denominator to see if the fractions are equal
    D. add the same fraction to both ratios to see if the fractions are equal

16. What value of \( r \) makes this proportion true?
    \[ \frac{r}{4} = \frac{3}{5} \]
    A. \( r = 3,84 \)
    B. \( r = 4,2 \)
    C. \( r = 5,5 \)
    D. \( r = 10,08 \)

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**Lesson Practice • Part 2**

**Domain 2 • Lesson 11**

**Proportional Relationships**

**Getting the Idea**

You can use proportions to solve problems. Proportional relationships, such as the number of miles driven at a constant speed and the amount of time spent driving, can be represented by equal ratios. Relationships that are not proportional, such as a person's age and height, cannot be represented by equal ratios.

**Example 1**

Derek counted 24 marshmallows in 3 servings of Marshy Morsels. At this rate, how many marshmallows are in 12 servings?

**Strategy**

Write and solve a proportion.

**Solution**

At this rate, there are 96 marshmallows in 12 servings.
Example 3

18 is what percent of 60?

Strategy
Write and solve a proportion.

Cross multiply.

Solution

Coached Example

Mr. Collins is planning a party for his homeroom class. There are 30 students in his class. He wants each student to have a serving of 8 fluid ounces of juice. Each jug of juice contains 40 fluid ounces. At this rate, how many jugs of juice will he need for the party?

First find the unit rate, the number of servings of juice in each jug.

Write the number of fluid ounces for each student. ________

Write the number of fluid ounces in each jug. ________

To find the unit rate, write a ________ that compares the number of fluid ounces in each jug to the number of fluid ounces for each student. ________

Simplify the ratio to write the unit rate. ________ servings per jug.

To find the number of jugs Mr. Collins needs, ________ the number of students in the class by the number of servings per jug.

Mr. Collins will need ________ jugs of juice for the party.

Lesson Practice • Part 1

Choose the correct answer.

1. Mrs. Simpson drove 105 miles in \(\frac{3}{4}\) hour. What was Mrs. Simpson's speed in miles per hour?
   A. 35 miles per hour
   B. 42 miles per hour
   C. 45 miles per hour
   D. 52.5 miles per hour

2. A restaurant charges a single price for its buffet. The total bill for a table of 6 people having the buffet was $294. Each of the 8 people at a second table also had the buffet. What was the total bill at the second table?
   A. $392
   B. $441
   C. $490
   D. $588

3. On a standardized test, Raul answered the first 22 questions in 5 minutes. There are 77 questions on the test. If he continues to answer questions at the same rate, how long will it take him to complete the test from start to finish?
   A. 15 minutes
   B. 16 minutes
   C. 16.5 minutes
   D. 17.5 minutes

4. Kendall knows that a 45-fluid ounce pitcher can hold enough lemonade for 6 people. At this rate, how many fluid ounces of lemonade will Kendall need to serve 28 people?
   A. 45 fluid ounces
   B. 71 fluid ounces
   C. 180 fluid ounces
   D. 195 fluid ounces

5. One 50-pound bag of fertilizer will cover 75 square feet of lawn. How many pounds of fertilizer will Timmy need to cover 120 square feet of lawn?
   A. 80 pounds
   B. 70 pounds
   C. 60 pounds
   D. 50 pounds

6. A factory uses 15 pounds of steel for every 18 pounds of copper. How many pounds of steel will the factory use for 3,700 pounds of copper?
   A. 2,250 pounds
   B. 2,400 pounds
   C. 3,240 pounds
   D. 3,700 pounds

7. A computer downloads a 48-kilobyte file in 5 seconds. At this rate, how long will it take the computer to download a file that is 120 kilobytes?
   A. 2 seconds
   B. 11 seconds
   C. 12.5 seconds
   D. 14.4 seconds

8. Taylor buys 8 comic books for $18. Each comic book costs the same amount.
   A. What is the cost per comic book that Taylor pays? Show your work.
   B. At this rate, how many comic books can Taylor buy with $27? Show your work.
Lesson Practice • Part 2

Choose the correct answer.

Use this information for questions 1 and 2.

Mrs. Graham put 150 gallons of water into a swimming pool in 6 minutes.

1. At that rate, how many minutes would it take to fill a 20,000-gallon pool?
   A. 13 1/3 minutes
   B. 156 minutes
   C. 800 minutes
   D. 900 minutes

Use this information for questions 4 and 5.

A bullet train traveled 270 kilometers in 1.5 hours. The entire trip is scheduled to last 5 hours.

5. If the train continues at the same rate, which proportion can be used to find the length, in kilometers, \( y \), of the trip?
   A. \( \frac{270}{1.5} = \frac{x}{y} \)
   B. \( \frac{3}{5} = \frac{x}{y} \)
   C. \( \frac{3}{5} = \frac{270}{y} \)
   D. \( \frac{3}{5} = \frac{y}{270} \)

Use this information for questions 6 and 7.

Two gallons of paint will cover 700 square feet. How many gallons of paint are needed to cover 1,800 square feet?

6. What is the value of \( k \)?
   A. \( k = 630 \)
   B. \( k = 810 \)
   C. \( k = 900 \)
   D. \( k = 945 \)

7. Luna has scored 75 points in her first 6 games. If she keeps scoring at the same rate per game, how many points will she score in 10 games?
   A. 240
   B. 250
   C. 260
   D. 270

9. What value of \( k \) makes this proportion true?
   \( \frac{12}{16} = \frac{4}{6} \)
   A. \( k = 25 \)
   B. \( k = 27 \)
   C. \( k = 28 \)
   D. \( k = 30 \)

9. Alejandro has a 2,400-word paper to type on his computer. He has typed 450 words in 12 minutes. At that rate, how many more minutes will it take him to complete typing?
   A. 48 minutes
   B. 52 minutes
   C. 64 minutes
   D. 120 minutes

10. How many dollars would Thomas receive for 160 British pounds?
    A. \$252.80
    B. \$173.80
    C. \$132.91
    D. \$101.27

11. What is the constant of proportionality?
    A. \$0.31 per British pound
    B. \$0.63 per British pound
    C. \$1.58 per British pound
    D. \$2.03 per British pound

12. A person who weighs 150 pounds weighs 25 pounds on the Moon. What is the weight of a 1,800-pound car on the Moon? Show your work.
    B. Suppose an object weighs 38 pounds on the Moon. What is that object's weight on Earth? Show your work.

Domain 2 • Lesson 12

Represent Proportional Relationships

Getting the Idea

A directly proportional relationship is an equation of the form \( y = kx \). It is a relationship between two quantities in which one is a constant multiple of the other. When one quantity changes, the other quantity changes by a constant factor, \( k \). The constant factor \( k \) is the constant of proportionality.

Example 1

The function table below shows the relationship between the side lengths of a regular octagon and its perimeter.

<table>
<thead>
<tr>
<th>Side Lengths, ( s ) (inches)</th>
<th>Perimeter, ( P ) (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>9</td>
<td>?</td>
</tr>
</tbody>
</table>

If a regular octagon has side lengths of 9 inches, what is its perimeter?

Strategy

Write and solve an equation.

Write an equation to represent the situation.
The perimeter is always 8 times the side length of a regular octagon. So, 8 is the constant of proportionality.
\[ P = 8s \]

Substitute the side length of 9 for \( s \) and find the perimeter.
\[ P = 8 \times 9 \text{ in.} \]
\[ = 72 \text{ in.} \]

Solution

A regular octagon with a side length of 9 inches has a perimeter of 72 inches.

Example 2

An empty swimming pool is being filled at a rate of 10 gallons per minute. Make a graph to display the amount of water in the pool each minute for 6 minutes.

Strategy

Write an equation and create a function table to represent the situation.

Write an equation to represent the situation.
Let \( x \) = the number of minutes and \( y \) = the number of gallons.
\[ y = 10x \]

Make a function table to show the number of gallons in the pool each minute.
At 0 minutes, when \( x = 0 \), there is no water going into the pool, so \( y = 0 \).
At 1 minute, when \( x = 1 \), the pool is filled with 10 gallons of water.
At 2 minutes, when \( x = 2 \), the pool is filled with 20 gallons of water.
Complete the rest of the table.

<table>
<thead>
<tr>
<th>Number of Minutes ( x )</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Gallons ( y )</td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
</tr>
</tbody>
</table>

Make a line graph, using the ordered pairs from the function table.

Solution

The graph is shown in Step 3.

A directly proportional relationship is a linear relationship because it forms a straight line when graphed. The graph of a proportional relationship is a straight line that passes through the origin at \((0, 0)\). It will also pass through the point \((1, k)\), where \( k \) is the constant of proportionality, or the unit rate.
Example 3
The graph below shows the amounts charged for purchasing different numbers of roses from a florist. Is there a proportional relationship between the number of roses bought and the cost? If so, what is the constant of proportionality and what does it mean in this context?

Costs of Roses

<table>
<thead>
<tr>
<th>Number of Roses</th>
<th>Cost in Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

Strategy
Analyze the graph to determine if the relationship is proportional.

Step 1
Think about the graph of a proportional relationship.
The graph of a proportional relationship is a straight line that passes through the origin. Since this graph matches that description, it shows a proportional relationship.

Step 2
Determine the constant of proportionality.
The graph must pass through the point (1, 2), where k is the constant of proportionality.
The graph passes through the point (1, 2). So, k is 2.

Step 3
Determine what the constant of proportionality means in this context.
In this situation, the fact that k = 2 means that each rose costs $2.

Solution
The relationship is proportional and the constant of proportionality, 2, means that each rose costs $2.

Coached Example
A movie theater charges $16 for 2 tickets, and $32 for 4 tickets. How much would it cost for 10 tickets? Make a graph to represent the situation.

Let x represent the number of tickets.
Let y represent the cost, in dollars.
Write an equation to represent the situation.

Complete the function table.

<table>
<thead>
<tr>
<th>Number of Tickets</th>
<th>Cost in Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Create a graph to show the values in the table.

The graph passes through the point (1, ____). So, _______ is the constant of proportionality, or the unit rate.

It would cost _______ for 12 people.

Lesson Practice • Part 1

Use the function table for questions 1 and 2.
The table shows the relationship between the side lengths of a regular pentagon and its perimeter.

<table>
<thead>
<tr>
<th>Side Length, s (inches)</th>
<th>Perimeter, P (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
</tr>
</tbody>
</table>

1. Which equation shows the relationship between the side length and the perimeter of a regular pentagon?
   A. P = s + 5
   B. P = 5s
   C. P = 3s
   D. P = 4s + 5

2. If a regular pentagon has side lengths of 8 inches, what is its perimeter?
   A. 13 inches
   B. 30 inches
   C. 40 inches
   D. 45 inches

Use the graph for questions 3-5.
The graph shows the relationship between the cost and the number of uniforms ordered by a sports team.

1. Which equation shows the relationship between the number of uniforms, x, and the cost, y?
   A. y = 2x
   B. y = 10x
   C. y = x

2. What is the unit cost of a uniform?
   A. $2 per uniform
   B. $3 per uniform
   C. $10 per uniform
   D. $20 per uniform

3. How much will it cost the team to order 8 uniforms?
   A. $20
   B. $160
   C. $160
   D. $180

6. Amber rides 30 miles in 2 hours. Which equation shows the relationship between the distance, d, and the time, t, that she rides?
   A. d = 2t
   B. d = 15t
   C. d = 30t
   D. d = 32t

7. Pasha bought 3 pounds of onions for $2.67. Which ros is in proportional to 3 pounds at $2.67?
   A. $3.00
   B. $5.00
   C. $6.65
   D. $4.97

8. Ritter Rambler charges $25 per day to rent a kayak. How much will it cost to rent a kayak for 5 days?
   A. Write and solve an equation to solve the problem.

   B. Make a graph to display the relationship.
Lesson Practice • Part 2

Choose the correct answer.

Use the function table for questions 1 and 2.

The table shows the relationship between the number of touchdowns, \( r \), and the number of points, \( p \).

<table>
<thead>
<tr>
<th>Number of Touchdowns, ( r )</th>
<th>Number of Points, ( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
</tr>
</tbody>
</table>

1. Which equation shows the relationship between the number of touchdowns and the number of points?
   A. \( p = 6r \)
   B. \( p = 6 + r \)
   C. \( p = \frac{1}{6}r \)
   D. \( p = \frac{r}{6} \)

2. How many touchdowns are worth 72 points?
   A. 11
   B. 12
   C. 13
   D. 14

3. Which equation shows the relationship between the number of hours, \( x \), and the number of miles, \( y \)?
   A. \( y = 50x \)
   B. \( y = 60x \)
   C. \( y = 100x \)
   D. \( y = 120x \)

4. At the rate it is traveling, how long will it take the train to travel 450 miles?
   A. 7.5 hours
   B. 8 hours
   C. 8.5 hours
   D. 9 hours

5. What is Joaquin’s unit rate, in miles per hour?
   \( \frac{5.5 \text{ miles}}{22 \text{ hours}} \)
   A. \( n = 5.2 \)
   B. \( n = 6.5 \)
   C. \( n = 10.8 \)
   D. \( n = 37.8 \)

6. A candle craft pack has 180 candles in 5 boxes. Each box holds the same number of candles. Which equation shows the relationship between the number of boxes, \( b \), and the number of candles, \( n \)?
   A. \( n = 36b \)
   B. \( n = 24b \)
   C. \( n = 360b \)
   D. \( n = 900b \)

7. What does the ordered pair \((1, y)\) represent on a graph of a proportional relationship?
   A. the origin
   B. the ratio of \( x \) to the total
   C. the ratio of \( y \) to \( x \)
   D. the unit rate

8. At Babs’ Second Chance Book, two books cost $6, four books cost $12, and six books cost $18.
   A. What is the cost for 10 books?

   B. Make a graph to display the relationship between the cost and the number of books bought.

9. A stage designer is making a rectangular stage that is 7 yards in length and 16 yards in width. The fabric for the stage costs $2.90 per square yard. How much will it cost to make the stage?

   A. \( a = 7 + 16 \)
   B. \( a = 2\frac{7}{16} \)
   C. \( a = 12 \)
   D. \( a = 5\frac{1}{4} \)

10. Friendship bracelets sell for $7 each. How much will it cost to buy 5 friendship bracelets?
   A. Write and solve an equation to solve the problem.

   B. Make a graph to display the relationship.
riddled the film from the projector and inserted in its place a peaceful tropical slide which did not move or treasure. The whole world was a stonewall.

The silence was so immense and unbelievable that you felt your eye might have been stifled if you had lost your hearing altogether. The children put their heads to their knees. They stood apart. The door slid back and the smell of the silent, working world came to them.

The sun came out. It was the color of flowering bronze and it was very large. And the sky around it was a blazing blue sky. And the jungle burst with sunlight at the children, released from their spell, rooked out, yelling, into the upsurge.

"Now don't get up far," called the teacher after them. "You've only two hours, you know. You wouldn't want to get caught out!"

But they were running and fleeing their faces up to the sky and feeling the sun on their cheeks like a warm iron. They were taking off their jackets and letting the sun bear their arms.

"Oh, it's better than the sun lamps, isn't it?"

"Much, much better!"

They stopped running and stood in the great jungle that covered Venus, that gave and never stopped growing, tumultuously, even as you watched. It was a nest of epochs, overflowing great arms of flesh-like wood, waving, flowering this brief spring. It was the color of redwood, the color of jungle, fuzzy for many years without sun. It was the color of tigers and white owls and blue and it was the color of the moon.

The children lay out, laughing, on the jungle matness, and heard it sigh and speak.

"Ready?"

"Ready."

"Now?"

"Seem."

"Do the scientists really know? Will it happen today? Will I be able to see for myself?"

The children propped each other like so many eggs, so very many upreduated, peering out for a look at the hidden sun. It was.

It had been raining for seven years; thousands upon thousands of days composted and dried from one and to the other sun, with the dawn and gods of water, with the secret beyond fall of showers and the constrictions of storms so heavy they were told was rain. Years swarmed over the islands. A thousand forces had been eroded under the rain and what an upthrust of times to be condensed again. And this was the way life was forever on the planet Venus, and this was theしようk of the children of the rocks of no men who had come to a mining world to set up civilizations and live out their lives. "It's stopping, it's stopping!"

"Yes, yes."

Marge sat apart from these children who could never remember a time there wasn't rain and rain and sun. They were all more years old, and if there had been a day, seven years ago, when the sun came out for so long and showed its face to the unused world, they could not recall. Sometimes, at night, she heard them stir, in remembrance, and she knew they were dreaming and remembering and old or as yellow as a coin large enough to buy the world with.

She knew they thought they remembered a Venusian, like a blossing in the face, in the body, in the arms and legs and trembling lands. But then they always awoke to the turning, the children looking long of slow beat nails upon the roof, the walk, the gardens, the forecasts, and their dreams were gone.

All day yesterday they had read in class about the sun. About how like a lemon it was, not hot. And they had written small words or essays or poems about it.

I think the sun is a flower.

That bloom for just one hour.

That was Marge's poem, read in a quiet voice in the still classroom while the rain was falling outside.

"Are you didn't write that?" protested one of the boys.

"I did," said Marge. "I did."

"William?" said the teacher.

"Get away!"

"No, of course the children cried."

"It's like a fire," she said. "As the stove."

"You're lying, you don't remember!" cried the children.

But she remembered and stood quietly apart from all of them and watched the patterning windows. And once, a month ago, she had refused to shower in the school shower room, and clutched her hands to her ears and over her head, screening the water wasn't touch her hand. So often after, dully, dimly, she washed it, she was different and they knew her difference and kept away.

There was talk that her father and mother were taking their magic to Earth next year, it seemed vital to her that they do so, though it meant the loss of thousands of dollars to her family. And so, the children hated her for all these reasons of big and little consequence. They hated her pride; her voice. Her silence, her thinness, and her possible future. "Get away!" The boy gave her another push. "Then, for the first time, she turned and looked at him. And what she was waiting for was in her eyes."

"Don't, don't round around here!" cried the boy angrily. "You won't see nothing!" Her lips moved.
**All Summer in a Day**

**Figurative Language Practice**

Name: ______________________

- Identify the type of figurative language being used.

<table>
<thead>
<tr>
<th>Simile</th>
<th>Metaphor</th>
<th>Alliteration</th>
<th>Sensory Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

1. The sun is a flower; that blooms for just one hour. ______________________

2. About how like a lemon it was, and how hot. ______________________

3. She was an old photograph dusted from an album... ______________________

4. "It's like a penny," she said once, eyes closed. ______________________

5. And the sky around it was a blazing blue tile color. ______________________

6. Now she stood, separate, staring at the rain... ______________________

7. ... and the loud wet world beyond the huge glass. ______________________

8. They walked slowly down the hall in the sound of the cold rain. ______________________

9. It was a nest of octopi, clustering up great arms of flesh-like weed... ______________________

10. They stood as if someone had driven them, like so many stakes, into the floor. ______________________

**All Summer in a Day Characterization**

Name: ______________________

- Characterization is the process by which the author reveals the personality of the character.
- Use the chart below to examine Margot as a character.

<table>
<thead>
<tr>
<th>Character's Attributes</th>
<th>Example or Quotation from the Text</th>
<th>What the Example or Quotation from the Text Reveals about the Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>What the Character Looks Like</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What the Character Says</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What the Character Thinks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What the Character Does</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What Other Characters Say, Think, or Feel About the Character</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**All Summer in a Day**

**Elements of Story**

Name: ______________________

- Identify the elements of the story "All Summer in a Day."

**Story Elements:** Information from the Text:

- **Point of View:** ______________________
- **Characters:** ______________________
- **Setting(s):** ______________________
- **Plot:** ______________________
- **Conflict:** ______________________
- **Theme(s):** ______________________

- Which story element stood out the most? Why?
All Summer in a Day Close Reading Questions

Name: _______________________

- Read the short story "All Summer in a Day" by Ray Bradbury. Then answer the following questions.

1. Where does the story take place?

2. Who are the parents of the children in the schoolroom?

3. What event are the children looking forward to? Why is this event so special?

4. When did Margot arrive? Where did she live before, and for how long?

5. Describe Margot.

6. Why do the other children hate Margot?

7. Why did Margot refuse to shower? Based on this, what can we infer about Margot?

8. What is the rumor regarding Margot’s parents’ plans? Why do you think they are planning this?

9. What do the children tell Margot about the sun?

10. What do the children do to Margot?

11. How do the children spend their time outdoors?

12. How do the children react as the weather shifts back to rain?

13. How do the children feel once they’ve remembered about Margot? How do you know?

14. How does the story end?

15. How would you describe the mood of the story at the end?
Directions:

Write a story using the vocabulary words below. You are to use each word in the story according to the word’s definition. This story can be about anything you like.

Economics Vocabulary #1

1. Traditional Economy- all economic decisions are based on customs, traditions, & beliefs of the past.
2. Command Economy- all economic decisions are made by the government.
3. Market Economy- economic decisions are made based on the changes in prices that occur as buyers & sellers interact in the marketplace.
4. Mixed Economy- a combination of both traditional and command economies.
5. Economics- the study of the making, buying, and selling of goods and services.
6. Producer- anyone who makes or grows a good or performs a service
7. Consumer- anyone who buys a good or service.
8. Good- something you can feel or any kind of merchandise.
9. Supply- The amount of something available for use.
10. Loss- when the amount of money a person or company spends is more than they receive or taken in.
11. Profit- the positive gain from an investment or business after subtracting expenses.
12. Taxes- the money that the government collects from individuals and businesses to pay for public goods and services.
13. Demand- how much of a product or service is desired by buyers
14. Scarcity- There is a limited supply of something
15. Service- Any kind of work performed for others.

11. Confederation- a permanent union of sovereign states for certain common purposes.
12. Unitary- system of political organization in which most or all of the governing power resides in a centralized government, in contrast to a federal state.
13. Federal- pertaining to or of the nature of a union of states under a central government distinct from the individual governments of the separate states, as in federal government; federal system.
14. Oligarchy- government by the few, especially despotic power exercised by a small and privileged group for corrupt or selfish purposes.

Monthly Budget: You are to use the information below to set up your monthly budget. You have to 1) choose the type of job you want to do, 2) choose the type of house you want to live in, 3) choose what type of vehicle you want to drive, 4) choose your cell phone plan, and 5) choose your cable/internet plan. Write out your budget on a separate page and calculate how much it will cost you to live each month, and then subtract the total amount of bills from your monthly salary to see how much money you have left over. After determining how much you have left over, then answer the following questions:

Questions to consider throughout the Month:
1. Do we get to go out to eat at a nice restaurant?
2. Do we get to go and do a Fun Activity? (Bowling, Movies, Arcade, etc.)
3. Do we get to go Shopping?
4. How might you improve your education to improve your Standard of Living?
5. If you had a new or more specialized job how might this improve your Monthly earnings?
6. What is the possibility of you wanting and getting a second job?
7. What type of job do you see your self having when you get older?

Choose the monthly salary you would like to earn after completing your education. The amounts below are after taxes:

- $4500- Doctor
- $4000- Engineer
- $3500- Dentist
- $3000- Owner of Small Business
- $2500- Teacher/Coach
- $2000- Factory Worker

Mortgage/Rent

House #1 = $1700/month
3400 sq. ft. 4 Bedroom, 3 bath
Utilities/month = $400

House #2 = $950/month
2200 sq. ft. 3 Bedroom, 2 Bath
Utilities/month = $275

House #3 = $650/month
1100 sq. ft. 3 Bedroom, 1 bath
Utilities/month = $200
Rental House #1 - $650/month
1000 sq. ft. 2 Bedroom, 2 bath
Utilities/month = $250

Rental Apartment #2 - $550/month
800 sq. ft. 2 Bedroom, 1 bath
Utilities/month = $250

Rental Mobile Home #3 - $450/month
800 sq. ft. 2 bedroom, 1 bath
Utilities/month = $300

**VEHICLE PAYMENT, INSURANCE, AND GAS**

GMC Sierra crew cab Z71 - $700/month
Insurance - $200/month
Gas - $200/month

Chevrolet Colorado extended cab - $500/month
Insurance - $175/month
Gas - $160/month

GMC Acadia SLE - $500/month
Insurance - $160/month
Gas - $130/month

Chevrolet Equinox LS - $400/month
Insurance - $150/month
Gas - $110/month

**Cell Phone Plans**

Talk/Text/No Data - $100/month

Talk/Text/4 GB Data - $160/month

Talk/Text/8 GB Data - $200/month

**Cable/Internet**

Top of the Line Package - $250/month
(Every channel and fastest internet speeds)

Middle of the Road Package - $180/month
(Most channels and good internet speeds)

Basic Package - $100/month
(Few channels and slow internet speeds)

**Groceries**

Eat like a King - $300/month

Eat modestly - $200/month

Eat on a budget - $100/month

**Savings - we all need to save to plan for our future & emergencies**
LEVELS OF ORGANIZATION

Read the passage below and answer the following questions about the levels of organization in living things.

Levels of Organization

Some living things contain one cell that performs all needed functions. Multicellular organisms are made of many parts that are needed for survival. These parts are divided into levels of organization. There are five levels: cells, tissues, organs, organ systems, and organisms.

All living things are made of cells. This is what distinguishes living things from other objects. Cells are the basic building blocks of all organisms. Although cells are made of smaller parts, none of these parts could survive on their own. Cells are the simplest level of organization.

Many cells working together form tissues. The cells involved are specialized to cooperate with each other to accomplish one common goal. There are four different types of tissues in both plants and animals.

When there are layers of tissues working together, they form an organ. All animals contain organs. In fact, mammals have five vital organs that they cannot live without: kidneys, lungs, liver, heart, and brain.

When organs work together, they form organ systems. Organ systems keep the body regulated and in a stable state. These systems often work together and rarely work in isolation. The human body has 11 organ systems.

Organelles are technically any form that can carry out their own functions such as taking material in and pushing material out. Some fully functioning organisms are made up of just one cell. For the purposes of this level of organization, organisms are made up of many organ systems working together.

1. __________ are the smallest unit of structure and function in living things.

2. An organism cannot be made of one cell or many cells. TRUE or FALSE (Highlight correct answer)

3. Many cells that work together to complete a common goal are called __________

4. There is only one type of tissue in living things. TRUE or FALSE (Highlight correct answer)

5. A group of more than one type of tissue working together to perform a common job is called __________

6. What are the 3 vital organs listed in the passage that all mammals cannot live without? 1. __________
   2. __________
   3. __________

7. Organs working together to complete a function are called an __________
   (Highlight correct answer)

8. Any living thing that can carry out life processes is called an __________
   (Highlight correct answer)

9. The most complex level of organization, even though it may be single-celled or multi-cellular.

CELLS - ORGANELLES

Match each organelle with its function — use the word bank below. Write the correct letter in the space provided.

<table>
<thead>
<tr>
<th>ORGANELLE</th>
<th>FUNCTION - plant, animal, or both?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Endoplasmic</td>
<td></td>
</tr>
<tr>
<td>B. Cytoplasm</td>
<td></td>
</tr>
<tr>
<td>C. Nucleus</td>
<td></td>
</tr>
<tr>
<td>D. Ribosomes</td>
<td></td>
</tr>
<tr>
<td>E. Golgi bodies</td>
<td></td>
</tr>
<tr>
<td>F. Mitochondria</td>
<td></td>
</tr>
<tr>
<td>G. Cell wall</td>
<td></td>
</tr>
<tr>
<td>H. Lysosome</td>
<td></td>
</tr>
<tr>
<td>I. Cell membrane</td>
<td></td>
</tr>
<tr>
<td>J. Chloroplast</td>
<td></td>
</tr>
</tbody>
</table>

1. "Brain of the cell": holds DNA.
2. "Cleaner crew of the cell": digests waste and recycles molecules for future use.
3. "Post Office of the cell": sorts, packages, and ships nutrients out to the outside organelles.
4. "Highway of the cell": transports proteins to other organelles — may be rough or smooth.
5. "Factory of the cell": makes proteins.
6. Provides rigid layer for cell structure/support — found only in plant cells.
7. Gel-like substance inside the cell — it's where the other organelles are found.
8. "Powerhouse of the cell": makes energy in the form of ATP during cellular respiration.
9. In plant cells only, this is the site of photosynthesis.
10. Separates the inside of the cell from the outside — provides shape/support and allows materials to enter and leave the cell.