Review: Proportional Relationships w/ Tables & Equations
Unit 2 Lessons 2.1-2.6

Here are three different recipes for punch mix. Two of these mixtures taste the same and one tastes different.

- Recipe 1: Mix 2 cups of Sprite with 3 cups of cranberry juice.
- Recipe 2: Mix 9 cups of Sprite with 12 cups of cranberry juice.
- Recipe 3: Mix 5 cups of Sprite with 7.5 cups of cranberry juice.

1) Which two recipes will taste the same, and which one will taste different? Complete the table and make sure you show your work to how you got your answers.

<table>
<thead>
<tr>
<th></th>
<th>Sprite</th>
<th>Cranberry Juice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recipe 1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Recipe 2</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Recipe 3</td>
<td>5</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Recipe 2 is different.

2) When you mix two colors of paint in equivalent ratios, the resulting color is always the same. Complete the table and make sure you show your work to how you got your answers.

<table>
<thead>
<tr>
<th></th>
<th>cups of red paint</th>
<th>cups of yellow paint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mix 1</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Mix 2</td>
<td>1</td>
<td>1/3</td>
</tr>
<tr>
<td>Mix 3</td>
<td>12</td>
<td>4</td>
</tr>
</tbody>
</table>

a) How many cups of yellow paint should you mix with 1 cup of red paint to make the same shade of orange? Explain or show your reasoning.

b) Express the proportional relationship represented by this table using WORDS ONLY.

Cups of yellow paint (y) to cups of red paint (x)

k = \frac{1}{3}

C) What is the constant of proportionality?
3) Mai is filling her fish tank. Water flows into the tank at a constant rate. Complete the table and make sure you show your work to how you got your answers.

<table>
<thead>
<tr>
<th>time (minutes)</th>
<th>water (gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4.8</td>
</tr>
<tr>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>3</td>
<td>3.6</td>
</tr>
<tr>
<td>35</td>
<td>42</td>
</tr>
</tbody>
</table>

\[ \frac{x}{y} = \frac{4.8}{4} \]

\[ k = \frac{y}{x} = 1.2 \text{ gallons/minute} \]

a) How many gallons of water will be in the fish tank after 3 minutes?

3.6 gallons

b) How long will it take to fill the tank with 42 gallons of water?

35 minutes

c) What is the constant of proportionality?

\[ k = 1.2 \text{ gallons/minute} \]

Fill in the missing values in the table, then find the constant of proportionality.

4) Fill in the table:

\[ \frac{x}{y} = \frac{36}{12} = 3 \]

5) Fill in the table:

\[ \frac{40}{8} = 5 \]

\[ \frac{20}{4} = 5 \]

\[ \frac{60}{12} = 5 \]

Constant of Proportionality: 3

Constant of Proportionality: \( \frac{1}{5} \)

Constant of Proportionality: \( \frac{1}{2} \)

6) Fill in the table:

\[ \frac{4}{4} = 1 \]

\[ \frac{15}{7.5} = 2 \]

\[ \frac{10}{5} = 2 \]

Constant of Proportionality: \( \frac{1}{2} \)

7) Give 2 equivalent ratios to \( \frac{1}{6} \).

1) \( \frac{2}{12} \)

\[ \frac{1}{6} \times 2 = \frac{2}{12} \]

2) \( \frac{3}{18} \)

\[ \frac{1}{6} \times 3 = \frac{3}{18} \]

Answers may vary
8) Complete table to find which crescent moon is different than the others.

<table>
<thead>
<tr>
<th></th>
<th>Width (tip to tip)</th>
<th>Height (tip to tip)</th>
<th>( \text{height \over width} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td>12</td>
<td>( {12 \over 4} = 3 )</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>6</td>
<td>( {6 \over 2} = 3 )</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>3</td>
<td>( {3 \over 1} = 3 )</td>
</tr>
<tr>
<td>D</td>
<td>2</td>
<td>4</td>
<td>( {4 \over 2} = 2 )</td>
</tr>
</tbody>
</table>

Which moon is different, explain why?

D, different C of P

9) Snow is falling steadily in Syracuse, New York. After 2 hours, 4 inches of snow has fallen. Fill the table out to answer the questions below.

\[ x = \frac{y}{2} = 2 \]

<table>
<thead>
<tr>
<th>time (hours)</th>
<th>snow (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>6.5</td>
<td>13</td>
</tr>
<tr>
<td>( x )</td>
<td>( 2x )</td>
</tr>
</tbody>
</table>

a. If it continues to snow at the same rate, how many inches of snow would you expect after 6.5 hours? If you get stuck, you can use the table to help.

13 inches

b. Write an equation that gives the amount of snow that has fallen after \( x \) hours at this rate.

\[ y = 2 \cdot x \]

c. How many inches of snow will fall in 24 hours if it continues to snow at this rate?

\[ x = \text{time, } y = 2 \cdot x, \quad y = 48 \text{ in} \]
10) An albatross is a large bird that can fly 400 kilometers in 8 hours at a constant speed. Using \( d \) for distance in kilometers and \( t \) for number of hours, an equation that represents this situation is \( d = 50t \).

a. What is the constant of proportionality for the number of hours to the number of kilometers?

\[
k = \frac{hrs}{km} = \frac{8}{400} = \frac{1}{50}
\]

b. What is the constant of proportionality for the number of kilometers to the number of hours?

\[
k = \frac{km}{hr} = \frac{400}{8} = 50
\]

c. What is the relationship between these two values?

Reciprocals

d. Write another equation that relates \( d \) and \( t \) in this context.

\[
t = \frac{1}{50} \cdot t
\]

11) Based on her recipe, Elena knows that 5 servings of granola have 1,750 calories.

a. If she eats 2 servings of granola, how many calories does she eat?

Unit Rate = \( \frac{1750}{5} = 350 \) cal. serv.

\[
350 \times 2 = 700 \text{ calories}
\]

b. If she wants to eat 175 calories of granola, how many servings should she eat?

\[
\begin{align*}
5 &= s \\
\frac{350 \cdot s}{350} &= \frac{175}{\text{servings}}
\end{align*}
\]

c. Write an equation to represent the relationship between the number of calories \( c \) and the number of servings of granola \( g \).

\[
c = 350 \cdot g \\
\text{or} \\
g = \frac{1}{350} \cdot c
\]