1

Making Punch

Unit Rate Representations

WARM UP

Determine a unit rate in terms of each quantity for the given ratio.

1. 24 bracelets : 6 hours
2. 153 miles : 9 gallons
3. $48 : 3 pounds
4. 45 students : 3 teachers

LEARNING GOALS

- Compute unit rates associated with ratios of whole numbers and fractions.
- Represent unit rates using tables and graphs.
- Use unit rates to solve problems.

You have learned about ratios, rates, and unit rates. How can you use tables and graphs to represent unit rates and solve problems?

The Pumpkin-iest!

Paige loves everything pumpkin: pumpkin waffles, pumpkin hand soap, pumpkin chili …. Now she's trying to make the perfect pumpkin smoothie. She is using this recipe:

Pumpkin Smoothie Recipe	
• 1 banana ($\frac{3}{4}$ cup)	• $\frac{1}{4}$ teaspoon pumpkin pie spice
• $\frac{1}{4}$ teaspoon cinnamon	• 1 cup ice
• 2 tablespoons maple syrup	• $\frac{2}{3}$ cup pumpkin puree
• $\frac{1}{2}$ cup milk	• $\frac{1}{2}$ cup vanilla yogurt

Paige wants to experiment with the given recipe.

1. What ingredients can Paige increase to make the smoothie more pumpkin-y? Less pumpkin-y?

2. What ingredients can Paige decrease to make the smoothie more pumpkin-y? Less pumpkin-y?

ACTIVITY
1.1

Determining Unit Rates

Four students share their recipes for lemon-lime punch. The class decides to analyze the recipes to determine which one will make the fruitiest tasting punch.

Mason's Recipe	Tyler's Recipe
4 cups lemon-lime concentrate 8 cups club soda	3 cups lemon-lime concentrate 5 cups club soda
Carlos's Recipe	**Zeb's Recipe**
2 cups lemon-lime concentrate 3 cups club soda	1 cup lemon-lime concentrate 4 cups club soda

1. Which recipe has the strongest taste of lemon-lime? Show your work and explain your reasoning.

2. Which has the weakest taste of lemon-lime? Show your work and explain your reasoning.

Emily and Julio each used unit rates to compare Mason's and Tyler's recipes.

Emily

Mason's recipe
4 cups lemon-lime : 8 cups club soda
The unit rate is $\frac{1}{2}$ cup lemon-lime per 1 cup of club soda

Tyler's recipe
3 cups lemon-lime : 5 cups club soda
The unit rate is $\frac{3}{5}$ cup lemon-lime per 1 cup of club soda

$\frac{3}{5} > \frac{1}{2}$, so Tyler's recipe has the stronger taste of lemon-lime.

Julio

Mason's recipe
4 cups lemon-lime : 12 cups total punch
The unit rate is $\frac{1}{3}$ cup lemon-lime per cup of punch

Tyler's recipe
3 cups lemon-lime : 8 cups total punch
The unit rate is $\frac{3}{8}$ cup lemon-lime per cup of punch

$\frac{3}{8} > \frac{1}{3}$, so Tyler's recipe has the stronger taste of lemon-lime.

3. Compare Julio's and Emily's strategies. In what ways are they different? How did they arrive at the same answer?

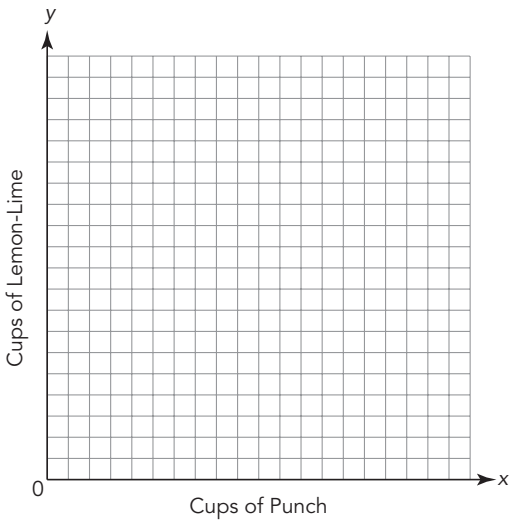
4. Complete each table and include the unit rate of lemon-lime for each cup of punch for each recipe. Then, draw a graph for each recipe on the coordinate plane. Label each graph with the person's recipe and the unit rate.

Mason's Recipe				
Lemon-Lime (c)				
Total Punch (c)	1			

Tyler's Recipe				
Lemon-Lime (c)				
Total Punch (c)	1			

Carlos's Recipe				
Lemon-Lime (c)				
Total Punch (c)	1			

Zeb's Recipe				
Lemon-Lime (c)				
Total Punch (c)	1			



5. What does the steepness of each line represent?

6. How could you use the graphs to determine which recipe has the strongest lemon-lime taste?

NOTES

TALK the TALK

Getting Unit Rate-ier

Look back at the activity *The Pumpkin-iest!* Use the smoothie recipe to answer each question.

1. **One teaspoon is approximately $\frac{1}{50}$ cup, and 1 tablespoon is equal to 3 teaspoons. Approximately how many cups of smoothie does Paige's recipe make?**

2. **How pumpkin-y are Paige's smoothies if she follows the recipe? Write a unit rate to represent the amount of pumpkin-y ingredients per cup of smoothie.**