

# Making Punch

MATH  
Weeks of  
9/14 - 9/27/19

1

## 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?

## Getting Started

### 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?

## 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?

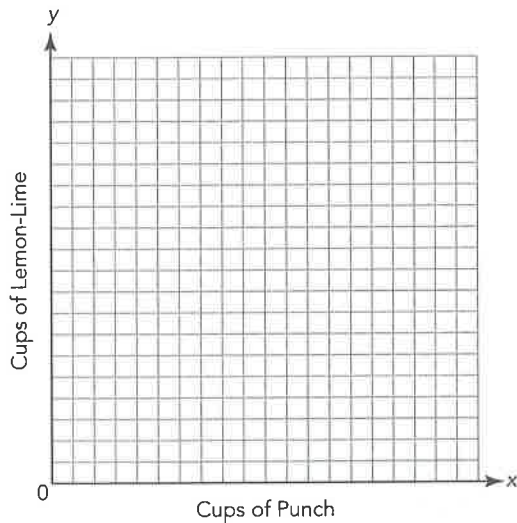
4. Complete each table and include the unit rate of lemon-lime for each cup of punch for each recipe. Then draw a graph for each recipe on the coordinate plane. Label each graph with the person's recipe and the unit rate.

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			



The steepness of a graphed line is called its slope.



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?

**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.



# Assignment

homework  
math 7 due 9/20/19

## Write

How can unit rates be helpful when solving problems?

## Remember

A rate is a ratio that compares quantities with different units. A unit rate is a rate in which the numerator or denominator (or both) is 1.

A unit rate is represented by the ordered pair  $(1, r)$  on a coordinate plane.

## Practice

Complete each table and write a unit rate for the given situation.

1. General house cleaning (sweeping the floors, vacuuming, laundry, etc.) can burn 470 calories every 2 hours.

<b>Time (hours)</b>	1	2	3	4	5
<b>Calories burned</b>					

2. A full strip plus another half of a strip of staples contains 315 staples.

<b>Number of Strips</b>	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$
<b>Number of Staples</b>					

3. Victoria is making punch for a school party. The recipe she is using calls for 2 cups of lemonade to make 5 cups of punch.

<b>Cups of Lemonade</b>					
<b>Cups of Punch</b>					

homework  
Math 7 due 9/27/19

Complete each table and write a unit rate for the given situation. Then, graph the relationship on a coordinate plane.

4. The owner of a city parking garage uses a rate table so that he can look up the parking charges quickly.

Hours	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Charge	\$2.25							

5. The owner of a city parking garage uses a rate table so that he can look up the parking charges quickly.

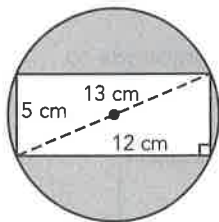
Hours	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Charge				\$13.00				

## Stretch

A line is graphed through points at (4, 5) and (8, 10). What is the ordered pair of the unit rate?

## Review

Use the circle shown to answer each question. Use 3.14 for  $\pi$ . Round to the nearest hundredth.



1. Calculate the exact area of the circle.
2. Calculate the circumference of the circle.
3. Determine the total area of the shaded regions.

Use 3.14 for  $\pi$ . Round to the nearest hundredth.

4. Ben's dog, Tripp, is on a leash that is 6 feet long. What is the approximate circular area of Tripp's play area?

Determine each number.

5. 49 is 70% of what number?
6. 99 is 36% of what number?