Unit Rates in Real Life: Smoothies, Trips, and Texts

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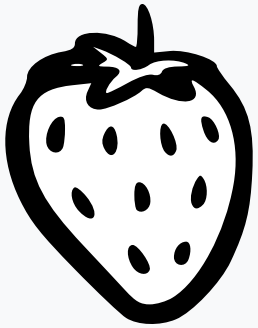
Lesson:

A unit rate tells how much of one thing goes with exactly 1 of another, like 3 cups of fruit per 1 serving. In this set you will find unit rates, compare them, and catch mistakes. Always name the units in your head: 4 means nothing until you say 4 miles per hour.



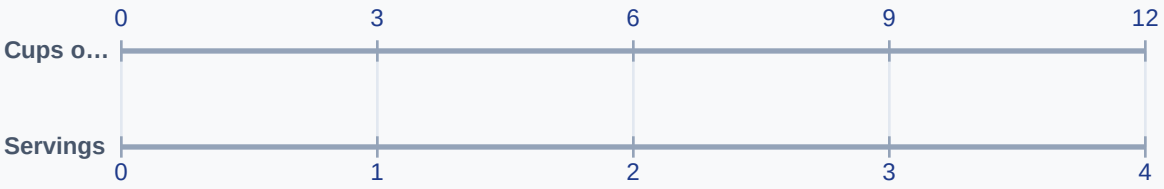
> A rate compares two quantities with different units. A unit rate tells about the amount for 1 of the second quantity. For example, if a smoothie recipe uses 3 cups of fruit for 1 serving, the unit rate is 3 cups per serving. The words per serving show that the recipe is being described for one serving.

Same recipe, growing batch

Cups of fruit	3	6	9	12
Servings	1	2	3	4

Every column is the same relationship. The first column shows the unit rate: 3 cups for 1 serving.

Two lines, one rate



The top line counts cups, the bottom counts servings. Lining up 3 with 1 shows the unit rate, 3 cups per serving.

> Rates can be written as a ratio or as a fraction. In a ratio like 20 miles in 4 hours, the unit rate helps you find the amount for 1 hour. Since 20 ÷ 4 = 5, the unit rate is 5 miles per hour. That means the road trip covers 5 miles in each hour.

Example 1: The lesson's recipe uses 6 cups of fruit for 2 servings. 6 ÷ 2 = 3, so the unit rate is 3 cups of fruit per serving, the same unit rate the table and double number line show.

Example 2: A road trip goes 27 miles in 3 hours. 27 ÷ 3 = 9, so the unit rate is 9 miles per hour.

> In a phone plan, 30 texts for 2 dollars can be described with a unit rate of 15 texts per dollar. The unit rate makes the comparison easier because it shows the amount for just 1 dollar. This same thinking works for smoothies, road trips, and many other real-life situations.

Example 3: A phone plan gives 40 texts for 5 dollars. 40 ÷ 5 = 8, so the unit rate is 8 texts per dollar.

When you use rate language, be specific about what each number means. Say '3 cups per serving,' not just '3.' Say '4 miles per hour,' not just '4.' The units explain the relationship and help the rate make sense.

Rates and unit rates

Rate	Unit rate
20 miles in 4 hours	5 miles per hour
6 cups of fruit for 2 servings	3 cups of fruit for 1 serving
40 texts for 5 dollars	8 texts for 1 dollar

Worked example: read across each row. The left column states a rate; the right column states that same rate for exactly 1.

A unit rate always keeps the second quantity equal to 1. If the comparison is 8 ounces of yogurt for 4 smoothies, divide both parts by 4 to find the unit rate. That gives 2 ounces per smoothie. This is the same relationship written in a simpler way for one smoothie.

Example 4: A smoothie shop uses 16 ounces of yogurt for 8 smoothies. 16 ÷ 8 = 2, so the unit rate is 2 ounces of yogurt per smoothie, the same relationship as 8 ounces for 4 smoothies, just a bigger batch.

Instructions:

Find each unit rate, compare rates, or check a worked answer. Type only the number for each answer.

1. A smoothie recipe uses 8 cups of fruit for 2 servings. What is the unit rate in cups per serving?

Answer: _____

2. A phone plan has 18 texts for 3 dollars. What does the unit rate show for 1 dollar?

Answer: _____

3. A student says 9 ounces of yogurt for 3 smoothies gives 6 ounces per smoothie because 9 - 3 = 6. What is the correct unit rate?

Answer: _____

4. Which unit rate is greater: 9 miles in 3 hours or 16 miles in 4 hours? Enter the greater unit rate.

Answer: _____

5. A smoothie recipe uses 15 ounces of yogurt for 3 smoothies. What is the unit rate in ounces per smoothie?

Answer: _____

6. Compare these two rates: smoothie A has 10 ounces for 5 servings, and smoothie B has 6 ounces for 3 servings. What is the unit rate for each, and what number do both unit rates equal?

Answer: _____

7. A student says 12 miles in 3 hours means 12 miles per hour. What is the correct unit rate?

Answer: _____

8. A road trip uses 45 gallons of fuel for 9 hours of driving. What is the unit rate in gallons per hour?

Answer: _____

9. A smoothie shop uses 12 bananas for 4 smoothies. How many bananas are used for 1 smoothie?

Answer: _____

10. Two road trips are compared. Trip A: 21 miles in 3 hours. Trip B: 28 miles in 4 hours. What is the unit rate for each trip, and what number do both unit rates equal?

Answer: _____

11. A student says 24 texts for 4 dollars means 4 texts per dollar. What is the correct unit rate?

Answer: _____

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(Answer Key)

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1. A smoothie recipe uses 8 cups of fruit for 2 servings. What is the unit rate in cups per serving?
Hint: Divide the fruit cups by the number of servings.

Correct Answer: 4

Explanation: 8 ÷ 2 = 4, so the unit rate is 4 cups per serving.

2. A phone plan has 18 texts for 3 dollars. What does the unit rate show for 1 dollar?
Hint: Divide the texts by the dollars.

Correct Answer: 6

Explanation: 18 ÷ 3 = 6, so the unit rate is 6 texts per dollar.

3. A student says 9 ounces of yogurt for 3 smoothies gives 6 ounces per smoothie because 9 - 3 = 6. What is the correct unit rate?
Hint: Use division, not subtraction.

Correct Answer: 3

Explanation: 9 ÷ 3 = 3, so the correct unit rate is 3 ounces per smoothie.

4. Which unit rate is greater: 9 miles in 3 hours or 16 miles in 4 hours? Enter the greater unit rate.
Hint: Find both unit rates.

Correct Answer: 4

Explanation: 9 ÷ 3 = 3 miles per hour and 16 ÷ 4 = 4 miles per hour. The greater unit rate is 4.

5. A smoothie recipe uses 15 ounces of yogurt for 3 smoothies. What is the unit rate in ounces per smoothie?
Hint: Divide 15 by 3.

Correct Answer: 5

Explanation: 15 ÷ 3 = 5, so the unit rate is 5 ounces per smoothie.

6. Compare these two rates: smoothie A has 10 ounces for 5 servings, and smoothie B has 6 ounces for 3 servings. What is the unit rate for each, and what number do both unit rates equal?
Hint: Find each unit rate by dividing ounces by servings.

Correct Answer: 2

Explanation: 10 ÷ 5 = 2 and 6 ÷ 3 = 2, so both unit rates equal 2 ounces per serving.

7. A student says 12 miles in 3 hours means 12 miles per hour. What is the correct unit rate?
Hint: Find how many miles for 1 hour.

Correct Answer: 4

Explanation: 12 ÷ 3 = 4, so the correct unit rate is 4 miles per hour.

8. A road trip uses 45 gallons of fuel for 9 hours of driving. What is the unit rate in gallons per hour?
Hint: Divide gallons by hours.

Correct Answer: 5

Explanation: 45 ÷ 9 = 5, so the unit rate is 5 gallons per hour.

9. A smoothie shop uses 12 bananas for 4 smoothies. How many bananas are used for 1 smoothie?
Hint: Divide the bananas by the smoothies.

Correct Answer: 3

Explanation: 12 ÷ 4 = 3, so the unit rate is 3 bananas per smoothie.

10. Two road trips are compared. Trip A: 21 miles in 3 hours. Trip B: 28 miles in 4 hours. What is the unit rate for each trip, and what number do both unit rates equal?
Hint: Find each miles-per-hour rate.

Correct Answer: 7

Explanation: 21 ÷ 3 = 7 and 28 ÷ 4 = 7, so both unit rates equal 7 miles per hour.

11. A student says 24 texts for 4 dollars means 4 texts per dollar. What is the correct unit rate?
Hint: Divide texts by dollars.

Correct Answer: 6

Explanation: 24 ÷ 4 = 6, so the correct unit rate is 6 texts per dollar.