

Ratios and Scaling a Fruit Drink Recipe — Facilitator guide

Teaching notes and answers

Task 1: Complete the Ratio Table (Question 1)

Missing Table Entries:

- Row 3 (Orange Juice = 9, Total = 15): Pineapple Juice = 6 cups
- Row 4 (Pineapple Juice = 8, Total = 20): Orange Juice = 12 cups
- Row 5 (Orange Juice = 15, Pineapple Juice = 10): Total Punch = 25 cups

Pattern Explanation:

Every equivalent row scales orange juice, pineapple juice, and the total by the same factor, preserving the 3:2 ratio (total 5 parts). For example, Row 3 scales by a factor of 3 ($3 \times 3 = 9$, $2 \times 3 = 6$, $5 \times 3 = 15$), Row 4 scales by a factor of 4 ($3 \times 4 = 12$, $2 \times 4 = 8$, $5 \times 4 = 20$), and Row 5 scales by a factor of 5 ($3 \times 5 = 15$, $2 \times 5 = 10$, $5 \times 5 = 25$).

Question 2 Answer

Correct Answer: B. 4 cups

Question 3 Answer

The total parts in the ratio are $3 + 2 = 5$ parts. To make 45 cups, each part is $45 \div 5 = 9$ cups. Orange Juice: $3 \times 9 = 27$ cups. Pineapple Juice: $2 \times 9 = 18$ cups.

Question 4 Answer

No, the classmate is incorrect. Adding the same amount to both ingredients changes the ratio. The original ratio is 3:2 (or 1.5). If we add 2 cups to each, the new ratio is $(3+2):(2+2) = 5:4$ (or 1.25). Since the ratios are not equivalent (1.5 is not equal to 1.25), the drink will taste different.

Worksheet answer copy

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The Tropical Punch Recipe

Welcome to the Tropical Punch kitchen! Today we are learning how to scale a recipe using ratios. A ratio compares two quantities. When we scale a recipe up or down, we must keep the ratio of ingredients the same so the drink tastes exactly the same.

Our Tropical Punch recipe uses a ratio of **3 cups of Orange Juice to 2 cups of Pineapple Juice** (3:2). This means for every 3 cups of Orange Juice, we must mix in 2 cups of Pineapple Juice.

Worked Example: Scaling the Recipe

Problem: If you use 12 cups of Orange Juice, how many cups of Pineapple Juice do you need?

Solution:

1. Write the ratio of Orange Juice to Pineapple Juice: $\frac{3}{2}$
2. Set up an equivalent fraction with the new amount: $\frac{3}{2} = \frac{12}{\text{Pineapple}}$
3. Identify the scale factor: Since $3 \times 4 = 12$, multiply the denominator by 4: $2 \times 4 = 8$.

Answer: You need **8 cups** of Pineapple Juice.

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Task 1: Complete the Ratio Table

Scaling the Tropical Punch Recipe

Complete the ratio table below for the Tropical Punch recipe. Then answer the question.

Orange Juice (cups)	Pineapple Juice (cups)	Total Punch (cups)
3	2	5
6	4	10
9		15
	8	20
15	10	

Explain the pattern you used to find the missing numbers in the table. How does the ratio of Orange Juice to Pineapple Juice remain constant?

2. If you want to make a double batch of Tropical Punch using 6 cups of Orange Juice, how many cups of Pineapple Juice do you need?

- ☐ A 2 cups
- ☐ B 4 cups
- ☐ C 6 cups
- ☐ D 10 cups

Answer: B. 4 cups

3. You want to make a large party batch of Tropical Punch that totals 45 cups. Using the ratio 3:2, how many cups of Orange Juice and how many cups of Pineapple Juice will you need? Show your calculations. (2 pts)

Answer: The total parts in the ratio are $3 + 2 = 5$ parts. To make 45 cups, each part is $45 \div 5 = 9$ cups. Orange Juice: $3 \times 9 = 27$ cups. Pineapple Juice: $2 \times 9 = 18$ cups.

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4. A classmate says, 'If I add 2 more cups of Orange Juice and 2 more cups of Pineapple Juice to the recipe, the drink will taste exactly the same because I added the same amount to both.' Is your classmate correct? Explain your reasoning using ratios. (2 pts)

Answer: No, the classmate is incorrect. Adding the same amount to both ingredients changes the ratio. The original ratio is 3:2 (or 1.5). If we add 2 cups to each, the new ratio is $(3 + 2) : (2 + 2) = 5 : 4$ (or 1.25). Since the ratios are not equivalent ($1.5 \neq 1.25$), the drink will taste different.