

NAME _____

Module 7 Ratio, Proportion, and Percent
 Lesson 4 Ratios, Rates, and Proportional Reasoning

Lesson Objectives

- Write ratios as fractions in simplest form.
- Determine unit rates.
- Use proportional reasoning and ratios to represent problem situations.

Subtopic 1 Ratios, Rates, and Unit Rates

A **ratio** is a comparison of two numbers.

A ratio is in **simplest form** when the numbers have no common factors.

A rate is a **ratio** of two quantities that have different units.

A unit rate is a rate in which the second quantity is **one** unit.

Unit cost is one type of unit rate.

Unit cost is the price of **one** item.

- 1** A bouquet contains eight roses and 20 tulips. Write the ratio of roses to tulips in simplest form.

$$\begin{aligned} \text{roses : tulips} &= 8 : 20 \\ \text{roses : tulips} &= 8 \div 4 : 20 \div 4 \\ \text{roses : tulips} &= 2 : 5 \\ &2:5 \end{aligned}$$

- 2** A case of 12 sodas costs \$4.20. What is the cost of each soda?

$$\begin{aligned} \frac{\text{cost}}{\text{case of soda}} &= \frac{\$4.20}{12} \\ \frac{\text{cost}}{\text{case of soda}} &= \frac{\$4.20 \div 12}{12 \div 12} \\ \frac{\text{cost}}{\text{case of soda}} &= \frac{\$0.35}{1} \end{aligned}$$

Each soda costs \$.35.

Subtopic 2 Use Ratios and Proportions to Solve Problems

- 3** Sam’s recipe for trail mix calls for five cups of peanuts and 12 ounces of coconut. If Sam only has three ounces of coconut, what quantity of peanuts should he use?

$$\begin{array}{l} \frac{\text{c peanuts} \rightarrow}{\text{oz coconut} \rightarrow} = \frac{5}{12} = \frac{?}{3} \\ \frac{5 \div 4}{12 \div 4} = \frac{1.25}{3} \end{array}$$

Sam should use $1\frac{1}{4}$ cups of peanuts.

- 4** Sheila found that her heart beats 40 times in 24 seconds. At this rate, how many times will her heart beat in 60 seconds?

$$\begin{array}{l} \frac{\text{beats} \rightarrow}{\text{seconds} \rightarrow} = \frac{40}{24} = \frac{?}{60} \\ 40 \times 60 = 24 \times ? \\ 2,400 = 24 \times ? \\ 100 = ? \end{array}$$

Sheila’s heart will beat 100 times in 24 seconds.

Subtopic 3 Comparing

- 5** When Gina makes chocolate milk, she uses three tablespoons of chocolate syrup for every four ounces of milk. Rita uses four tablespoons of chocolate syrup for every five ounces of milk. Use a table to find whose chocolate milk has the stronger chocolate flavor.

<i>s</i> = syrup (tbsp)		<i>m</i> = milk (oz)	
Gina		Rita	
<i>s</i>	<i>m</i>	<i>s</i>	<i>m</i>
3	4	4	5
6	8	8	10
9	12	<u>12</u>	<u>15</u>
<u>12</u>	<u>16</u>	16	20

Rita’s chocolate milk has the stronger chocolate flavor.