

A **proportion** is a statement that two ratios or rates are equivalent.

$\frac{1}{3}$ and $\frac{2}{6}$ are equivalent ratios. $\frac{1}{3} = \frac{2}{6}$ is a proportion.

You can solve problems with proportions in two ways.

A. Use equivalent ratios.

Hanna can wrap 3 boxes in 15 minutes.
How many boxes can she wrap in 45 minutes?

$$\frac{3}{15} = \frac{\quad}{45}$$
$$\frac{3 \cdot 3}{15 \cdot 3} = \frac{9}{45}$$

$3 \times 3 = ?$
 $15 \times 3 = 45$

Hanna can wrap 9 boxes in 45 minutes.

B. Use unit rates.

Dan can cycle 7 miles in 28 minutes.
How long will it take him to cycle 9 miles?

$$\frac{28 \text{ min}}{7 \text{ mi}} = \frac{\quad}{1 \text{ mi}}$$

Divide by 7.

$$\frac{28}{7} = \frac{28 \div 7}{1} = \frac{4}{1}, \text{ or 4 minutes per mile}$$

To cycle 9 miles, it will take Dan 9×4 , or 36 minutes.

Problem 1

Mrs. O'Neill tiles 24 square feet in 3 hours. How many square feet can she tile in 9 hours?

Use a proportion.

$$\frac{24}{3} = \frac{\quad}{9}$$

$3 \times 3 = 9$

$$\frac{24}{3} = \frac{72}{9}$$

$24 \times 3 = \quad$

She can tile 72 square feet in 9 hours.

Problem 2

Which is the better buy: an 18-ounce box of cereal for \$4.50 or a 30-ounce box of cereal for \$9.00?

Use a unit rate.

$$\frac{4.50}{18} = 0.25$$

$0.25 < 0.30$

$$\frac{9.00}{30} = 0.30$$

The 18-ounce box has a lower unit rate, so it is the better buy.

This table shows the prices for different-sized bottles of fruit juices.

Size	Capacity (oz.)	Cost (\$)
Small	8	2.80
Medium	12	3.96
Large	16	4.80

Rows are read left to right.

Column headings tell you what data is below.

Columns are read up and down.

1. What is the unit cost for each bottle?

a. Small (8 oz): _____

b. Medium (12 oz): _____

c. Large (16 oz): _____

2. Cara drank a 6-ounce glass from the 12-ounce bottle. How much did her drink cost?

3. Sean drank an 8-ounce glass from the 16-ounce bottle. How much did his drink cost?

4. Luca had a 4-ounce glass from the 16-ounce bottle. How much did his drink cost?

This table shows the time three delivery people worked, the miles they drove, and the amount each earned.

Driver	Miles Driven	Hours Driven	Earnings (\$)
Jeff	65	7	158.75
Alicia	82	8	180.80
LeShawn	56	6	118.50

5. a. How much did Alicia earn per hour? _____
b. How much would she earn for 5 hours of work? _____
6. a. On average, how far did LeShawn drive in an hour? _____
b. On average, how far would she drive in 2 hours? _____
7. Who had the highest earnings per hour? _____