Scale It Up

Use ratios, conversions, and percents to find missing values.

7.CE.2 · The student will solve problems, including those in context, involving proportional relationships. Given a proportional relationship between two quantities, create and use a ratio table to determine missing values. Write and solve a proportion that represents a proportional relationship between two quantities to find a missing value, including problems in context. Apply proportional reasoning to solve problems in context, including converting units of measurement, when given the conversion factor. Estimate and determine the percentage of a given whole number, including but not limited to the use of benchmark percentages.

Name _____ Date _____

THE BIG IDEA

Proportional quantities change by the same scale factor. Use a ratio table or write a/b = c/x, then multiply or divide to find x. For a percent, change the percent to a fraction or decimal and multiply by the whole, and use the given conversion factor for units.

Worked example

6 tickets cost $9. At the same rate, what do 14 tickets cost?

1. Find the cost of 1 ticket: $9 / 6 = $1.50.
2. Multiply by 14 tickets: 14 x $1.50 = $21.

$21

1. Practice

A printer makes 5 posters in 12 minutes. Use a ratio table to find how many posters it makes in 36 minutes.

Posters	Minutes

2. Practice

Solve the proportion: 8/15 = x/45.

3. Practice

Given that 1 yard = 3 feet, convert 8 yards to feet.

4. Practice

Find 25% of 68.

5. Practice

Estimate 15% of 80 using 10% and 20% as benchmarks. Then find the exact amount and explain why it fits your estimate.

6. Practice

A 16-ounce bottle costs $4. At the same rate, how much would a 28-ounce bottle cost?

7. Apply

The music club sells 18 stickers for $12. At the same price per sticker, how much would 45 stickers cost?

8. Apply

A gaming tournament lasts 150 minutes. A break takes 12% of the tournament time. How many minutes is the break?

9. Challenge

A fun run is 2.4 kilometers long. Given that 1 kilometer = 1,000 meters, 35% of the route is shaded. How many meters of the route are shaded? Explain your reasoning.

What to accept

Accept equivalent proportions, ratio tables, and correct unit-rate methods. For percent problems, accept fraction, decimal, benchmark-percent, or equation methods when the final answer is correct.

1. Practice

15 posters

Posters	Minutes
5	12
10	24
15	36

2. Practice

x = 24

3. Practice

24 feet

4. Practice

17

5. Practice

10% is 8 and 20% is 16; 15% is halfway, so 12. Exact: 0.15 × 80 = 12.

6. Practice

$7

7. Apply

$30

Write 12/18 = x/45. Simplify the rate to $2/3 per sticker, then multiply 45 x 2/3.

8. Apply

18 minutes

Find 10% of 150, which is 15, and find 2%, which is 3. Add 15 + 3.

9. Challenge

840 meters. Convert 2.4 kilometers to 2,400 meters, then find 35% of 2,400: 0.35 x 2,400 = 840.