

Scale It Up

Use fractions to resize quantities.

GRADE 5 • 5.NF.B.5

CCSS.Math.Content.5.NF.B.5 "Interpret multiplication as scaling (resizing), by:"

NAME _____

DATE _____

SCALE FACTORS

A fraction used as a scale factor changes the size of a quantity. A factor less than 1 makes the quantity smaller, and a factor greater than 1 makes it larger. Find the fraction of the quantity to calculate the new size.

WORKED EXAMPLE

Find $\frac{2}{3} \times 12$. Tell whether 12 is enlarged or reduced.

1. First find $\frac{1}{3}$ of 12: $12 \div 3 = 4$.
2. Then find $\frac{2}{3}$: $2 \times 4 = 8$.
3. Because $\frac{2}{3}$ is less than 1, the amount is reduced.

Answer: 8, reduced

PRACTICE 6 problems

1 Find $\frac{1}{4} \times 20$. Is 20 enlarged or reduced?

ANSWER _____

2 Find $\frac{5}{6} \times 30$. Is 30 enlarged or reduced?

ANSWER _____

3 Find $\frac{9}{10} \times 40$. Is 40 enlarged or reduced?

ANSWER _____

4 Find $\frac{7}{4} \times 20$. Is 20 enlarged or reduced?

ANSWER _____

5 Find $\frac{11}{12} \times 48$. Is 48 enlarged or reduced?

ANSWER _____

6 Find $\frac{6}{5} \times 45$. Is 45 enlarged or reduced?

ANSWER _____

APPLY IT Show your work

- 1** A game designer plans a 45-minute level. A special version is $\frac{6}{5}$ as long as the planned level. How many minutes is the special version?

WORK SPACE

ANSWER _____

- 2** A robot's battery lasts 63 minutes in normal mode. In speed-test mode, it lasts $\frac{4}{9}$ as long. How many minutes does the battery last in speed-test mode?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A rectangular poster is 36 cm wide. A printer first scales the width by $\frac{9}{4}$. Then it scales the new width by $\frac{4}{9}$. What is the final width? Explain why.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Find $\frac{1}{4} \times 20$. Is 20 enlarged or reduced?	5, reduced
2	Find $\frac{5}{6} \times 30$. Is 30 enlarged or reduced?	25, reduced
3	Find $\frac{9}{10} \times 40$. Is 40 enlarged or reduced?	36, reduced
4	Find $\frac{7}{4} \times 20$. Is 20 enlarged or reduced?	35, enlarged
5	Find $\frac{11}{12} \times 48$. Is 48 enlarged or reduced?	44, reduced
6	Find $\frac{6}{5} \times 45$. Is 45 enlarged or reduced?	54, enlarged

PART 2 • APPLY IT

1. **54 minutes** Find $\frac{1}{5}$ of 45, which is 9. Then multiply 9 by 6 to get 54, and the level is longer because $\frac{6}{5}$ is greater than 1.
2. **28 minutes** Find $\frac{1}{9}$ of 63, which is 7. Then multiply 7 by 4 to get 28, and the battery lasts less time because $\frac{4}{9}$ is less than 1.

CHALLENGE

36 cm. The factors $\frac{9}{4}$ and $\frac{4}{9}$ multiply to 1, so the second scaling reverses the first scaling.

Accept equivalent work that correctly finds each scaled amount. For scale direction, accept larger or smaller in place of enlarged or reduced.