

Product Size Detectives

Use the other factor to predict whether a product grows, shrinks, or stays equal.

GRADE 5 • NY-5.NF.5.a

NY-5.NF.5.a "Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication."

NAME _____

DATE _____

SPOT THE SCALE FACTOR

When you multiply a positive number by a factor greater than 1, the product is greater than that number. When you multiply by a factor between 0 and 1, the product is less than that number. When you multiply by 1, the product stays equal to that number.

WORKED EXAMPLE

Without multiplying, compare $18 \times \frac{3}{5}$ to 18.

1. Look at the other factor, $\frac{3}{5}$.
2. $\frac{3}{5}$ is less than 1.
3. Multiplying 18 by a number less than 1 makes the product smaller.

Answer: $18 \times \frac{3}{5}$ is less than 18.

PRACTICE 6 problems

- 1** Without multiplying, compare 27×4 to 27. Write greater than, less than, or equal to.

ANSWER _____

- 2** Without multiplying, compare $35 \times \frac{1}{7}$ to 35. Write greater than, less than, or equal to.

ANSWER _____

- 3** Without multiplying, compare 16×1 to 16. Write greater than, less than, or equal to.

ANSWER _____

- 4** Without multiplying, compare $\frac{2}{3} \times 24$ to 24. Write greater than, less than, or equal to.

ANSWER _____

- 5** Without multiplying, compare $\frac{7}{4} \times 12$ to 12. Write greater than, less than, or equal to.

ANSWER _____

- 6** Without multiplying, compare $\frac{9}{10} \times 50$ to 50. Write greater than, less than, or equal to.

ANSWER _____

APPLY IT Show your work

- 1** A game gives Jordan $\frac{3}{2}$ times as many coins as 40 coins. Without finding the number of coins, will Jordan have more than, less than, or exactly 40 coins? Explain.

WORK SPACE

ANSWER _____

- 2** For a science club project, Nia uses $\frac{5}{8}$ of a 64-page notebook. Without finding how many pages she uses, will the number of pages be more than, less than, or exactly 64 pages? Explain.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Without multiplying, put these products in order from least to greatest: $42 \times \frac{3}{4}$, 42×1 , and $42 \times \frac{5}{4}$. Explain how you know.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Without multiplying, compare 27×4 to 27. Write greater than, less than, or equal to.	greater than
2	Without multiplying, compare $35 \times \frac{1}{7}$ to 35. Write greater than, less than, or equal to.	less than
3	Without multiplying, compare 16×1 to 16. Write greater than, less than, or equal to.	equal to
4	Without multiplying, compare $\frac{2}{3} \times 24$ to 24. Write greater than, less than, or equal to.	less than
5	Without multiplying, compare $\frac{7}{4} \times 12$ to 12. Write greater than, less than, or equal to.	greater than
6	Without multiplying, compare $\frac{9}{10} \times 50$ to 50. Write greater than, less than, or equal to.	less than

PART 2 • APPLY IT

1. **Jordan will have more than 40 coins because $\frac{3}{2}$ is greater than 1.** Since $\frac{3}{2}$ is greater than 1, multiplying 40 by $\frac{3}{2}$ makes the product greater than 40.
2. **Nia will use less than 64 pages because $\frac{5}{8}$ is less than 1.** Since $\frac{5}{8}$ is less than 1, multiplying 64 by $\frac{5}{8}$ makes the product less than 64.

CHALLENGE

$42 \times \frac{3}{4}$, 42×1 , $42 \times \frac{5}{4}$. Since $\frac{3}{4}$ is less than 1, its product is less than 42. Multiplying by 1 keeps the product equal to 42, and $\frac{5}{4}$ is greater than 1, so its product is greater than 42.

Accept comparison words or the symbols $>$, $<$, and $=$ when they clearly compare the product to the stated factor. For explanations, accept any correct statement that identifies whether the other factor is less than, equal to, or greater than 1.