LESSON MAKER PRO

Resize Detective

Predict how a fraction changes a number.

GRADE 5 · MT.5.NF.5

MT.5.NF.5 "Interpret multiplication as scaling (resizing), by: Comparing 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 _____

MULTIPLICATION RESIZES

For a positive number, multiplying by a fraction greater than 1 makes a larger number. Multiplying by a fraction less than 1 makes a smaller number, while multiplying by 1 leaves it the same. Multiplying the top and bottom of a fraction by the same number is multiplying the fraction by 1, so its value stays the same.

WORKED EXAMPLE

Without finding the product, compare 18 × 11/10 with 18.

1. 11/10 is greater than 1 because 11 is greater than 10.
2. Multiplying a positive number by a fraction greater than 1 makes it larger.

Answer: 18 × 11/10 > 18

PRACTICE 6 problems

1 Without finding the product, compare 12 × 5/3 with 12. Write <, >, or =.

ANSWER _____

2 Without finding the product, compare 15 × 2/5 with 15. Write <, >, or =.

ANSWER _____

3 Without finding the product, compare 13 × 4/4 with 13. Write <, >, or =.

ANSWER _____

4 Without finding the product, compare 20 × 3/8 with 20. Write <, >, or =.

ANSWER _____

5 Complete 2/3 × 4/4 = ___. Does the fraction's value grow, shrink, or stay the same?

ANSWER _____

_____

6 Without finding the product, compare 16 × 7/5 with 16. Explain how you know.

ANSWER _____

_____

APPLY IT Show your work

1 A game designer starts with an icon that is 32 pixels wide. She resizes its width by a factor of 5/8. Without finding the new width, will it be greater or less than 32 pixels? Explain.

WORK SPACE

ANSWER _____

2 A video editor starts with a 28-second clip. They stretch its length by a factor of 4/3. Without finding the new length, will the clip last more or less than 28 seconds? Explain.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Ava says 3/4 × 2/2 is greater than 3/4 because both numbers in the fraction get bigger. Is Ava right? Explain using multiplication by 1. Then, without finding the product, compare 24 × (3/4 × 2/2) with 24.

WORK SPACE AND ANSWER

ANSWER KEY # Resize Detective

GRADE 5 · MT.5.NF.5

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Without finding the product, compare 12 × 5/3 with 12. Write <, >, or =.	**12 × 5/3 > 12**
2	Without finding the product, compare 15 × 2/5 with 15. Write <, >, or =.	**15 × 2/5 < 15**
3	Without finding the product, compare 13 × 4/4 with 13. Write <, >, or =.	**13 × 4/4 = 13**
4	Without finding the product, compare 20 × 3/8 with 20. Write <, >, or =.	**20 × 3/8 < 20**
5	Complete 2/3 × 4/4 = ___. Does the fraction's value grow, shrink, or stay the same?	**8/12; it stays the same.**
6	Without finding the product, compare 16 × 7/5 with 16. Explain how you know.	**16 × 7/5 > 16 because 7/5 is greater than 1.**

PART 2 · APPLY IT

1. **Less than 32 pixels.** Since 5/8 is less than 1, multiplying the positive width by 5/8 makes it smaller.
2. **More than 28 seconds.** Since 4/3 is greater than 1, multiplying the positive length by 4/3 makes it larger.

CHALLENGE

No. Since 2/2 = 1, multiplying 3/4 by 2/2 gives 6/8, which has the same value as 3/4. Because 3/4 is less than 1, 24 × (3/4 × 2/2) < 24.

Accept any correct explanation based on whether the multiplying fraction is less than, equal to, or greater than 1. For the challenge, accept either 3/4 or 6/8 as the fraction used to justify the comparison.