LESSON MAKER PRO

Fraction Size Switch

See how a factor changes a product.

GRADE 5 · 5.NF.B.5b

CCSS.Math.Content.5.NF.B.5b "Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case)..."

NAME _____ DATE _____

FACTORS CHANGE SIZE

When you multiply a positive number by a fraction greater than 1, the product is greater than the number you started with. When you multiply by a fraction less than 1, the product is smaller. A fraction like n/n equals 1, so multiplying by it makes an equivalent fraction.

WORKED EXAMPLE

Write an equivalent fraction for 19/23 by multiplying by 14/14.

1. 14/14 = 1.
2. 19/23 x 14/14 = (19 x 14)/(23 x 14).
3. (19 x 14)/(23 x 14) = 266/322.

Answer: 266/322, which is equal to 19/23

PRACTICE 6 problems

1 Without multiplying, is 3/5 x 6/5 greater or smaller than 3/5?

ANSWER _____

2 Find the product: 8 x 3/4

ANSWER _____

3 Multiply 2/3 by 5/5. Write the result with a denominator of 15.

ANSWER _____

4 Use 3/3 to write an equivalent fraction for 4/11.

ANSWER _____

5 Write > or <: 9/10 x 7/6 __ 9/10

ANSWER _____

6 Find the product: 5/8 x 9/8

ANSWER _____

APPLY IT Show your work

1 In a game, Diego has 10 badges. A weekend bonus makes his badge total 3/2 times as large. How many badges does he have? Explain why the new total is greater than 10.

WORK SPACE

ANSWER _____

2 Jordan's science club video is 18 minutes long. A trailer is 2/3 as long as the full video. How long is the trailer? Explain why it is shorter than the full video.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Without finding any exact products, arrange these from least to greatest: 7/12 x 3/4, 7/12 x 1, 7/12 x 5/4. Explain your reasoning.

WORK SPACE AND ANSWER

ANSWER KEY

Fraction Size Switch

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Without multiplying, is 3/5 x 6/5 greater or smaller than 3/5?	**greater**
2	Find the product: 8 x 3/4	**6**
3	Multiply 2/3 by 5/5. Write the result with a denominator of 15.	**10/15**
4	Use 3/3 to write an equivalent fraction for 4/11.	**12/33**
5	Write > or <: 9/10 x 7/6 __ 9/10	**>**
6	Find the product: 5/8 x 9/8	**45/64**

PART 2 · APPLY IT

1. **15 badges.** The factor 3/2 is greater than 1, so the product is greater than 10. Multiply 10 x 3/2 to get 15. Since 3/2 is greater than 1, the badge total increases.
2. **12 minutes.** The factor 2/3 is less than 1, so the product is smaller than 18. Multiply 18 x 2/3 to get 12. Since 2/3 is less than 1, the trailer is shorter.

CHALLENGE

7/12 x 3/4 < 7/12 x 1 < 7/12 x 5/4. Multiplying by 3/4, a fraction less than 1, makes the product smaller, while multiplying by 5/4, a fraction greater than 1, makes the product greater.

Accept correct comparison words or symbols and explanations that name whether the factor is greater than or less than 1. For problems that request a specific denominator, require that denominator.