LESSON MAKER PRO

Growing by Fractions

Multiply by fractions greater than 1 and compare.

GRADE 5 · 5.NF.B.13.b

5.NF.B.13.b "Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number and relate the principle of fraction equivalence."

NAME _____ DATE _____

MORE THAN ONE WHOLE

A fraction with a numerator greater than its denominator is greater than 1. When you multiply a positive number by a fraction greater than 1, the product is greater than the starting number. To see why, write the starting number as an equivalent fraction with the same denominator as the product.

WORKED EXAMPLE

Find $8 \times 5/4$. Show why the product is greater than 8.

1. 5/4 is greater than 1 because 5 is greater than 4.
2. $8 \times 5/4 = 40/4 = 10$.
3. $8 = 32/4$, and $40/4 > 32/4$.

Answer: 10, which is greater than 8.

PRACTICE 6 problems

1 Find $3 \times 4/3$.

ANSWER _____

2 Find $10 \times 6/5$.

ANSWER _____

3 Find $14 \times 9/7$.

ANSWER _____

4 Find $4 \times 7/4$. Write 4 as a fraction with denominator 4 to show why the product is greater than 4.

ANSWER _____

5 Find $16 \times 3/2$.

ANSWER _____

6 Find $6 \times 7/3$. Use equivalent fractions to show why the product is greater than 6.

ANSWER _____

APPLY IT Show your work

1 Mia has 18 stickers. After a trading day, her collection is 4/3 as large as before. How many stickers does she have now? Use equivalent fractions to show why she has more than before.

WORK SPACE

ANSWER _____

2 Kai practices a dance for 20 minutes on Friday. On Saturday, Kai practices for 7/5 as long. How many minutes does Kai practice on Saturday? Use equivalent fractions to show why that time is longer.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A club grows from 12 members to 20 members. What fraction greater than 1 can you multiply by 12 to get 20? Write the fraction in twelfths, then as an equivalent fraction in thirds. Explain why multiplying by it makes the club larger.

WORK SPACE AND ANSWER

ANSWER KEY

Growing by Fractions

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find 3 × 4/3.	**4**
2	Find 10 × 6/5.	**12**
3	Find 14 × 9/7.	**18**
4	Find 4 × 7/4. Write 4 as a fraction with denominator 4 to show why the product is greater than 4.	**7; 4 = 16/4, and 7 = 28/4. Since 28/4 > 16/4, the product is greater than 4.**
5	Find 16 × 3/2.	**24**
6	Find 6 × 7/3. Use equivalent fractions to show why the product is greater than 6.	**14; 6 = 18/3, and 14 = 42/3. Since 42/3 > 18/3, the product is greater than 6.**

PART 2 · APPLY IT

1. **24 stickers; 18 = 54/3, and 24 = 72/3. Since 72/3 > 54/3, she has more stickers.** Multiply 18 × 4/3 to get 24. Compare 54/3 and 72/3 to show that 24 is greater than 18.
2. **28 minutes; 20 = 100/5, and 28 = 140/5. Since 140/5 > 100/5, Saturday's practice is longer.** Multiply 20 × 7/5 to get 28. Compare 100/5 and 140/5 to show that 28 minutes is longer than 20 minutes.

CHALLENGE

20/12 = 5/3. Since 5/3 > 1, multiplying 12 by 5/3 gives a number greater than 12.

Accept equivalent forms of each product and any correct same-denominator comparison. For the challenge, accept an explanation that 5/3 is greater than 1 because its numerator is greater than its denominator.