Unit 6, Lesson 19

Compare to 1

Let's explain what happens when we multiply a fraction by a fraction greater than 1, less than 1, or equal to 1.

Warm-up

What Do You Know about $\frac{15}{14} \times \frac{23}{30}$?

What do you know about $\frac{15}{14} \times \frac{23}{30}$?

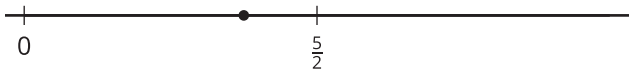
Activity 1

Compare Fraction Products on the Number Line

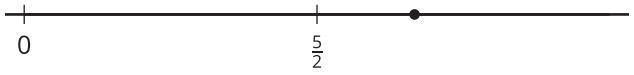
1. Match each expression to the number line that shows the same value.

- $\frac{2}{5} \times \frac{4}{3}$
- $\frac{3}{4} \times \frac{5}{2}$
- $\frac{4}{3} \times \frac{5}{2}$
- $\left(1 + \frac{1}{3}\right) \times \frac{5}{2}$
- $\left(1 - \frac{3}{5}\right) \times \frac{4}{3}$
- $\left(1 - \frac{1}{4}\right) \times \frac{5}{2}$

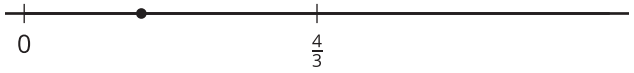
A



B



C



2. Choose one expression from each set. Explain whether the value is greater than or less than the second factor.

Activity 2

True Statement

1. Rewrite each expression as a sum or difference of 2 products.

   a. $\left(1 - \frac{2}{5}\right) \times \frac{4}{7}$

   b. $\left(1 + \frac{1}{5}\right) \times \frac{4}{7}$

   c. $\left(1 - \frac{3}{8}\right) \times \frac{4}{7}$

   d. $\left(1 + \frac{1}{8}\right) \times \frac{4}{7}$

2. Write $<$ or $>$ to make the inequality true.

   a. $\left(1 - \frac{2}{5}\right) \times \frac{4}{7}$ _____ $\frac{4}{7}$

   b. $\left(1 + \frac{1}{5}\right) \times \frac{4}{7}$ _____ $\frac{4}{7}$

   c. $\left(1 - \frac{3}{8}\right) \times \frac{4}{7}$ _____ $\frac{4}{7}$

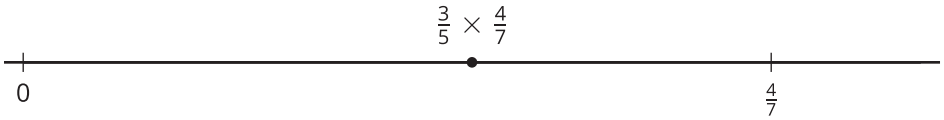
   d. $\left(1 + \frac{1}{8}\right) \times \frac{4}{7}$ _____ $\frac{4}{7}$

3. Describe the value of the product when $\frac{4}{7}$ is multiplied by a fraction greater than 1. Explain your reasoning.

4. Describe the value of the product when $\frac{4}{7}$ is multiplied by a fraction less than 1. Explain your reasoning.

Section C Summary

We learned how to compare the size of a product to the sizes of its factors.



To compare $\frac{3}{5} \times \frac{4}{7}$ with $\frac{4}{7}$, we can put them on a number line.
Since $\frac{3}{5}$ is 3 equal parts with 5 parts in the whole, it is to the left of $\frac{4}{7}$. We also can write $\frac{3}{5}$ as $1 - \frac{2}{5}$.

$$\left(1 - \frac{2}{5}\right) \times \frac{4}{7} = \frac{4}{7} - \left(\frac{2}{5} \times \frac{4}{7}\right)$$

The product is less than $\frac{4}{7}$, because it is $\frac{4}{7}$ minus a fraction.