

MULTIPLICATION

STEP 3 Multiplying Fractions Times Fractions

Purpose: To multiply fractions times fractions and compute products by canceling

Materials: Fraction Bars, water-base pens, copies of Master #6 on page 118, Fraction Playing Cards and Fraction Spinner

TEACHER MODELING/STUDENT COMMUNICATION

Activity 1 Multiplying fractions times fractions

Fraction Bars

water-base pens

pencils and paper

copies of Master #6

1. Show students and have them find a $\frac{1}{3}$ bar and demonstrate how to take $\frac{1}{2}$ of $\frac{1}{3}$ by using a water-base pen to split each part of the bar into 2 equal parts.



$$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

➤ One of these new split shaded parts is $\frac{1}{6}$ of a bar because a whole bar now contains 6 equal parts. The resulting product is $\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$.

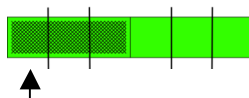
➤ Select any bar with just one part shaded. Explain how the bar can be used to find $\frac{1}{2}$ of the fraction for the bar. Write the multiplication equation.



$$\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$$

Lines from water-base can be washed off the bars.

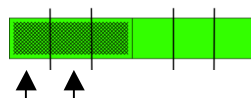
➤ Show students and have them find the green bar for $\frac{1}{2}$. Ask them to demonstrate and explain how to use their bar to find $\frac{1}{3}$ of $\frac{1}{2}$ and to write the resulting multiplication equation. (Split each part into 3 equal parts. One of the new shaded parts equals $\frac{1}{6}$ because there are now 6 equal parts in a whole bar. $\frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$)



$$\frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$$

Discuss the fact that $\frac{1}{2}$ of $\frac{1}{3}$ is equal to $\frac{1}{3}$ of $\frac{1}{2}$ and this is an example of the commutative property. In this case $\frac{1}{2} \times \frac{1}{3} = \frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$.

➤ Use your $\frac{1}{2}$ bar and show how to take $\frac{2}{3}$ of the shaded amount. Remember, taking $\frac{2}{3}$ of something means to divide it into 3 equal parts and take 2 of the new parts.



$$\frac{2}{3} \times \frac{1}{2} = \frac{2}{6}$$

2. Distribute copies Master #6 "Multiplying Fractions from Fraction Bars" on page 118. Note that multiplying by fractions less than 1 results in taking part of something.

3. Summarizing to see relationships and generalizations. List the above multiplication equations in one spot to help students compare and look for relationships.

- Study the multiplication equations and state a generalization for multiplying a fraction times a fraction. (**Multiply the numerator times the numerator and the denominator times the denominator.**)

4. Discuss the following misunderstood concept involving products of fractions.

- Why does multiplying by whole numbers tend to result in answers that are greater and multiplying by fractions tend to result in answers that are smaller? (Multiplying by a fraction less than 1 results in taking part of something.)

Activity 2 Computing products by canceling

Pencils
and paper

1. Ask students to compute the product $\frac{2}{3} \times \frac{7}{12}$ and write the answer in lowest terms. ($\frac{2}{3} \times \frac{7}{12} = \frac{14}{36} = \frac{7}{18}$)

- Compute the same product using canceling. Discuss the convenience of canceling.

$$\frac{\overset{1}{\cancel{2}}}{3} \times \frac{7}{\underset{6}{\cancel{12}}} = \frac{7}{18}$$

2. Write this product: $\frac{5}{6} \times \frac{9}{10}$.

- Sometimes it is possible to cancel more than once. Compute this product by canceling.

$$\frac{\overset{1}{\cancel{5}}}{\underset{2}{\cancel{6}}} \times \frac{\overset{3}{\cancel{9}}}{\underset{2}{\cancel{10}}} = \frac{3}{4}$$

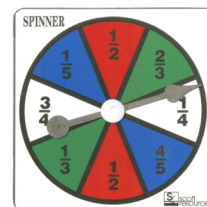
Activity 3 Products from Fraction Playing Cards and spinners

Fraction
Playing
Cards

Fraction
Spinners

1. Students will need playing cards and fraction spinners.

- Spread the cards face down, select one and spin the spinner. Multiply the fraction from your card times the fraction from the spinner and determine if it is less than or greater than $\frac{1}{4}$. Ask for illustrations.



2. Students play **Spin and Multiply** (page 105) a game in which fractions from the spinner are multiplied times fractions from the cards.

INDEPENDENT PRACTICE and ASSESSMENT

Worksheets 77-78 from the *Teacher Resource Package*



fractionbars.com Set 2 **Two-Par Golf** (Computing fraction operations to hit golf ball)