

Multiplying Fractions

Purpose

Students will use models to show an understanding of multiplication of fractions and will multiply fractions to solve problems.

Materials

For the teacher: overhead projector, overhead markers, transparent fraction bars

For each student: five or six 1" × 12" construction paper strips for folding, paper, pencil, copy of Black Line Master (BLM) *Showing Multiplication of Fractions*

Activity

A. Introduction

1. Tell students that you had pizza last night and that one-half of it was left over. Then say that you brought one-fourth of the leftover pizza for lunch today. Ask: "What fraction of the whole pizza did I bring for lunch?"
2. Tell students that they are going to be learning about multiplying fractions.
3. Review with students the meaning of multiplication of whole numbers (e.g., 4×5 is 4 sets of 5 items; 7×6 is 7 sets of 6 items). Emphasize the use of the word *of*.
4. Place a whole fraction bar on the overhead and, below it put two halves.
5. Ask: "What would $\frac{1}{4}$ of one of the halves be? The problem would be written $\frac{1}{4}$ of $\frac{1}{2}$ or $\frac{1}{4} \times \frac{1}{2}$."
6. Ask: "What size fraction pieces are needed to show $\frac{1}{4}$ of this $\frac{1}{2}$?" [$\frac{1}{8}$] "So, $\frac{1}{4}$ of $\frac{1}{2}$ is $\frac{1}{8}$." Write on the overhead " $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$."

B. Teacher-Led Activity

1. Tell students to fold one of their paper strips in half.
Ask: "What is the fraction for each piece?" [$\frac{1}{2}$]
2. Tell students to fold one of the halves into three pieces.
Ask: "What is the fraction for each piece?" [$\frac{1}{3}$]
3. Ask: "What is $\frac{1}{3}$ of $\frac{1}{2}$ of your strip?" Students should fold the whole strip to see that the answer is $\frac{1}{6}$. Write " $\frac{1}{2}$ of $\frac{1}{3}$ is $\frac{1}{6}$ or $\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$."

(continued)

connecting
across the
curriculum



English/ Language Arts

Have students write word problems involving multiplication of fractions. Ask students to exchange problems and solve them.

INCORPORATING
TECHNOLOGY



Let students use a multimedia program to create a multiplying fractions presentation that demonstrates their understanding. Each slide could have a story problem, the solved equation, and pictures representing the fractions multiplied.

Standards Link
5.1.5

Activity (continued)

4. Ask: "What is $\frac{2}{3}$ of $\frac{1}{2}$ of your strip?" [$\frac{2}{6}$] Write " $\frac{2}{3}$ of $\frac{1}{2} = \frac{2}{6}$ or $\frac{2}{3} \times \frac{1}{2} = \frac{2}{6}$."
5. Have students use paper folding to solve the following problems:
- $\frac{1}{4}$ of $\frac{1}{3}$
 - $\frac{3}{5}$ of $\frac{1}{2}$
 - $\frac{3}{3}$ of $\frac{1}{3}$
 - $\frac{4}{5}$ of $\frac{1}{2}$
 - $\frac{1}{5}$ of $\frac{1}{2}$
 - $\frac{1}{8}$ of $\frac{1}{2}$
 - $\frac{2}{5}$ of $\frac{1}{2}$

Each time, record the math sentence on the overhead.

6. Lead students to realize that when multiplying by less than 1 (a fraction), the answer is smaller than the original number. Students may also see the rule for multiplying fractions.
7. Hand out copies of the BLM and have students draw pictures to solve the problems.

Questions for Review

Basic Concepts and Processes

As students are completing the BLM, ask the following questions:



Can you show me what $\frac{1}{2}$ of $\frac{3}{4}$ is?



Can you explain why multiplying by a fraction results in a number smaller than the one you started with?

Name: _____

Showing Multiplication of Fractions

Draw pictures to show your answers. Write a number sentence for each question.

$\frac{7}{9}$ × $\frac{1}{2}$	<p>1. There are 8 boys in the Cub Scout pack. Half of the boys attended last night's meeting. Of the boys who attended, three-fourths earned a badge. What fraction of the total number of boys in the pack earned a badge?</p> <p>Number sentence: _____</p>	$\frac{5}{8}$ $\frac{6}{7}$ × $\frac{3}{4}$
× $\frac{6}{7}$	<p>2. Jane had a candy bar that was divided into 12 pieces. She gave her brother, Stan, $\frac{2}{3}$ of it. Stan gave $\frac{1}{4}$ of his piece to his friend, Joe. What fraction of the original candy bar did Joe have?</p> <p>Number sentence: _____</p>	× $\frac{2}{3}$ × $\frac{7}{9}$
$\frac{3}{4}$ × $\frac{5}{8}$	<p>3. Susie is going to make cookies for her friend. The recipe calls for $\frac{3}{4}$ cups of sugar. Susie wants to use just $\frac{1}{2}$ of the sugar called for in the recipe. How much sugar will she use?</p> <p>Number sentence: _____</p>	$\frac{1}{2}$ × $\frac{2}{3}$ × $\frac{1}{7}$
$\frac{2}{3}$ ×	<p>4. Mrs. Jones has 25 students in her fifth grade class. Only $\frac{2}{5}$ of the class made a perfect score on the math test. Only $\frac{1}{2}$ of those students made a perfect score on the science test. What fraction of the students made a perfect score on both tests?</p> <p>Number sentence: _____</p>	$\frac{1}{7}$

Showing Multiplication of Fractions

Teacher Directions

Distribute copies of the BLM *Showing Multiplication of Fractions*, and direct students to draw pictures of pies (circles), bars, or sets to show their answers.

Answer Key

1. $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

2. $\frac{2}{3} \times \frac{1}{4} = \frac{2}{12}$ (or $\frac{1}{6}$)

3. $\frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$ cup

4. $\frac{2}{5} \times \frac{1}{2} = \frac{2}{10}$ (or $\frac{1}{5}$)