

# Multiplying Fractions

## Purpose

Students will explain how to multiply positive fractions and perform the calculations.

## Materials

*For the teacher:* nine 3" × 11" strips of paper, overhead projector, overhead markers

*For each student:* nine 3" × 11" strips of paper

*For each pair of students:* copy of Black Line Master (BLM) *Ghoulash in a Flash*, paper, pencil

## Activity

### A. Teacher-Led Activity

1. Review what multiplication of whole numbers means (i.e.,  $2 \times 3$  means two groups of three). Tell students that multiplication of fractions means the same (i.e.,  $\frac{1}{2} \times \frac{1}{4}$  means  $\frac{1}{2}$  group of  $\frac{1}{4}$ ).
2. Have students fold a paper strip into two pieces. Ask: "What is the name of the fraction for one of the parts?" [ $\frac{1}{2}$ ]
3. Have students fold the strip in half again horizontally. Ask: "What is  $\frac{1}{2}$  of one of the halves?" [ $\frac{1}{4}$ ]
4. Write the problem on the boards: " $\frac{1}{2}$  of  $\frac{1}{2} = \frac{1}{4}$  or  $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ "
5. Have students fold another paper strip into three pieces. Ask: "What is the name of the fraction for one of the parts?" [ $\frac{1}{3}$ ]
6. Have students refold their strip and then fold it in half horizontally.
7. Ask: "What is  $\frac{1}{2}$  of  $\frac{1}{3}$ ?" [ $\frac{1}{6}$ ]. Write: " $\frac{1}{2}$  of  $\frac{1}{3} = \frac{1}{6}$  or  $\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$ ."
8. Ask: "What is  $\frac{1}{2}$  of  $\frac{2}{3}$ ?" [ $\frac{2}{6}$ ]. Write: " $\frac{1}{2}$  of  $\frac{2}{3} = \frac{2}{6}$  or  $\frac{1}{2} \times \frac{2}{3} = \frac{2}{6}$ ."
9. Do several more examples of multiplication problems similar to above each time folding, looking at the resulting fraction, and writing a problem.
10. Draw a large rectangle on the board. Draw vertical lines on the rectangle to divide the rectangle into four equal parts. Say: "I want to find  $\frac{1}{3}$  of  $\frac{1}{4}$  of this rectangle. I have already divided the rectangle into four equal parts. Now we can find  $\frac{1}{3}$  of one of these parts." Shade one of the  $\frac{1}{4}$  sections.



(continued)

### EXTENDING THE ACTIVITY



Have students bring in recipes from home, looking for the number of people the recipe serves. Have students double and triple the ingredients for each recipe.

### connecting across the curriculum



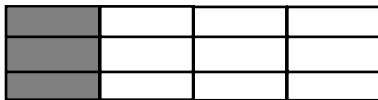
#### English/ Language Arts

Create a classroom recipe book. Ask students to write their favorite recipes down on paper. Encourage students to write detailed preparation directions. Make a copy of the book for each student to take home and share with their families.

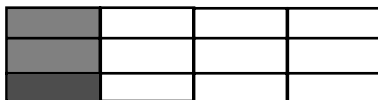
### Standards Link 6.2.5

**Activity (continued)**

11. Draw horizontal lines on the rectangle to divide the entire rectangle into three equal parts. (You should now see the rectangle divided into 12 total sections.)



12. Say: “Now I have divided the rectangle into thirds. If I want to know which section represents  $\frac{1}{3}$  of  $\frac{1}{4}$  of the rectangle, where would I look?” (Prompt students to answer that you should look at the shaded section, which is the original  $\frac{1}{4}$ .) Have student choose one of the  $\frac{1}{3}$  sections inside the shaded area. Shade this section so that it appears darker than the original shading.




13. Explain to students that the darkly shaded area represents  $\frac{1}{3}$  of  $\frac{1}{4}$  of the rectangle. Tell students that  $\frac{1}{3}$  of  $\frac{1}{4}$  is  $\frac{1}{12}$ . Show them by counting the individual sections and identifying the one darkly shaded section as being  $\frac{1}{12}$  of the whole.
14. Ask: “What is  $\frac{1}{4} \times \frac{1}{3}$ ?” [ $\frac{1}{12}$ ]
15. Lead students to look at the previous examples to discover the algorithm for multiplying fractions (i.e., “To multiply a fraction times a fraction, the numerators and the denominators are each multiplied to find the solution.”)
16. Model for the students the multiplication of a whole number times a fraction as well as mixed numbers times a fraction or another mixed number.


**B. Partner Activity**

1. Give each pair of students a copy of the BLM *Ghoulash in a Flash*.
2. Have students work with a partner to rewrite the recipe to serve 18 people, 27 people, and 72 people.

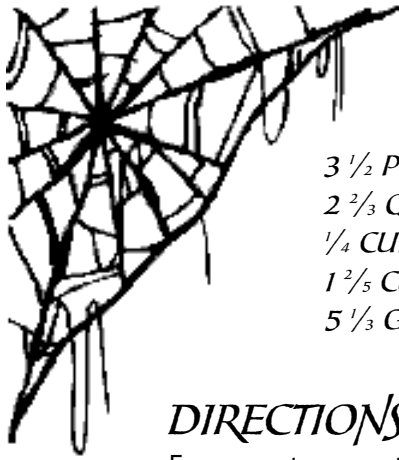
**Classroom Assessment****Basic Concepts and Processes**

During the activity, discuss the following questions with your students to gauge their understanding of the indicators:

 Show me how to multiply  $\frac{1}{2}$  times  $2\frac{2}{3}$ .

 Explain how to solve this problem.

Name: \_\_\_\_\_



## *GHOULASH IN A FLASH*

*3 1/2 POUNDS MOTH DUST*  
*2 2/3 QUARTS GOBLIN GREASE*  
*1/4 CUP LIZARD SCALES*  
*1 2/5 CUPS TOAD WARTS*  
*5 1/3 GALLONS SPIDER BROTH*

*1 IGUANA TOOTH*  
*4 7/8 QUARTS RAT BLOOD*  
*1 2/3 BAT WINGS*  
*1/2 VAMPIRE TONGUE*  
*2 3/4 CUPS MASHED MONSTER MEAT*

### *DIRECTIONS:*

Fry monster meat for one hour. Add goblin grease, spider broth, rat blood, and bat wings and simmer two days. Chop lizard scales, iguana tooth, and vampire tongue and stir into mixture. Sprinkle the top with moth dust.

*SERVES:* 36 hungry ghouls



*FOR 18 PEOPLE:*

*FOR 27 PEOPLE:*

*FOR 72 PEOPLE:*



# GHOULASH IN A FLASH

## Teacher Directions

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Distribute one copy of the BLM *Ghoulash in a Flash* to each student. Have students rewrite the recipe on the BLM to serve 18 people, 27 people, and 72 people.

## Answer Key

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### 18 People

$1\frac{3}{4}$  pounds MOTH DUST  
 $1\frac{1}{3}$  quarts GOBLIN GREASE  
 $\frac{1}{8}$  cups LIZARD SCALES  
 $\frac{7}{10}$  cups TOAD WARTS  
 $2\frac{2}{3}$  gallons SPIDER BROTH

$\frac{1}{2}$  IGUANA TOOTH  
 $2\frac{7}{16}$  quarts RAT BLOOD  
 $\frac{5}{6}$  BAT WINGS  
 $\frac{1}{4}$  VAMPIRE TONGUE  
 $1\frac{3}{8}$  cups MASHED MONSTER MEAT

### 27 People

$2\frac{5}{8}$  pounds MOTH DUST  
2 quarts GOBLIN GREASE  
 $\frac{3}{16}$  cups LIZARD SCALES  
 $1\frac{1}{20}$  cups TOAD WARTS  
4 gallons SPIDER BROTH

$\frac{3}{4}$  IGUANA TOOTH  
 $3\frac{21}{32}$  quarts RAT BLOOD  
 $1\frac{1}{4}$  BAT WINGS  
 $\frac{3}{8}$  VAMPIRE TONGUE  
 $2\frac{1}{16}$  cups MASHED MONSTER MEAT

### 72 People

7 pounds MOTH DUST  
 $5\frac{1}{3}$  quarts GOBLIN GREASE  
 $\frac{1}{2}$  cups LIZARD SCALES  
 $2\frac{4}{5}$  cups TOAD WARTS  
 $10\frac{2}{3}$  gallons SPIDER BROTH

2 IGUANA TEETH  
 $9\frac{3}{4}$  quarts RAT BLOOD  
 $3\frac{1}{3}$  BAT WINGS  
1 VAMPIRE TONGUE  
 $5\frac{1}{2}$  cups MASHED MONSTER MEAT