

Dividing by Fractions

Purpose

Students will use models to show an understanding of dividing by fractions and will use division of 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 Division of Fractions*

Activity

A. Introduction

1. Tell students that they are going to be learning about dividing by fractions.
2. Review with students the meaning of division of whole numbers (e.g., $20 \div 4$ means *how many 4s in 20*; $42 \div 7$ means *how many 7s in 42*). Emphasize the use of *how many in*.
3. Place a whole fraction bar on the overhead, and below it put two halves. Say: "I have a candy bar divided into two pieces or halves. I now want to divide half of the candy bar into four pieces or fourths. How many one-fourths are in $\frac{1}{2}$?" [2] Show this using two one-fourth pieces under one of the one-halves.
4. Say: "The question asks how many one-fourths in $\frac{1}{2}$, or $\frac{1}{2} \div \frac{1}{4} = 2$."

B. Teacher-Led Activity

1. Tell students to fold two of their paper strips into three pieces or thirds.
2. Ask: "How many one-thirds are in both of your strips?" [6] Explain that the number sentence is $2 \div \frac{1}{3} = 6$.
3. Tell students to fold one of their paper strips into three pieces or thirds.
4. Ask: "How many one-sixths are in $\frac{1}{3}$? Fold your paper to find the answer. The answer is 2. The number sentence is $\frac{1}{3} \div \frac{1}{6} = 2$."
5. Have students divide another strip into four pieces or fourths.

(continued)

connecting
across the
curriculum



English/ Language Arts

Have students write word problems involving division of fractions to be exchanged with others in the class.

INCORPORATING
TECHNOLOGY



Let students use interactive Web sites, such as www.aaamath.com, to generate division of fraction problems.

Standards Link
5.1.5

Activity (continued)

6. Ask: "How many one-eighths are in $\frac{3}{4}$? Fold your paper to find the answer. The answer is 6. The number sentence is $\frac{3}{4} \div \frac{1}{8} = 6$."
7. Ask: "How many thirds would be in one of the fourths? Fold a second strip into three pieces or thirds. Compare the strips to see that there are $\frac{3}{4}$ of a third in $\frac{1}{4}$. The number sentence would be $\frac{1}{4} \div \frac{1}{3} = \frac{3}{4}$."
8. Continue in this manner with a few more examples. Each time write the number sentence on the overhead.
9. Lead the class to discover that when a number is divided by less than one, the resulting number is larger than the one divided. Students may also see that the rule for dividing a whole number or fraction by a fraction is the same as inverting the second fraction and multiplying (this is not important at this grade).
10. 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 how many eighths are in a half?



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

Name: _____

Showing Division of Fractions

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



1. Jonathan went to the store and bought a $\frac{1}{2}$ gallon of milk. The container will not fit into his refrigerator (he has a mini-fridge), so he wants to pour it into several $\frac{1}{8}$ -gallon containers. How many containers will he need?

Number sentence _____

2. How many $\frac{1}{4}$ -hour episodes of a cartoon could you watch in $\frac{1}{2}$ hour?

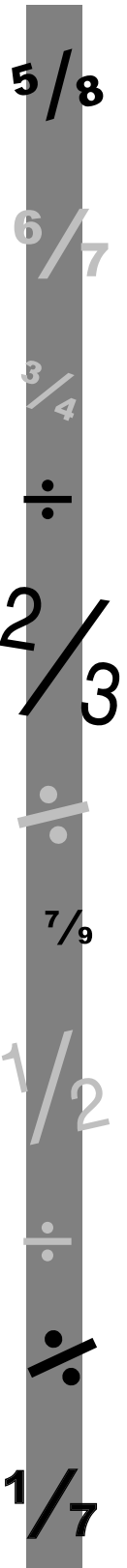
Number sentence _____

3. Janice is making cookies. The recipe calls for $\frac{2}{3}$ cups of sugar. She has only $\frac{1}{6}$ -cup measuring cups. How many $\frac{1}{6}$ cups are there in $\frac{2}{3}$?

Number sentence _____

4. Paul has 2 pounds of butter. He wants to divide the butter into $\frac{1}{4}$ -pound pieces. How many $\frac{1}{4}$ -pound pieces are in 2 pounds?

Number sentence _____



Showing Division of Fractions

Teacher Directions

Distribute one copy of the BLM *Showing Division of Fractions* to each student. Direct students to draw pictures of pies (circles), bars, or sets to show their answers.

Answer Key

1. $\frac{1}{2} \div \frac{1}{8} = 4$

2. $\frac{1}{2} \div \frac{1}{4} = 2$

3. $\frac{2}{3} \div \frac{1}{6} = 4$

4. $2 \div \frac{1}{4} = 8$