LESSON 3

## Objective

Interpret a fraction as division of the numerator by the denominator.

## Common Core State Standards

- **5.NF.3** Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*

Number and Operations-Fractions

# Fractions as Division

Division problems are frequently written as stacked fractions. This lesson introduces students to fractions as division problems and helps familiarize them with mixed-number answers. Fraction Circles and other concrete models will help students visualize these concepts.

**Try It!** *Perform the Try It! activity on the next page.*

## Talk About It

Discuss the Try It! activity.

- **Ask:** *Will each camper get a whole liter of water? More than a liter? How many pieces does the fifth Fraction Circle need to be divided into?*
- **Ask:** *How can you write the division problem as a fraction? Which number is the numerator? Which number is the denominator? How do you know?*
- Have students write the problem as the improper fraction $\frac{5}{4}$.

## Solve It

Reread the problem with students. Have students draw the problem and write it as a fraction equal to the correct mixed-number answer.

## More Ideas

For other ways to teach about fractions as division—

- Have students multiply $\frac{3}{4}$ by 4, $\frac{4}{5}$ by 5, and $\frac{5}{6}$ by 6. Discuss that if $\frac{3}{4} \times 4 = 3$, then $3 \div 4 = \frac{3}{4}$. Have students model the multiplication problems with Deluxe Rainbow Fraction® Circles.
- Have students use Fraction Tower® Equivalency Cubes and Folding Number Lines (fractions side) to model the following problem: Maya wants to divide 40 pounds of oats evenly among her 6 horses. How many pounds of oats will each horse get? Have students identify between what two whole numbers the answer lies (6 and 7) and model dividing the remainder.

## Formative Assessment

Have students try the following problem.

*If 3 friends want to divide 5 oranges equally, how many oranges does each friend get?*

**A.** $\frac{3}{5}$ **B.** $1\frac{2}{3}$ **C.** $2\frac{1}{3}$ **D.** $2\frac{1}{2}$

## Try It! 20 minutes | Groups of 4

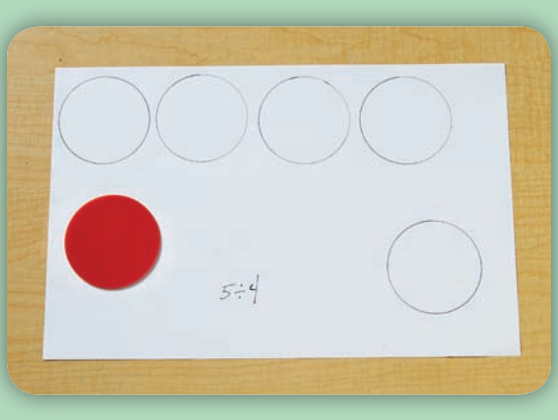
Here is a problem about using fractions as division.

*Four campers need to share 5 liters of water equally. How many liters of water does each camper get?*

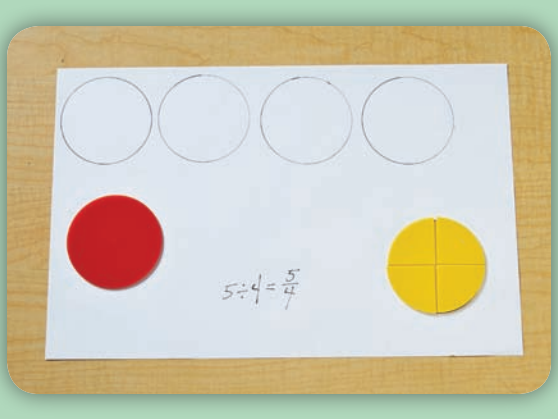
Introduce the problem. Then have students do the activity to solve the problem. Distribute Fraction Circles, paper, and pencils to students.

### Materials

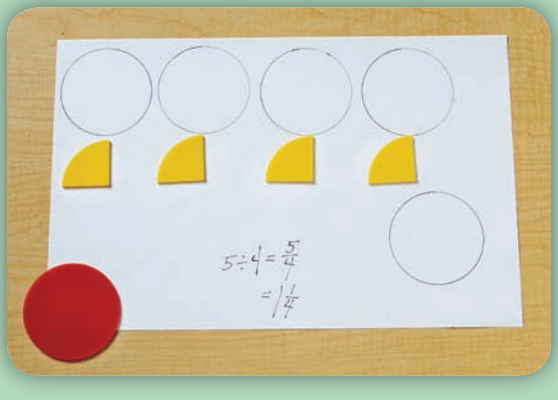
- Deluxe Rainbow Fraction® Circles (1 set per group)
- paper (11" × 17"; 1 sheet per group)
- pencils (1 per group)




**1. Ask:** *How many liters of water are there?* Have students show the number 5 with 5 whole Fraction Circles or by tracing a whole Fraction Circle 5 times. **Ask:** *How many campers are there? How would you write this as a division problem?* Have students write 5 ÷ 4.




**2. Ask:** *How can you divide those 5 circles evenly by 4? If each camper gets one whole liter, how will they divide the remaining liter? What fraction of the remaining liter of water will each camper get?*




**3. Say:** *You can write this division problem as the fraction* $\frac{5}{4}$. **Ask:** *What mixed number does the fraction* $\frac{5}{4}$ *equal?*

### ⚠ Look Out!

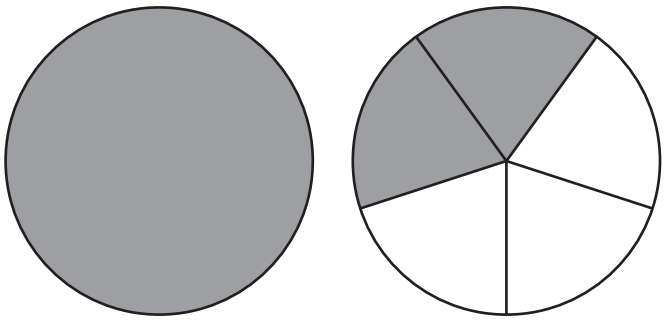
Students may have difficulty with Step 2. Remind them that each of the 4 campers will need an equal share of the remaining liter, so they would use fourths to model this step.

**Answer Key**

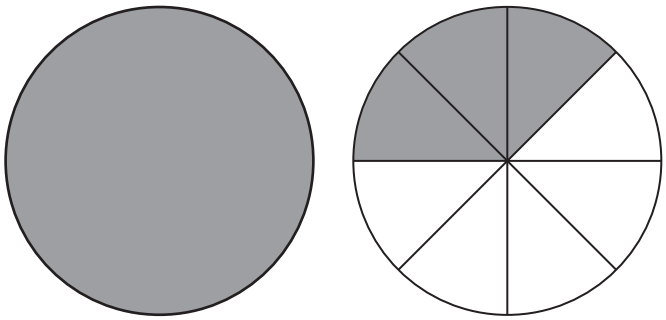
**Use Fraction Circles to model each division problem. Write the problem as a fraction. Write the quotient as a mixed number.**

(Check students' work.)

**1.** $7 \div 5 =$ $\frac{7}{5}$ $=$ $1\frac{2}{5}$



**2.** $11 \div 8 =$ $\frac{11}{8}$ $=$ $1\frac{3}{8}$



**Using Fraction Circles, model each division problem. Sketch the model. Write the problem as a fraction. Write the quotient as a mixed number.**

(Check students' models.)

**3.** $8 \div 6 =$ $\frac{8}{6}$ $=$ $1\frac{2}{6} = 1\frac{1}{3}$

**4.** $9 \div 4 =$ $\frac{9}{4}$ $=$ $2\frac{1}{4}$

**Write each quotient as a mixed number.**

**5.** $14 \div 6 =$ $2\frac{2}{6}$

**6.** $27 \div 5 =$ $5\frac{2}{5}$

**7.** $15 \div 4 =$ $3\frac{3}{4}$

**8.** $9 \div 7 =$ $1\frac{2}{7}$

## *Answer Key*

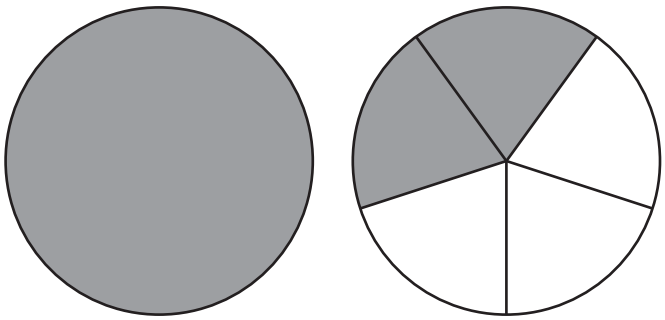
**Challenge!** Explain how knowing $\frac{6}{5} \times 5 = 6$ can help you solve $6 \div 5 = \frac{6}{5}$.

Challenge: (Sample) I know that multiplication and division have an inverse relationship, so by knowing $\frac{6}{5} \times 5 = \frac{30}{5} = 6$, I can better understand $6 \div 5$.

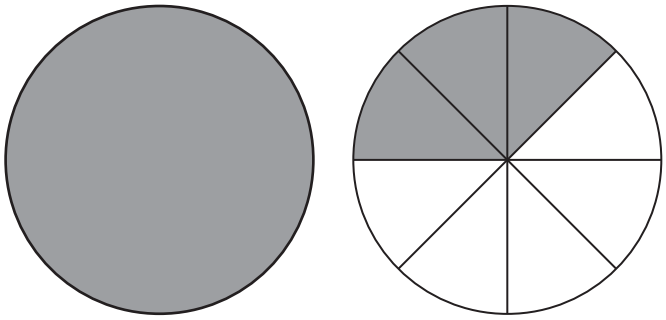
Name _____

**Use Fraction Circles to model each division problem. Write the problem as a fraction. Write the quotient as a mixed number.**

**1.** 7 ÷ 5 = _____ = _____



**2.** 11 ÷ 8 = _____ = _____



**Using Fraction Circles, model each division problem. Sketch the model. Write the problem as a fraction. Write the quotient as a mixed number.**

**3.** 8 ÷ 6 = _____ = _____

**4.** 9 ÷ 4 = _____ = _____

**Write each quotient as a mixed number.**

**5.** 14 ÷ 6 = _____

**6.** 27 ÷ 5 = _____

**7.** 15 ÷ 4 = _____

**8.** 9 ÷ 7 = _____

Name _____

**Challenge!** Explain how knowing $\frac{6}{5} \times 5 = 6$ can help you solve $6 \div 5 = \frac{6}{5}$.