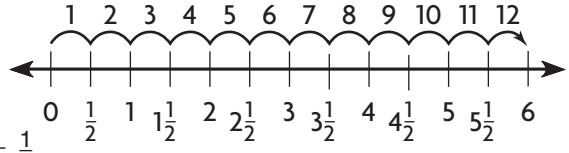
Name _____

Divide Fractions and Whole Numbers

You can use a number line to help you divide a whole number by a fraction.

Divide. $6 \div \frac{1}{2}$

Step 1 Draw a number line from 0 to 6. Divide the number line into halves. Label each half on your number line, starting with $\frac{1}{2}$.



Step 2 Skip count by halves from 0 to 6 to find $6 \div \frac{1}{2}$.

Step 3 Count the number of skips. It takes 12 skips to go from 0 to 6. So the quotient is 12.

$6 \div \frac{1}{2} =$ 12 because 12 $\times \frac{1}{2} = 6$.

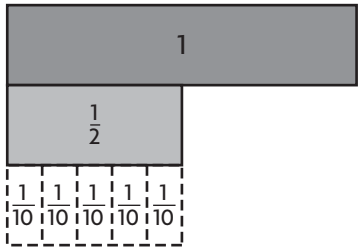
You can use fraction strips to divide a fraction by a whole number.

Divide. $\frac{1}{2} \div 5$

Step 1 Place a $\frac{1}{2}$ strip under a 1-whole strip.

Step 2 Find 5 fraction strips, all with the same denominator, that fit exactly under the $\frac{1}{2}$ strip.

Each part is $\frac{1}{10}$ of the whole.



Step 3 Record and check the quotient.

$\frac{1}{2} \div 5 = \frac{1}{10}$ because $\frac{1}{10} \times 5 = \frac{1}{2}$.

So, $\frac{1}{2} \div 5 = \frac{1}{10}$.

Divide. Draw a number line or use fraction strips.

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

2. $2 \div \frac{1}{3} =$ _____

3. $4 \div \frac{1}{4} =$ _____

4. $\frac{1}{5} \div 3 =$ _____

5. $\frac{1}{3} \div 2 =$ _____

6. $4 \div \frac{1}{5} =$ _____

Name _____

Quotient Match Riddle

Find the quotient. Write each quotient as a fraction. Each quotient in the numbered column should match a quotient in the lettered column.

1. $3 \div \frac{1}{6} =$ _____

2. $\frac{1}{5} \div 2 =$ _____

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

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

5. $\frac{1}{2} \div 3 =$ _____

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

7. $\frac{1}{6} \div 2 =$ _____

A. $\frac{1}{10} \div 1 =$ _____

E. $3 \div 18 =$ _____

N. $8 \div \frac{1}{3} =$ _____

P. $6 \div \frac{1}{3} =$ _____

S. $\frac{1}{3} \div 4 =$ _____

R. $4 \div \frac{1}{3} =$ _____

W. $2 \div 16 =$ _____

To solve the riddle, write the letter that corresponds to the matching exercise number.

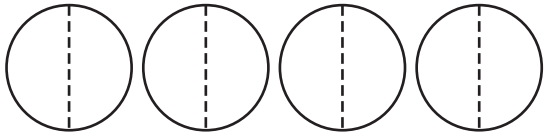
What is black and white and read all over?

___	___	___	___	___	___	___	___	___	___
2	6	5	4	7	1	2	1	5	3

Name _____

Problem Solving • Use Multiplication

Nathan makes 4 batches of soup and divides each batch into halves. How many $\frac{1}{2}$-batches of soup does he have?

Read the Problem	Solve the Problem
What do I need to find? I need to find the number of $\frac{1}{2}$-batches of soup Nathan has.	Since Nathan makes 4 batches of soup, my diagram needs to show 4 circles to represent the 4 batches. I can divide each of the 4 circles in half. 
What information do I need to use? I need to use the size of each batch of soup and the total number of batches of soup Nathan makes.	
How will I use the information? I can make a diagram to organize the information from the problem. Then I can use the diagram to find the number of $\frac{1}{2}$-batches of soup Nathan has after he divides the 4 batches of soup.	To find the total number of halves in the 4 batches, I can multiply 4 by the number of halves in each circle. $4 \div \frac{1}{2} = 4 \times$ 2 $=$ 8 So, Nathan has 8 one-half-batches of soup.

Draw a diagram to help you solve the problem.

1. A nearby park has 8 acres of land to use for gardens. The park divides each acre into fourths. How many $\frac{1}{4}$-acre gardens does the park have?

2. Clarissa has 3 pints of ice tea that she divides into $\frac{1}{2}$-pint servings. How many $\frac{1}{2}$-pint servings does she have?

Name _____

Eating Fractions

Solve each problem. You may find it helpful to draw a diagram.

1. Alexia makes 8 submarine sandwiches. She cuts 4 of the sandwiches into thirds. She cuts the remaining 4 sandwiches into halves. Alexia eats 2 of the $\frac{1}{3}$-sandwich pieces. Her brother Bob eats 2 of the $\frac{1}{2}$-sandwich pieces.
   - What fraction of the 8 sandwiches does Alexia eat? _____
   - What fraction of the 8 sandwiches does Bob eat? _____
   - Altogether, what fraction of the 8 sandwiches do Alexia and Bob eat? _____
2. Consuela and her three friends order 2 pizzas. Consuela cuts each pizza into 8 equal slices. She saves 2 slices of pizza for her older brother. Then she and her friends share the rest of the pizza, each eating the same number of slices. What fraction of the 2 pizzas is left over?

   _____
3. **Stretch Your Thinking** Benjamin has 3 pies: 1 apple, 1 blueberry, and 1 cherry. He cuts the apple pie into 4 equal slices, the blueberry pie into 6 equal slices, and the cherry pie into 8 equal slices. Benjamin eats 1 slice of the apple pie and 1 slice of the cherry pie. His friend Lola eats 2 slices of the blueberry pie. Who eats the greater fraction of pie? How much more?

   _____
4. Write Math **Explain** how you solved Problem 2.

   _____

   _____

   _____

   _____

   _____

   _____

Name _____

Connect Fractions to Division

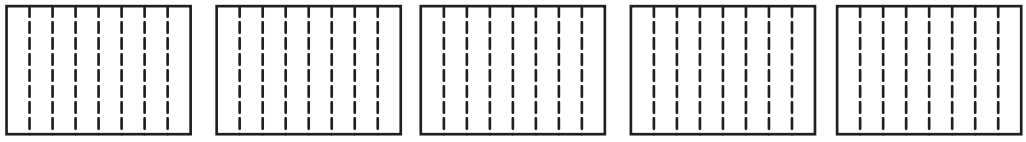
You can write a fraction as a division expression.

$\frac{4}{5} = 4 \div 5$ $\frac{15}{3} = 15 \div 3$

There are 8 students in a wood-working class and 5 sheets of plywood for them to share equally. What fraction of a sheet of plywood will each student get?

Divide. 5 ÷ 8 **Use a drawing.**

Step 1 Draw __5__ rectangles to represent 5 sheets of plywood. Since there are 8 students, draw lines to divide each piece of plywood into __eighths__.



Each student's share of 1 sheet of plywood is $\frac{1}{8}$.

Step 2 Count the total number of eighths each student gets.

Since there are 5 sheets of plywood, each student will get 5 of the __eighths__, or $\frac{5}{8}$.

Step 3 Complete the number sentence.

$5 \div 8 = \frac{5}{8}$

Step 4 Check your answer.

Since $\frac{5}{8}$ × 8 = 5, the quotient is correct.

So, each student will get $\frac{5}{8}$ of a sheet of plywood.

Complete the number sentence to solve.

1. Ten friends share 6 pizzas equally. What fraction of a pizza does each friend get?

6 ÷ 10 = _____

2. Four students share 7 sandwiches equally. How much of a sandwich does each student get?

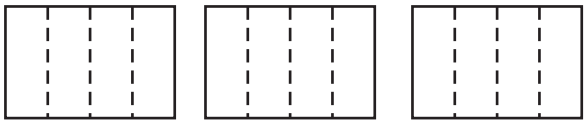
7 ÷ 4 = _____

Name _____

Fraction Models and Division

Write and complete a division number sentence that is represented by the model. Use whole numbers for the dividend and the divisor. Then write a real-world problem that you can solve using the model and the corresponding number sentence.

1.

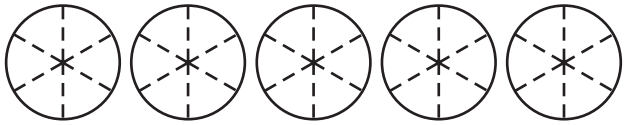


_____

_____

_____

2.



_____

_____

_____

_____

3. Write Math In Exercises 1 and 2, you wrote division sentences that are represented by the models. How did you decide what number to use as the dividend and what number to use as the divisor?

_____

_____

_____

_____

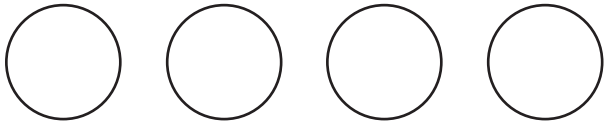
Name _____

Fraction and Whole-Number Division

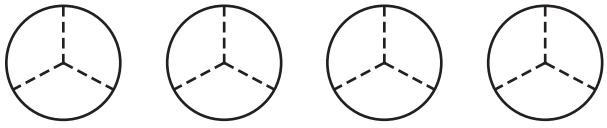
You can divide fractions by solving a related multiplication sentence.

Divide. $4 \div \frac{1}{3}$

Step 1 Draw 4 circles to represent the dividend, 4.



Step 2 Since the divisor is $\frac{1}{3}$, divide each circle into thirds.



Step 3 Count the total number of thirds.

When you divide the 4 circles into thirds, you are finding the number of thirds in 4 circles, or finding 4 groups of 3.

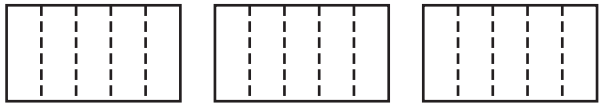
There are 12 thirds.

Step 4 Complete the number sentence.

$4 \div \frac{1}{3} = 4 \times \underline{3} = \underline{12}$

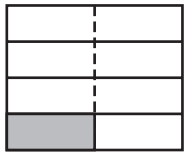
Use the model to complete the number sentence.

1.



$3 \div \frac{1}{5} = 3 \times \_\_\_\_ = \_\_\_\_$

2.



$\frac{1}{4} \div 2 = \frac{1}{4} \times \_\_\_\_ = \_\_\_\_$

Write a related multiplication sentence to solve.

3. $2 \div \frac{1}{5}$

4. $\frac{1}{3} \div 3$

5. $\frac{1}{6} \div 2$

6. $5 \div \frac{1}{4}$

Name _____

Unknown Dividends and Divisors

Find the unknown dividend or divisor. Then use the letter of each unknown dividend or divisor to solve the riddle below.

1. $2 \div Y = 6$

$Y =$ _____

2. $\frac{1}{5} \div E = \frac{1}{10}$

$E =$ _____

3. $I \div \frac{1}{4} = 16$

$I =$ _____

4. $R \div 3 = \frac{1}{12}$

$R =$ _____

5. $4 \div H = 32$

$H =$ _____

6. $H \div \frac{1}{12} = 12$

$H =$ _____

7. $E \div \frac{1}{5} = 15$

$E =$ _____

8. $3 \div N = 15$

$N =$ _____

9. $7 \div T = 14$

$T =$ _____

10. $H \div \frac{1}{2} = 16$

$H =$ _____

11. $G \div \frac{1}{4} = 20$

$G =$ _____

12. $2 \div E = 12$

$E =$ _____

13. $\frac{1}{2} \div T = \frac{1}{14}$

$T =$ _____

14. $H \div \frac{1}{3} = 18$

$H =$ _____

Who invented fractions?

___	___	___	___	___	___	___	___	___	___	___	___	___	___
$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	1	2	3	4	5	6	7	8

Name _____

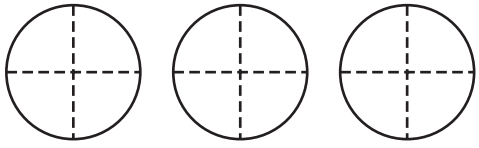
Interpret Division with Fractions

You can draw a diagram or write an equation to represent division with fractions.

Beatriz has 3 cups of applesauce. She divides the applesauce into $\frac{1}{4}$-cup servings. How many servings of applesauce does she have?

One Way Draw a diagram to solve the problem.

Draw 3 circles to represent the 3 cups of applesauce. Since Beatriz divides the applesauce into $\frac{1}{4}$-cup servings, draw lines to divide each "cup" into fourths.



To find $3 \div \frac{1}{4}$, count the total number of fourths in the 3 circles.

So, Beatriz has 12 one-fourth-cup servings of applesauce.

Another Way Write an equation to solve.

Write an equation. $3 \div \frac{1}{4} = n$

Write a related multiplication equation. $3 \times 4 = n$

Then solve. $12 = n$

So, Beatriz has 12 one-fourth-cup servings of applesauce.

1. Draw a diagram to represent the problem. Then solve.

Drew has 5 granola bars. He cuts the bars into halves. How many $\frac{1}{2}$-bar pieces does he have?

2. Write an equation to represent the problem. Then solve.

Three friends share $\frac{1}{4}$ of a melon. What fraction of the whole melon does each friend get?

Name _____

What's the Story?

For each exercise, write a story problem that you can solve with the type of division equation described.

1. a whole number divided by a unit fraction, with a quotient of 4

_____

_____

_____

2. a unit fraction divided by a whole number, with a quotient of $\frac{1}{6}$

_____

_____

_____

3. a whole number divided by a unit fraction, with a quotient of 10

_____

_____

_____

4. a unit fraction divided by a whole number, with a quotient of $\frac{1}{12}$

_____

_____

_____

5. a whole number divided by a whole number, with a quotient of $\frac{3}{8}$

_____

_____

_____