

Learning Objective: Students will be able to use a visual model and a formal rule to divide by a fraction.

Warm Up

$$\begin{array}{r} 705 \\ \times 156 \\ \hline \end{array}$$

$$\begin{array}{r} 183 \\ \times 515 \\ \hline \end{array}$$

$$\begin{array}{r} 625 \\ \times 208 \\ \hline \end{array}$$

$$\begin{array}{r} 276 \\ \times 150 \\ \hline \end{array}$$

$$\begin{array}{r} 957 \\ \times 393 \\ \hline \end{array}$$

$$\begin{array}{r} 547 \\ \times 404 \\ \hline \end{array}$$

$$\begin{array}{r} 719 \\ \times 628 \\ \hline \end{array}$$

$$\begin{array}{r} 919 \\ \times 800 \\ \hline \end{array}$$

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Warm Up Answers

$\begin{array}{r} 705 \\ \times 156 \\ \hline 4,230 \\ 35,250 \\ 70,500 \\ \hline 109,980 \end{array}$	$\begin{array}{r} 183 \\ \times 515 \\ \hline 915 \\ 1,830 \\ 91,500 \\ \hline 94,245 \end{array}$	$\begin{array}{r} 625 \\ \times 208 \\ \hline 5,000 \\ 0 \\ 125,000 \\ \hline 130,000 \end{array}$	$\begin{array}{r} 276 \\ \times 150 \\ \hline 0 \\ 13,800 \\ 27,600 \\ \hline 41,400 \end{array}$
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$\begin{array}{r} 957 \\ \times 393 \\ \hline 2,871 \\ 86,130 \\ 287,100 \\ \hline 376,101 \end{array}$	$\begin{array}{r} 547 \\ \times 404 \\ \hline 2,188 \\ 0 \\ 218,800 \\ \hline 220,988 \end{array}$	$\begin{array}{r} 719 \\ \times 628 \\ \hline 5,752 \\ 14,380 \\ 431,400 \\ \hline 451,532 \end{array}$	$\begin{array}{r} 919 \\ \times 800 \\ \hline 0 \\ 0 \\ 735,200 \\ \hline 735,200 \end{array}$
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Lesson 2.2

October 17, 2016

Essential Question:

How can you divide by a fraction?

Lesson 2.2

October 17, 2016

Lesson Objective:

Students will be able to:

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Self-Evaluation Scale

Score	Description
4	I can teach other students how to use a visual model and a formal rule to divide by a fraction.
3	I can use a visual model and a formal rule to divide by a fraction.
2	I recognize, but still need help to use a visual model and a formal rule to divide by a fraction.
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Homework Answers

2.1 Record and Practice Journal

Multiply. Write the answer in simplest form.

1. $\frac{1}{6} \times \frac{5}{8}$
 $\frac{5}{48}$

2. $\frac{7}{9} \times 3$
 $2\frac{1}{3}$

3. $\frac{8}{9} \times \frac{3}{5}$
 $\frac{8}{15}$

4. $\frac{7}{8} \times 2\frac{1}{3}$
 $2\frac{1}{24}$

5. $7 \times 3\frac{9}{14}$
 $25\frac{1}{2}$

6. $5\frac{5}{9} \times 2\frac{7}{10}$
 15

7. You reserve $\frac{2}{5}$ of the seats on a tour bus. You are able to fill $\frac{5}{8}$ of the seats you reserve. What fraction of the seats on the bus are you able to fill?

$$\frac{1}{4}$$

8. A triangle has a base of $5\frac{2}{3}$ inches and a height of 3 inches. What is the area of the triangle?

$$8\frac{1}{2} \text{ in.}^2$$

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Activity 1 & 2

With a partner, work on Activity 1 & 2 on pages 35 & 36 of your Big Ideas Record and Practice Journal.

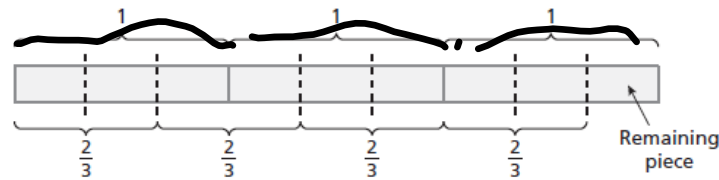
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1 ACTIVITY: Dividing by a Fraction

Work with a partner. Write the division problem and solve it using a model.

a. How many two-thirds are in three?

The division problem is _____.



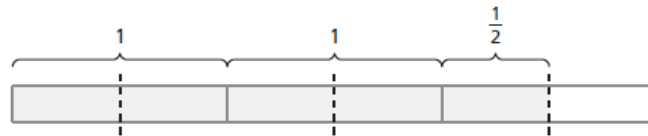
How many groups of $\frac{2}{3}$ are in 3? _____

The remaining piece represents _____ of $\frac{2}{3}$.

So, there are _____ groups of $\frac{2}{3}$ in 3.

So, _____ \div _____ = _____.

b. How many halves are in five halves?



c. How many four-fifths are in eight?

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Work with a partner.

a. Complete each table.

Division Table

$8 \div 16$	$\frac{1}{2}$
$8 \div 8$	1
$8 \div 4$	2
$8 \div 2$	4
$8 \div 1$	8
$8 \div \frac{1}{2}$	16
$8 \div \frac{1}{4}$	32
$8 \div \frac{1}{8}$	64

Multiplication Table

$8 \times \frac{1}{16}$	$\frac{1}{2}$
$8 \times \frac{1}{8}$	1
$8 \times \frac{1}{4}$	2
$8 \times \frac{1}{2}$	4
8×1	8
8×2	16
8×4	32
8×8	64

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Two numbers whose product is 1 are **reciprocals**. To write the reciprocal of a number, write the number as a fraction. Then invert the fraction.

So, the reciprocal of a fraction $\frac{a}{b}$ is $\frac{b}{a}$, where a and $b \neq 0$.

The Meaning of a Word ● Invert

When you **invert** a glass, you turn it over.



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1 Writing Reciprocals

	<i>Original Number</i>	<i>Fraction</i>	<i>Reciprocal</i>	<i>Check</i>
a.	$\frac{3}{5}$	$\frac{3}{5}$	$\frac{5}{3}$	$\frac{3}{5} \times \frac{5}{3} = 1$
b.	$\frac{9}{5}$	$\frac{9}{5}$	$\frac{5}{9}$	$\frac{9}{5} \times \frac{5}{9} = 1$
c.	2	$\frac{2}{1}$	$\frac{1}{2}$	$\frac{2}{1} \times \frac{1}{2} = 1$

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On Your Own

Write the reciprocal of the number.

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

2. 5

3. $\frac{7}{2}$

4. $\frac{4}{9}$

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Key Idea

Dividing Fractions

Words To divide a number by a fraction, multiply the number by the reciprocal of the fraction.

Numbers $\frac{1}{5} \div \frac{3}{4} = \frac{1}{5} \times \frac{4}{3} = \frac{1 \times 4}{5 \times 3}$

Algebra $\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c} = \frac{a \cdot d}{b \cdot c}$, where $b, c,$ and $d \neq 0$

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2 Dividing a Fraction by a Fraction

Find $\frac{1}{6} \div \frac{2}{3}$.

$$\frac{1}{6} \div \frac{2}{3} = \frac{1}{6} \times \frac{3}{2}$$

Multiply by the reciprocal of $\frac{2}{3}$, which is $\frac{3}{2}$.

$$= \frac{1 \times \cancel{3}^1}{\cancel{6}_2 \times 2}$$

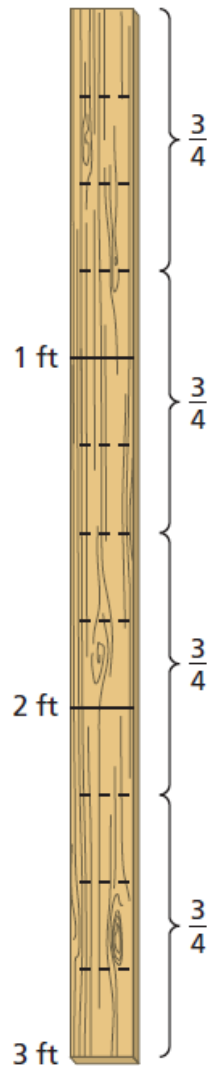
Multiply fractions. Divide out the common factor 3.

$$= \frac{1}{4}$$

Simplify.

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EXAMPLE 3 Dividing a Whole Number by a Fraction



A piece of wood is 3 feet long. How many $\frac{3}{4}$ -foot pieces can you cut from the piece of wood?

Method 1: Draw a diagram. Mark each foot on the diagram. Then divide each foot into $\frac{1}{4}$ -foot sections.

Count the number of $\frac{3}{4}$ -foot pieces of wood. There are four.

❖ So, you can cut four $\frac{3}{4}$ -foot pieces from the piece of wood.

Method 2: Divide 3 by $\frac{3}{4}$ to find the number of $\frac{3}{4}$ -foot pieces.

$$\begin{aligned}
 3 \div \frac{3}{4} &= 3 \times \frac{4}{3} \\
 &= \frac{\cancel{3}^1 \times 4}{\cancel{3}_1} \\
 &= 4
 \end{aligned}$$

Multiply by the reciprocal of $\frac{3}{4}$, which is $\frac{4}{3}$.

Multiply. Divide out the common factor 3.

Simplify.

❖ So, you can cut four $\frac{3}{4}$ -foot pieces from the piece of wood.

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On Your Own

Divide. Write the answer in simplest form.

5. $\frac{2}{7} \div \frac{1}{3}$

6. $\frac{1}{2} \div \frac{1}{8}$

7. $\frac{3}{8} \div \frac{1}{4}$

8. $\frac{2}{5} \div \frac{3}{10}$

9. How many $\frac{1}{2}$ -foot pieces can you cut from a 7-foot piece of wood?

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4 Dividing a Fraction by a Whole Number

Find $\frac{4}{5} \div 2$.

$$\frac{4}{5} \div 2 = \frac{4}{5} \div \frac{2}{1}$$

Write 2 as an improper fraction.

$$= \frac{4}{5} \times \frac{1}{2}$$

Multiply by the reciprocal of $\frac{2}{1}$, which is $\frac{1}{2}$.

$$= \frac{\overset{2}{\cancel{4}} \times 1}{5 \times \cancel{2}_1}$$

Multiply fractions. Divide out the common factor 2.

$$= \frac{2}{5}$$

Simplify.

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Assignment

Complete problems 8, 9, 11, 13, 19, 21, 43, 48, & 51
on pages 67 & 68 in your Big Ideas Text Book.

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Homework

HW:

Mon. 10/17: In your Big Ideas Record and Practice Journal page 34

Tues. 10/18: In your Big Ideas Record and Practice Journal page 38.