

Lesson 2.2

October 30, 2013

WarmUp

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Essential Question

How can you divide by a fraction?

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LessonTarget

To be able to:

- use a formal rule to divide by a fraction.

Self-Evaluation Rubric

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 a visual model and a formal rule to divide by a fraction.
1	I do not know how to use a visual model and a formal rule to divide by a fraction.

Reciprocals

Two numbers whose product is one.

$$\frac{1}{2} \cdot \frac{2}{1} = 1 \quad \frac{1}{4} \cdot \frac{4}{1} = 1 \quad 1 \cdot 1 = 1$$

$$\frac{1}{10} \cdot \frac{10}{1} = 1 \quad \frac{1}{6} \cdot \frac{6}{1} = 1 \quad \frac{1}{3} \cdot \frac{3}{1} = 1$$

$$\frac{8}{7} \cdot \frac{7}{8} = 1 \quad \frac{5}{6} \cdot \frac{6}{5} = 1$$

$$\frac{5}{7} \cdot \frac{7}{5} = 1$$

Invert

To put upside down or in the opposite position, order, or arrangement.

The Meaning of a Word ● Invert

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

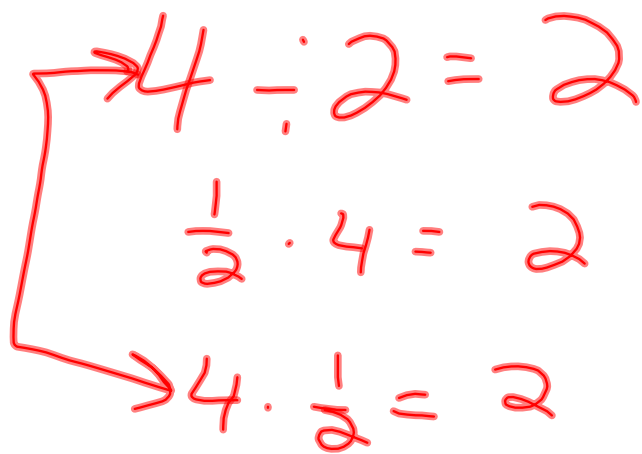


1 Writing Reciprocals

	<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	$\frac{2}{1}$	$\frac{1}{2}$	$\frac{2}{1} \times \frac{1}{2} = 1$

TryIt!

Try numbers 1 - 4 on page 64 of
your Big Ideas Text Book.



Handwritten red equations:

$$\rightarrow 4 \div 2 = 2$$
$$\frac{1}{2} \cdot 4 = 2$$
$$\rightarrow 4 \cdot \frac{1}{2} = 2$$

Division =
Mult. of the
Reciprocal

$$6 \div 3 = 2$$

$$2 \cdot \frac{1}{2} = \frac{2}{1} \div \frac{1}{1} = 2$$

$$\frac{3}{5} \div \frac{4}{25}$$

Steps

① rewrite first number

$$\cdot \frac{3}{5}$$

② change div \rightarrow mult

③ take reciprocal of 2nd number

$$\frac{25}{4}$$

$$\frac{3}{5} \div \frac{4}{25}$$

$$\frac{3}{5} \cdot \frac{25}{4} = \frac{15}{4} = 3\frac{3}{4}$$

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 $\frac{3}{2}$.

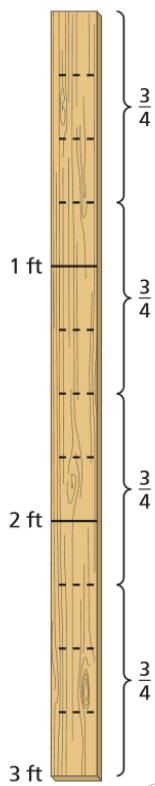
$$= \frac{1 \times \cancel{3}^1}{\cancel{6}_2 \times 2}$$

Multiply fractions. Divide out the common factor 3.

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

Simplify.

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.

$$\begin{aligned}
 3 \div \frac{3}{4} &= 3 \times \frac{4}{3} && \text{Multiply by the reciprocal of } \frac{3}{4}, \text{ which is } \frac{4}{3}. \\
 &= \frac{\overset{1}{\cancel{3}} \times 4}{\cancel{3} \underset{1}{}} && \text{Multiply. Divide out the common factor 3.} \\
 &= 4 && \text{Simplify.}
 \end{aligned}$$

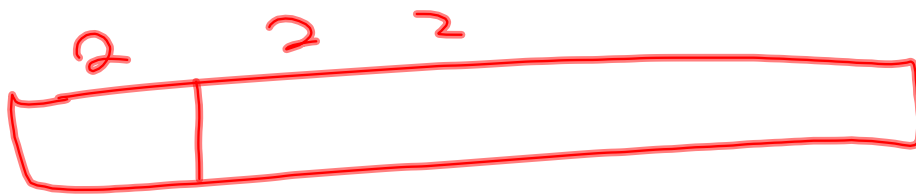
So, you can cut four $\frac{3}{4}$ -foot pieces from the piece of wood.

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

$$\cancel{3} \cdot \frac{4}{\cancel{3}} = \frac{4}{1} = 4$$

TryIt!

Try numbers 7 & 9 on page 65
of your Big Ideas Text Book.



$$7 \div \frac{1}{2}$$

$$7 \cdot 2$$

$$\frac{4}{9} \div \frac{7}{81}$$

$$\frac{4}{\cancel{9}} \cdot \frac{\cancel{81}^9}{7} = \frac{36}{7} = 5\frac{1}{7}$$

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NO
HW