MrF

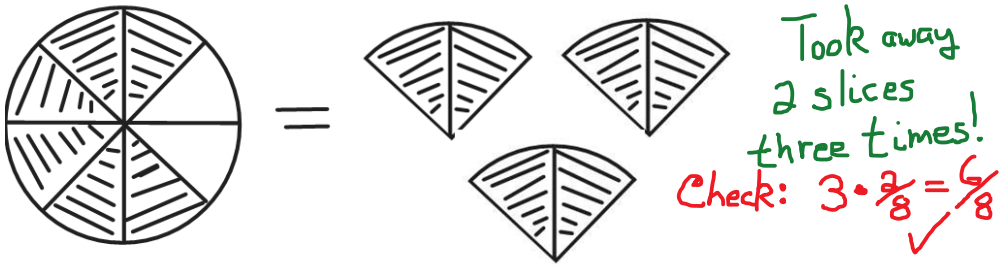
GRADE 10 ESSENTIAL
UNIT X – PRIOR STUDIES
FRACTIONS: DIVISION

Name:_____
Date: _____

The last fraction lesson(s). You will know everything there is to know! Good job!

Dividing means to subtract an amount multiple times. How many times can you take away groups of two from six? Answer: Three times. That is dividing! $6 \div 2 = 3$.

Now with fractions. How many times can you take away two slices of pizza from six slices of an eight slice pizza? $\frac{6}{8} \div \frac{2}{8} = 3$. Easy!



So if you have six eighths of a whole eight slice pizza and take out two slices at a time you can feed three people!

The quick explanation. The way to do fraction dividing is to '***flip***' the divisor and multiply. You already know how to multiply!

Example. $\frac{6}{8} \div \frac{2}{8} \Rightarrow \frac{6}{8} \cdot \frac{8}{2} = \frac{48}{16} = 3$ (flip)

Another "word for "flip" is "reciprocal"

That is it! Now let's explain it all in more detail below.

Lesson 1 Reciprocals

The product of any number and its **reciprocal** is 1.

reciprocals

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

The reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$. "flip"

The reciprocal of $\frac{3}{2}$ is $\frac{2}{3}$.

reciprocals

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

The reciprocal of $\frac{1}{2}$ is $\frac{2}{1} = 2$.

The reciprocal of 2 is $\frac{1}{2}$. since 2 is $\frac{2}{1}$

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Write the reciprocal of each of the following.

"Flip"

	a	b	c	d
1.	$\frac{3}{5}$ $\frac{5}{3}$	$\frac{7}{8}$ ____	$\frac{4}{5}$ ____	$\frac{5}{7}$ ____
2.	$\frac{5}{3}$ ____	$\frac{8}{7}$ ____	$\frac{5}{4}$ ____	$\frac{7}{5}$ ____
3.	$\frac{1}{8}$ ____	$\frac{1}{3}$ ____	$\frac{1}{4}$ ____	$\frac{1}{9}$ ____
4.	$\frac{8}{1}$ ____	$\frac{3}{1}$ ____	$\frac{4}{1}$ ____	$\frac{9}{1}$ ____
5.	$8 = \frac{8}{1} \rightarrow \frac{1}{8}$	3 ____	4 ____	9 ____
6.	$\frac{8}{5}$ ____	6 ____	$\frac{2}{3}$ ____	$\frac{11}{6}$ ____
7.	15 ____	$\frac{10}{9}$ ____	$\frac{12}{11}$ ____	17 ____

Lesson 2 Division (whole numbers by fractions)

$$15 \div \frac{3}{4} = \frac{15}{1} \times \frac{4}{3}$$

$$= \frac{15 \times 4}{1 \times 3}$$

$$= \frac{60}{3}$$

$$= 20$$

To divide by a fraction, multiply by its reciprocal.

Multiply the fractions.

Write the answer in simplest form.

Always reduce to simplest form

$$10 \div \frac{6}{7} = \frac{10}{1} \times \frac{7}{6}$$

$$= \frac{10 \times 7}{1 \times 6}$$

$$= \frac{70}{6}$$

$$= 11\frac{2}{3}$$

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Write each answer in simplest form.

	a	b	c	d
1.	$10 \div \frac{1}{3} = \frac{10}{1} \cdot \frac{3}{1} = 30$	$8 \div \frac{1}{2}$	$7 \div \frac{1}{4}$	$6 \div \frac{1}{5}$
2.	$14 \div \frac{2}{7}$	$15 \div \frac{2}{5}$	$16 \div \frac{3}{8}$	$18 \div \frac{5}{9}$

CHECK DIVIDING. And do not forget to check! Checking subtraction is easy you add it back. Checking division is easy you multiply it back!

$14 \div \frac{2}{7} = 14 \cdot \frac{7}{2} = 49$ Check → $49 \cdot \frac{2}{7} = 14$? Yes ☺

Check by 'undoing'; do it backwards!

Lesson 3 Division (fractions by whole numbers)

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

To divide by a whole number, multiply by its reciprocal.

Multiply the fractions.

Check: $\frac{1}{8} \cdot 4 = \frac{1}{2}$ ✓

$$\frac{2}{3} \div 5 = \frac{2}{3} \times \frac{1}{5} = \frac{2 \times 1}{3 \times 5} = \frac{2}{15}$$

Check: $\frac{2}{15} \cdot 5 = \frac{2}{3}$ ✓

Write each answer in simplest form.

	a	b	c	d
1.	$\frac{1}{2} \div 6 = \frac{1}{2} \cdot \frac{1}{6} = \frac{1}{12}$	$\frac{1}{4} \div 2$	$\frac{1}{3} \div 5$	$\frac{1}{6} \div 2$
2.	$\frac{3}{5} \div 4$	$\frac{5}{8} \div 2$	$\frac{3}{4} \div 4$	$\frac{5}{6} \div 3$

Check: $\frac{1}{12} \cdot 6 = \frac{1}{2}$ ✓

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Lesson 3 Problem Solving

Draw pictures? Show work of course

Solve. Write each answer in simplest form.

1. $\frac{1}{3}$ of a bag of flour is separated into two bowls. The same amount of flour is in each bowl. How much flour is in each bowl?

1.

$1/3 \div 2 = 1/6$

Check: $1/6 + 1/6 = 2/6 = 1/3$ ✓

_____ of a bag is in each bowl.

2. One half of a room is painted. Each of four people did the same amount of painting. How much of the room did each person paint?

2.

Each person painted _____ of the room.

3. Kevin used $\frac{3}{4}$ of a container of gasoline to mow a lawn three times. How much gasoline did he use to mow the lawn once?

3.

He used _____ of a container.

5. $\frac{7}{8}$ of a bucket of liquid is poured into four containers. Each container has the same amount in it. How much liquid is in each container?

5.

_____ of a bucket is in each container.

Lesson 4 Division (fractions by fractions)

Multiply by the reciprocal.

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

Multiply by the reciprocal.

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

Write the answer in simplest form.

Write each answer in simplest form.

	a	*b*	*c*	*d*
1.	$\frac{1}{5} \div \frac{1}{2}$	$\frac{1}{3} \div \frac{1}{2}$	$\frac{1}{8} \div \frac{1}{4}$	$\frac{1}{9} \div \frac{1}{6}$
2.	$\frac{3}{5} \div \frac{1}{2}$	$\frac{4}{7} \div \frac{2}{3}$	$\frac{4}{5} \div \frac{1}{10}$	$\frac{5}{6} \div \frac{2}{3}$

Lesson 4 Problem Solving

Solve. Write each answer in simplest form.

1. How many $\frac{1}{6}$ h sessions are there in $\frac{1}{2}$ h?

There are _____ sessions.

2. It takes Erika $\frac{1}{4}$ h to pack a lunch. How many lunches can she pack for her children in $\frac{3}{4}$ h?

She can pack _____ lunches.

3. In problem **2,** Erika reduces the time to pack a lunch to $\frac{1}{8}$ h. Now how many lunches can she pack in $\frac{3}{4}$ h?

She can pack _____ lunches.

4. A machine uses gas at the rate of 1 L every $\frac{1}{5}$ h. How many litres would be used in 4 h?

_____ L would be used.

5. Suppose the machine in problem **4** uses 1 L of gas every $\frac{4}{5}$ h? How many litres would be used in 4 h?

_____ L would be used.

6. Tom puts $\frac{3}{8}$ of a package of nuts in each bag. How many bags can Tom fill with $\frac{3}{4}$ package of nuts?

_____ bags can be filled.

Lesson 6 Division (mixed numerals)

$$2\frac{1}{5} \div 4 = \frac{11}{5} \div 4$$

Change the mixed numerals to fractions.

$$= \frac{11}{5} \times \frac{1}{4}$$

To divide, multiply by the reciprocal.

$$= \frac{11}{20}$$

Multiply the fractions.

Write the answer in simplest form.

$$3\frac{1}{2} \div 1\frac{1}{2} = \frac{7}{2} \div \frac{3}{2}$$

$$= \frac{7}{2} \times \frac{2}{3}$$

$$= \frac{14}{6}$$

$$= 2\frac{1}{3}$$

Write each answer in simplest form.

	a	*b*	*c*	*d*
1.	$2\frac{1}{2} \div 3$	$1\frac{2}{5} \div 3$	$4 \div 1\frac{1}{3}$	$6 \div 1\frac{1}{3}$

2. $1\frac{2}{7} \div 2\frac{1}{2}$ $1\frac{1}{5} \div 2\frac{2}{3}$ $4\frac{1}{2} \div 1\frac{1}{5}$ $1\frac{4}{5} \div 1\frac{1}{5}$

Lesson 6 Problem Solving

Solve. Write each answer in simplest form.

1. Five bags of sand are put into containers. How many containers are needed if $1\frac{1}{4}$ bags of sand are put into each one?

_____ containers are needed.

2. Caroline works $1\frac{1}{2}$ h each day. How many days will it take her to work 15 h?

It will take _____ days.

3. Each class period is $\frac{5}{6}$ h long. How many periods can there be in $2\frac{1}{2}$ h?

There can be _____ periods in $2\frac{1}{2}$ h.

4. The town spread $7\frac{1}{2}$ truckloads of salt on the streets. $1\frac{1}{4}$ truckloads were spread on each block. How many blocks are in the town?

_____ blocks are in the town.

CONGRATULATIONS!
YOU ARE DONE FRACTIONS!
Forever? Until your child or family ask you!!