

Module 3 - Lesson 16:

Reason about the size of quotients of whole numbers and unit fractions and quotients of unit fractions and whole numbers.

CCSS Standard – 5.NF.B.7.a / 5.NF.B.7.b

FLUENCY (10-min)

Whiteboard Exchange: Convert Customary Weight Units



1 pound is equal to how many ounces?

$$1 \text{ lb} = \underline{\hspace{2cm}} \text{ oz}$$

$\frac{1}{16} \times 16?$

$$\frac{1}{16} \text{ lb} = \underline{\hspace{2cm}} \text{ oz}$$

$\frac{1}{4} \times 16?$

$$\frac{1}{4} \text{ lb} = \underline{\hspace{2cm}} \text{ oz}$$

$\frac{3}{4} \times 16?$

$$\frac{3}{4} \text{ lb} = \underline{\hspace{2cm}} \text{ oz}$$

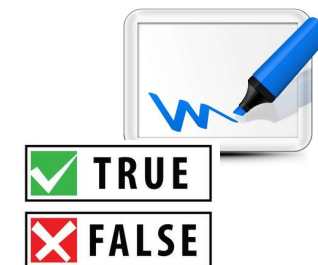
$\frac{5}{8} \times 16?$

$$\frac{5}{8} \text{ lb} = \underline{\hspace{2cm}} \text{ oz}$$

FLUENCY (10-min)

Whiteboard Exchange: True or False Number Sentences

Is the number sentence true or false?
Raise your hand when you know.



$$1 \times \frac{5}{7} > \frac{5}{7}$$

If it is false, change it to be true.

**KNOW THE
RULES !**

Notice that we multiplied $\frac{5}{7}$ by EXACTLY ONE, so the rule is.....?

FLUENCY (10-min)

Whiteboard Exchange: True or False Number Sentences



TRUE

FALSE

Is the number sentence true or false?
Raise your hand when you know.

$$6 \times \frac{5}{7} = \frac{5}{7}$$

If it is false, change it to be true.

**KNOW THE
RULES !**

Notice that we multiplied $\frac{5}{7}$ by a number **GREATER THAN ONE**, so the rule is.....?

FLUENCY (10-min)

Whiteboard Exchange: True or False Number Sentences

Is the number sentence true or false?

Raise your hand when you know.



TRUE

FALSE

$$\frac{2}{3} \times \frac{4}{9} < \frac{4}{9}$$

**KNOW THE
RULES !**

Notice that we multiplied $\frac{4}{9}$ by a fraction LESS THAN ONE, so the rule is?

FLUENCY (10-min)

Whiteboard Exchange: True or False Number Sentences



TRUE

FALSE

Is the number sentence true or false?
Raise your hand when you know.

$$\frac{4}{3} \times \frac{4}{9} < \frac{4}{9}$$

If it is false, change it to be true.

**KNOW THE
RULES !**

Notice that we multiplied $\frac{4}{9}$ by a number **GREATER THAN ONE**, so the rule is.....?

FLUENCY (10-min)

Whiteboard Exchange: True or False Number Sentences

Is the number sentence true or false?

Raise your hand when you know.



TRUE

FALSE

$$\frac{5}{8} \times \frac{6}{6} = \frac{5}{8}$$

**KNOW THE
RULES !**

Notice that we multiplied $\frac{5}{8}$ by EXACTLY ONE, so the rule is.....?

LAUNCH (5-min)

Create a real-world situation that could be represented by the expression.

TASK:

Pair up.

Look at the expression given here.

Create a real-world situation that could be represented by the expression.

$$6 \div \frac{1}{2} = 12$$

Samples:

Audrey pours 6 liters of orange juice into glasses. Each glass holds $\frac{1}{2}$ liter of juice. How many glasses does she fill?

Abram has 6 cans of paint. That is $\frac{1}{2}$ of the paint he needs to paint a room. How many cans will Abram need to paint the room?

Today, we will relate division expressions to word problems and reason about the size of quotients.

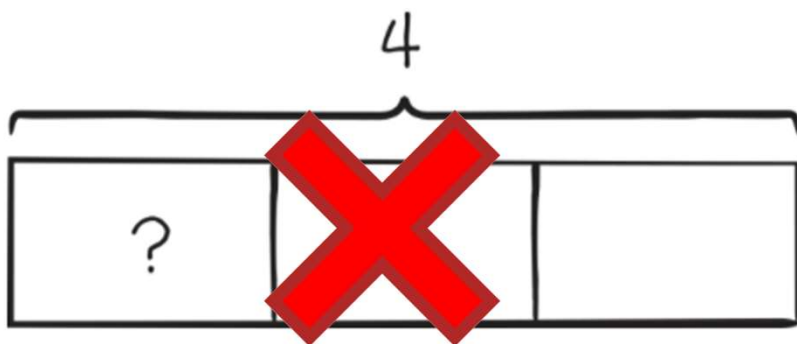
LEARN (35-min)

Reason About the Size of the Quotient in Context

Read the word problem below.

Blake and 3 friends share $\frac{1}{3}$ pound of frozen yogurt equally.
How many pounds of frozen yogurt does each person get?

Does this tape diagram match the story?

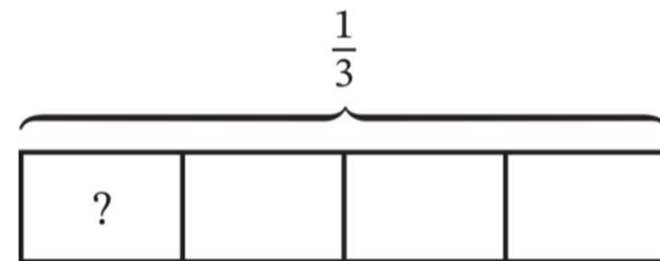


Why do you think this student labeled the tape diagram 4?

What should have the tape diagram be labeled? Why?

Does this student need to change anything else about their tape diagram?

*Remember, the tape diagram represents a story. How would **you** make a tape diagram to fit this story?*



Thinking back on the RULES, will the quotient of this problem be GREATER THAN or LESS THAN $\frac{1}{3}$?

LEARN (35-min)

Reason About the Size of the Quotient in Context

LEARN book page 147.

Circle the expression that can be used to solve the word problem.

1. How many $\frac{1}{2}$ -pound servings of shrimp can Miss Song make with 6 pounds of shrimp?

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

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

What does 6 represent in this expression?

What does $\frac{1}{2}$ represent in this expression?

Without finding the actual quotient yet, will the quotient be greater than 6 or less than 6?

How do you know?

$$6 \div \frac{1}{2} = 12$$

LEARN (35-min)

Reason About the Size of the Quotient in Context

LEARN book page 147.

Circle the expression that can be used to solve the word problem.

2. $8 \div \frac{1}{3}$

greater than 8

less than 8

RULE: When dividing a whole number by a unit fraction, the quotient will be **GREATER THAN** the dividend because it takes more fractional parts to make a whole.

$$8 \div \frac{1}{3} = 24$$

LEARN (35-min)

Reason About the Size of the Quotient in Context

LEARN book page 147.

Circle the expression that can be used to solve the word problem.

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

greater than $\frac{1}{6}$

less than $\frac{1}{6}$

RULE: When dividing a unit fraction by a whole number, the quotient will be **LESS THAN** the dividend because the dividend is being divided into smaller parts.

$$\frac{1}{6} \div 6 = \frac{1}{36}$$

LEARN (35-min)

Know the Rules!

**KNOW THE
RULES!**

$$8 \div \frac{1}{3}$$

When dividing a whole # by a unit fraction, the quotient is GREATER than the dividend because it takes more fractional parts to make a whole.

$$\frac{1}{6} \div 6$$

When dividing a unit fraction by a whole #, the quotient is LESS than the dividend because The dividend is being divided into smaller parts.

LEARN (35-min)

Know the Rules!

**KNOW THE
RULES!**

$$8 \div \frac{1}{3}$$

When dividing a whole # by a unit fraction, the quotient is GREATER than the dividend because it takes more fractional parts to make a whole.

$$\frac{1}{6} \div 6$$

When dividing a unit fraction by a whole #, the quotient is LESS than the dividend because The dividend is being divided into smaller parts.

LEARN (35-min)

Compare Expressions without Evaluating

$$\frac{1}{2} \div 4 > \frac{1}{4} \div 4$$

$$3 \div \frac{1}{3} > \frac{1}{3} \div 3$$

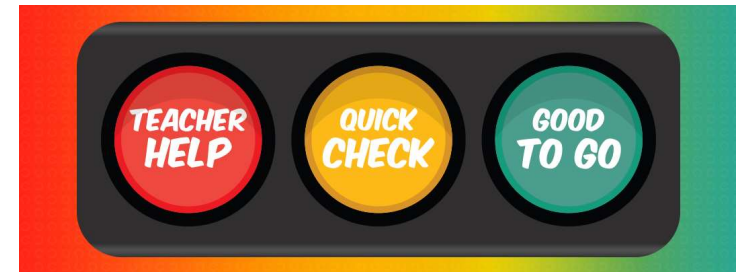
$$5 \div \frac{1}{4} > 5 \div \frac{1}{3}$$

$$\frac{1}{9} \times 3 > \frac{1}{9} \div 3$$

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

LAND (10-min)

Exit Ticket



 **16**

Use $>$, $=$, or $<$ to compare the expressions. Explain how you can compare the expressions without evaluating them.

1. $6 \div \frac{1}{12}$ _____ $6 \div \frac{1}{2}$

Explain:

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

Explain:

Exit Ticket – PAGE 153

Small Group Time:

Problem Set Pages 149 -150

Homework:

Page 103 APPLY BOOK