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## **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



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

 **TRUE**

 **FALSE**

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

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.

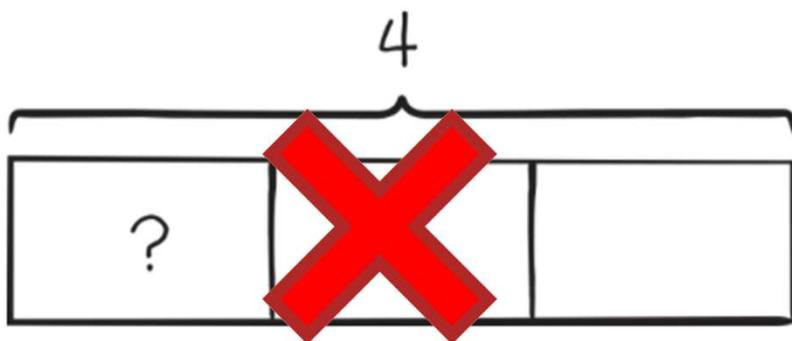
**LEARN** (35-min)

**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?

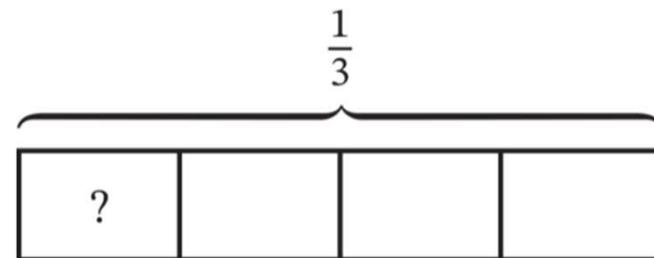


*Why do you think this student labeled the tape diagram 4?*

*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