How Many Groups
(Part 2)

Lesson # 5

6.NS.A.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because 3/4 of 8/9 is 2/3. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?

Addressing

Let's use blocks and diagrams to understand more about division with fractions.

Today's Goals

❏ I can find how many groups there are when the number of groups and the amount in each group are not whole numbers.

Reasoning with Fraction Strips

Warm Up 5.1

Write a fraction or whole number as an answer for each question. If you get stuck, use the fraction strips. Be prepared to share your strategy.
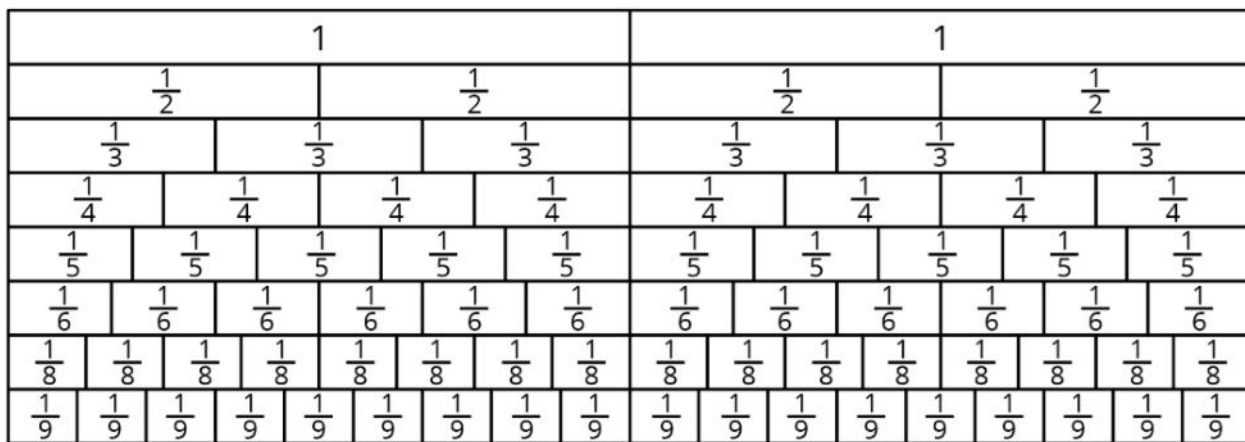
1. How many $\frac{1}{2}$s are in 2?

2. How many $\frac{1}{5}$s are in 3?

3. How many $\frac{1}{8}$s are in $1\frac{1}{4}$?
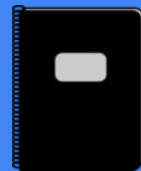
4. $1 \div \frac{2}{6} = ?$

5. $2 \div \frac{2}{9} = ?$

6. $4 \div \frac{2}{10} = ?$

1										1								
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$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	

More Reasoning with Pattern Blocks

Activity 5.2
- ● MLR5: Co-craft Questions & Problems
- ● MLR8: Discussion Supports

1. If the trapezoid represents 1 whole, what do each of the following shapes represent? Be prepared to show or explain your reasoning.

    a. 1 triangle

    b. 1 rhombus

    c. 1 hexagon

2. Use pattern blocks to represent each multiplication equation. Use the trapezoid to represent 1 whole.

    a. $3 \cdot \frac{1}{3} = 1$

    b. $3 \cdot \frac{2}{3} = 2$

3. Diego and Jada were asked "How many rhombuses are in a trapezoid?"

- Diego says, "$1\frac{1}{3}$. If I put 1 rhombus on a trapezoid, the leftover shape is a triangle, which is $\frac{1}{3}$ of the trapezoid."

- Jada says, "I think it's $1\frac{1}{2}$. Since we want to find out 'how many rhombuses,' we should compare the leftover triangle to a rhombus. A triangle is $\frac{1}{2}$ of a rhombus."

4. Select *all* equations that can be used to answer the question: "How many rhombuses are in a trapezoid?"

a. $\frac{2}{3} \div ? = 1$

b. $? \cdot \frac{2}{3} = 1$

c. $1 \div \frac{2}{3} = ?$

d. $1 \cdot \frac{2}{3} = ?$

e. $? \div \frac{2}{3} = 1$

Let's Talk About It
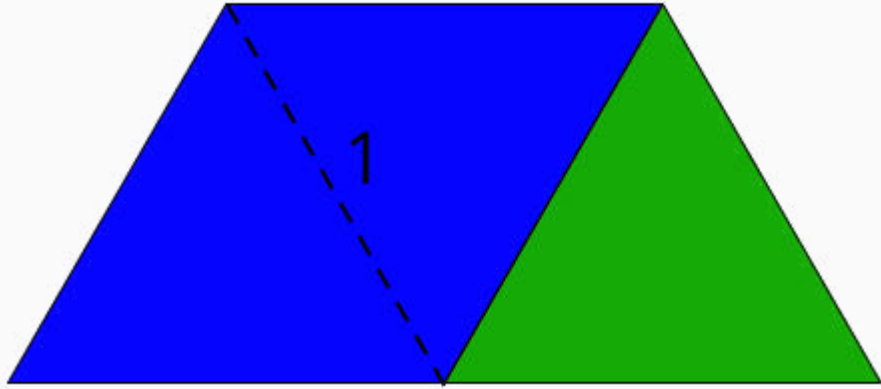
- This is a 'how many groups of this in that?' question. What makes 1 group, in this case?
- How do we know whether to compare the remainder to the rhombus or the trapezoid?

Drawing Diagrams to Show Equal-Sized Groups

Activity 5.3

- MLR8 Discussion Supports
- Group Presentations

For each situation, draw a diagram for the relationship of the quantities to help you answer the question. Then write a multiplication equation or a division equation for the relationship. Be prepared to share your reasoning.

1. The distance around a park is $\frac{3}{2}$ miles. Noah rode his bicycle around the park for a total of 3 miles. How many times around the park did he ride?

2. You need $\frac{3}{4}$ yard of ribbon for one gift box. You have 3 yards of ribbon. How many gift boxes do you have ribbon for?

3. The water hose fills a bucket at $\frac{1}{3}$ gallon per minute. How many minutes does it take to fill a 2-gallon bucket?

Time to Present!

While other groups are presenting think about:

- Whether the equations make sense.
- How the presented diagrams shows the number of groups, the size of each group, and a total amount.

Are you ready for more?

How many heaping teaspoons are in a heaping tablespoon? How would the answer depend on the shape of the spoons?

Lesson Synthesis

We can think of the question 'how many ¾ are in 2' in terms of equal sized groups.
- **What do the ¾ and the 2 represent?**
- **What are we looking for?**

Lesson Synthesis

We can think of the question 'how many ¾ are in 2' in terms of equal sized groups.
- **What multiplication equation can we write for this situation?**
- **What division equation can we write?**

Lesson Synthesis

- **We can draw a diagram and count how many groups of ¾ there are in 2. How many whole groups of ¾ are there?**
- **How do we deal with a remainder that is less than one whole group?**

Today's Goals

❏ I can find how many groups there are when the number of groups and the amount in each group are not whole numbers.

Bags of Tangerines

Cool Down 5.4

Cool Down

A grocery store sells tangerines in $\frac{2}{5}$ kg bags. A customer bought 4 kg of tangerines for a school party. How many bags did he buy?

1. Select **all** equations that represent the situation.

   a. $4 \cdot \frac{2}{5} = ?$ b. $? \cdot \frac{2}{5} = 4$ c. $\frac{2}{5} \div 4 = ?$ d. $4 \div \frac{2}{5} = ?$ e. $? \div \frac{2}{5} = 4$

2. Draw a diagram to represent the situation. Answer the question.