

How Many Groups? (Part 2)

Goals

- Coordinate multiplication and division equations and pattern block diagrams in which the red trapezoid represents 1 whole.
- Create a diagram to represent and solve a problem asking “How many groups?” in which the size of a group and the number of groups are fractions, and explain (orally) the solution method.
- Identify or generate a multiplication or division equation that represents a given situation involving a fractional divisor.

Learning Target

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

Student Learning Goal

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

Lesson Narrative

In this lesson, students continue to use visual tools to reason about “How many groups?” questions and representing them with equations. The number of groups is not always a whole number, prompting students to quantify a partial group. The connection between “How many groups?” questions and division is also made explicit.

Students begin by using fraction strips—a familiar representation from earlier grades—to determine how many whole-number groups of a fraction are in a given number. The fraction strips allow students to count groups of unit and non-unit fractions.

Next, students use pattern blocks to find an unknown number of groups and encounter a case in which the answer is not a whole number. They consider how to express a fraction of a group and the multiplication and division equations that can represent the situation. The last activity, which is optional, gives students an opportunity to practice reasoning about situations with equal groups of fractions, writing equations, and creating their own diagrams to answer the questions.

Access for Students with Diverse Abilities

- Representation (Activity 1, Activity 2)

Access for Multilingual Learners

- MLR8: Discussion Supports (Activity 1)
- MLR7: Compare and Connect (Activity 2)

Instructional Routines

- MLR7: Compare and Connect

Required Materials

Materials to Gather

- Geometry toolkits: Activity 2, Activity 3
- Pattern blocks: Activity 2
- Tools for creating a visual display: Activity 3

Required Preparation

Activity 2:

- Prepare enough pattern blocks such that each group of 3–4 students has at least 1 hexagon and 4 of each of the other shapes (triangle, rhombus, and trapezoid).
- For the digital version of the activity, acquire devices that can run the applet.

Lesson:

- Prepare enough pattern blocks such that each group of 3–4 students has at least 1 hexagon and 4 of each of the other shapes (triangle, rhombus, and trapezoid).

Lesson Timeline

5
min

Warm-up

25
min

Activity 1

20
min

Activity 2

10
min

Lesson Synthesis

Assessment

5
min

Cool-down

Warm-up

Reasoning with Fraction Strips

10
min

Activity Narrative

In this *Warm-up*, students continue to think of division in terms of equal-size groups, using fraction strips as an additional tool for reasoning.

Monitor for how students transition from concrete questions (the first three) to symbolic ones (the last three). Framing division expressions as “How many of this fraction is in that number?” may not yet be intuitive to students. They will further explore that connection in a later activity. For now, support them using whole-number examples such as by asking “How do you interpret $6 \div 2$?”

The divisors used here involve both unit fractions and non-unit fractions. The last question shows a fractional divisor that is not on the fraction strips. This encourages students to transfer the reasoning used with fraction strips to a new problem, or to use an additional strategy, such as by first writing an equivalent fraction.

As students work, identify those who are able to modify their reasoning effectively, even if the approach may not be efficient (such as adding a row of $\frac{1}{10}$ s to the fraction strips). Ask them to share later.

Launch

Give students 2–3 minutes of quiet work time.

Student Task Statement

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 reasoning.

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

4

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

15

How many $\frac{1}{8}$ s are in $1\frac{1}{4}$?

10

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

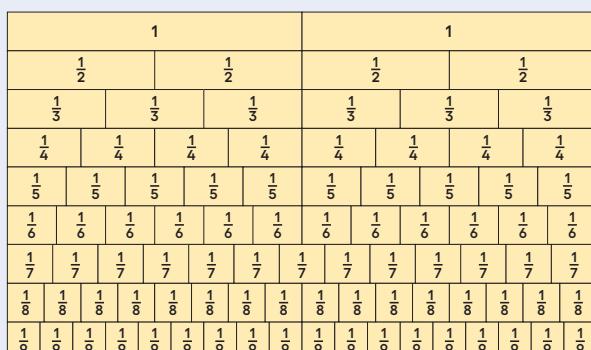
3

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

9

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

20



Building on Student Thinking

Because the fraction strips do not show tenths, students might be unsure how to approach the last question. Ask questions such as:

“Could any of the given fraction strips help you reason about $\frac{2}{10}$?”

“How did you reason about the two earlier questions? Could you use the same reasoning to answer this question?”

Student Workbook

LESSON 5

How Many Groups? (Part 2)

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

Warm-up Reasoning with Fraction Strips

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 reasoning.

How many $\frac{1}{2}$ s are in 2? _____

How many $\frac{1}{3}$ s are in 3? _____

How many $\frac{1}{5}$ s are in $1\frac{1}{4}$? _____

$1 + \frac{2}{5} = ?$ _____

$2 + \frac{2}{9} = ?$ _____

$4 + \frac{2}{10} = ?$ _____

1	1	1	1
$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$

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Access for Multilingual Learners (Activity 1, Launch)**Speaking, Listening: MLR8****Discussion Supports.**

Use this routine to support whole-class discussion. After a student shares their reasoning for whether they agree with Diego or Jada, ask students to restate what they heard using precise mathematical language. Ask the original speaker if their peer was accurately able to restate their thinking. Call students' attention to any words or phrases that helped to clarify the original statement. This provides more students with an opportunity to produce language as they interpret the reasoning of others.

Design Principle(s): Support Sense-Making

Access for Students with Diverse Abilities (Activity 1, Launch)**Representation: Internalize Comprehension.**

Provide students with a graphic organizer, such as a table showing the name and image of each pattern block, to record the value of the pattern blocks in the context of this activity.

Supports accessibility for: Visual-Spatial Processing, Organization

Activity Synthesis

Focus the discussion on how students interpreted division expressions such as $1 \div \frac{2}{6}$ and found their values. Invite students to share their responses and reasoning. Highlight observations that finding the value of $1 \div \frac{2}{6}$ is like finding how many $\frac{2}{6}$ s are in 1, or finding the missing factor in $? \cdot \frac{2}{6} = 1$.

For the last question, if no students mention using a unit fraction that is equivalent to $\frac{2}{10}$, ask them to discuss this idea.

Activity 1**More Reasoning with Pattern Blocks**25
min**Activity Narrative****There is a digital version of this activity.**

This activity serves two purposes: to explicitly bridge “How many of this in that?” questions to division expressions, and to explore division situations in which the quotients are not whole numbers.

Once again, students move from reasoning concretely and visually to reasoning symbolically. They start by thinking about “How many rhombuses are in a trapezoid?” and then express that question as multiplication ($? \cdot \frac{2}{3} = 1$ or $\frac{2}{3} \cdot ? = 1$) and division ($1 \div \frac{2}{3}$). Students think about how to deal with a remainder in such problems.

As students discuss in groups, listen for their explanations for the question “How many rhombuses are in a trapezoid?” Select two students to share later—one person to elaborate on Diego’s argument, and another to support Jada’s argument.

This activity works best when each student has access to pattern blocks. If pattern blocks are not available, consider using the digital version of the activity. In the digital version, students use an applet to investigate fractional relationships with pattern blocks. The applet allows students to place and compare pattern blocks with or without a grid.

Launch

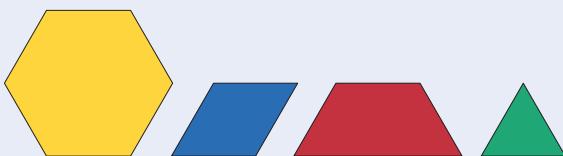
Tell students that they will use pattern blocks again to think about equal-size groups involving fractions, but that this time the trapezoid represents 1 whole.

Arrange students in groups of 3–4. Provide access to pattern blocks and geometry toolkits. Give students 10 minutes of quiet work time for the first three questions and a few minutes to discuss their responses and collaborate on the last question.

Student Task Statement

Your teacher will give you pattern blocks. Use them to answer the questions.

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



- $\frac{1}{3}$
Sample reasoning: Three triangles make a trapezoid.
- $\frac{2}{3}$
Sample reasoning: Two triangles make a rhombus and each triangle represents $\frac{1}{3}$.
- 2
Sample reasoning: Two trapezoids make a hexagon.

- 2.** Use pattern blocks to represent each multiplication equation. Use the trapezoid to represent 1 whole. Sketch or trace the blocks to record your representation.

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.”

Do you agree with either of them? Explain or show your reasoning.

The answer is $1\frac{1}{2}$, as noted by Jada.

Sample reasoning: Since the question is “How many rhombuses ... ?” the leftover space should be compared to a rhombus. A triangle is half of a rhombus, so we can fit $1\frac{1}{2}$ rhombuses in a trapezoid.

Student Workbook**More Reasoning with Pattern Blocks**

Your teacher will give you pattern blocks. Use them to answer the questions.

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



2. Use pattern blocks to represent each multiplication equation. Use the trapezoid to represent 1 whole. Sketch or trace the blocks to record your representation.

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.”

Do you agree with either of them? Explain or show your reasoning.

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

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

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

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

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

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4. Select **all** the 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. $? \div \frac{2}{3} = 1$

Activity Synthesis

Focus the whole-class discussion on the last two questions. In particular, discuss how the visual representation helps us reason about Jada’s and Diego’s points of view, as well as the connections between the verbal and numerical representations of the situation.

Select the two previously identified students to explain why Diego or Jada is correct. Display a visual representation of “How many rhombuses are in a trapezoid?” for all to see (as shown here), or use the applet for illustration.



The Geogebra applet ‘Reasoning with Pattern Blocks’ is available here:
geogebra.org/m/EpztQZ6y.

Activity 2: Optional**Drawing Diagrams to Show Equal-size Groups**25
min**Activity Narrative**

- This activity gives students another opportunity to use diagrams and equations to make sense of division involving fractions. Reasoning repeatedly about “How many of these are in that?” questions in different situations allows students to notice regularity in how the quantities can be related by multiplication and division.
- For each situation, many kinds of visual representations are possible, but creating a meaningful representation may be challenging nonetheless. Urge students to use the contexts to generate ideas for useful diagrams, and to start with a draft and modify it as needed. Students may also use the fraction strips in the *Warm-up* as a starting point for drawing diagrams.
- Monitor for diagrams that:
- Clearly show the given quantities in the situation (including the size of 1 group and a total amount).
- Effectively communicate the answer to the question (the number of groups).
- Can be generalized to different situations. Tape diagrams, and number lines are some possible examples.

Launch

Arrange students in groups of 2–3.

Give students 8–10 minutes of quiet work time and a few minutes to share their responses with their group.

Provide access to geometry toolkits and tools for creating a visual display.

During the group discussions, instruct students to exchange feedback on each other’s diagrams and to notice any that might be particularly effective, efficient, or easy to understand. Tell each group that later they will be asked to create a display that shows their solution to one problem.

Select students who created diagrams with different strengths as described in the *Activity Narrative*, and ask them to share later.

Instructional Routines**MLR7: Compare and Connect**

ilclass.com/r/10695592

Please log in to the site before using the QR code or URL.

**Access for Multilingual Learners (Activity 2)****MLR7: Compare and Connect**

This activity uses the *Compare and Connect* math language routine to advance representing and conversing as students use mathematically precise language in discussion.

Access for Students with Diverse Abilities (Activity 2, Launch)**Representation: Internalize Comprehension.**

Demonstrate and encourage students to use color coding and annotations to illustrate connections between representations. For example, use the same color to represent the 2 gallons in the diagram and in the equation,

$2 \div \frac{1}{3} = ?$, and then label each as “dividend.”

Supports accessibility for: Visual-Spatial Processing

Building on Student Thinking

When writing equations, students may reverse the values for the divisor and dividend. Encourage students to think about the meanings of the quantities in context. Consider asking:

*"Which number is being divided?
Which number is being used to divide?"*

"How reasonable is the quotient of your division equation? Does the result of division match what you found when reasoning with diagrams?"

Student Workbook

2 Drawing Diagrams to Show Equal-size Groups

For each situation:

- Draw a diagram to represent the situation.
- Answer the question.
- Write a multiplication equation or a division equation for the relationship.

1 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?

Equation: _____

2 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?

Equation: _____

3 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?

Equation: _____

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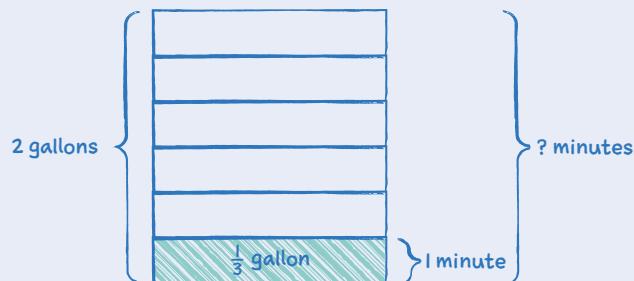
Student Task Statement

For each situation:

- Draw a diagram to represent the situation.
- Answer the question.
- Write a multiplication equation or a division equation for the relationship.

1. 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?

- Sample diagram:

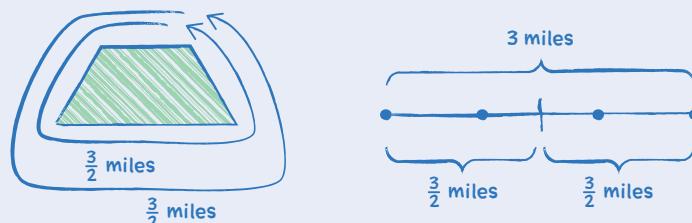


- Answer: 6 minutes

Equation: $6 \cdot \frac{1}{3} = 2$ or $2 \div \frac{1}{3} = 6$ (or equivalent)

2. 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?

- Sample diagram:

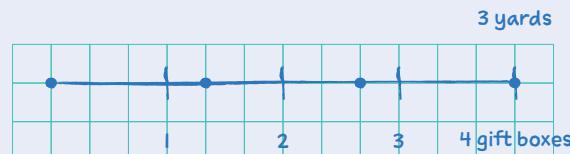


- Answer: 2 (times around the park)

Equation: $2 \cdot \frac{3}{2} = 3$ or $3 \div \frac{3}{2} = 2$ (or equivalent)

3. 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?

- Sample diagram:



- Answer: 4 (gift boxes)

Equation: $4 \cdot \frac{3}{4} = 3$ or $3 \div \frac{3}{4} = 4$ (or equivalent)

Are You Ready for More?

There are 48 level teaspoons in 1 cup. Estimate:

- How many rounded teaspoons are in 1 cup?

Sample responses:

- About 24 rounded teaspoons, assuming a rounded teaspoon has 2 times the amount of a level teaspoon
- About 16 rounded teaspoons, assuming a rounded teaspoon has 3 times the amount of a level teaspoon

- How many scant teaspoons are in 1 cup?

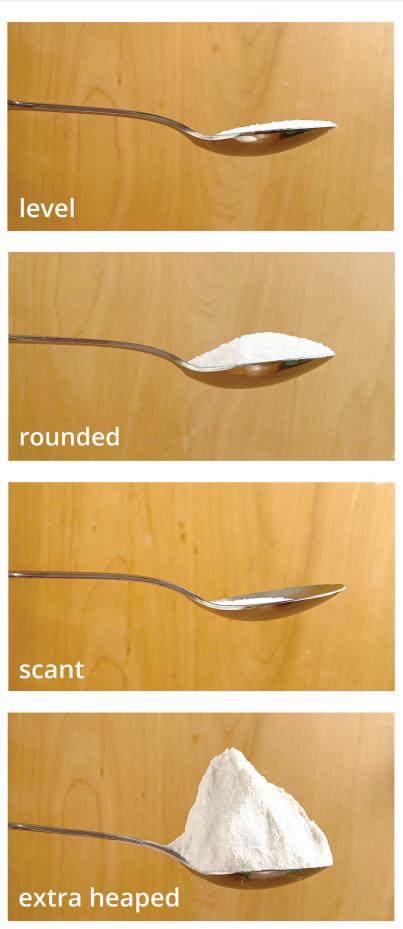
Sample responses:

- About 96 scant teaspoons, assuming a scant teaspoon has half the amount of a level teaspoon
- About 144 scant teaspoons, assuming a scant teaspoon has a third the amount of a level teaspoon

- How many extra-heaped teaspoons are in 1 cup?

Sample responses:

- About 12 extra-heaped teaspoons, assuming an extra-heaped teaspoon has 4 times as much as a level teaspoon.
- About 8 extra-heaped teaspoons, assuming an extra-heaped teaspoon has 6 times as much as a level teaspoon.

**Student Workbook**

Drawing Diagrams to Show Equal-size Groups

Are You Ready for More?
There are 48 level teaspoons in 1 cup. Estimate:

- How many rounded teaspoons are in 1 cup?
- How many scant teaspoons are in 1 cup?
- How many extra-heaped teaspoons are in 1 cup?

level
rounded
scant
extra heaped

Activity Synthesis

Use *Compare and Connect* to help students compare, contrast, and connect the different diagrams and equations. Invite groups to prepare a display that shows the representations they created to answer their assigned question. Encourage students to include details that will help others interpret their thinking. For example, specific language, use of different colors, shading, arrows, labels, and notes. Give students time to investigate each other's work. Urge them to pay attention to two things: how the number of groups, the size of each group, and a total amount can be seen in each diagram, and whether the equations make sense.

During the whole-class discussion, ask questions such as:

- ❑ “How are the diagrams (or equations) for different situations alike? How are they different?”
- “How do the size of each group, the number of groups, and a total amount show up in each diagram (or equation)?”
- “Are there any benefits or drawbacks to one type of diagram compared to another?”

As time permits, invite previously selected students to share features of their diagrams and how the diagrams support their reasoning.

Lesson Synthesis

The purpose of the discussion is to highlight that we can find the number of groups—including when it is not a whole number—when the size of a group is a fraction. Tools such as fraction strips and pattern blocks can support our reasoning.

Consider asking the following questions and using fraction strips or pattern blocks as needed during the discussion:

- ❑ “Suppose we want to find how many $\frac{1}{3}$ s are in 2. How can fraction strips help us? How can block patterns help us?”
Both tools let us see the groups of $\frac{1}{3}$ and count them.
- ❑ “Suppose we want to find how many $\frac{2}{3}$ s are in 3. How many full groups of $\frac{2}{3}$ are in 3?”
4
There's $\frac{1}{3}$ left over. How do we deal with a remainder that is less than 1 full group?
We compare the size of the remainder with the size of 1 group. $\frac{1}{3}$ is half of $\frac{2}{3}$, so it is $\frac{1}{2}$ of a group.
- ❑ “What multiplication equation represents the question ‘How many $\frac{2}{3}$ s are in 3?’”
 $? \cdot \frac{2}{3} = 3$
- ❑ “What division equation represents the same question?”
 $3 \div \frac{2}{3} = ?$

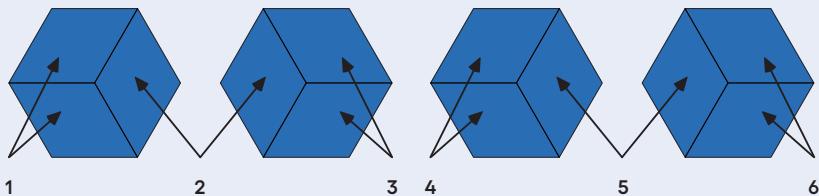
Lesson Summary

Suppose one batch of cookies requires $\frac{2}{3}$ cup of flour. How many batches can be made with 4 cups of flour?

We can think of the question as being: “How many $\frac{2}{3}$ s are in 4?” and represent it using multiplication and division equations.

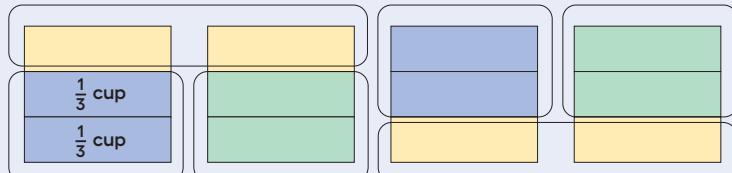
$$\begin{aligned} ? \cdot \frac{2}{3} &= 4 \\ 4 \div \frac{2}{3} &=? \end{aligned}$$

Let’s use pattern blocks to visualize the situation and say that a hexagon is 1 whole.



Since 3 rhombuses make a hexagon, 1 rhombus represents $\frac{1}{3}$, and 2 rhombuses represent $\frac{2}{3}$. We can see that 6 pairs of rhombuses make 4 hexagons, so there are 6 groups of $\frac{2}{3}$ in 4.

Other kinds of diagrams can also help us reason about equal-sized groups involving fractions. This example shows how we might reason about the same question asked earlier: “How many $\frac{2}{3}$ -cup are in 4 cups?”



We can see each “cup” partitioned into thirds, and that there are 6 groups of $\frac{2}{3}$ -cup in 4 cups. In both diagrams, we see that the unknown value (or the “?” in the equations) is 6. So we can now write:

$$\begin{aligned} 6 \cdot \frac{2}{3} &= 4 \\ 4 \div \frac{2}{3} &= 6 \end{aligned}$$

Student Workbook

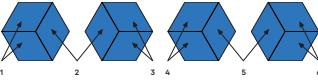
5 Lesson Summary
Suppose one batch of cookies requires $\frac{2}{3}$ cup of flour. How many batches can be made with 4 cups of flour?

We can think of the question as being: “How many $\frac{2}{3}$ s are in 4?” and represent it using multiplication and division equations.

$$7 \cdot \frac{2}{3} = 4$$

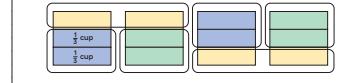
$$4 \div \frac{2}{3} = ?$$

Let’s use pattern blocks to visualize the situation and say that a hexagon is 1 whole.



Since 3 rhombuses make a hexagon, 1 rhombus represents $\frac{1}{3}$, and 2 rhombuses represent $\frac{2}{3}$. We can see that 6 pairs of rhombuses make 4 hexagons, so there are 6 groups of $\frac{2}{3}$ in 4.

Other kinds of diagrams can also help us reason about equal-sized groups involving fractions. This example shows how we might reason about the same question asked earlier: “How many $\frac{2}{3}$ -cup are in 4 cups?”



We can see each “cup” partitioned into thirds, and that there are 6 groups of $\frac{2}{3}$ -cup in 4 cups. In both diagrams, we see that the unknown value (or the “?” in the equations) is 6. So we can now write:

$$6 \cdot \frac{2}{3} = 4$$

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

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Responding To Student Thinking**More Chances**

Students will have more opportunities to understand the mathematical ideas addressed here. There is no need to slow down or add additional work to the next lessons.

Cool-down**Two-fifths in 4**5
min

Make copies of fraction strips available for students who wish to use them.

Student Task Statement

How many $\frac{2}{5}$ s are in 4?

1. Answer the question and show your reasoning.

10

Sample reasoning:

- Ten groups of $\frac{2}{5}$ make $\frac{20}{5}$, which is 4.
- There are 20 fifths in 4, so that means 10 groups of two-fifths.

2. 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. $? \div \frac{2}{5} = 4$

Practice Problems

7 Problems

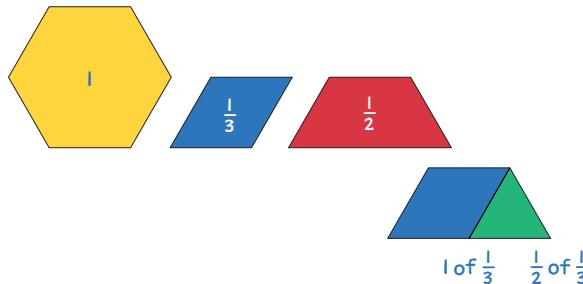
Problem 1

What is the value of $\frac{1}{2} \div \frac{1}{3}$? Use pattern blocks to represent and find this value.

The yellow hexagon represents 1 whole. Explain or show your reasoning.

$$1\frac{1}{2}$$

Sample reasoning:



One rhombus and $\frac{1}{2}$ of a rhombus compose one trapezoid.

Problem 2

Use a standard inch ruler to answer each question. Then, write a multiplication equation and a division equation that answer the question.

a. How many $\frac{1}{2}$ s are in 7?

- Multiplication: $14 \cdot \frac{1}{2} = 7$ (or equivalent)
- Division: $7 \div \frac{1}{2} = 14$

b. How many $\frac{3}{8}$ s are in 6?

- Multiplication: $16 \cdot \frac{3}{8} = 6$ (or equivalent)
- Division: $6 \div \frac{3}{8} = 16$

c. How many $\frac{5}{16}$ s are in $1\frac{7}{8}$?

- Multiplication: $6 \cdot \frac{5}{16} = 1\frac{7}{8}$ (or equivalent)
- Division: $1\frac{7}{8} \div \frac{5}{16} = 6$

Student Workbook

LESSON 5

PRACTICE PROBLEMS

1. What is the value of $\frac{1}{2} + \frac{1}{3}$? Use pattern blocks to represent and find this value. The yellow hexagon represents 1 whole. Explain or show your reasoning.



2. Use a standard inch ruler to answer each question. Then, write a multiplication equation and a division equation that answer the question.

a. How many $\frac{1}{2}$ s are in 7?

b. How many $\frac{3}{8}$ s are in 6?

c. How many $\frac{5}{16}$ s are in $1\frac{7}{8}$?



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Lesson 5 Practice Problems

Student Workbook

5 Practice Problems

1 Use the tape diagram to answer the question: How many $\frac{2}{5}$ s are in $1\frac{1}{2}$? Show your reasoning.

a. How many groups of $\frac{1}{2}$ are in the following quantities?

- $3\frac{5}{8}$
- $4\frac{1}{4}$
- $7\frac{3}{4}$

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Student Workbook

5 Practice Problems

from Unit 4, Lesson 4 Write a multiplication equation and a division equation to represent each sentence or diagram.

a. There are 12 fourths in 3.

b.

c. How many $\frac{2}{3}$ s are in 6?

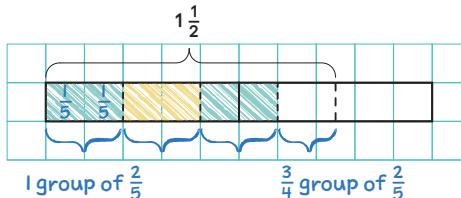
d.

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Problem 3

Use the tape diagram to answer the question: How many $\frac{2}{5}$ s are in $1\frac{1}{2}$? Show your reasoning.

$3\frac{3}{4}$



Problem 4

How many groups of $\frac{1}{2}$ are in the following quantities?

a. $3\frac{5}{8}$

$7\frac{1}{4}$

b. $4\frac{1}{4}$

$8\frac{1}{2}$

c. $7\frac{3}{4}$

$15\frac{1}{2}$

Problem 5

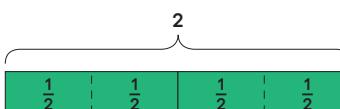
from Unit 4, Lesson 4

Write a multiplication equation and a division equation to represent each sentence or diagram.

- a. There are 12 fourths in 3.

$12 \cdot \frac{1}{4} = 3$ (or equivalent), e.g., $3 \div \frac{1}{4} = 12$ or $3 \div \frac{1}{4} = 12$

- b.

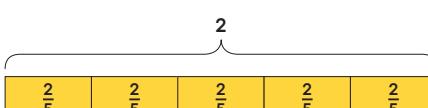


$4 \cdot \frac{1}{2} = 2$ (or equivalent), e.g., $2 \div \frac{1}{2} = 4$ or $2 \div \frac{1}{2} = 4$

- c. How many $\frac{2}{3}$ s are in 6?

$? \cdot \frac{2}{3} = 6$ (or equivalent), $6 \div \frac{2}{3} = ?$ (or equivalent)

- d.



$5 \cdot \frac{2}{5} = 2$ (or equivalent), $2 \div 5 = \frac{2}{5}$ (or equivalent)

Lesson 5 Practice Problems

Problem 6

from Unit 3, Lesson 4

At a farmer's market, two vendors sell fresh milk. One vendor sells 2 liters for \$3.80, and another vendor sells 1.5 liters for \$2.70. Which is the better deal? Explain your reasoning.

Sample response: 1.5 liters at \$2.70 is a better deal. The 1.5-liter-size costs \$1.80 per liter since $2.70 \div 1.5 = 1.80$. The 2-liter size costs \$1.90 per liter because $3.80 \div 2 = 1.90$. The 1.5-liter bottle is less expensive per liter.

Problem 7

from Unit 3, Lesson 5

A recipe uses 5 cups of flour for every 2 cups of sugar.

a. How much sugar is used for 1 cup of flour?

$\frac{2}{5}$ or 0.4 cup of sugar are used for every cup of flour.

b. How much flour is used for 1 cup of sugar?

$\frac{5}{2}$ or 2.5 cups of flour are used for every cup of sugar.

c. How much flour is used with 7 cups of sugar?

$17.5 \cdot (2.5) = 17.5$ so with 7 cups of sugar, there will be 17.5 or $17\frac{1}{2}$ cups of flour.

d. How much sugar is used with 6 cups of flour?

$(0.4) \cdot 6 = 2.4$ so with 6 cups of flour, there will be 2.4 or $2\frac{2}{5}$ cups of sugar.

flour (cups)	sugar (cups)
5	2
1	$\frac{2}{5}$
$\frac{5}{2}$	1
$\frac{35}{2}$	7
6	$\frac{12}{5}$

Student Workbook

6 Practice Problems
from Unit 3, Lesson 4
At a farmer's market, two vendors sell fresh milk. One vendor sells 2 liters for \$3.80, and another vendor sells 1.5 liters for \$2.70. Which is the better deal? Explain your reasoning.

7 from Unit 3, Lesson 5
A recipe uses 5 cups of flour for every 2 cups of sugar.

a. How much sugar is used for 1 cup of flour?

b. How much flour is used for 1 cup of sugar?

c. How much flour is used with 7 cups of sugar?

d. How much sugar is used with 6 cups of flour?

Learning Targets

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

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