SAVVAS

Grade 5

Let's Investigate Take and Teach

enVision+ MATHEMATICS

Real-World Math. Real-World Ready.

Let's Investigate

Lesson

9-1 Fractions and Division

FOCUS

Mathematics Objective Use prior knowledge of fractions to understand how fractions are related to division.

Language Objective Describe, orally and in writing, the patterns that connect fractions to division of whole numbers.

Essential Understanding A fraction can be interpreted as the division of the numerator by the denominator.

COHERENCE

Look Back Previously, students extended their understanding of fractions to recognize $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, that is $\frac{a}{b} = a \times \frac{1}{b}$.

This Lesson Students learn to use concepts of division to extend their understanding of the fraction $\frac{a}{b}$ to learn that $a \div b = \frac{a}{b}$.

Look Ahead The next lesson explicitly develops the concepts of division to extend their understanding of the fraction $\frac{a}{b}$ to learn that $a \div b = \frac{a}{b}$.

Cross-Cluster Connection Relating fractions to division connects to using division concepts to find whole-number quotients.

RIGOR

Conceptual Understanding Students explore their understanding of division and fractions by relating them as $\frac{a}{b} = a \div b$.

Vocabulary

none

Materials

- Fraction models: squares (or Teaching Tool 28)

Student Resources

Family Engagement

Intervention System (IS)
H17 Fractions and Division

Teacher Resources

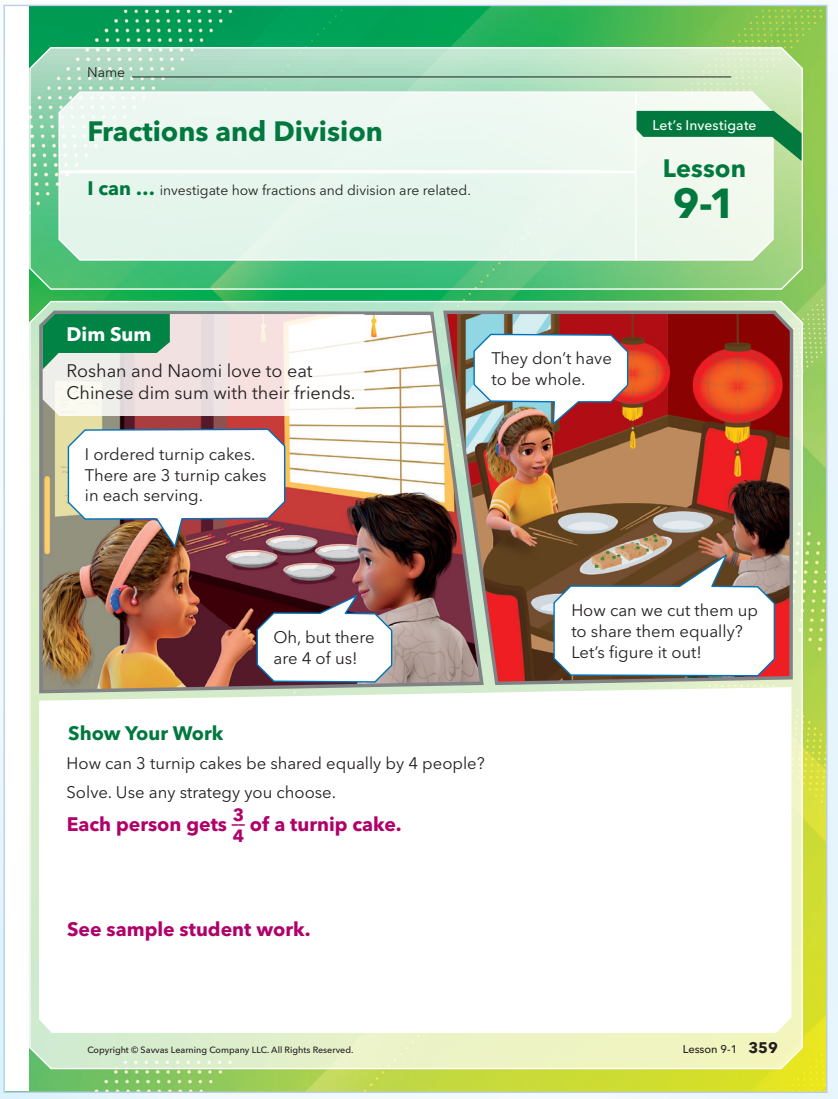
enVision on the Go

Exit Ticket Support for using the Exit Ticket is available online.

Step 1 Investigate

10-25 min

Investigate Scout Observational Assessment



Name _____

Fractions and Division

I can ... investigate how fractions and division are related.

Let's Investigate

Lesson 9-1

Dim Sum

Roshan and Naomi love to eat Chinese dim sum with their friends.

I ordered turnip cakes. There are 3 turnip cakes in each serving.

Oh, but there are 4 of us!

They don't have to be whole.

How can we cut them up to share them equally? Let's figure it out!

Show Your Work

How can 3 turnip cakes be shared equally by 4 people?

Solve. Use any strategy you choose.

Each person gets $\frac{3}{4}$ of a turnip cake.

See sample student work.

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MENU

I'd like some spring rolls.

Each serving has 5 rolls. Let's order one serving.

How can we divide them so we each get the same amount?

Show Your Work

How can 5 spring rolls be shared equally by 4 people?

Solve. Use any strategy you choose.

Each person gets $1\frac{1}{4}$ spring rolls.

See sample student work.

Build G.R.I.T. Develop a growth mindset.

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MTP Anticipate

Anticipate students' solution strategies. Think of various ways students might use their prior knowledge to solve the problem. See the next page for sample student work.

Introduce the Investigation

Use the Slow Reveal Slides You might use the slides to reveal part of the information. Then ask: What do you notice? What do you wonder?

Elevate Student Voice: Engage Students in the Context Have students bring their own unique experiences and ideas to the situation by using prompts like these, ask:

- Have you ever shared a favorite food with friends? How did you share the servings equally?
- Tell about a time you tried to equally share something so that each person got the same amount, such as food or prizes. How did you decide how much each person got?

Check for Understanding

MLR6 Three Reads

Read the task to the class. Ask:

- What is the task about?
- What are Naomi and Roshan wanting to share?

Have students read the task by themselves. Ask:

- How many people will be sharing the food?
- What did Naomi notice about a serving of turnip cakes?

Have a student read the task to the class. Ask:

- What is the task asking you to find?
- What two questions did Naomi and Roshan ask?

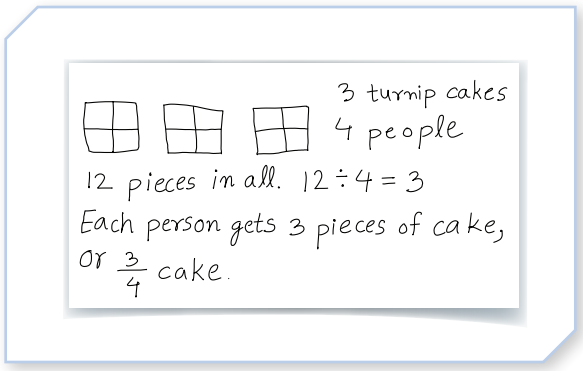
Step 1 Investigate *continued*

Sample Student Work

Dim Sum Problem A

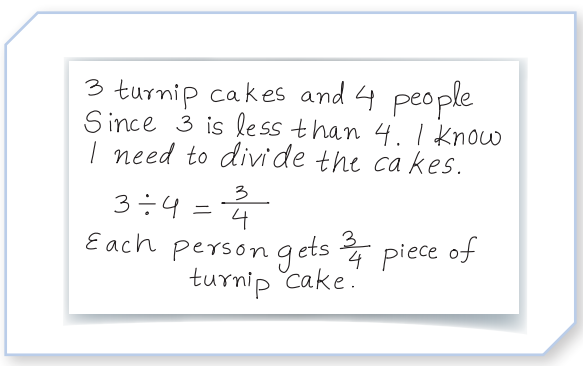
Solve a problem involving equally dividing 3 whole turnip cakes between 4 people (division of whole numbers; $3 \div 4$) leading to an answer in the form of a fraction ($\frac{3}{4}$) so that a fraction can be interpreted as a division problem.

- **Viktor drew a model showing dividing the cakes into 4 equal pieces.** He determined there would be 12 pieces in total, which divides equally into 3, so each person would get $3\frac{1}{4}$-sized pieces or $\frac{3}{4}$ of a piece of cake.



You might ask Viktor: How did you know you needed to divide the cakes into smaller fourths? [Listen for "Since there were more people than cakes, I knew I needed to divide each cake into pieces equal to the number of people."]

- **Gabrielle recognized that division would lead to a fraction.** She knew that each person would get less than a whole cake. When she divided 3 by 4 she found the answer to be a fraction.

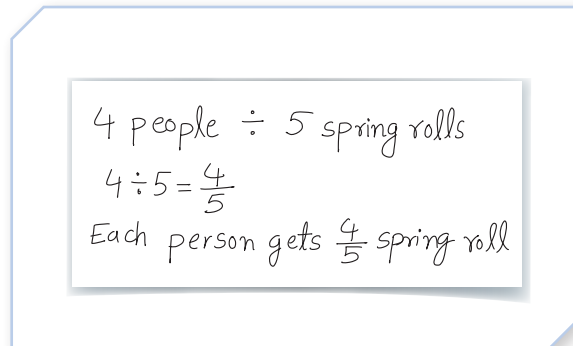


You might ask Gabrielle: How did you know that $3 \div 4$ equals $\frac{3}{4}$? [Listen for "Dividing 3 by 4 is the same as saying 3 parts of 4 or $\frac{3}{4}$."]

Dim Sum Problem B

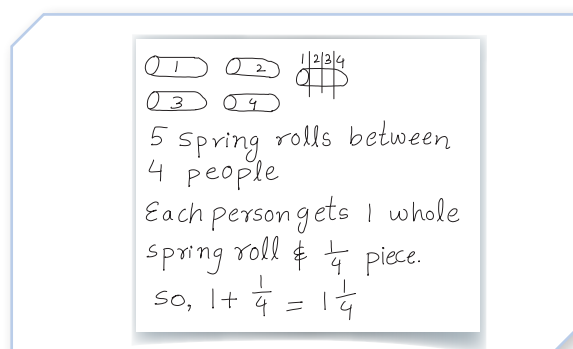
Solve a problem involving equally dividing 5 whole spring rolls between 4 people (division of whole numbers; $5 \div 4$) leading to answers in the form of a mixed number ($1\frac{1}{4}$) so that division can also be interpreted as a fraction.

- **Marvin used division to find a fraction.** He divided 4 by 5 and recognized the relationship between fractions and division. **Misconception** He reversed the dividend and divisor, so his quotient is incorrect.



You might ask Marvin: Why did you divide 4 by 5? [Listen for "There are four people and 5 spring rolls to share. Oh, I should divide the spring rolls, not the people."]

- **Lindsey drew a model and used reasoning to count equal portions.** She knew each person would get 1 whole portion and then divided the final whole into equal $\frac{1}{4}$-sized portions. Then she added to find the total portion for each person.



You might ask Lindsey: Why did you draw the lines on the fifth spring roll? [Listen for "So I could show splitting the spring roll into equal $\frac{1}{4}$-sized pieces."]

Step 1 Investigate *continued*

MTP Monitor

Monitor Students at Work Ask questions to assess and advance students' thinking.

Assessing Questions

Questions for Students to Understand Their Thinking

- Ask: Can you tell/show me what you did?
- Ask: How can you write a division expression to represent each serving that will be shared equally?

Questions for You as You Observe

- How are students representing the problem?
- What prior knowledge are they using to find the answer in the form of a fraction or mixed number?

Advancing Questions

Questions to Ask Students Who Need Help

- If students cannot get started, ask: How many people will be sharing the foods? [4]
- If students' work is incorrect, ask: How did you get that answer? Listen for understandings and build on what they know.

Questions to Help Students Think More Deeply

- Ask: Is there another way to solve the problems?
- Ask: Do you notice a pattern in how division and fractions might be related?

Early Finishers

Ask: How would you share 9 spring rolls among 4 people? How about 8 people? [Sample answer: $9 \div 4 = \frac{9}{4}$ or $2\frac{1}{4}$ spring rolls each; $9 \div 8 = \frac{9}{8}$ or $1\frac{1}{8}$ spring roll each.]

MTP Select and Sequence

Select and Sequence Students' Solutions for them to present with the goal of building understanding of key concepts.

Start with solutions that show a common error of not correctly determining which number is the divisor. (Marvin)

Then show solutions that model the problem to find a fractional portion. (Viktor, Lindsey)

Finally, show solutions that use a division expression to find the answer as a fraction. (Gabrielle)

Step 2 Connect

10-55 min

MTP Connect

Name _____

Connect

1. **Model with Math** Why can you use division to solve these problems?
   Sample answer: The problems are about separating into equal groups.

2. **Use Structure** How were the solutions to the two problems alike? How were they different?
   Sample answer: The number of people tells you how many groups to make. Since there were the same number of people for both problems, the solutions had the same denominators. In the first problem, there were more people than objects, so the answer was less than 1. But in the second problem, there were fewer people than objects, so the answer was greater than 1.

3. **Look for Relationships** What do you think would happen if there were 2 rice noodle rolls and 3 people? Does that follow the same pattern of the two problems you just solved?
   Sample answer: Each person gets $\frac{2}{3}$. Yes; you divide the number of servings by the number of people.

Talk About Big Ideas Suppose you divide two whole numbers and get a fraction for the quotient. How are those whole numbers related to the fraction?

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Connect Solution Strategies Discuss students' work. Ask how the solutions are similar and different. Help students see that Viktor and Lindsey broke the food servings into equal pieces while Gabrielle wrote a division expression. But they found that dividing a whole number by 4 resulted in answers as fractions with 4 as the denominator.

Connect to Key Concepts Use the Connect questions to build understanding of the key concept at the top of the next page.

MTP Talk About Ideas

Have students engage in a think-pair-share to discuss the relationship between division and fractions. Listen for students who recognized that a division problem can be written as a fraction so that the dividend matches the numerator, and the divisor matches the denominator.

Step 3 Practice and Problem Solving

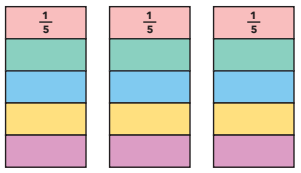
10-15 min

Interactive Practice Adaptive Practice

5 cats share 3 boxes of cat food equally. How much does each cat get?

Divide each box into fifths.

Each cat gets $\frac{1}{5}$ of each box. This is the same as $\frac{3}{5}$ of 1 box.



You can use a fraction to represent the result of dividing two whole numbers. When b is not 0, $a \div b = \frac{a}{b}$.

$3 \div 5 = \frac{3}{5}$ Each cat gets $\frac{3}{5}$ of a box.

Practice and Problem Solving

Lesson Help

For **1–4**, write each division expression as a fraction or mixed number.

1. $1 \div 10$ **$\frac{1}{10}$** **2.** $7 \div 12$ **$\frac{7}{12}$** **3.** $5 \div 3$ **$\frac{5}{3}$ or $1\frac{2}{3}$** **4.** $6 \div 8$ **$\frac{6}{8}$ or $\frac{3}{4}$**

For **5–8**, write a division expression for each fraction. **Sample answers given.**

5. $\frac{6}{7}$ **$6 \div 7$** **6.** $\frac{1}{4}$ **$1 \div 4$** **7.** $\frac{7}{9}$ **$7 \div 9$** **8.** $\frac{8}{5}$ **$8 \div 5$**

For **9–12**, tell what fraction each person gets when they share equally.

9. 8 students share 6 breakfast bars.
$\frac{6}{8}$ or $\frac{3}{4}$ of a breakfast bar

10. 2 children share 3 oranges.
$\frac{3}{2}$ or $1\frac{1}{2}$ oranges

11. 10 friends share 7 dollars.
$\frac{7}{10}$ of a dollar

12. 5 friends share 5 muffins
$\frac{5}{5}$ or 1 muffin

Assessment Practice

13. Which equation is **NOT** true?

Ⓐ $3 \div 10 = \frac{3}{10}$
Ⓑ $6 \div 9 = \frac{6}{9}$
Ⓒ $4 \div 7 = \frac{7}{4}$
Ⓓ $9 \div 5 = \frac{9}{5}$

14. Which equation is made true with the number 5?

Ⓐ $2 \div \square = \frac{2}{5}$
Ⓑ $4 \div 20 = \square$
Ⓒ $\square \div 5 = \frac{1}{5}$
Ⓓ $\square \div 6 = \frac{6}{5}$

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MLL Multilingual Learners Reading

Emerging Read the first sentence on the page with students. Then write "share equally" on the board. Ask: What does *share equally* mean? [To get the same amount] Draw a picture to represent 10 notebooks shared equally among 5 people. Circle 5 groups of 2 notebooks. Say: The 10 notebooks have been *shared equally* among 5 people. This means each person gets 2 notebooks, or the same number of notebooks. Have students point to the text and read *shared equally*.

Expanding Have students read the first sentence on the page. Ask: What does it mean to *share* something *equally*? [To get the same amount] Ask students to draw a picture to illustrate the idea of something being *shared equally*.

Bridging Have students read the first sentence on the page with a partner. Then have partners draw a picture of a new problem that shows something being *shared equally*.

Reflection

Have students look at the models at the top of the page. Ask: Why are the models split into $\frac{1}{5}$? [Sample answer: To show each box is shared equally between 5 cats] Ask: What is represented by the division expression written under the models? [3 boxes of food divided between 5 cats.] Ask: How can you represent the division of whole numbers as a fraction? [Sample answer: The first number (dividend) is the numerator, and the second number (divisor) is the denominator.]

Error Intervention Item 9
If students are unsure which number is the dividend and which is the divisor,
then encourage them to draw a model of the problem to help them realize which is being shared, or divided, the students or the breakfast bars.

Item 12 Remind students that fractions can be rewritten in their simplest form, so $\frac{5}{5}$ can be rewritten as a whole number.

MTP Quick Check

Formative Assessment

Check marks indicate items for prescribing differentiation. Item 13: 1 point. Items 3 and 9: up to 2 points. The online Quick Check is auto scored and auto prescribes differentiation.

Step 4 Assess and Differentiate

10-15 min

Additional Practice

Name _____

Additional Practice

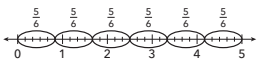
Fractions and Division **9-1**

Another Look!

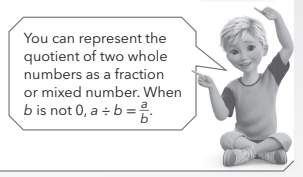
Video

$5 \div 6 = ?$

Divide 5 wholes into 6 equal parts. You can show this on a number line marked in sixths.



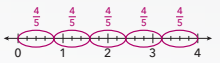
Each part is $\frac{5}{6}$. So $5 \div 6 = \frac{5}{6}$.



1. Use the number line or draw another model to show $4 \div 5$. Then complete the equation.

$4 \div 5 = \frac{4}{5}$

Sample answer:



For **2–5**, write each division expression as a fraction or mixed number.

2. $5 \div 8$ — $\frac{5}{8}$

3. $10 \div 12$ — $\frac{10}{12}$ or $\frac{5}{6}$

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

5. $1 \div 15$ — $\frac{1}{15}$

For **6–9**, write a division expression for each fraction.

6. $\frac{3}{10}$ — $3 \div 10$

7. $\frac{1}{8}$ — $1 \div 8$

8. $\frac{5}{12}$ — $5 \div 12$

9. $\frac{7}{4}$ — $7 \div 4$

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For **10–13**, tell what fraction each person gets when they share equally.

10. 8 friends share 3 submarine sandwiches.
$\frac{3}{8}$ of a sandwich

11. 8 people share 10 burritos.
$\frac{10}{8}$ or $1\frac{1}{4}$ burritos

12. 4 children share 9 waffles.
$\frac{9}{4}$ or $2\frac{1}{4}$ waffles

13. 16 campers share 12 bags of trail mix.
$\frac{12}{16}$ or $\frac{3}{4}$ of a bag

14. Six friends equally share the ribbon shown. What fraction of a yard of red ribbon does each friend get? Blue ribbon? Green ribbon?
Red: $\frac{4}{6}$ or $\frac{2}{3}$ yard; blue: $\frac{7}{6}$ or $1\frac{1}{6}$ yards; green: $\frac{15}{6}$ or $2\frac{1}{2}$ yards

15. **Use Structure** Toya says, "You can always write the quotient of two whole numbers as a fraction or mixed number as long as you're not dividing by zero." Navin says, "That's not true. I divided $12 \div 4$ and got a whole number 3, not a fraction." Who is correct? Explain.
Toya is correct. Sample answer: You can write the quotient of $12 \div 4$ as $\frac{12}{4}$, which is a fraction.

16. **Higher Order Thinking** Explain how you could easily write a division expression for $1\frac{4}{5}$.
Sample answer: Write $1\frac{4}{5}$ as $\frac{9}{5}$. A division expression for $\frac{9}{5}$ is $9 \div 5$. So, a division expression for $1\frac{4}{5}$ is also $9 \div 5$.

Assessment Practice

17. Which equation is **NOT** true?

Ⓐ $6 \div 5 = \frac{6}{5}$
Ⓑ $7 \div 10 = \frac{10}{7}$
Ⓒ $5 \div 8 = \frac{5}{8}$
Ⓓ $3 \div 12 = \frac{1}{4}$

18. Which equation is made true with the number 8?

Ⓐ $5 \div \square = \frac{8}{5}$
Ⓑ $2 \div 16 = \square$
Ⓒ $\square \div 10 = \frac{4}{5}$
Ⓓ $2 \div \square = 4$

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Differentiation Library

The **Differentiation Library** at the beginning of this topic shows the differentiation options available, each of which can be appropriate for all students. However, based on the **Quick Check** results, you may choose to prescribe:

0–3 points: Intervention Activity or Reteach to Build Understanding Activity

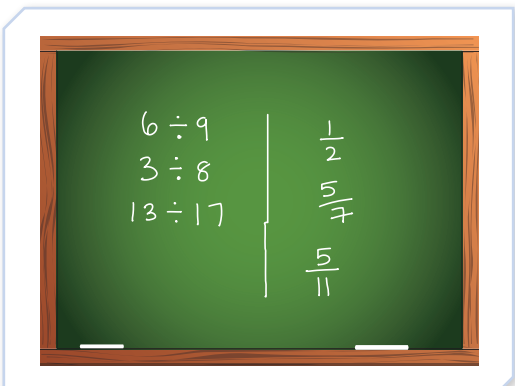
4–5 points: Enrichment Activity

In addition, **Multilingual Learners** may benefit from the Build Mathematical Literacy Activity.

Intervention Activity

Materials Pencils, Paper

- Display these division expressions and fractions on the board. Ask students to write the division expressions shown as fractions. Then ask them to write the fractions shown as division expressions.



- Ask students to write both a division expression and a fraction to represent each of these situations:

  5 girls share 6 apples.
  7 boys share 14 oranges.
  8 friends share 3 pizzas.
  6 friends share 5 pounds of trail mix.

Video Tutorial

Another Look Video

Intentional Blank Page

Name _____

Fractions and Division

Let's Investigate

Lesson 9-1

I can ... investigate how fractions and division are related.

Dim Sum

Roshan and Naomi love to eat Chinese dim sum with their friends.

Show Your Work

How can 3 turnip cakes be shared equally by 4 people?

Solve. Use any strategy you choose.

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Show Your Work

How can 5 spring rolls be shared equally by 4 people?

Solve. Use any strategy you choose.

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Name _____

Connect

1. **Model with Math** Why can you use division to solve these problems?

2. **Use Structure** How were the solutions to the two problems alike? How were they different?

3. **Look for Relationships** What do you think would happen if there were 2 rice noodle rolls and 3 people? Does that follow the same pattern of the two problems you just solved?

TALK ABOUT IDEAS Suppose you divide two whole numbers and get a fraction for the quotient. How are those whole numbers related to the fraction?

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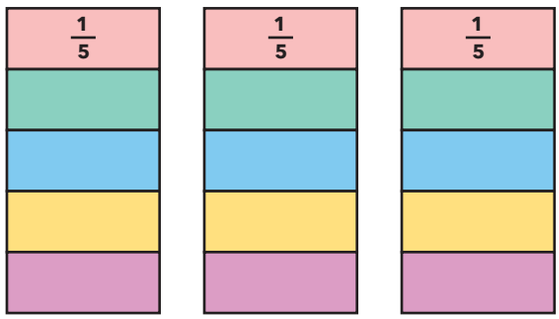
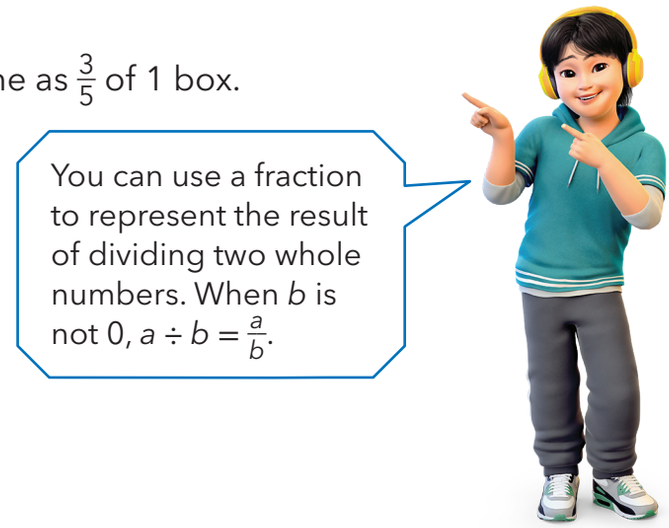
5 cats share 3 boxes of cat food equally. How much does each cat get?

Divide each box into fifths.

Each cat gets $\frac{1}{5}$ of each box. This is the same as $\frac{3}{5}$ of 1 box.



$3 \div 5 = \frac{3}{5}$ Each cat gets $\frac{3}{5}$ of a box.



Practice and Problem Solving

Lesson Help

For **1–4**, write each division expression as a fraction or mixed number.

1. $1 \div 10$ **2.** $7 \div 12$ **3.** $5 \div 3$ **4.** $6 \div 8$

For **5–8**, write a division expression for each fraction.

5. $\frac{6}{7}$ **6.** $\frac{1}{4}$ **7.** $\frac{7}{9}$ **8.** $\frac{8}{5}$

For **9–12**, tell what fraction each person gets when they share equally.

9. 8 students share 6 breakfast bars.

10. 2 children share 3 oranges.

11. 10 friends share 7 dollars.

12. 5 friends share 5 muffins

Assessment Practice

13. Which equation is **NOT** true?

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