



$$\frac{3}{2} = \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$$



## Sampler



# Student Book: Introduction

The Introduction presents a problem or poses a “big idea” question that connects what students already know to what they are about to learn.

## Use What You Know *(whole class)*

**Teacher’s Role** As students answer the questions on the page, ask them to explain their reasoning and help them see how they can use what they already know to solve the problem.

Use *Real World Connections* in the Teacher Resource Book (TRB) for active learning as students connect the math of the lesson to their own experiences. Encourage students from other cultures to share their experiences.

**Student’s Role** Students who come to understand that they can apply what they have already learned to new problem situations develop a deeper understanding of mathematical relationships. This understanding allows them to see mathematics as interconnected concepts and skills rather than as separate, unrelated ideas.

## Lesson 16 Introduction

### Add and Subtract Fractions

4.NF.B.3a  
4.NF.B.3d

#### Use What You Know

In Lesson 15, you learned that adding fractions is a lot like adding whole numbers. Take a look at this problem.

Lynn, Paco, and Todd split a pack of 12 baseball cards. Lynn gets 4 cards, Paco gets 3 cards, and Todd gets the rest of the cards. What fraction of the pack does Todd get?



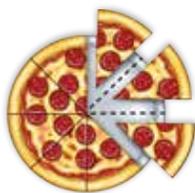
- How many cards do Lynn and Paco get altogether? \_\_\_\_\_
- How many cards does Todd get? \_\_\_\_\_
- There are 12 cards in the pack. What fraction represents the whole pack of cards? \_\_\_\_\_
- If Lynn gets 4 cards out of 12, that means she gets  $\frac{4}{12}$  of the pack. If Paco gets 3 cards out of 12, what fraction of the pack does he get? \_\_\_\_\_
- What fraction of the pack do Lynn and Paco get altogether? \_\_\_\_\_
- Explain how you could find the fraction of the pack that Todd gets.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Find Out More**

We often use **fractions** in real life. Fractions can describe something that has several equal parts, as in the baseball card problem. In that problem the “whole” is the pack of cards. Since there are 12 cards in the pack, each card represents  $\frac{1}{12}$  of the whole.



Fractions in real life can also describe the equal parts of a single object, such as a pizza cut into 8 equal slices. The pizza is the “whole,” and all the slices of pizza are equal parts of the same whole. Since there are 8 equal-sized slices, each slice is  $\frac{1}{8}$  of the pizza. Even if a person takes away one or more slices, the “whole” is still the same 8 slices.



**Reflect**

1 Give another example of a “whole” object with equal parts that can be described by fractions.

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**Find Out More** (whole class)

**Teacher’s Role** Discuss as a class, guiding students to see how the questions they just answered and the formal mathematics presented are related. Use the suggestions in the Step By Step to help guide the discussion. Use the *Hands-On Activities* in the TRB to reinforce a skill or concept through another, often concrete, approach. Hands-On Activities can help ELL and other students visualize concepts.

**Student’s Role** As they engage intellectually with the content, students build foundational understanding of what they will be learning in the lesson.

**Reflect** (small group)

**Student’s Role** By summarizing what they have learned in their own words, students are encouraged to look for and make use of structure.

**Teacher’s Role** Have students read and discuss the *Reflect*, then write an answer in their own words. Observe responses to assess student’s understanding.

**Teacher’s Role** Assign *Practice and Problem Solving* as independent work in class or at home for additional practice with key prerequisite skills of the lesson.

# Student Book: Modeled and Guided Instruction

The Modeled and Guided Instruction supports students as they explore different ways of solving a real-world or mathematical problem.

## Lesson 16 Modeled and Guided Instruction

### Learn About Adding Fractions

Read the problem. Then explore different ways to understand adding fractions.

Josie and Margo are painting a fence green. Josie starts at one end and paints  $\frac{3}{10}$  of the fence. Margo starts at the other end and paints  $\frac{4}{10}$  of it. What fraction of the fence do they paint?

#### Picture It/Model It *(whole class)*

**Teacher's Role** Read the problem at the top of the page, then work through the *Picture It* and *Model It* as a class. Pose the scaffolded questions to guide students' understanding of the approaches on the page.

Use *Mathematical Discourse* questions in the Teacher Resource Book (TRB) to promote thoughtful dialogue about the models and strategies. Encourage the exchange of ideas among students by having them suggest solution methods that differ from those shown. Have students share which solution strategy works best for them and explain why.

**Student's Role** As they discuss different ways of representing a given problem, students begin to understand there are multiple access points from which they can draw on prior knowledge.

Looking at other ways to solve the problem encourages students to think in ways they would not have otherwise, building flexibility in their ability to solve problems.

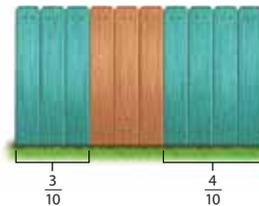
**Picture It** You can use a picture to help understand the problem.

Think what the fence might look like. It has 10 equal-sized parts.

Each part is  $\frac{1}{10}$  of the whole.

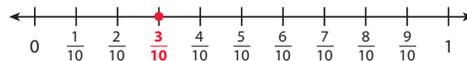


The girls paint 3 tenths and 4 tenths of the fence.

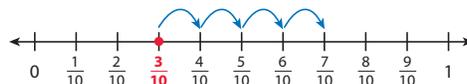


**Model It** You can also use a number line to help understand the problem.

The number line below is divided into tenths, with a point at  $\frac{3}{10}$ .



Start at  $\frac{3}{10}$  and count 4 tenths to the right to add  $\frac{4}{10}$ .



## Student Instruction Book

**Connect It** Now you will solve the problem from the previous page using equations.

- 2 How do you know that each section of fence is  $\frac{1}{10}$  of the total fence?

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- 3 What do the numerators, 3 and 4, tell you? \_\_\_\_\_

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- 4 How many sections of the fence did Josie and Margo paint altogether? \_\_\_\_\_

- 5 Complete the equations to show what fraction of the fence Josie and Margo painted altogether.

Use words: **3 tenths** + **4 tenths** =  tenths

Use fractions:  $\frac{3}{10}$  +  $\frac{4}{10}$  =  $\frac{\text{ } \text{ }}{10}$

- 6 Explain how you add fractions that have the same denominator.

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**Try It** Use what you just learned to solve these problems. Show your work on a separate sheet of paper.

- 7 Lita and Otis are helping their mom clean the house. Lita cleaned  $\frac{1}{3}$  of the rooms. Otis cleaned  $\frac{1}{3}$  of the rooms. What fraction of the rooms did Lita and Otis clean altogether? \_\_\_\_\_

- 8 Mark's string is  $\frac{1}{5}$  of a meter long. Bob's string is  $\frac{3}{5}$  of a meter long. How long are the two strings combined? \_\_\_\_\_ of a meter

**Connect It** (whole class)

**Teacher's Role** Discuss the *Connect It* as a class, guiding students to make the connection between the representations on the previous page and a more general symbolic representation of the problem and solution.

Use *SMP Tips* in the TRB to help students advance through the content, critically analyze information, and use complex cognitive thinking. This reflects the expectation that students are actively engaged in doing mathematics rather than passively receiving mathematics instruction.

**Student's Role** Students who engage with the symbolic representations by making and defending conjectures are able to apply what they have learned to solve similar problems. This helps them understand their own progress as they look for approaches that work best for them and find what they still need feedback on.

**Try It** (small group)

**Student's Role** Discussing how the responses to the *Connect It* relate to the problem they are about to solve adds to students' understanding as they apply the newly learned skill to a new situation.

**Teacher's Role** Have students read and discuss the *Try It*, then solve the problems on their own. Look for errors in student thinking and use the TRB *Error Alerts* to provide support.

**Teacher's Role** Assign *Practice and Problem Solving* as independent work in class or at home for additional practice with the skills of the lesson.

# Student Book: Guided Practice

The Guided Practice provides feedback to students as they share their thinking and find solutions to real-world problems.

## Lesson 16 Guided Practice

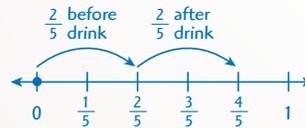
### Adding and Subtracting Fractions

Study the example below. Then solve problems 16–18.

#### Example

Jessica hiked  $\frac{2}{5}$  of a mile on a trail before she stopped to get a drink of water. After her drink, Jessica hiked another  $\frac{2}{5}$  of a mile. How far did Jessica hike in all?

Look at how you could show your work using a number line.



**Solution** Jessica hiked  $\frac{4}{5}$  of a mile.



The student used labels and “jump” arrows to show each part of the hike on a number line. It is just like adding whole numbers!

#### Pair/Share

How else could you solve this problem?

- 16 Ruth made 1 fruit smoothie. She drank  $\frac{1}{3}$  of it. What fraction of the fruit smoothie is left?

Show your work.

**Solution** \_\_\_\_\_



What fraction represents the whole fruit smoothie?

#### Pair/Share

How did you and your partner decide what fraction to start with?

#### Example (whole class)

**Teacher’s Role** Have students work together in small groups to respond to the *Pair/Share* question. Encourage students to explore multiple approaches and use both linguistic and nonlinguistic representations.

**Student’s Role** As students explain their solutions and strategies to their peers, they develop the understanding that there are many ways to formulate real-life situations as mathematical problems. Hearing other approaches guides them to look at each problem from multiple perspectives, enriching their understanding of the mathematics and helping them make connections.

#### Problems (small group)

**Student’s Role** Students work individually to represent their mathematical solutions in concrete, symbolic, or written form as they solve real-world problems.

In the *Pair/Share* discussion, students explain their solution pathways to others and respond to clarifying questions. This encourages students to examine their premises and build logical arguments.

**Teacher’s Role** Circulate and ask guiding questions that require students to elaborate on important information and summarize their thinking.

## Student Instruction Book

- 17 Mr. Chang has a bunch of balloons.  $\frac{3}{10}$  of the balloons are red.  $\frac{2}{10}$  of the balloons are blue. What fraction of the balloons are neither red nor blue?

Show your work.

Solution \_\_\_\_\_

- 18 Emily ate  $\frac{1}{6}$  of a bag of carrots. Nick ate  $\frac{2}{6}$  of the bag of carrots. What fraction of the bag of carrots did Emily and Nick eat altogether? Circle the letter of the correct answer.

- A  $\frac{1}{6}$
- B  $\frac{1}{3}$
- C  $\frac{3}{6}$
- D  $\frac{3}{12}$

Rob chose **D** as the correct answer. How did he get that answer?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



I think that there are at least two different steps to solve this problem.

### Pair/Share

How is this problem different from the others you've seen in this lesson?



To find the fraction of the bag Emily and Nick ate altogether, should you add or subtract?

### Pair/Share

Does Rob's answer make sense?

### Pair/Share (small group)

**Student's Role** Actively discussing their approaches after solving a problem on their own helps students identify what they are clear about and where they are confused. As they are challenged to justify their thinking, they gain experience in providing logical explanations.

**Teacher's Role** Continue to have students solve each problem individually, then *Pair/Share* to discuss the solution pathways they chose. Observe discussions, listening for indications that students are actively engaging with content to gain understanding.

Use the *Solutions* in the Teacher Resource Book as examples of one way to solve the problem. Encourage students to tell how their solutions are similar to or different from these solutions.

**Teacher's Role** Assign *Practice and Problem Solving* as independent work in class or at home for additional practice with all the skills of the lesson.

# Student Book: Independent Practice

The Independent Practice provides students with questions in a variety of assessment formats that integrate and extend concepts and skills.

## Lesson 16 Independent Practice

### Practice Adding and Subtracting Fractions

#### Problem (independent)

**Student's Role** As students read each problem, they think about possible approaches, create a plan, and make decisions about how to represent the problem. Checking their work to be sure their answer makes sense prompts them to provide more complete responses.

**Teacher's Role** As students work on their own, walk around the room to maintain student engagement and to monitor their progress and understanding.

Open-ended questions are an opportunity for students to show multiple approaches, and when appropriate, more than one correct response.

Use the *Solution* and DOK level or the scoring rubrics in the Teacher Resource Book (TRB) as a guide to the level of complex thinking each item requires.

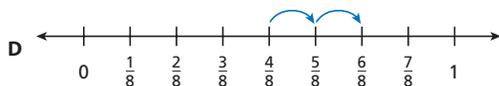
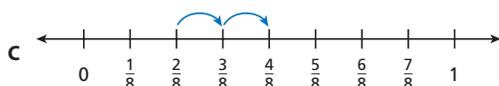
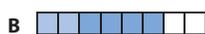
#### Solve the problems.

- 1 Liang bought some cloth. He used  $\frac{5}{8}$  of a yard for a school project. He has  $\frac{2}{8}$  of a yard left. How much cloth did Liang buy?  
A  $\frac{3}{8}$  of a yard  
B  $\frac{7}{16}$  of a yard  
C  $\frac{7}{8}$  of a yard  
D  $\frac{8}{8}$  of a yard
- 2 Carmela cut a cake into 12 equal-sized pieces. She ate  $\frac{2}{12}$  of the cake, and her brother ate  $\frac{3}{12}$  of the cake. What fraction of the cake is left?  
A  $\frac{1}{12}$   
B  $\frac{5}{12}$   
C  $\frac{7}{12}$   
D  $\frac{12}{12}$
- 3 Lee's muffin mix calls for  $\frac{2}{3}$  cup of milk and  $\frac{1}{3}$  cup of oil. How much more milk than oil does she need for the muffin mix?  

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## Student Instruction Book

- 4 Put It Together** Lucy and Melody are painting a room. They divided the room into 8 equal sections. Lucy painted 2 sections and Melody painted 4 sections. Which model can be used to find the total fraction of the room they painted? Circle the letters of all that apply.



- 5** In all, Cole and Max picked  $\frac{9}{10}$  of a bucket of blueberries. Cole picked  $\frac{3}{10}$  of a bucket of blueberries. What fraction of a bucket of blueberries did Max pick?

**Show your work.**

**Answer** Max picked \_\_\_\_\_ of a bucket of blueberries.

- 6** A melon is cut into 8 equal slices. Together, Regan and Juanita will eat  $\frac{5}{8}$  of the melon. What is one way the girls could eat that fraction of the melon?

**Show your work. Write an equation to represent your answer.**

**Answer** Regan could eat \_\_\_\_\_ of the melon, and  
Juanita could eat \_\_\_\_\_ of the melon.

**Equation** \_\_\_\_\_

**Self Check** Go back and see what you can check off on the Self Check on page 143.

### Assess and Remediate *(small group)*

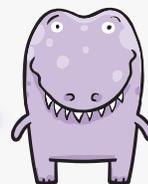
**Teacher's Role** Have students respond to the "exit" question in the *Quick Check and Remediation* in the TRB. For those who respond incorrectly, identify common errors or misconceptions and provide the additional instruction.

Ask the second "exit" question and have students explain their thinking to determine whether to reteach, provide additional practice, or move the student forward.

**Student's Role** Explaining their thinking engages students in learning that requires them to link what they learned in the lesson to new situations.

## Dear Family,

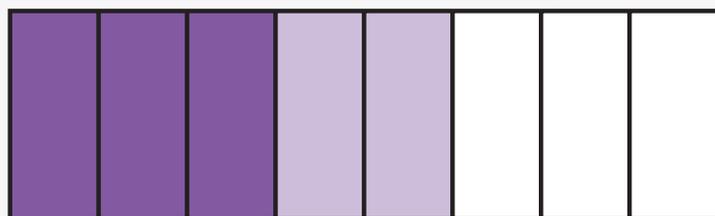
This week your child is learning how to add and subtract like fractions.



Like fractions have denominators that are the same.

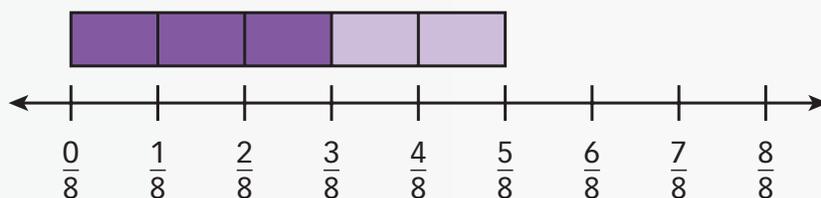
**like fractions:**  $\frac{1}{4}$  and  $\frac{3}{4}$       **unlike fractions:**  $\frac{1}{2}$  and  $\frac{3}{4}$

To find the sum of like fractions, understand that you are just adding like units. Just as 3 apples plus 2 apples is 5 apples, 3 eighths plus 2 eighths is 5 eighths. Similarly, when you take away, or subtract, 2 eighths from 5 eighths, you have 3 eighths left.



$$\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$$

You can also use a number line to understand adding and subtracting like fractions.



Remember that the denominator just names the units in the same way as “apples” names units. So,

- to add two fractions with the same denominator, the sum of the numerators tells how many of those units you have.
- to subtract two fractions with like denominators, the difference of the numerators tells how many of those units you have.

Invite your child to share what he or she knows about adding and subtracting fractions by doing the following activity together.



## Add and Subtract Fractions Activity

Do an activity with your child to add and subtract fractions.

**Materials:** a bowl, a measuring cup, and the ingredients shown in the recipe

Follow the recipe below to make a creamy cracker spread or veggie dip. Then add and subtract fractions with these next steps.

- What fraction of a cup is the total amount of spread? ( $\frac{7}{8}$ )
- Spread  $\frac{1}{8}$  cup on crackers or veggies. How much spread is left? ( $\frac{6}{8}$ )
- Make up a simple recipe using fractions for someone else in the family to make.

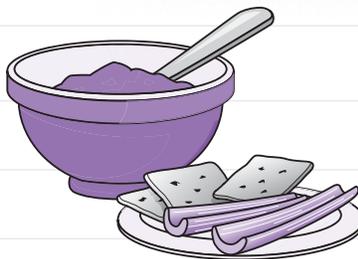
### Recipe for Creamy Spread

#### Ingredients:

$\frac{5}{8}$  cup peanut butter

$\frac{2}{8}$  cup cream cheese

Crackers or veggies



#### Directions:

Mix the peanut butter and cream cheese together in a medium size bowl. Serve immediately with crackers or sliced fresh veggies. Enjoy!



# Add and Subtract Fractions

## Use What You Know

In Lesson 15, you learned that adding fractions is a lot like adding whole numbers. Take a look at this problem.

Lynn, Paco, and Todd split a pack of 12 baseball cards. Lynn gets 4 cards, Paco gets 3 cards, and Todd gets the rest of the cards. What fraction of the pack does Todd get?



- How many cards do Lynn and Paco get altogether? \_\_\_\_\_
- How many cards does Todd get? \_\_\_\_\_
- There are 12 cards in the pack. What fraction represents the whole pack of cards? \_\_\_\_\_
- If Lynn gets 4 cards out of 12, that means she gets  $\frac{4}{12}$  of the pack. If Paco gets 3 cards out of 12, what fraction of the pack does he get? \_\_\_\_\_
- What fraction of the pack do Lynn and Paco get altogether? \_\_\_\_\_
- Explain how you could find the fraction of the pack that Todd gets.

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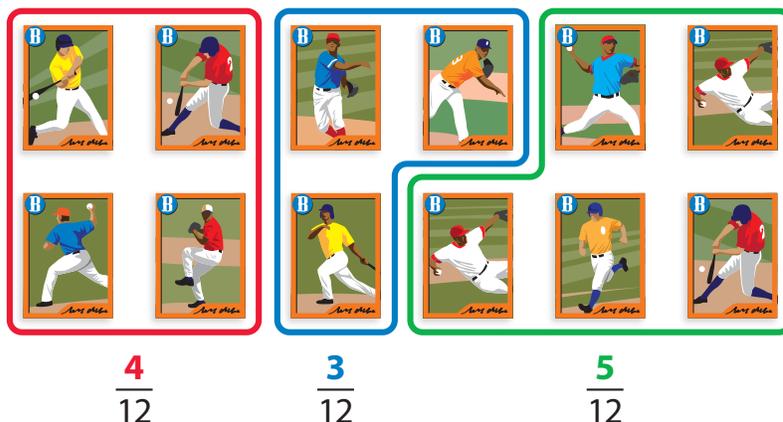


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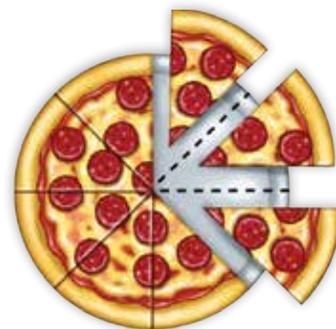
## Find Out More

We often use **fractions** in real life. Fractions can describe something that has several equal parts, as in the baseball card problem. In that problem the “whole” is the pack of cards. Since there are 12 cards in the pack, each card represents  $\frac{1}{12}$  of the whole.



Fractions in real life can also describe the equal parts of a single object, such as a pizza cut into 8 equal slices.

The pizza is the “whole,” and all the slices of pizza are equal parts of the same whole. Since there are 8 equal-sized slices, each slice is  $\frac{1}{8}$  of the pizza. Even if a person takes away one or more slices, the “whole” is still the same 8 slices.



### Reflect

- 1 Give another example of a “whole” object with equal parts that can be described by fractions.

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## Add and Subtract Fractions

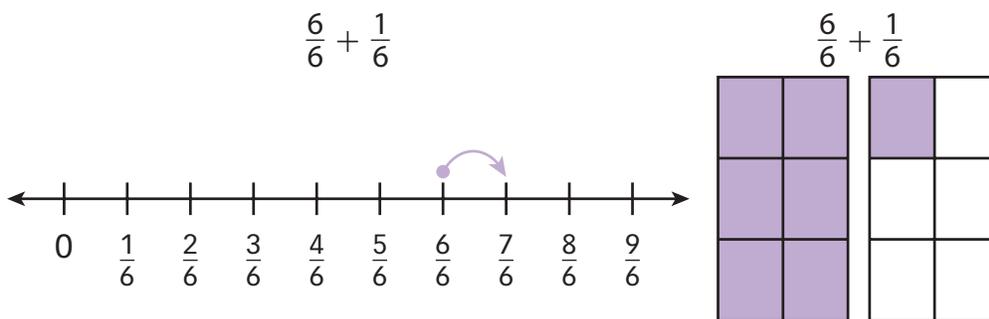
Name: \_\_\_\_\_

**Prerequisite: Model Fraction Addition and Subtraction**

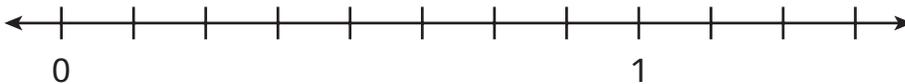
**Study the example problem showing fraction addition with number line and area models. Then solve problems 1–8.**

**Example**

Adding fractions means joining or putting together parts of a whole. On the number line, each whole is divided into 6 equal sections. Each rectangle is divided into 6 equal pieces.



- 1** Label the number line to show eighths.



- 2** Use the number line in problem 1 to show  $\frac{3}{8} + \frac{2}{8}$ .

- 3** Divide the rectangle to show eighths.

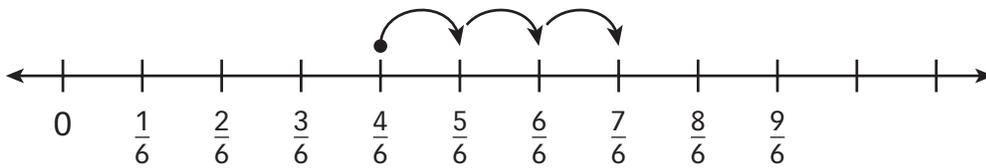


- 4** Use the rectangle in problem 3 to show  $\frac{3}{8} + \frac{2}{8}$ .

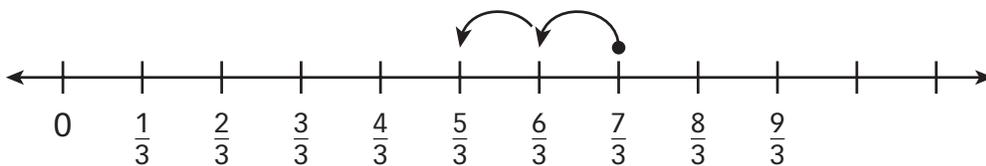


**Solve.**

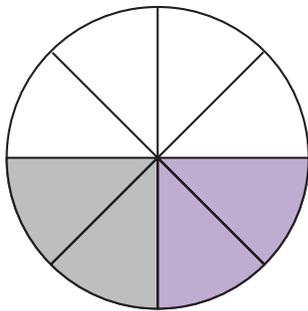
- 5 What is the fraction addition problem shown on this number line? \_\_\_\_\_



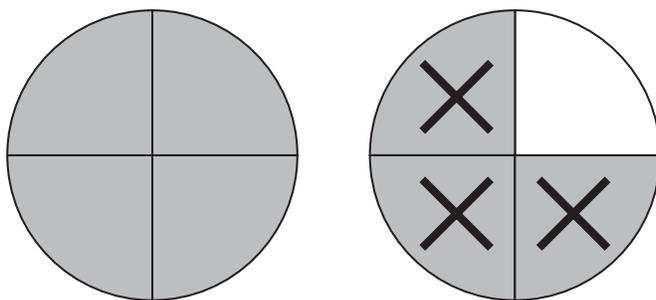
- 6 What is the fraction subtraction problem shown on this number line? \_\_\_\_\_



- 7 What is the fraction addition problem shown by this area model? \_\_\_\_\_



- 8 What is the fraction subtraction problem shown by this area model? \_\_\_\_\_



**Learn About** **Adding Fractions**

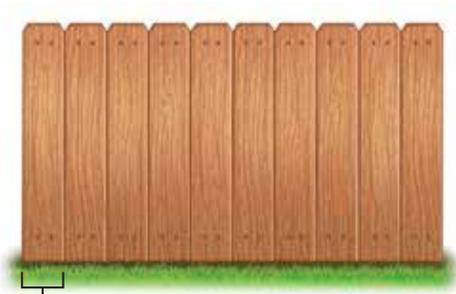
Read the problem. Then explore different ways to understand adding fractions.

Josie and Margo are painting a fence green. Josie starts at one end and paints  $\frac{3}{10}$  of the fence. Margo starts at the other end and paints  $\frac{4}{10}$  of it. What fraction of the fence do they paint?

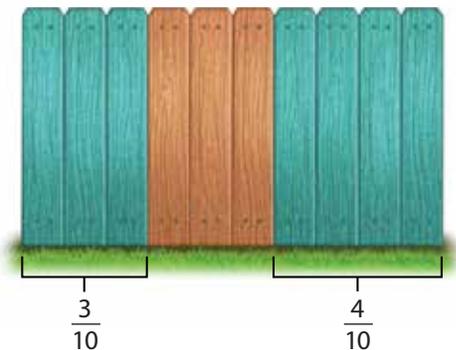
**Picture It** You can use a picture to help understand the problem.

Think what the fence might look like. It has 10 equal-sized parts.

Each part is  $\frac{1}{10}$  of the whole.

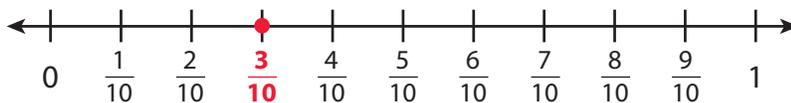


The girls paint 3 tenths and 4 tenths of the fence.

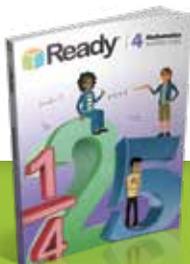
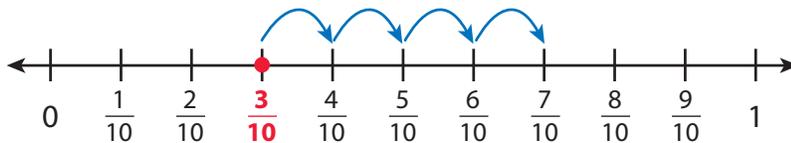


**Model It** You can also use a number line to help understand the problem.

The number line below is divided into tenths, with a point at  $\frac{3}{10}$ .



Start at  $\frac{3}{10}$  and count 4 tenths to the right to **add**  $\frac{4}{10}$ .



**▶ Connect It** Now you will solve the problem from the previous page using equations.

**2** How do you know that each section of fence is  $\frac{1}{10}$  of the total fence?

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**3** What do the numerators, 3 and 4, tell you? \_\_\_\_\_

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**4** How many sections of the fence did Josie and Margo paint altogether? \_\_\_\_\_

**5** Complete the equations to show what fraction of the fence Josie and Margo painted altogether.

Use words:     **3 tenths**    +    **4 tenths**    =     tenths

Use fractions:      $\frac{3}{10}$         +         $\frac{4}{10}$         =         $\frac{\text{□}}{10}$

**6** Explain how you add fractions that have the same denominator.

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**▶ Try It** Use what you just learned to solve these problems. Show your work on a separate sheet of paper.

**7** Lita and Otis are helping their mom clean the house. Lita cleaned  $\frac{1}{3}$  of the rooms. Otis cleaned  $\frac{1}{3}$  of the rooms. What fraction of the rooms did Lita and Otis clean altogether? \_\_\_\_\_

**8** Mark's string is  $\frac{1}{5}$  of a meter long. Bob's string is  $\frac{3}{5}$  of a meter long. How long are the two strings combined? \_\_\_\_\_ of a meter

## Add Fractions

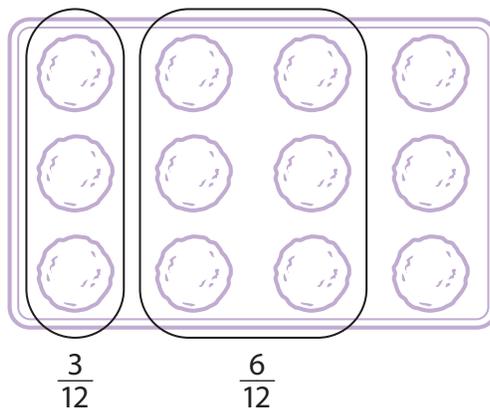
Study the example problem showing one way to add fractions. Then solve problems 1–13.

## Example

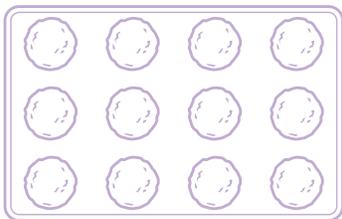
Shrina has a muffin tray that holds 12 muffins. She fills  $\frac{3}{12}$  of the tray with apple muffin batter. Then she fills  $\frac{6}{12}$  with pumpkin muffin batter. What fraction of the tray is filled?

$$\frac{3}{12} + \frac{6}{12} = \frac{9}{12}$$

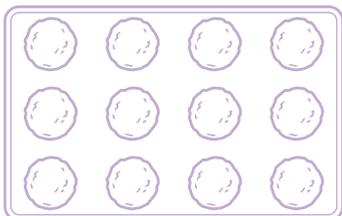
So,  $\frac{9}{12}$  of the muffin tray is filled.



- 1 Shade  $\frac{2}{12}$  of the muffin tray.

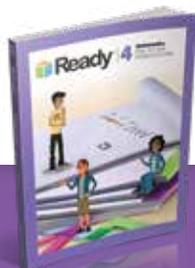


- 2 Sam fills  $\frac{2}{12}$  of the tray with banana muffin batter. Then she fills  $\frac{6}{12}$  with lemon muffin batter. Shade the diagram to show this.



- 3 In problem 2, what fraction of the tray is filled? \_\_\_\_\_

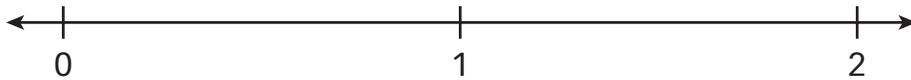
Write an equation for this problem that includes your answer. \_\_\_\_\_



**Solve.**

Kay ran  $\frac{6}{8}$  mile and rested. Then she ran another  $\frac{6}{8}$  mile.

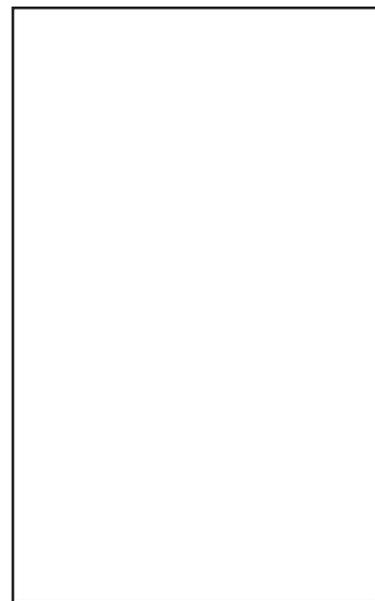
- 4 Divide the number line below to show eighths.



- 5 Label  $\frac{6}{8}$  on the number line above.
- 6 Use arrows to show  $\frac{6}{8} + \frac{6}{8}$  on the number line.
- 7 What is the total distance Kay ran? \_\_\_\_\_
- 8 Write an equation for this problem that includes your answer. \_\_\_\_\_

Jin cleaned  $\frac{1}{10}$  of the patio before lunch and cleaned  $\frac{9}{10}$  of the patio after lunch.

- 9 Divide the rectangle to show tenths.
- 10 Shade the rectangle to show the fraction Jin cleaned before lunch.
- 11 Use a different color to shade the rectangle to show the fraction Jin cleaned after lunch.
- 12 What fraction of the patio did Jin clean altogether?  
\_\_\_\_\_
- 13 Write an equation for this problem that includes your answer. \_\_\_\_\_



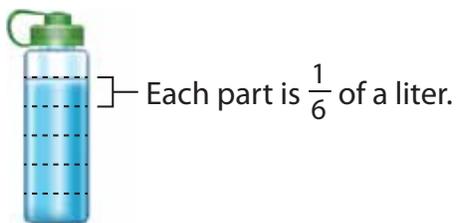
# Learn About Subtracting Fractions

Read the problem. Then explore different ways to understand subtracting fractions.

Alberto's 1-liter water bottle had  $\frac{5}{6}$  of a liter of water in it. He drank  $\frac{4}{6}$  of a liter. What fraction of a liter of water is left in the bottle?

 **Picture It** You can use a picture to help understand the problem.

The following model shows the water bottle divided into 6 equal parts. Five shaded parts show how much water was in the bottle.

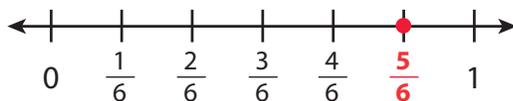


Alberto drank 4 sixths of a liter, so take away 4 shaded parts. The 1 shaded part that is left shows the fraction of a liter that is left.

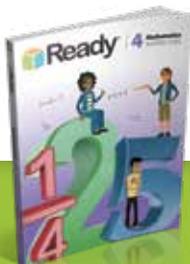
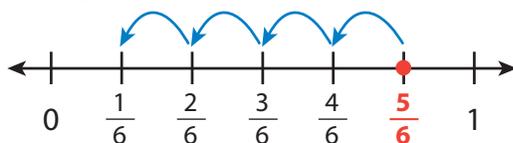


 **Model It** You can also use a number line to help understand the problem.

The number line below is divided into sixths, with a point at  $\frac{5}{6}$ .



Start at  $\frac{5}{6}$  and count back 4 sixths to **subtract**  $\frac{4}{6}$ .



**Connect It** Now you will solve the problem from the previous page using equations.

9 In *Picture It*, why does  $\frac{1}{6}$  represent 1 of the equal parts of the bottle?

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10 What do the numerators, 5 and 4, tell you? \_\_\_\_\_

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11 How many sixths of a liter are left in the bottle after Alberto drank 4 sixths? \_\_\_\_\_

12 Complete the equations to show what fraction of a liter is left in the bottle.

Use words:      **5 sixths**    –    **4 sixths**    =     sixth

Use fractions:       $\frac{5}{6}$       –       $\frac{4}{6}$       =       $\frac{\text{input}}{6}$

13 Explain how you subtract fractions with the same denominator.

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**Try It** Use what you just learned to solve these problems. Show your work on a separate sheet of paper.

14 Mrs. Kirk had  $\frac{3}{4}$  of a carton of eggs. She used  $\frac{2}{4}$  of the carton to make breakfast.

What fraction of the carton of eggs does Mrs. Kirk have left? \_\_\_\_\_

15 Carmen had  $\frac{8}{10}$  of the lawn left to mow. She mowed  $\frac{5}{10}$  of the lawn. Now what

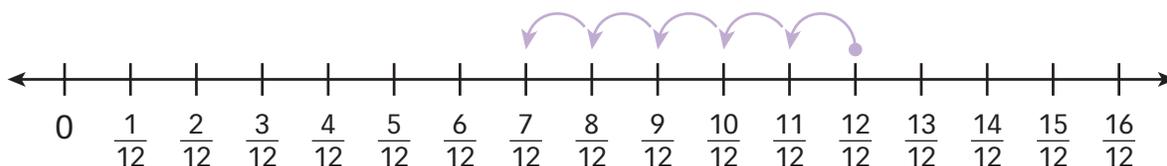
fraction of the lawn is left to mow? \_\_\_\_\_

## Subtract Fractions

Study the example showing one way to subtract fractions. Then solve problems 1–7.

## Example

Ali bought a carton of eggs. He used  $\frac{3}{12}$  of the eggs to cook breakfast. He used another  $\frac{2}{12}$  to make a dessert for dinner. What fraction of the carton is left?



$$\frac{12}{12} - \frac{3}{12} = \frac{9}{12}$$

$$\frac{9}{12} - \frac{2}{12} = \frac{7}{12}$$

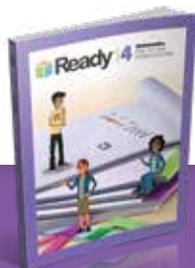
So,  $\frac{7}{12}$  of the carton is left.

Keisha is going to her friend's house  $\frac{8}{10}$  mile from home. Her mother drives her partway, then she walks the last  $\frac{3}{10}$  mile.

- 1 Divide the number line below to show tenths. Then label each tick mark.



- 2 Use arrows to show the problem on the number line you drew in problem 1.
- 3 How far did Keisha's mother drive her? \_\_\_\_\_
- 4 Write an equation for this problem that includes your answer. \_\_\_\_\_



**Solve.**

- 5 Anna made a quilt by sewing together green, white, and yellow fabric. When she was done,  $\frac{2}{6}$  of the quilt was green and  $\frac{3}{6}$  was yellow. The rest was white.

What fraction of the quilt was white?

**Show your work.**

Solution: \_\_\_\_\_

- 6 What is  $\frac{9}{8} - \frac{8}{8}$ ?

**Use a number line or an area model to show your thinking.**

Solution: \_\_\_\_\_

- 7 Shanice had 1 whole pizza. After eating some of it, she had  $\frac{4}{6}$  of the pizza left. What fraction of the pizza did she eat?

**Show your work.**

Solution: \_\_\_\_\_

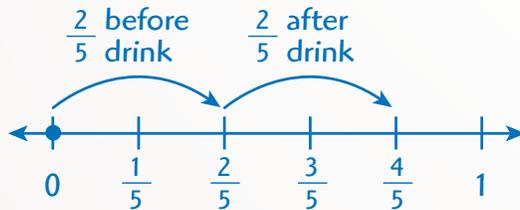
# Practice Adding and Subtracting Fractions

Study the example below. Then solve problems 16–18.

## Example

Jessica hiked  $\frac{2}{5}$  of a mile on a trail before she stopped to get a drink of water. After her drink, Jessica hiked another  $\frac{2}{5}$  of a mile. How far did Jessica hike in all?

Look at how you could show your work using a number line.



**Solution** Jessica hiked  $\frac{4}{5}$  of a mile.



The student used labels and “jump” arrows to show each part of the hike on a number line. It is just like adding whole numbers!

## Pair/Share

How else could you solve this problem?

- 16** Ruth made 1 fruit smoothie. She drank  $\frac{1}{3}$  of it. What fraction of the fruit smoothie is left?

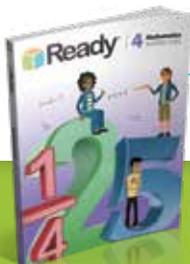
Show your work.



What fraction represents the whole fruit smoothie?

## Pair/Share

How did you and your partner decide what fraction to start with?



- 17 Mr. Chang has a bunch of balloons.  $\frac{3}{10}$  of the balloons are red.  $\frac{2}{10}$  of the balloons are blue. What fraction of the balloons are neither red nor blue?

**Show your work.**



I think that there are at least two different steps to solve this problem.

**Solution** \_\_\_\_\_

- 18 Emily ate  $\frac{1}{6}$  of a bag of carrots. Nick ate  $\frac{2}{6}$  of the bag of carrots. What fraction of the bag of carrots did Emily and Nick eat altogether? Circle the letter of the correct answer.

- A  $\frac{1}{6}$
- B  $\frac{1}{3}$
- C  $\frac{3}{6}$
- D  $\frac{3}{12}$

Rob chose **D** as the correct answer. How did he get that answer?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



To find the fraction of the bag Emily and Nick ate altogether, should you add or subtract?

**Pair/Share**

Does Rob's answer make sense?

## Add and Subtract Fractions

Solve the problems.

- 1 Lin bought  $\frac{3}{4}$  pound of cheddar cheese and some Swiss cheese. Altogether she bought  $\frac{7}{4}$  pounds of cheese. How much Swiss cheese did Lin buy?

A  $\frac{4}{8}$  of a pound      C  $\frac{10}{8}$  pounds  
 B  $\frac{4}{4}$  of a pound      D  $\frac{10}{4}$  pounds

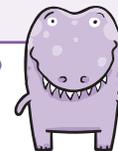
Does it make sense to add or subtract here?



- 2 Carrie has 2 meters of ribbon. She cuts off pieces of ribbon that are  $\frac{5}{10}$  meter,  $\frac{1}{10}$  meter, and  $\frac{7}{10}$  meter. How long is the remaining piece of ribbon?

A  $\frac{1}{10}$  meter      C  $\frac{7}{10}$  meter  
 B  $\frac{3}{10}$  meter      D  $\frac{13}{10}$  meters

This problem seems to have more than one step.



Lee chose **D** as the correct answer. How did she get that answer?

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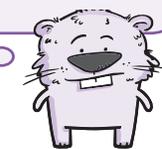


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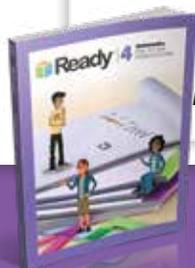
- 3 Ms. Atkins had a basket of tomatoes. She used  $\frac{5}{12}$  of the tomatoes to make soup. She used  $\frac{2}{12}$  in a salad. What fraction of the tomatoes are left?

**Show your work.**

What fraction can you use to represent all of the tomatoes?

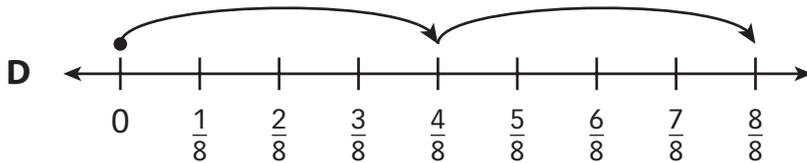
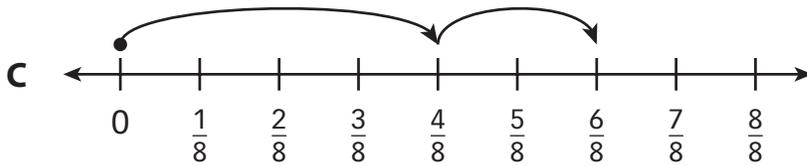


Solution: \_\_\_\_\_

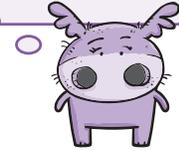


**Solve.**

- 4** Jo and Kira are raking leaves in the yard. They divide the yard into 8 equal sections. Jo rakes 4 sections. Kira rakes 2 sections. Which model can be used to find the total fraction of the yard they rake? Circle the letter of all that apply.



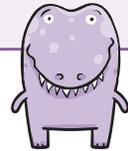
Two different models could show the same problem.



- 5** A pizza is cut into 6 equal pieces. After Eli and Dan eat some,  $\frac{1}{6}$  of the pizza is left. What fraction could each boy eat? Give one possible answer.

**Show your work.**

To find the fraction that was eaten, should you add or subtract?

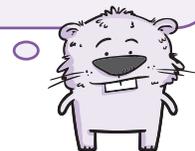


*Solution:* \_\_\_\_\_

- 6** Milo has 2 hours of free time. He spends  $\frac{2}{4}$  of an hour with his dog. He spends  $\frac{3}{4}$  of an hour drawing. What fraction of an hour does he have left?

**Show your work.**

How can you write 2 wholes as a fraction?



*Solution:* \_\_\_\_\_

Solve the problems.

1 Liang bought some cloth. He used  $\frac{5}{8}$  of a yard for a school project. He has  $\frac{2}{8}$  of a yard left. How much cloth did Liang buy?

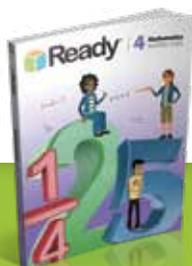
- A  $\frac{3}{8}$  of a yard
- B  $\frac{7}{16}$  of a yard
- C  $\frac{7}{8}$  of a yard
- D  $\frac{8}{8}$  of a yard

2 Carmela cut a cake into 12 equal-sized pieces. She ate  $\frac{2}{12}$  of the cake, and her brother ate  $\frac{3}{12}$  of the cake. What fraction of the cake is left?

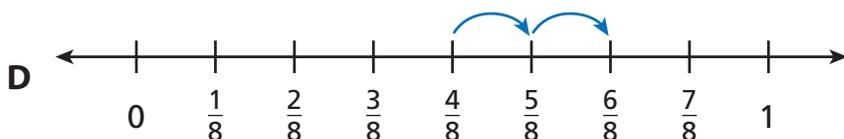
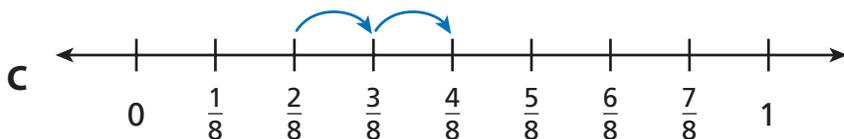
- A  $\frac{1}{12}$
- B  $\frac{5}{12}$
- C  $\frac{7}{12}$
- D  $\frac{12}{12}$

3 Lee's muffin mix calls for  $\frac{2}{3}$  cup of milk and  $\frac{1}{3}$  cup of oil. How much more milk than oil does she need for the muffin mix?

\_\_\_\_\_



- 4 Lucy and Melody are painting a room. They divided the room into 8 equal sections. Lucy painted 2 sections and Melody painted 4 sections. Which model can be used to find the total fraction of the room they painted? Circle the letters of all that apply.



- 5 In all, Cole and Max picked  $\frac{9}{10}$  of a bucket of blueberries. Cole picked  $\frac{3}{10}$  of a bucket of blueberries. What fraction of a bucket of blueberries did Max pick?

**Show your work.**

**Answer** Max picked \_\_\_\_\_ of a bucket of blueberries.

- 6 A melon is cut into 8 equal slices. Together, Regan and Juanita will eat  $\frac{5}{8}$  of the melon. What is one way the girls could eat that fraction of the melon?

**Show your work. Write an equation to represent your answer.**

**Answer** Regan could eat \_\_\_\_\_ of the melon, and  
Juanita could eat \_\_\_\_\_ of the melon.

**Equation** \_\_\_\_\_

 **Self Check** Go back and see what you can check off on the Self Check on page 143.

# Sampler

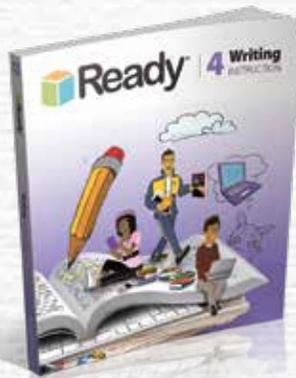
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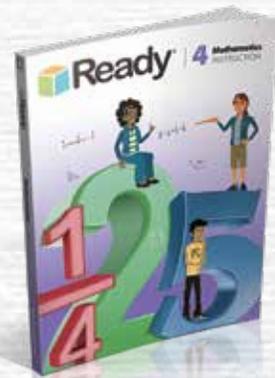
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