

ASSESSMENT RESOURCES

Using Operations to Solve Complex Problems



This work is protected by United States copyright laws and is provided *solely for the use of teachers and administrators* in teaching courses and assessing student learning in their classes and schools. Dissemination or sale of *any* part of this work (including on the World Wide Web) will destroy the integrity of the work and is *not* permitted.

Copyright © 2012 Savvas Education, Inc., or its affiliate(s). All Rights Reserved. Printed in the United States of America. This publication is protected by copyright, and permission should be obtained from the publisher prior to any prohibited reproduction, storage in a retrieval system, or transmission in any form or by any means, electronic, mechanical, photocopying, recording, or likewise. The publisher hereby grants permission to reproduce these pages, in part or in whole, for classroom use only, the number not to exceed the number of students in each class. Notice of copyright must appear on all copies. For information regarding permissions, write to Savvas Curriculum Group Rights & Permissions, One Lake Street, Upper Saddle River, New Jersey 07458.

America's Choice, the America's Choice A logo, Math Navigator, the Savvas logo are trademarks, in the U.S. and/or other countries, of Savvas Learning Co. or its affiliate(s).

Teacher Materials

Pre-Test/Post-Test Administration 1

Lesson 8: Checkpoint 1 4

Lesson 14: Checkpoint 2 8

Student Materials

Lesson 8: Checkpoint 1 and Answer Sheet 12

Lesson 14: Checkpoint 2 and Answer Sheet 17

Image Credits 22

Pre-Test/Post-Test Administration

test administration

For the pre-test, let students know that this test will help you determine what they already know. Explain that the module will help them learn how to solve problems that seem difficult now.

For the post-test, remind students that this test will help you determine what they have learned about using operations to solve complex problems.

Online Testing

Once your testing window has started, you can begin testing.

- Seat students individually in front of a computer.
- Give each student a piece of scratch paper.
- Make sure that students have pencils.
- Have students use their access codes to log in to the pre-test.
- Before each student begins the test, confirm that he or she is taking the correct test.

Tell students that:

- Each question will be displayed on the computer screen. Students should select the answer they think is best by clicking on the option choice and then clicking to confirm the choice.
- After students answer a question, the next question will appear on the computer screen.
- Students may choose to skip a question and flag it to come back to before ending the test.

During the test:

- Observe students as they work to make sure that they are actively engaged in the testing process.
- Support any students who seem to find the material challenging. Encourage them to make a good estimate for any problem they find difficult. You may wish to provide manipulatives.

Once students have answered all the questions, they should follow the online prompts to conclude the test.

 After the pre-test if some students finish early, pair each of them with another student. Give each student a Student Book. Tell the students to read the instructions on page 1 of the Student Book and start working.



english language learners

Be aware that some English language learners (ELLs) may have difficulty with the language on the test. Make note of any students who appear to be having difficulty with vocabulary. These students may need additional help when new terminology is introduced in the module.



Paper-and-Pencil Test

- Print copies of the test and answer sheets for each student from ARO.
- Seat students individually.
- Distribute tests, answer sheets, and scratch paper.
- Make sure that students have #2 pencils.
- Instruct students to fill in the answers on their answer sheets.

During the test:

- Observe students as they work to make sure that they are actively engaged in the testing process.
- Support any students who seem to find the material challenging. Encourage them to make a good estimate for any problem they find difficult. You may wish to provide manipulatives.

After students finish, collect their tests, answer sheets, and scratch paper. You will need to upload students' answers to the ARO system so you can analyze the results.



After the pre-test if some students finish early, pair each of them with another student. Give each student a Student Book. Tell the students to read the instructions on page 1 of the Student Book and start working.



analyzing results

Irrespective of the method (online or paper-and-pencil) that you chose to administer the test, your students must be enrolled in the ARO system in order for you to obtain computer-generated reports.

These reports:

- Offer rich, instructionally-relevant information to teachers and administrators at the individual student, class, grade, school, and district levels.
- Include total test score performance information and item-level analysis for each student and for all students combined.
- Are important references in helping you to assess the misconceptions your students are struggling with and decide what concepts to focus on during the module.

For results:

- **Online Testing:** ARO will automatically generate performance reports.
- **Paper-and-Pencil Test:** Upload students' data to ARO. Once you have uploaded the data, ARO will generate performance reports.

Additional information about the online test reporting can be found on ARO.

Remember to give a copy of the reports to the students' regular mathematics teachers to help them in planning subsequent instruction.

reflection

 When students have finished working on their pre- or post-tests, ask them to open the Student Book to page 1 for the pre-test and page 76 for the post-test and write a response to the reflection prompt.



english language learners

It is important to point out to ELLs the progress they have made over the course of the module. Help them look back to where they were when they started so they can see how much they have progressed with both the language and the mathematics.

Checkpoint 1

8



preparation

- Make a copy of the Checkpoint 1 lesson and answer sheet for each student.
- Seat students individually and distribute the checkpoint lesson and the answer sheet to each student.
- Ask students to put their names on their answer sheets.



setting the direction

This lesson is the first checkpoint lesson of the module. Tell students that today's lesson is a checkpoint lesson; it will help them see how well they understand the concepts they have recently learned.

Tell students to read the checkpoint problems to themselves. They should complete the problems by doing the work and circling the answers in the checkpoint lesson. Then they should fill in the answers on the answer sheet.

At the end of the lesson, collect the completed answer sheets. Enter the data from each checkpoint into ARO. The report generated by ARO will help you assess whether students are on track and making sufficient progress.

checkpoint

Give students 6–10 minutes to complete the problems.

Tell students to complete problems 1–4. Ask students to be sure they have circled their answers in their checkpoint lessons before you collect the answer sheets.

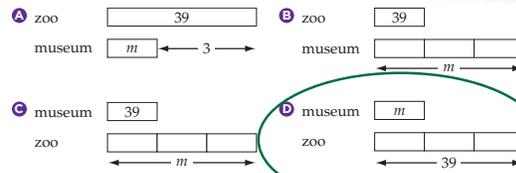
Collect the answer sheets after students have completed the checkpoint. Have students use their checkpoint lesson to make revisions during Learning from the Checkpoint. Enter the data from this checkpoint into ARO.

checkpoint

Solve each problem below. Write your answer on the answer sheet. Circle each answer in the checkpoint lesson, too.

1. Josh lives 3 times as far from the zoo as the museum. He lives 39 miles from the zoo. How far does Josh live from the museum?

Which diagram best represents the situation?



2. Maria sends 120 text messages the first week she gets her cell phone. In the second week, she sends only 8 text messages. How many times more text messages does she send the first week than the second week?

Which equation can you use to solve the problem?

Let n = the unknown quantity.

- A $n = 120 - 8$ B $120 = n + 8$
 C $n \times 8 = 120$ D $n = 120 \times 8$



3. Mr. Samson and three of his friends go out for pizza. They split the bill equally. The bill comes to \$42.00. How much does each person pay?

- A \$10.00 B \$10.50 C \$11.00 D \$14.00



4. Mrs. Chi buys a 2-pound block of cheddar cheese. She uses 3 ounces of cheese to make one grilled cheese sandwich. How many grilled cheese sandwiches can she make from a 2-pound block of cheddar cheese?

- A 5 sandwiches B 6 sandwiches C 10 sandwiches D 11 sandwiches



learning from the checkpoint



Explain to the group that when students choose the wrong answer, it is usually because they have a misconception or have made a common mistake. Then select one of the wrong answers and identify it as a “common wrong answer.” Ask students to write a sentence or two explaining the misconception or mistake that makes the answer a common wrong answer.

Learning from Problem 1

The correct answer is **D**.

Students should be able to represent a multiplicative comparison problem using a diagram.

learning from the checkpoint

Problem 1

Look at problem 1 again. Which of the wrong answers is a common wrong answer? Explain your reasoning.

Answers will vary.

A student might choose Answer B if he misread the problem and thought the museum was 3 times as far as the zoo.

Assessment Resources, page 14



Answer choice **B**:

Possible misconception: A student might choose Answer **B** if he misread the problem and thought the museum was 3 times as far as the zoo.

Suggestion: To prevent this error, have students underline the key information in the problem and then sketch what they know about the situation. Ask students to explain what their sketch shows.

Learning from Problem 2

The correct answer is **C**.

Students should be able to write an equation to represent a multiplicative comparison situation.

Problem 2

Look at problem 2 again. Which of the wrong answers is a common wrong answer? Explain your reasoning.

Answers will vary.

A student might choose Answer A if she thought it was a comparison problem involving subtraction.

Assessment Resources, page 14



Answer choice **A**:

Possible misconception: A student might choose Answer **A** if she thought it was an additive comparison problem.

Suggestion: To prevent this error, have students identify whether the problem is asking how many more 120 is than 8 (additive comparison situation) or how many times more 120 is than 8 (multiplicative comparison situation). Ask students to make a sketch of the situation using a diagram.

Learning from Problem 3

The correct answer is **B**.

Students should be able to divide to find the answer and understand that the remainder is represented as cents. Students need to remember to count Mr. Samson as one of the diners.

Problem 3

Look at problem 3 again. Which of the wrong answers is a common wrong answer? Explain your reasoning.

Answers will vary.

A student might choose Answer D if he forgot to count

Mr. Samson as one of the diners, so he divided the total bill by 3 instead of by 4.

Assessment Resources, page 14



Answer choice **D**:

Possible misconception: A student might choose Answer **D** if he forgot to count Mr. Samson as one of the diners, so he divided the total bill by 3 instead of by 4.

Suggestion: To prevent this error, have students sketch the problem situation using a diagram. Ask, "How many people went out for pizza? How many people are splitting the bill equally?"

Learning from Problem 4

The correct answer is **C**.

Students should understand that sometimes they need to ignore the remainder in the answer to a problem involving division.

Problem 4

Look at problem 4 again. Which of the wrong answers is a common wrong answer? Explain your reasoning.

Answers will vary.

A student might choose Answer D if she found $32 \div 3 = 10 \text{ R}2$ and counted the remainder as a whole sandwich.

Assessment Resources, page 14



Answer choice **D**:

Possible misconception: A student might choose Answer **D** if she found $32 \div 3 = 10 \text{ R}2$ and counted the remainder as a whole sandwich.

Suggestion: To prevent this error, have students model or sketch the problem situation and explain what the remainder represents.



reflection



When you have about 2 minutes left, stop the discussion, even if they are not finished. Have students respond to the reflection prompt in the Student Book.

Checkpoint 2

14



preparation

- Make a copy of the Checkpoint 2 lesson and answer sheet for each student.
- Seat students individually and distribute the checkpoint lesson and the answer sheet to each student.
- Ask students to put their names on their answer sheets.



setting the direction



This lesson is a checkpoint lesson. Use the ritual for checkpoints to conduct the lesson.

Seat students individually and ask them to put their names on their answer sheets.



scaffolding for success

Remind students to circle key information in the problems to help them understand how to solve it.



english language learners

Some ELLs may be intimidated by the testing situation. Be sure to check for comprehension and provide assistance with the language in the problems as needed.

At the end of the lesson, collect the completed answer sheets. Enter the data from each checkpoint into ARO. The report generated by ARO will help you assess whether students are on track and making sufficient progress.



checkpoint



Give students 6–10 minutes to complete the problems.

Tell students to complete problems 1–4. Ask students to be sure they have circled their answers in their checkpoint lessons before you collect the answer sheets.

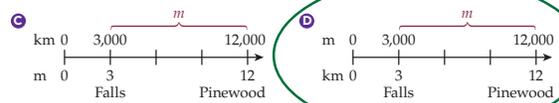
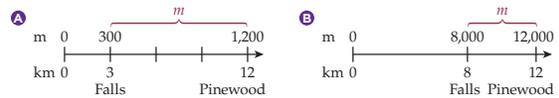
Collect the answer sheets after students have completed the checkpoint. Have students use their checkpoint lesson to make revisions during Learning from the Checkpoint. Enter the data from this checkpoint into ARO.

checkpoint

Solve each problem below. Write your answer on the answer sheet. Circle each answer in the checkpoint lesson, too.

1. The Pinewood Trail is 12 kilometers long. This is 4 times the distance of the Falls Trail. How many meters longer is the Pinewood Trail than the Falls Trail?

Which diagram best represents this situation?



2. Anthony swims for 25 minutes each day for 6 days. Which equation represents the number of minutes Anthony swims in 6 days?

A $3 \times 60 = m$ **B** $6 \times 25 = m$ **C** $180 - 150 = m$ **D** $6 + m = 25$

3. Mr. Hakim buys 2 pounds of plain yogurt. He uses 10 ounces in a muffin recipe. Then if he eats 6 ounces a day, how many days will it take Mr. Hakim to finish the container?

Which is the best estimate of the answer?

A 1 day **B** 2 days **C** 4 days **D** 6 days

4. Amir buys 10 raffle tickets for \$0.50 each. Malaya buys 4 times as many raffle tickets as Amir. How much more money does Malaya spend on raffle tickets than Amir?

Which sentence answers the question correctly?

- A** Malaya spends \$2 more on raffle tickets than Amir.
B Malaya spends \$15 more on raffle tickets than Amir.
C Malaya spends \$20 more on raffle tickets than Amir.
D Malaya spends \$25 more on raffle tickets than Amir.



learning from the checkpoint

 Explain to the group that when students choose the wrong answer, it is usually because they have a misconception or have made a common mistake. Ask students to write a sentence or two explaining the misconception or mistake that makes the answer a common wrong answer.

Learning from Problem 1

The correct answer is **D**.

Students should be able to represent a problem situation visually by sketching a diagram and should know how many meters equal 1 kilometer.

learning from the checkpoint

Problem 1

The correct answer to problem 1 is **D**.
Why might someone choose **A** as the correct answer?

Someone might think that 100 meters is equal to 1 kilometer.

Assessment Resources, page 19



Answer choice **A**:

Possible misconception: A student might choose Answer **A** if he thought 100 meters is equal to 1 kilometer.

Suggestion: To prevent this error, ask, “What does kilo mean? Is a kilometer larger or smaller than a meter? How many meters are equal to 1 kilometer? Then how many meters are equal to 3 kilometers?”

Learning from Problem 2

The correct answer is **B**.

Students should be able to write an equation with a letter standing for the unknown quantity to represent the first step in a multistep problem situation.

Problem 2

The correct answer to problem 2 is **B**.
Why might someone choose **A** as the correct answer?

Someone might think that they need to find the number of minutes in 3 hours.

Assessment Resources, page 19



Answer choice **A**:

Possible misconception: A student might choose Answer **A** if she found the number of minutes in 3 hours, not the total number of minutes Anthony swims for 6 days.

Suggestion: To prevent this error, have students draw a sketch of the problem situation, explaining what the known and unknown quantities are in the situation. Then ask, “Where do you see how many minutes Anthony swims each day? How can you find out how many minutes he swims in 6 days?”

Learning from Problem 3

The correct answer is **C**.

Students should be able to convert pounds to ounces and estimate an answer to a multistep problem.

Problem 3

The correct answer to problem 3 is **C**.
Why might someone choose **A** as the correct answer?

Someone might think there are 8 ounces in a pound instead of 16 ounces.

Assessment Resources, page 19



Answer choice **A**:

Possible misconception: A student might choose Answer **A** if he thought 8 ounces equal 1 pound instead of 16 ounces.

Suggestion: To prevent this error, have students sketch the problem situation. Ask, "How many ounces equal 1 pound?"

Learning from Problem 4

The correct answer is **B**.

Students should be able to solve a multistep problem and write the answer in a complete sentence.

Problem 4

The correct answer to problem 4 is **B**.
Why might someone choose **D** as the correct answer?

Someone might add how much Amir and Malaya spent instead of subtracting to find the difference.

Assessment Resources, page 19



Answer choice **D**:

Possible misconception: A student might choose Answer **D** if she added to find how much Amir and Malaya spent instead of subtracted to find the difference.

Suggestion: To prevent this error, have students model or sketch the problem situation and then explain the situation verbally. Ask, "What are you trying to find?"



reflection



When you have about 2 minutes left, stop the discussion, even if they are not finished. Have students respond to the reflection prompt in the Student Book.

Checkpoint 1

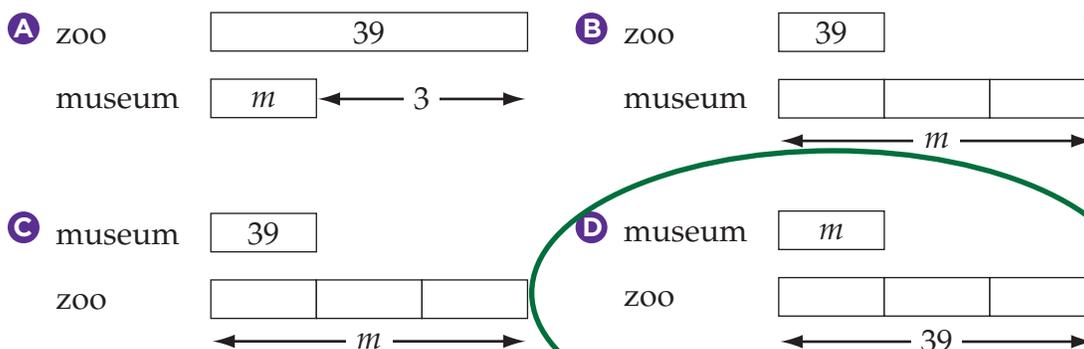
8

checkpoint

Solve each problem below. Write your answer on the answer sheet. Circle each answer in the checkpoint lesson, too.

1. Josh lives 3 times as far from the zoo as the museum. He lives 39 miles from the zoo. How far does Josh live from the museum?

Which diagram best represents the situation?



2. Maria sends 120 text messages the first week she gets her cell phone. In the second week, she sends only 8 text messages. How many times more text messages does she send the first week than the second week?

Which equation can you use to solve the problem?
Let n = the unknown quantity.

- A** $n = 120 - 8$ **B** $120 = n + 8$
C $n \times 8 = 120$ **D** $n = 120 \times 8$



3. Mr. Samson and three of his friends go out for pizza. They split the bill equally. The bill comes to \$42.00. How much does each person pay?

A \$10.00

B \$10.50

C \$11.00

D \$14.00



4. Mrs. Chi buys a 2-pound block of cheddar cheese. She uses 3 ounces of cheese to make one grilled cheese sandwich. How many grilled cheese sandwiches can she make from a 2-pound block of cheddar cheese?

A 5 sandwiches

B 6 sandwiches

C 10 sandwiches

D 11 sandwiches



learning from the checkpoint

Problem 1

Look at problem 1 again. Which of the wrong answers is a common wrong answer? Explain your reasoning.

Answers will vary.

A student might choose Answer B if he misread the problem and thought the museum was 3 times as far as the zoo.

Problem 2

Look at problem 2 again. Which of the wrong answers is a common wrong answer? Explain your reasoning.

Answers will vary.

A student might choose Answer A if she thought it was a comparison problem involving subtraction.

Problem 3

Look at problem 3 again. Which of the wrong answers is a common wrong answer? Explain your reasoning.

Answers will vary.

A student might choose Answer D if he forgot to count Mr. Samson as one of the diners, so he divided the total bill by 3 instead of by 4.

Problem 4

Look at problem 4 again. Which of the wrong answers is a common wrong answer? Explain your reasoning.

Answers will vary.

A student might choose Answer D if she found $32 \div 3 = 10 \text{ R}2$ and counted the remainder as a whole sandwich.

Class Information

School _____

City _____ State _____

Teacher (mathematics class) _____

Student Information

Grade _____

First name _____

Last name _____

Date of birth _____ (month) _____ (day) _____ (year)

Male Female

How many years have you been at this school? _____ years

Do you usually speak English at home? Yes No

Does anyone in your home usually speak a language other than English?

Yes No

Name _____

	A	B	C	D
1.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Checkpoint 2

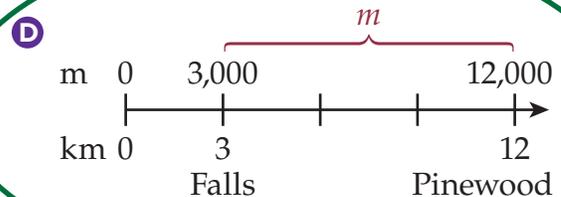
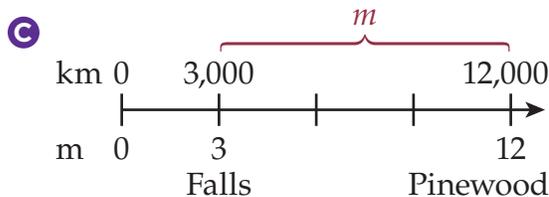
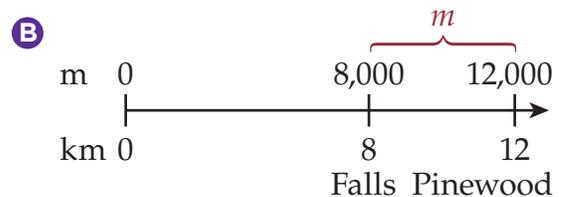
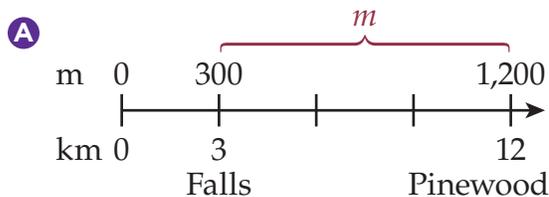
14

checkpoint

Solve each problem below. Write your answer on the answer sheet.
Circle each answer in the checkpoint lesson, too.

1. The Pinewood Trail is 12 kilometers long. This is 4 times the distance of the Falls Trail. How many meters longer is the Pinewood Trail than the Falls Trail?

Which diagram best represents this situation?



2. Anthony swims for 25 minutes each day for 6 days. Which equation represents the number of minutes Anthony swims in 6 days?

A $3 \times 60 = m$

B $6 \times 25 = m$

C $180 - 150 = m$

D $6 + m = 25$

3. Mr. Hakim buys 2 pounds of plain yogurt. He uses 10 ounces in a muffin recipe. Then if he eats 6 ounces a day, how many days will it take Mr. Hakim to finish the container?

Which is the best estimate of the answer?

- A 1 day
 B 2 days
 C 4 days
 D 6 days

4. Amir buys 10 raffle tickets for \$0.50 each. Malaya buys 4 times as many raffle tickets as Amir. How much more money does Malaya spend on raffle tickets than Amir?

Which sentence answers the question correctly?

- A Malaya spends \$2 more on raffle tickets than Amir.
 B Malaya spends \$15 more on raffle tickets than Amir.
 C Malaya spends \$20 more on raffle tickets than Amir.
 D Malaya spends \$25 more on raffle tickets than Amir.



learning from the checkpoint

Problem 1

The correct answer to problem 1 is **D**.

Why might someone choose **A** as the correct answer?

Someone might think that 100 meters is equal to 1 kilometer.

Problem 2

The correct answer to problem 2 is **B**.

Why might someone choose **A** as the correct answer?

Someone might think that they need to find the number of minutes in 3 hours.

Problem 3

The correct answer to problem 3 is **C**.

Why might someone choose **A** as the correct answer?

Someone might think there are 8 ounces in a pound instead of 16 ounces.

Problem 4

The correct answer to problem 4 is **B**.

Why might someone choose **D** as the correct answer?

Someone might add how much Amir and Malaya spent instead of subtracting to find the difference.

Class Information

School _____

City _____ State _____

Teacher (mathematics class) _____

Student Information

Grade _____

First name _____

Last name _____

Date of birth _____ (month) _____ (day) _____ (year)

Male Female

How many years have you been at this school? _____ years

Do you usually speak English at home? Yes No

Does anyone in your home usually speak a language other than English?

Yes No

Name _____

	A	B	C	D
1.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Grateful acknowledgement is made to the following for copyrighted material:

12 t. ©iStockphoto.com **12** m. ©iStockphoto.com/Uros Petrovic **12** b. ©iStockphoto.com/Izabela Habur
13 t. ©iStockphoto.com **13** b.l. ©iStockphoto.com/Camilla Wisbauer **13** b.m. ©iStockphoto.com/Benjamin
Brandt **18** b. ©iStockphoto.com/Scott Rothstein

Note: Every effort has been made to locate the copyright owner of material reproduced in this component.
Omissions brought to our attention will be corrected in subsequent editions.