

ASSESSMENT RESOURCES

Understanding Area and Perimeter



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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 understanding area and perimeter.

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 91 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

7

➤ 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.

Ask students to be sure they have circled their answers in their checkpoint lesson before you collect the answer sheets.

Checkpoint 1 7

checkpoint

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

- Using your metric ruler, determine which measure best represents the length of the path below:

A 25 cm
 B 16 cm
 C 6 cm
 D $17\frac{1}{2}$ cm
- If once around a rectangle is 60 inches and the rectangle is 5 inches wide, how long is the rectangle?

A 55 inches
 B 10 inches
 C 50 inches
 D 25 inches
- What is the perimeter of the following shape?

A 30 ft
 B 28 ft
 C 24 ft
 D Don't have enough information
- Which situation does NOT represent the context of finding a perimeter.

A Determining how much ribbon you need to place a ribbon border around a poster.
 B Deciding how much carpeting you need to carpet your whole bedroom.
 C Figuring out how many bricks you need to make an edge around your garden.
 D Calculating how many strings of lights you need in order to string lights all the way around the backyard fence.

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.



english language learners

This is a good opportunity for students to practice their writing and math reasoning skills. It is also an opportunity for the instructor to model effective oral and written language structures necessary for language development.

Learning from Problem 1

The correct answer is **D**.

When measured with the metric ruler to the nearest centimeter, the length of the path from start to end is 17 centimeters.

learning from the checkpoint

Problem 1

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

What error would cause a student to choose answer **B**?

The student might have measured a straight path from start to end rather than follow the path as it changes directions.

Assessment Resources, page 13



Answer choice **B**:

Possible misconception: The student might think he is supposed to measure a straight path from start to end rather than follow the path as it changes directions.

Suggestion: Ask the student to trace the path with his finger. Help him to understand that the path is represented by the jagged line, not merely the shortest distance from start to end.

Learning from Problem 2

The correct answer is **D**.

If the rectangle is 5 inches wide and 10 inches long, the perimeter of the rectangle is 30 inches. Therefore, once around the rectangle would be 30 inches.

Problem 2

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

What error would cause a student to choose answer **A**?

The student realizes that once around the rectangle is 60 inches, but forgets about the concept of perimeter and instead tries to find what he should add to 5 to get 60.

Assessment Resources, page 13



Answer choice **A**:

Possible misconception: A student might have doubled the width and subtracted that sum from the perimeter to find twice the length, but then she forgot to divide by 2 to get the length.

Suggestion: Have students sketch a diagram to show the known and unknown quantities, so that they can visually understand that twice the length and twice the width equals the perimeter.

Learning from Problem 4

The correct answer is **B**.

The situation described in **B** is talking more about filling up the space on the floor rather than knowing the length around the edge of a floor. So **B** is asking area rather than perimeter.

Problem 4

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

What error would cause a student to choose answer **C**?

The student may automatically think about bricks as materials to fill in areas such as sidewalks, patios, etc.

Assessment Resources, page 13



Answer choice **C**:

Possible misconception: The student may automatically think about bricks as materials to fill in areas such as sidewalks, patios, and so on.

Suggestion: Ask the student to draw a picture of a garden area and to indicate on the picture where the bricks will be placed. Once he sees that the bricks will only be on the border of the garden, he may realize that it is a situation associated with perimeter.

If time permits, ask one or two students to share their responses.



scaffolding for success

Check that students understand the term common, and have them say in their own words why it is important to look at common wrong answers.



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.

➤ 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. 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.



scaffolding for success

Remind students to circle key information in a problem 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 lesson before you collect the answer sheets.



scaffolding for success

For problem 1, be sure that students understand the meaning of the word dimension and its significance in this context.

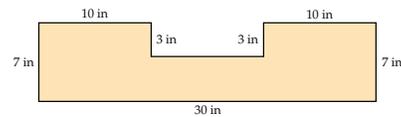
Checkpoint 2 14

checkpoint

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

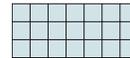
1. A rectangle with dimensions $11\frac{1}{2}$ yd by 10 yd has area:
- A 115 sq yd B $110\frac{1}{2}$ sq yd C 43 sq yd D $21\frac{1}{2}$ sq yd

2. Find the area of the shape below.



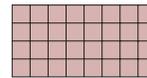
- A 120 sq in B 210 sq in C 170 sq in D 180 sq in

3. The area of the rectangle below can be expressed as an addition problem by:



- A $3 + 7$ B $3 + 7 + 3 + 7$
 C $3 + 3 + 3 + 3 + 3 + 3$ D $7 + 7 + 7$

4. The area of the rectangle below can be expressed using the distributive property as:



- A $(4 \times 3) + (4 \times 5)$ B $(4 \times 8) + (4 \times 8) + (4 \times 8) + (4 \times 8)$
 C $4 \times (2 + 2)$ D $4 \times (8 + 8)$

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 **A**.

Students should understand to multiply the length by the width to find the area of the rectangle.

learning from the checkpoint

Problem 1

The correct answer to problem 1 is **A**.
What error would cause a student to choose answer **D**?

The student added the two dimensions instead of multiplying the two dimensions.

Assessment Resources, page 17



Answer choice **D**:

Possible misconception: The student might think he is supposed to add the length and width instead of multiply.

Suggestion: Ask the student to sketch the rectangle on grid paper and count the number of square units inside the rectangle.



scaffolding for success

“What error would cause a student to choose this answer?” This is a challenging metacognitive question. You may need to model the thought process for answering the question first because students will probably not have had much experience with this way of thinking.

Learning from Problem 2

The correct answer is **D**.

Students should be able to understand the visual diagram and read the units for length and width. Then they should find the area by multiplying the length times the width.

Problem 2

The correct answer to problem 2 is **D**.
What error would cause a student to choose answer **B**?

The student multiplied the outer dimensions together to find the area without considering that the shape is not simply a rectangle.

Assessment Resources, page 17



Answer choice **B**:

Possible misconception: The student multiplied the outer dimensions together to find the area without considering that the shape is not simply a rectangle.

Suggestion: Remind students that area is the number of square units it takes to cover a shape without gaps or overlaps and that perimeter is the distance around a shape. Give students experiences finding areas of rectangles using square tiles.

Learning from Problem 3

The correct answer is **D**.

Students should understand how to find area by adding same-sized rows together or by adding same-sized columns together.

Problem 3

The correct answer to problem 3 is **D**.
What error would cause a student to choose answer **C**?

The student mistakenly computed the perimeter instead of the area.

Assessment Resources, page 17



Answer choice **C**:

Possible misconception: A student might miscount the number of columns in the rectangle, counting only 6 instead of 7.

Suggestion: Ask the student to place a tick mark on each column as she counts to ensure that all columns are counted.

If time permits, ask one or two students to share their responses.



english language learners

Some ELL students may not be fluent enough in English to use the mathematical terminology necessary to describe the misconceptions. If they want to answer a question, allow them plenty of time to formulate the language and assist them by modeling what they are saying with appropriate mathematical terminology. It is also helpful if you write relevant math terms on the board as you discuss them.



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.

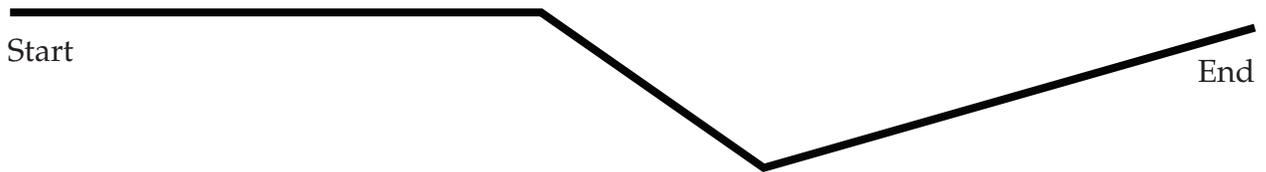
Checkpoint 1

7

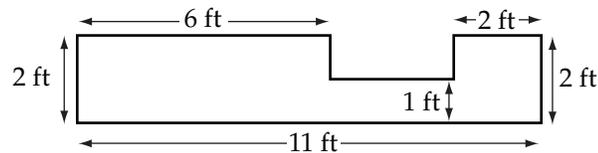
checkpoint

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

1. Using your metric ruler, determine which measure best represents the length of the path below:



- A** 25 cm **B** 16 cm **C** 6 cm **D** $17\frac{1}{2}$ cm
2. If once around a rectangle is 60 inches and the rectangle is 5 inches wide, how long is the rectangle?
- A** 55 inches **B** 10 inches **C** 50 inches **D** 25 inches
3. What is the perimeter of the following shape?



- A** 30 ft **B** 28 ft
- C** 24 ft **D** Don't have enough information
4. Which situation does NOT represent the context of finding a perimeter.
- A** Determining how much ribbon you need to place a ribbon border around a poster.
- B** Deciding how much carpeting you need to carpet your whole bedroom.
- C** Figuring out how many bricks you need to make an edge around your garden.
- D** Calculating how many strings of lights you need in order to string lights all the way around the backyard fence.



learning from the checkpoint

Problem 1

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

What error would cause a student to choose answer **B**?

Problem 2

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

What error would cause a student to choose answer **A**?

Problem 4

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

What error would cause a student to choose answer **C**?

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

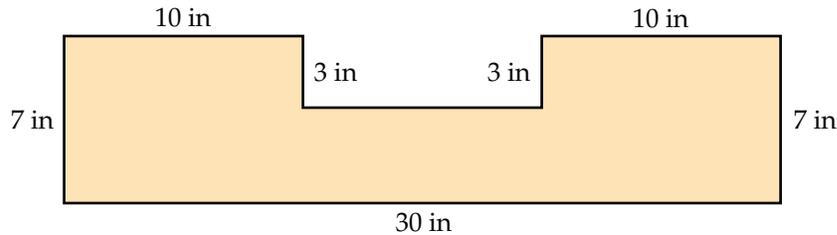
checkpoint

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Circle each answer in your checkpoint lesson, too.

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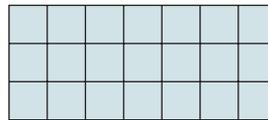
A 115 sq yd **B** $110\frac{1}{2}$ sq yd **C** 43 sq yd **D** $21\frac{1}{2}$ sq yd

2. Find the area of the shape below.



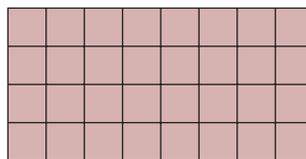
A 120 sq in **B** 210 sq in **C** 170 sq in **D** 180 sq in

3. The area of the rectangle below can be expressed as an addition problem by:



A $3 + 7$ **B** $3 + 7 + 3 + 7$
C $3 + 3 + 3 + 3 + 3 + 3$ **D** $7 + 7 + 7$

4. The area of the rectangle below can be expressed using the distributive property as:



A $(4 \times 3) + (4 \times 5)$ **B** $(4 \times 8) + (4 \times 8) + (4 \times 8) + (4 \times 8)$
C $4 \times (2 + 2)$ **D** $4 \times (8 + 8)$

learning from the checkpoint

Problem 1

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

What error would cause a student to choose answer **D**?

Problem 2

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

What error would cause a student to choose answer **B**?

Problem 3

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

What error would cause a student to choose answer **C**?

Class Information

School _____

City _____ State _____

Teacher (mathematics class) _____

Student Information

Grade _____

First name _____

Last name _____

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

Male Female

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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"/>

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