California Mathematics 4

Chapter 11
Resource Masters

Includes:

Chapter Resources
- Graphic Organizer
- Student-Built Glossary
- Family Letter
- Anticipation Guide
- Game

Leveled Lesson Resources
- Reteach
- Skills Practice
- Homework Practice
- Problem-Solving Practice
- Enrich

Assessment Resources
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- Chapter Pretest
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- Chapter 11 Assessment Line-up
- Answer Keys

All Answers Included
# Grade 4 Chapter 11

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Teacher’s Guide to Using the Chapter 11 Resource Masters

The Chapter 11 Resource Masters includes the core materials needed for Chapter 11. These materials include worksheets, extensions, and assessment options. The answers for these pages appear at the back of this booklet.

All of the materials found in this booklet are included for viewing and printing on the TeacherWorks Plus™ CD-ROM.

Chapter Resources

Graphic Organizer (page 1) This master is a tool designed to assist students with comprehension of grade-level concepts. You can use this graphic organizer in coordination with the appropriate lesson. While the content and layout of these tools vary, their goal is to assist students by providing a visual representation from which they can learn new concepts.

Student Glossary (page 2) This master is a study tool that presents the key vocabulary terms from the chapter. You may suggest that students highlight or star the terms they do not understand. Give this list to students before beginning Lesson 11-1. Remind them to add these pages to their mathematics study notebooks.

Anticipation Guide (page 6) This master is a survey designed for use before beginning the chapter. You can use this survey to highlight what students may or may not know about the concepts in the chapter. If feasible, interview students in small groups, asking them the interview questions in the guide. There is space for recording how well students answer the questions before they complete the chapter. You may find it helpful to interview students a second time, after completing the chapter, to determine their progress.

Game (page 7) A game is provided to reinforce chapter concepts and may be used at appropriate times throughout chapter.

Resources for Lessons

Reteach Each lesson has an associated Reteach worksheet. In general, the Reteach worksheet focuses on the same lesson content but uses a different approach, learning style, or modality than that used in the Student Edition. The Reteach worksheet closes with computational practice of the concept.

Skills Practice The Skills Practice worksheet for each lesson focuses on the computational aspect of the lesson. The Skills Practice worksheet may be helpful in providing additional practice of the skill taught in the lesson. It also contains word problems that cover the skill. Spaces for students’ answers are provided on the worksheet.

Homework Practice The Homework Practice worksheet provides an opportunity for additional computational practice. The Homework Practice worksheet includes word problems that address the skill taught in the lesson. Spaces for students’ answers are provided on the worksheet.

Problem-Solving Practice The Problem-Solving Practice worksheet presents additional reinforcement in solving word problems that apply both the concepts of the lesson and some review concepts.

Enrich The Enrich worksheet presents activities that extend the concepts of the lesson or offer a historical or multicultural look at the lesson’s concepts. Some Enrich materials are designed to widen students’ perspectives on the mathematics they are learning.

Resources for Problem-Solving Lessons In recognition of the importance of problem-solving strategies, worksheets for problem-solving lessons follow a slightly different format. For problem-solving lessons, a two-page Reteach worksheet offers a complete model for choosing a problem-solving strategy. For each Problem-Solving Strategy lesson, Reteach and Homework
Practice worksheets offer reinforcement of the strategy taught in the Student Edition lesson. In contrast, the Problem-Solving Investigation worksheets include a model strategy on the Reteach worksheets and provide problems requiring several alternate strategies on practice worksheets.

**Assessment Options**

The assessment masters in the Chapter 11 Resource Masters offer a wide variety of assessment tools for monitoring progress as well as final assessment.

**Individual Progress Checklist** This checklist explains the chapter’s goals or objectives. Teachers can record whether a student’s mastery of each objective is beginning (B), developing (D), or mastered (M). The checklist includes space to record notes to parents as well as other pertinent observations.

**Chapter Diagnostic Assessment** This one-page test assesses students’ grasp of skills that are needed for success in the chapter.

**Chapter Pretest** This one-page quick check of the chapter’s concepts is useful for determining pacing. Performance on the pretest can help you determine which concepts can be covered quickly and which specific concepts may need additional time.

**Mid-Chapter Review** This one-page chapter test provides an option to assess the first half of the chapter. It includes both multiple-choice and free-response questions.

**Quizzes** Three free-response quizzes offer quick assessment opportunities at appropriate intervals in the chapter.

**Vocabulary Test** This one-page test focuses on chapter vocabulary. It is suitable for all students. It includes a list of vocabulary words and questions to assess students’ knowledge of the words.

**Oral Assessment** This two-page test consists of one page for teacher directions and questions and a second page for recording responses. Although this assessment is designed to be used with all students, the interview format focuses on assessing chapter content assimilated by ELL students. The variety of approaches includes solving problems using manipulatives as well as pencil and paper.

**Chapter Project Rubric** This one-page rubric is designed for use in assessing the chapter project. You may want to distribute copies of the rubric when you assign the project and use the rubric to record each student’s chapter project score.

**Foldables Rubric** This one-page rubric is designed to assess the chapter Foldables graphic organizer. The rubric is written to the students, telling them what you will be looking for as you evaluate their completed Foldables graphic organizer.

**Leveled Chapter Tests**

- **Form 1** assesses basic chapter concepts through multiple-choice questions and is designed for use with on-level students.
- **Form 2A** is designed for on-level students and is primarily for those who may have missed the Form 1 test. It may be used as a retest for students who received additional instruction following the Form 1 test.
- **Form 2B** is designed for students with a below-level command of the English language.
- **Form 2C** is a free-response test designed for on-level students.
- **Form 2D** is written for students with a below-level command of the English language.
- **Form 3** is a free-response test written for above-level students.
- **Extended-Response Test** is an extended response test for on-level students.

**Student Recording Sheet** This one-page recording sheet is for the standardized test in the Student Edition.

**Cumulative Standardized Test Practice** This three-page test, aimed at on-level students, offers multiple-choice questions and free-response questions.

**Answers**

The answers for the Anticipation Guide and Lesson Resources are provided as reduced pages with answers appearing in black. Full size line-up answer keys are provided for the Assessment Masters.
Use this graphic organizer to take notes on Chapter 11: **Geometry and Measurement**. Fill in the missing sections of the graphic organizer.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>congruent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>symmetry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>line of symmetry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rotational symmetry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>perimeter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>area</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
This is an alphabetical list of new vocabulary terms you will learn in **Chapter 11: Geometry and Measurement**. As you study the chapter, complete each term’s definition or description. Remember to add the page number where you found the term. Add this page to your math study notebook to review vocabulary at the end of the chapter.

<table>
<thead>
<tr>
<th>Vocabulary Term</th>
<th>Found on Page</th>
<th>Definition/Description/Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>circle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>congruent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hexagon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>perimeter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>symmetry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>trapezoid</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dear Family,

Today my class started Chapter 11: Geometry and Measurement. I will be learning to identify congruent figures. I will also be learning to find perimeter, area, and circumference. Here are my vocabulary words and an activity that we can do together.

Love, ______________________

Key Vocabulary

**congruent** two shapes having the same size and the same shape

**symmetry** an object has symmetry if one side is the mirror image of the other side

**perimeter** the distance around a shape or region

**area** the number of square units needed to cover the inside of a region or plane figure

**hexagon** a polygon with six sides and six angles

**trapezoid** a quadrilateral with only one pair of parallel sides

**circle** a closed figure in which all points are the same distance from a fixed point called the center of the circle

**Activity**

Use construction paper, a ruler, and a compass to cut out a square, circle, rectangle and triangle. Once the shapes have been cut out, examine them to find lines of symmetry. If you can find a line of symmetry, draw it on the shape. If you can’t, simply write “no line of symmetry” on the shape. Repeat activity using different shapes each time.

**Books to Read:**

*The Patchwork Quilt* by Valerie Flournoy

*A Cloak for a Dreamer* by Aileen Freidman

*The Librarian Who Measured the Earth* by Kathryn Lasky
Estimada familia:

Hoy mi clase comenzó el Capítulo 11: La medición y la geometría. Aprenderé a identificar figuras congruentes y también a calcular el perímetro, el área y la circunferencia. A continuación, están mis palabras de vocabulario y una actividad que podemos hacer juntos.

Vocabulario clave

congruente dos figuras con la misma forma y el mismo tamaño

simetría un objeto posee simetría si un lado es una imagen especular del otro lado

perímetro la distancia alrededor de una figura o región

área el número de unidades cuadradas necesarias para cubrir el interior de una región o figura plana

hexágono polígono con seis lados y seis ángulos

trapecio cuadrilátero con exactamente un par de lados paralelos

círculo figura cerrada en la cual todos los puntos equidistan de un punto fijo llamado centro del círculo

Cariños, ______________________

Actividad

Usen cartulina para recortar un cuadrado, un círculo, un rectángulo y un triángulo. Cuando los hayan recortado, examínenlos para buscar ejes de simetría. Si pueden conseguir un eje de simetría, trácenlo sobre la figura. Si no pueden encontrar ninguno, simplemente escriban “sin ejes de simetría” sobre la figura. Repitan la actividad usando diferentes figuras cada vez.

Libros recomendados

The Patchwork Quilt de Valerie Flournoy

A Cloak for a Dreamer de Aileen Freidman

The Librarian Who Measured the Earth de Kathryn Lasky
## Anticipation Guide

### Number, Operations, and Algebraic Thinking

### Before you begin Chapter 11

- Read each statement.
- Decide whether you agree (A) or disagree (D) with the statement.
- Write A or D in the first column OR if you are not sure whether you agree or disagree, write NS (not sure).

### STEP 1

**A, D, or NS** | **Statement** | **STEP 2** | **A or D**
--- | --- | --- | ---
1. | Two shapes that have different size and shape are congruent. | | |
2. | An object has symmetry if one side is the mirror image of the other side. | | |
3. | Perimeter is the distance around a shape or region. | | |
4. | Area is the number of square units needed to cover the inside of a region or plane figure. | | |
5. | A hexagon has 8 sides. | | |
6. | A circle is a plane figure in which all points are the same distance from a point called the center. | | |
7. | A trapezoid has one pair of parallel sides. | | |
8. | A trapezoid is a quadrilateral. | | |
9. | A quadrilateral has 10 sides. | | |
10. | All shapes are congruent. | | |

### After you complete Chapter 11

- Reread each statement and complete the last column by entering an A (agree) or a D (disagree).
- Did any of your opinions about the statements change from the first column?
- For those statements that you mark with a D, use a separate sheet of paper to explain why you disagree. Use examples, if possible.
Chapter 11 Game

Adding up the Area

Ready

2 number cubes
Paper and pencil

Set

Refresh your memory:
Area of a rectangle = length × width
Perimeter of a rectangle = (2 × length) + (2 × width)

GO!

1. Player 1 tosses the number cubes. The numbers tossed represent the length and width of a rectangle.

2. Calculate the perimeter and the area of the rectangle.

3. Add the area and the perimeter together to find the score for the round.

4. Repeat the steps with player 2.

5. Continue taking turns. Add the scores from each round together. The winner is the first player to reach 200.

\[ P = 4 + 4 + 5 + 5 = 18 \]
\[ A = 5 \times 4 = 20 \]
\[
\begin{array}{c}
18 \\
+ 20 \\
\hline
38 \\
\end{array}
\]

4

5

3

1

1

5

3

1
Reteach
Geometry: Congruent

Similar Figures          Congruent Figures          Not congruent

- same shape
- different sizes

- same shape
- same size

- not the same shape
- not the same size

To see if figures are congruent, trace one figure. If it fits exactly on top of the other figure, the two figures are congruent.

Tell whether the figures are congruent. Write yes or no.

1. ____________________________  4. ____________________________

2. ____________________________  5. ____________________________

3. ____________________________  6. ____________________________
Skills Practice

Geometry: Congruent

Tell whether the figures are congruent. Write yes or no.

1. ____________

2. ____________

3. ____________

4. ____________

Copy each figure on a separate piece of dot paper. Then draw one congruent figure.

5.

8.

6.

9.

7.

10.
Tell whether the figures are congruent. Write yes or no.

1. __________ 2. __________

3. __________ 4. __________

5. __________ 6. __________

Identify the part of the circle shown.

(Lesson 10–9)

7. __________ 8. __________ 9. __________

Name the parts of the circle.

10. SW __________ 11. WV __________

12. W __________ 13. ST __________
Problem-Solving Practice
Geometry: Congruent

Tell whether the figures are congruent. Write yes or no.

1. Amy drew these two figures on dot paper. Look at the figures. Are they congruent?

2. Hamid looked at the ends of two wooden blocks. Are they congruent?

3. Next, Amy drew the right triangle below. On a separate sheet of dot paper, copy the figure. Then, draw one congruent figure.

4. Hamid traced the end of another wooden block onto dot paper. The figure he traced looks like this. On a separate sheet of dot paper, copy the figure. Then, draw one congruent figure.

5. Inez wants to make two pentagons. On a separate sheet of dot paper, draw two congruent pentagons.
Look at the figures below. How can you cut along the grid lines to make two congruent “pieces” from each figure?

Cut out the pieces to test whether each piece is the same size and shape. Or, draw lines where you would cut the figures.
Reteach

Geometry: Symmetry

Follow these steps to find out if a figure has bilateral symmetry.

Trace Figure A and cut it out. Fold it along one of the dashed lines. The two halves match. The dashed line is a **line of symmetry**. The figure has **bilateral symmetry**. Unfold the figure. Fold the figure along the other dashed lines. The halves match, so all the lines are lines of symmetry.

Follow these steps to find out if Figure B has rotational symmetry.

Trace Figure B and cut it out. Place it on top of the original Figure B. Put your pencil point on the dot in the center. Turn the top figure 90°. The top figure matches the original figure. Turn the top figure 180°. The figures match. Figure B has **rotational symmetry**.

Tell whether each figure has line symmetry. Write yes or no.

1. [Diagram of a triangle]

2. [Diagram of a rectangle]

3. [Diagram of a semicircle]

Tell whether the dashed line is a line of symmetry. Then, tell whether the figure has rotational symmetry. Write yes or no.

4. [Diagram with dashed line and dot]

5. [Diagram of a diamond with dashed line]

6. [Diagram of a figure with dashed line]
Tell whether each figure has line symmetry. Write yes or no.

1.  

2.  

3.  

4.  

Tell whether the dotted line is a line of symmetry. Write yes or no.

5.  

6.  

7.  

8.  

9.  

10.  

11. On a separate sheet of paper, draw a figure with rotational symmetry.

12. On a separate sheet of paper, draw a figure with bilateral symmetry.
Tell whether each figure has line symmetry. Write yes or no. Then tell how many lines of symmetry the figure has.

1. 

2. 

3. 

4. 

Tell whether the figure has rotational symmetry. Write yes or no.

5. 

6. 

7. 

8. 

Spiral Review

Tell whether the figures are congruent. Write yes or no. (Lesson 11-1)

9. 

10. 

11. 

12. 

13. 

14. 
Problem-Solving Practice

Geometry: Symmetry

Solve.

1. The pattern on Beth’s floor is in the shape of a plus sign. She copies the shape onto paper and draws a dotted line through the center. Is the dotted line a line of symmetry?

2. Sam is painting a picture of his mother. If he wants to make sure her face is symmetrical in the painting, what can he do to the canvas before he begins?

3. Sheila draws this flower with 6 petals. Then she draws a dotted line through the center of her flower as shown here to find out whether the flower is symmetrical. Is the dotted line a line of symmetry on Sheila’s flower?

4. How many lines of symmetry can you draw through a square?

5. Mirabel is drawing a picture of a flower she found near their campsite. The flower has 5 petals. She draws a dotted line through her flower. There are 3 petals on one side of the line. Is the dotted line Mirabel drew a line of symmetry? How can you tell without drawing it?
Natural Symmetry

Have you ever wondered why kite strings attach to the kite where they do? One of the reasons it is easy to fly a kite, is that kites have bilateral symmetry. This makes them easier to balance and control.

Many things in nature have symmetry too. Think about animals that fly. Name three that have natural bilateral symmetry:

1. 
2. 
3. 

Draw a picture of two things found in nature that have rotational symmetry.
Perimeter is the distance around a closed figure. To find the perimeter, add the lengths of all the sides.

10 ft
15 ft
10 ft
+ 15 ft
50 ft

The perimeter of the rectangle is 50 ft.

Find the perimeter of each figure

1. \[ \begin{align*}
4 \text{ in.} & \quad 4 \text{ in.} \\
\quad & \quad \quad + \\
4 \text{ in.} & \quad \quad \quad \quad = \quad \quad \quad \quad \\
\end{align*} \]

2. \[ \begin{align*}
5 \text{ in.} & \quad 5 \text{ in.} \\
5 \text{ in.} & \quad 5 \text{ in.} \\
\quad & \quad + \\
\quad & \quad + \\
\quad & \quad + \\
\quad & \quad + \\
\quad & \quad = \\
\end{align*} \]

3. \[ \begin{align*}
3 \text{ ft} & \quad 3 \text{ ft} \\
3 \text{ ft} & \quad 3 \text{ ft} \\
\quad & \quad + \\
\quad & \quad + \\
\quad & \quad = \\
\end{align*} \]

4. \[ \begin{align*}
5 \text{ in.} & \quad 4 \text{ in.} \\
6 \text{ in.} & \quad 3 \text{ in.} \\
\quad & \quad + \\
\quad & \quad + \\
\quad & \quad \quad = \\
\end{align*} \]

5. \[ \begin{align*}
5 \text{ m} & \quad 5 \text{ m} \\
7 \text{ m} & \quad 7 \text{ m} \\
\quad & \quad + \\
\quad & \quad + \\
\quad & \quad = \\
\end{align*} \]

6. \[ \begin{align*}
8 \text{ cm} & \quad 7 \text{ cm} \\
7 \text{ cm} & \quad 8 \text{ cm} \\
\quad & \quad + \\
\quad & \quad + \\
\quad & \quad = \\
\end{align*} \]
Skills Practice

Measurement: Perimeter

Find the perimeter of each figure.

1. \[ \text{Perimeter} = 2 \times (5 \text{ cm} + 10 \text{ cm}) = 2 \times 15 \text{ cm} = 30 \text{ cm} \]

2. \[ \text{Perimeter} = 2 \times (10 \text{ mm} + 9 \text{ mm}) + 2 \times 10 \text{ mm} = 22 \text{ mm} + 20 \text{ mm} = 42 \text{ mm} \]

3. \[ \text{Perimeter} = 8 \text{ mm} + 8 \text{ mm} + 8 \text{ mm} + 8 \text{ mm} = 32 \text{ mm} \]

4. \[ \text{Perimeter} = 3 \times 4 \text{ mm} + 2 \times 4 \text{ mm} = 16 \text{ mm} \]

5. \[ \text{Perimeter} = 2 \times (4 \text{ cm} + 5 \text{ cm}) + 2 \times 4 \text{ cm} = 12 \text{ cm} + 8 \text{ cm} = 20 \text{ cm} \]

ALGEBRA Find the length of each missing side.

7. \[ \text{Perimeter} = 2 \times (3 \text{ in.} + 10 \text{ in.}) = 2 \times 13 \text{ in.} = 26 \text{ in.} \]

8. \[ \text{Perimeter} = 2 \times (8 \text{ ft} + 4 \text{ ft}) = 2 \times 12 \text{ ft} = 24 \text{ ft} \]

9. \[ \text{Perimeter} = 4 \times 11 \text{ yd} = 44 \text{ yd} \]

Find the perimeter of each item.

10. Gerry plans a rectangular garden plot that is 30 feet long and 15 feet wide. What is the perimeter of the garden plot?
    \[ \text{Perimeter} = 2 \times (30 \text{ ft} + 15 \text{ ft}) = 2 \times 45 \text{ ft} = 90 \text{ ft} \]

11. A fence around a rectangular corral has a length of 180 feet and a width of 90 feet. What is the perimeter of the fence?
    \[ \text{Perimeter} = 2 \times (180 \text{ ft} + 90 \text{ ft}) = 2 \times 270 \text{ ft} = 540 \text{ ft} \]
Find the perimeter of each figure.

1. \[3 \text{ ft} \times 3\]
2. \[12 \text{ ft} \times 6\]
3. \[2 \text{ yd} \times 5\]

Find the perimeter of each figure in units.

4.
5.
6.

Spiral Review

Tell whether each figure has line symmetry. Write yes or no. If yes, tell how many lines of symmetry the figure has.

7.
8.

Tell whether the figure has rotational symmetry. Write yes or no.

9.
10.
Find the perimeter of each figure.

1. Jorge is drawing a design for a box car. He draws this rectangle to use as the base of the car. Find the perimeter of the rectangle.

   ![Rectangle Diagram]

2. The Hitoshi family plans to make a short sidewalk and patio in their backyard. First, they will need to place a frame around the space. This drawing shows the shape and dimensions of the frame they need to place. What is the frame’s perimeter?

   ![Frame Diagram]

3. Jorge uses this rectangle as a pattern for a picture of a building. What is the perimeter of his rectangle?

4. Mrs. Hitoshi decides to plant a flower bed next to the patio. She wants to use an iron border around the flower bed. She uses this grid to find out how many sections of iron border she will need. Find the perimeter of the flower bed.

   ![Flower Bed Grid]
Enrich

Perimeter Puzzles

Each square at the right is divided into three regions. Each region has a perimeter of 8 units.

The square at the right is divided into two regions. Each region has a perimeter of 10 units.

Divide each square below into the number of regions with the perimeter given. Try to do this in two different ways.

1. Number of regions: 4
   Perimeter of each region: 10

2. Number of regions: 5
   Perimeter of each region: 12

3. Number of regions: 6
   Perimeter of each region: 12
Reteach

Problem-Solving Strategy: Solve a Simpler Problem

Josie and Julia made 16 congruent hexagon-shaped signs for Cara’s surprise birthday party. Julia and Josie put ribbon around the edges of each of the signs. If each side of the hexagons is 13 inches, how much ribbon do Julia and Josie need?

<table>
<thead>
<tr>
<th>Step 1. Understand</th>
<th>Be sure you understand the problem.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read carefully.</td>
<td></td>
</tr>
<tr>
<td>What do you know?</td>
<td></td>
</tr>
<tr>
<td>• There are _____ signs.</td>
<td></td>
</tr>
<tr>
<td>• There are _____ sides to each sign.</td>
<td></td>
</tr>
<tr>
<td>• Each side of the sign is _____ inches long.</td>
<td></td>
</tr>
<tr>
<td>• Julia and Josie are putting ribbon around the edges of each sign.</td>
<td></td>
</tr>
<tr>
<td>What do you need to find?</td>
<td></td>
</tr>
<tr>
<td>• You need to find</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2. Plan</th>
<th>Make a plan.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solve a simpler problem.</td>
<td></td>
</tr>
<tr>
<td>Use simpler numbers to make up a problem similar to the one you need to solve. Then solve the real problem the same way.</td>
<td></td>
</tr>
</tbody>
</table>
Name ___________________________ Date ________________

### 11–4

#### Reteach (continued)

**Problem-Solving Strategy**

<table>
<thead>
<tr>
<th>Step 3. Solve</th>
<th>Carry out your plan.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Create a simpler problem.</td>
</tr>
<tr>
<td></td>
<td>Round 16 signs to 20 signs, and 13 inches to 10 inches to make multiplying easier.</td>
</tr>
<tr>
<td></td>
<td>6 sides $\times$ _______ or _______ inches.</td>
</tr>
<tr>
<td></td>
<td>20 signs $\times$ _______ inches = _______ inches.</td>
</tr>
<tr>
<td></td>
<td>The amount of ribbon used for both signs is about _______.</td>
</tr>
<tr>
<td></td>
<td>Now solve the real problem the same way.</td>
</tr>
<tr>
<td></td>
<td>6 sides $\times$ _______ or _______ inches.</td>
</tr>
<tr>
<td></td>
<td>16 signs $\times$ _______ inches = _______ inches.</td>
</tr>
<tr>
<td></td>
<td>The amount of ribbon used for both signs is _______.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 4. Check</th>
<th>Is the solution reasonable?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reread the problem.</td>
</tr>
<tr>
<td></td>
<td>Does your answer make sense? Explain.</td>
</tr>
<tr>
<td></td>
<td>__________________________________________</td>
</tr>
<tr>
<td></td>
<td>__________________________________________</td>
</tr>
<tr>
<td></td>
<td>__________________________________________</td>
</tr>
</tbody>
</table>

### Solve. Use the solve a simpler problem strategy.

1. Robert is going to buy 4 pounds of apples. He is also going to buy 6 pounds of grapes. The apples and grapes are both $2 a pound. What will be the total cost of the fruit? __________________________

2. Kyle’s CD has 12 songs, and each song is 4 minutes long. Jane’s CD has 15 songs, and each song is 3 minutes long. Whose CD plays longer and by how much? __________________________
Skills Practice

**Problem-Solving Strategy: Solve a Simpler Problem**

Solve. Use the *solve a simpler problem* strategy.

1. Mike’s school is being repainted. They use 225 gallons of white paint. They use 45 gallons fewer green paint than white paint. How many gallons of paint does he use in all? ________________

2. Julia is placing 63 baseball cards in an album. She will put the same number of cards on each of 7 pages. She can put 3 pictures in each row. How many rows will be on each page? ____________

3. Six farmers spend 310 hours in all planting corn. One of the farmers spent 60 hours. The rest spent the same amount of time each. How many hours did each spend on planting corn. ________________

Solve. Use any strategy.

4. There are 24 plants in a garden. There are 4 more tomato plants than red pepper plants. There are twice as many red pepper plants as green pepper plants. How many of each kind of plant is in the garden?

   __________________________________________________________________________
   __________________________________________________________________________
   Strategy: ___________________________________________________________________

5. The Yogurt Cart has the following 3 flavors: chocolate, vanilla, and strawberry. Yogurt comes in a cup or a cone. You can have no sprinkles, chocolate sprinkles, or rainbow sprinkles. How many different choices are there? ________________

   Strategy: ___________________________________________________________________

6. An ounce of cheddar cheese has 114 calories. An ounce of Brie cheese has 95 calories. How many more calories does an ounce of cheddar cheese have than an ounce of Brie cheese?

   __________________________________________________________________________
   Strategy: ___________________________________________________________________
Homework Practice

Problem-Solving Strategy: Solve a Simpler Problem

Solve. Use the solve a simpler problem strategy.

1. Nicholas had to make 6 cakes for the party. Each cake takes 12 minutes to mix, 21 minutes to bake, and 27 minutes to cool and decorate. How many hours will it take to make all 6 cakes? ____________

2. Ricardo grows tomatoes in his garden. Each tomato plant yields 22 tomatoes each week. He has 5 tomato plants. How many tomatoes does he have after 4 weeks? ________________

Spiral Review

Find the perimeter of each figure. (Lesson 11–3)

3.  
   \[ \begin{array}{c}
   \text{7 ft} \\
   \text{3 ft}
   \end{array} \]

4.  
   \[ \begin{array}{c}
   \text{9 ft} \\
   \text{9 ft}
   \end{array} \]

5.  
   \[ \begin{array}{c}
   \text{15 yd} \\
   \text{15 yd}
   \end{array} \]

6.  
   \[ \begin{array}{c}
   \text{1 m} \\
   \text{5 m}
   \end{array} \]

Find the perimeter of each figure in units.

7.  
   \[ \begin{array}{c}
   \text{4 in} \\
   \text{2 in}
   \end{array} \]

8.  
   \[ \begin{array}{c}
   \text{3 ft} \\
   \text{8 ft}
   \end{array} \]
1. Three congruent squares of concrete are placed next to each other to form a rectangular walkway. The perimeter of the concrete “path” is 24 feet.
   A. What are the dimensions of the rectangular walkway?
   ____________________________

   B. How much area does it cover?
   ____________________________

2. Centered inside each of the concrete squares is a circle that has a diameter of 2 feet. The circumference of the circle is marked with a wavy line.
   A. About how long is each wavy line?
   ____________________________

   B. How close to the edge of the concrete square does the wavy line ever get?
   ____________________________
   ____________________________
   ____________________________
   ____________________________
**Reteach**

*Measurement: Area*

**Area is the number of square units needed to cover a region or figure.**

You can use these two ways to find the area of a rectangle or square.

- Count the number of square units.
  - There are 25 square units.
  - The area is 25 square units.

- Multiply the length times the width.
  - \(5 \times 5 = 25\)
  - The area is 25 square units.

**Find the area of each figure.**

1. **length:** ____ units  
   **width:** ____ units  
   **area =** ____ square units

2. **length:** ____ units  
   **width:** ____ units  
   **area =** ____ square units

3. **length:** 3 ft  
   **width:** 8 ft

4. **length:** 4 in.  
   **width:** 7 in.

5. **length:** 2 in.  
   **width:** 4 in.

6. **length:** 6 ft  
   **width:** 9 ft
Skills Practice
Measurement: Area

Find the area of each figure.

1. 

2. 

3. 

4. 

5. 

6. 

Use grid paper to draw each of the following squares or rectangles. Tell whether the figure is a square or rectangle. Then find the area.

7. length: 5 cm
   width: 8 cm

8. length: 7 cm
   width: 7 cm

9. length: 7 cm
   width: 4 cm

Find the area and perimeter of each figure.

10. 

11. 

12. 

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Homework Practice

Measurement: Area

Find the area of each figure.

1. 

2. 
25 mm

Use the grid to draw each of the following squares or rectangles. Tell whether the figure is a square or rectangle. Then find the area.

3. Length: 6 units; width: 2 units:

4. Length: 4 units; width: 4 units:

Spiral Review

Solve. Use the solve a simpler problem strategy. (Lesson 11–4)

5. Maria found a store that sells handmade sweaters for $37. She wants to buy one for everyone in her family. She will buy 6 sweaters. How much will this cost? _______

6. James took a job delivering groceries in his neighborhood. He can carry 8 bags with each trip. If he takes 28 trips a day, how many bags does he deliver? __________

7. There are 32 students in Marissa’s class. Each student started the year with 15 pencils. How many pencils did the class start with? ________________
Find the area of each figure.

1. Lin and her sister are getting a new rug for their bedroom. The rug is 3 feet wide and 5 feet long. Find the area of the rug. __________

2. Lin wants to use blue tissue paper to decorate the top of a box that is 4 inches square. What is the area of the piece of tissue paper Lin needs? __________

3. Ms. Charles wants to carpet the reading nook shown here. How many square meters of carpet will Ms. Charles need for the reading nook? __________

4. Helena makes a canvas for an oil painting. Use graph paper to draw the shape of her canvas with length 12 centimeters and width 6 centimeters. Tell what shape Helena’s canvas is, and find the area. __________

5. Mike’s sister wants to make a cover for the gas grill on the deck. She has a piece of waterproof fabric that is 4 feet long and 1 foot wide. Use graph paper to draw a figure with length 4 ft and width 1 ft. Tell what the figure is, and find the area. Then tell what shape the section of the deck with the gas grill is and find the area. Will the piece of waterproof fabric cover the grill? __________

   \[
   \begin{array}{c}
   \text{3 m} \\
   \text{2 m}
   \end{array}
   \]
Jeremy’s family has a square swimming pool. A rope runs from the middle of one side to the middle of the opposite side to divide the shallow half from the deep half. One side of the pool is 30 feet long.

1. What is the perimeter of the swimming pool?

2. What is the surface area of the deep end?

3. What is the surface area of the entire pool?

4. What is the perimeter of the shallow end?

Katie’s family also has a swimming pool. Her family’s pool has a shallow end that is twice as long as Jeremy’s pool.

5. What is the perimeter of Katie’s pool?

6. What is the surface area of Katie’s pool?

7. What is the perimeter of the shallow end of Katie’s pool?
There are many ways to solve most math problems. You will decide which strategy works best for you when you read the problems.

**Problem-Solving Strategies**

**Reasonable Answers:** This strategy helps when you are looking for an estimate of something.

**Act it Out:** This strategy can help if you have to move things around to see how they fit together.

**Guess and Check:** This strategy can help when there is no pattern and many possible answers.

**Look for a pattern:** This strategy can help you solve problems when the input changes.

**Solve a Simpler Problem:** This strategy can help you break a problem into smaller, simpler problems.

At Sean’s school, the Specials teachers rotate which days they come to school. Art is every three days. Music is once a week, rotating days each week. Physical Education is every other day. If he had all three Specials on Monday, which Specials will he have this Friday.

<table>
<thead>
<tr>
<th>Understand</th>
<th>You know the pattern of his Specials classes. You also know that you need to use the pattern of classes to predict. You need to find out which classes Sean will have on Friday.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>Choose a strategy. There is a pattern for each class. Look at the rule of each pattern. Use the rule to figure out which classes will happen on Friday. Use the <em>look for a pattern</em> strategy to solve the problem.</td>
</tr>
<tr>
<td>Solve</td>
<td>The rules are: Art is every three days; Physical Education is every other day; Music is once a week, rotating days.</td>
</tr>
<tr>
<td>Check</td>
<td>Check to see if you are correct: Write out which days this week Sean would have Art, Music, and Physical Education. Art: Monday, Thursday Music: Monday Physical Education: Monday, Wednesday, Friday</td>
</tr>
</tbody>
</table>
Use any strategy shown below to solve. Tell what strategy you used.

- Use the four-step plan
- Reasonable answers
- Act it out
- Guess and check
- Look for a pattern
- Solve a simpler problem

1. Steve counted 344 legs at the dog park. If there are 110 guests at the park, how many are people and how many are dogs?

   Strategy: ________________________________

2. Arrange these 5 polygons to fit into this shape:

   Strategy: ________________________________

3. Sydney earns $1 per square foot that she cleans. If a room were 22 feet by 15 feet, how much would she be paid to clean it?

   Strategy: ________________________________

4. John can ride his bike 15 miles in 1 hour. Is it reasonable to say he could ride his bike 100 miles in 7 hours?

   Strategy: ________________________________

5. Michael has 88 toy cars. He has 19 more than Javier. Javier has 5 more than Jeff. How many cars does Jeff have?

   Strategy: ________________________________
Use any strategy shown below to solve.
Tell what strategy you used.

- Reasonable answers
- Act it out
- Guess and check
- Look for a pattern
- Solve a simpler problem

1. My brother tells me he has five bills in his wallet and they equal $32. If I can guess which bills they are: $20, $10, $5, $1, he will give them to me. What are the five bills in his wallet?

   Strategy: ____________________________________________

2. Allison cut out this paper to wrap a gift. What shape is the package she will wrap?

   Strategy: ____________________________________________

3. Elizabeth sells snacks for $2 after the football games. How much would she earn if she sold 57 snacks at each of four games?

   Strategy: ____________________________________________

4. Eduardo can complete 6 math problems in 15 minutes. Is it reasonable for him to say he can complete 25 problems in one hour?

   Strategy: ____________________________________________

5. Describe the pattern below and provide the next two numbers.
   2, 9, 16, 23, ________________

   Strategy: ____________________________________________
Use any strategy shown below to solve.
Tell what strategy you used.

- Reasonable answers
- Look for a pattern
- Act it out
- Solve a simpler problem
- Guess and check

1. A conference center has six rooms. Each room can hold up to 248 people. About how many people can fit in the conference center?

   Strategy: _____________________________________________________________

2. Ryan’s school is going on a field trip. If all six classrooms have 27 students going on the trip, how many students from the school are going?

   Strategy: _____________________________________________________________

3. Cole has 26 trophies. Julia has eight more than Cole. Eric has seven more than Julia. How many trophies does Eric have?

   Strategy: _____________________________________________________________

**Spiral Review**

**Find the area of each figure. (Lesson 11–5)**

4. 1 yd
   
   __________

5. __________

6. Mrs. Sanchez’s room has an area of 1295 square feet. Her room is 35 feet long. How wide is her room? ______

7. Chelsea wants to know the area of the pool deck she scrubs. It is 25 feet wide by 42 feet long. What is the area? _________________
You can draw a picture of a cube by lightly drawing two squares that overlap, and connecting the corners with diagonal lines.

1. On the left below draw a picture of a cube that would have a surface area of 6 square inches. Use a ruler to measure the line segments to make your drawing as accurate as possible.

2. On the right below, draw a cube that would have four times as much surface area.
When you need to find the area of a complex figure, you can break the figure into smaller, simpler parts.

Use this example to learn more about breaking a figure into smaller parts:

You can break this figure into 2 rectangles:
1. $9 \text{ cm} \times 3 \text{ cm} = 27 \text{ sq cm}$
2. $6 \text{ cm} \times 4 \text{ cm} = 24 \text{ sq cm}$

This complex figure’s area is $27 \text{ sq cm} + 24 \text{ sq cm} = 51 \text{ sq cm}$

**Find the area of each figure.**

1.  
   
   5 ft
   
   6 ft
   
   4 ft
   
   7 ft
   
   ________

2.  
   
   5 cm
   
   14 cm
   
   7 cm
   
   ________

3.  
   
   4 in.
   
   8 in.
   
   12 in.
   
   5 in.
   
   ________

4.  
   
   15 in.
   
   7 in.
   
   8 in.
   
   7 in.
   
   ________

5.  
   
   8 yd
   
   4 yd
   
   5 yd
   
   15 yd
   
   ________

6.  
   
   6 m
   
   5 m
   
   4 m
   
   ________
Find the area of each figure.

1. 15 in.  20 in.  5 in.  2 in. 

4. 15 cm  11 cm  12 cm  4 cm

2. 14 m  10 m  6 m  12 m

5. 12 in.  2 in.  5 in.  9 in.

3. 9 yd  3 yd  2 yd  5 yd

6. 10 ft  8 ft  8 ft  3 ft  12 ft

7. Caroline wants to make 2 blankets to replace her favorites. One is 3 feet \( \times \) 2 feet. The other is 7 feet \( \times \) 4 feet. What is the total area of both blankets?

8. All the walls in Sam's house are 8 feet high. He has three walls that are 12 feet, 14 feet, and 15 feet to paint. What is the total area of the 3 walls to paint?
Homework Practice

Measure: Area of Complex Figures

Find the area of each figure.

1. 15 ft 7 ft
   12 ft
   2 ft

2. 16 cm
   15 cm
   20 cm
   5 cm

3. 16 in.
   6 in.
   4 in.
   10 in.

4. 10 in.
   18 in.
   2 in.
   2 in.

5. 4 yd
   4 yd
   12 yd
   15 yd
   5 yd

6. 6 ft
   14 ft
   7 ft
   2 ft

Spiral Review

Use any strategy shown below to solve.
Tell what strategy you used. (Lesson 11–6)

- Reasonable answers
- Guess and check
- Act it out
- Look for a pattern
- Solve a simpler problem

7. My school has 17 classrooms. Each room can hold up to 35 students. How many students can come to my school?
   ___________________ Strategy: ___________________

8. Justin walks 16 dogs a day. Is it reasonable to say that he walks about 100 dogs in a week? _____ Strategy: ___________________
Find the area of each figure.

1. Amanda needs to wrap a gift. The box she has to wrap has 6 sides that are each 4 inches \( \times \) 4 inches. How much paper does she need to wrap this box?

2. Tony’s family wants to figure out how big an area of their home is. They discovered they have a large room that is 20 feet \( \times \) 17 feet and a room that is 12 feet \( \times \) 15 feet. How large is this area of their home?

3. Rosa placed a box that is 25 inches \( \times \) 36 inches on a table. She discovered that the table is exactly 1 inch larger on all sides. What is the area of the table’s top?

4. Patrick broke his neighbor’s window with a baseball. He wanted to find out how much it would cost to replace it. The window was 27 inches \( \times \) 34 inches on top and 27 inches \( \times \) 16 inches on the bottom. The store charges 10¢ per square inch for the glass. How much will the glass cost?

5. Emily is helping wallpaper her bathroom. She has a 3 feet \( \times \) 5 feet wall and a 2 feet \( \times \) 8 feet area to cover. How much wallpaper does she need?

6. Dan has to figure out how much fertilizer he needs for his lawn. His front lawn is 35 feet \( \times \) 17 feet. His side lawn is 9 feet \( \times \) 17 feet. His back lawn is 35 feet \( \times \) 12 feet. How large is his lawn?
Joleen has a wooden pencil case in the shape of a triangular prism. The case is 8 inches long and has three rectangular faces. Two ends of the case are equilateral triangles. Each one has a perimeter of 6 inches. Use the space below to figure out the total surface area of the pencil case.

Total surface area = ____________ square inches
Individual Progress Checklist

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<th>D</th>
<th>M</th>
<th>Goal</th>
<th>Progress</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Identify congruent figures.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Identify figures that have bilateral and rotational symmetry.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Understand and use formulas to find perimeter and area.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Relate perimeter and area.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Solve problems by working simpler problems.</td>
<td></td>
</tr>
</tbody>
</table>

Notes

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Chapter Diagnostic Assessment

Identify each polygon.

1. 

2. 

3. 

4. 

Find the value of each expression.

5. \(5 + 4 + 5 + 4 = \) 

8. \(17 \times 6 = \)

6. \(7 + 14 + 7 + 14 = \)

9. \((2 \times 4) + (2 \times 8) = \)

7. \(18 \times 5 = \)

10. \((2 \times 12) + (2 \times 6) = \)

Tell whether each figure is divided in half by the dashed line. Write yes or no.

11. 

12. 

13. 

Grade 4
Chapter Pretest

Tell whether the figures are congruent. Write yes or no.

1.  
   ![Figure 1]

2.  
   ![Figure 2]

Tell whether the figure has line symmetry, bilateral symmetry, or rotational symmetry.

3.  
   ![Figure 3]

4.  
   ![Figure 4]

Find the perimeter of each figure.

5.  
   ![Figure 5]

6.  
   ![Figure 6]

Find the area of the square or rectangle.

7.  
   ![Figure 7]

8.  
   ![Figure 8]
Tell whether each figure has line symmetry. Write yes or no. Tell how many lines of symmetry the figure has.

1.

Tell whether the figure has rotational symmetry. Write yes or no.

2.  

3.  

Tell whether the figures are congruent.

4.  

5.  

6.  

7.  

Solve.

8. Jennifer’s table is rectangular and 48 inches wide by 60 inches long. Her sister says she has a congruent table to switch with her. If her sister’s table is 48 inches long, how wide must it be?

9. Emma and Sam are best friends and like to have everything the same. Emma’s room is 9 feet 5 inches long by 10 feet 2 inches. Sam’s room is 10 feet 2 inches long by 9 feet 11 inches. Are their rooms congruent? Explain.
Find the perimeter of each figure.

1. \[ \text{3 ft} \quad \text{3 ft} \quad \text{3 ft} \quad \text{3 ft} \]
2. \[ \text{9 cm} \quad \text{9 cm} \quad \text{9 cm} \quad \text{9 cm} \]
3. \[ \text{6 in.} \quad \text{6 in.} \]
4. \[ \text{10 cm} \quad \text{5 cm} \]

Find the perimeter of each figure in units.

5. 

6. 

Solve. Use the solve a simpler problem strategy.

7. Miguel wore a pedometer as part of a class experiment. He discovered that he averages 8,000 steps on Mondays, 7,500 on Tuesdays; 8,500 on Wednesdays; and 9,500 on Thursdays and Fridays. How many steps does Miguel walk in those 5 days?

8. Sarah practices yoga for 40 minutes, 3 times a week. How long does she practice yoga in 1 month?
Quiz 3 (Lessons 11–5 through 11–7)

Find the area of each figure.

1. 

2. 

3. 

4. 

5. 

6. Ashley’s teacher let her choose if she wanted to sit at a desk that was 30 inches × 26 inches or at a table that was 29 inches × 27 inches. If she wants to sit at the larger place, which should she choose? ______________________________________________________________________

Use any strategy shown below to solve. Tell what strategy you used.

- Reasonable answers
- Look for a pattern
- Act it out
- Guess and check
- Solve a simpler problem

7. Max rides the bus to school. There are 38 students on each bus and 8 buses that come to school. If there are 385 students at the school, how many students walk? ________________

Strategy: ______________________________________________________________________

8. Jennifer scores 17 points per game on average. If there are 12 games in a season, how many points will she score? ________________

Strategy: ______________________________________________________________________
Mid-Chapter Review (Lesson 11–1 through 11–3)

Circle the correct choice.

1. Which figure is congruent to the hexagon shown?

   A.  
   B.  
   C.  
   D.  

2. How many lines of symmetry does this figure have?

   F. 1  
   G. 3  
   H. 4  
   J. 5  

3. What is the perimeter of this figure?

   A. 26 cm  
   B. 28 cm  
   C. 30 cm  
   D. 34 cm  

Tell whether each figure has line symmetry. Write yes or no. Then tell how many lines of symmetry the figure has.

4. 

5. 

Tell whether the figure has rotational symmetry. Write yes or no.

6. 

7. 

Solve.

8. Robert’s neighborhood is putting in a new playground. The playground area is a perfect rectangle. How much fencing will they need to place a fence around the perimeter of the playground?

   42 yd  
   55 yd

8. ______
Using the word bank below, complete each sentence by writing the correct word or words in the blank.

congruent
symmetry
perimeter
area
hexagon
trapezoid
circle

1. An object has ______________ if one side is the mirror image of the other side.

2. The number of square units needed to cover the inside of a region or plane figure is ______________.

3. A ______________ is a quadrilateral with one pair of parallel sides.

4. Two figures having the same size and shape are ______________.

5. ______________ is the distance around a shape or a region.

6. A ______________ is a closed figure in which all points are the same distance from a fixed point called the center of the circle.

7. A ______________ is a polygon with six sides and six angles.
Use construction paper to cut out a square, circle, rectangle and triangle.

Read each question aloud to the student. Then write the student’s answers on the lines below the question.

1. Can a line of symmetry be drawn on the square?

2. Can a line of symmetry be drawn on the circle?

3. Tell how you got your answer.

4. Can a line of symmetry be drawn on the rectangle?

5. Can a line of symmetry be drawn on the triangle?

6. Tell how you got your answer.
7. Lin, Amanda, and Ming are drawing quadrilaterals. Lin drew a square with sides 4 inches in length. What is the perimeter of the square?

________________________________________________________________________
________________________________________________________________________

8. What is the area of Lin’s square?

________________________________________________________________________
________________________________________________________________________

9. Tell how you found the perimeter and area.

________________________________________________________________________
________________________________________________________________________

10. Ming drew a rectangle with one side 8 inches and one side 3 inches. What is the perimeter of her rectangle?

________________________________________________________________________
________________________________________________________________________

11. What is the area of Ming’s rectangle?

________________________________________________________________________
________________________________________________________________________

12. Explain your answer.

________________________________________________________________________
________________________________________________________________________
# Chapter Project Rubric

<table>
<thead>
<tr>
<th>Score</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Student successfully completed the chapter project. Student demonstrated appropriate use of chapter information in completing the chapter project.</td>
</tr>
<tr>
<td>2</td>
<td>Student completed the chapter project with partial success. Student partially demonstrated appropriate use of chapter information in completing the chapter project.</td>
</tr>
<tr>
<td>1</td>
<td>Student did not complete the chapter project or completed it with little success. Student demonstrated very little appropriate use of chapter information in completing the chapter project.</td>
</tr>
<tr>
<td>0</td>
<td>Student did not complete the chapter project. Student demonstrated inappropriate use of chapter information in completing the chapter project.</td>
</tr>
</tbody>
</table>
# Foldable Rubric

**Geometry and Measurement**  
**Ten-tab Vocabulary Foldables**

<table>
<thead>
<tr>
<th>Score</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Student properly assembled Foldables graphic organizer according to instructions. Student recorded information related to the chapter in the manner directed by the Foldables graphic organizer. Student used the Foldables graphic organizer as a study guide and organizational tool.</td>
</tr>
<tr>
<td>2</td>
<td>Student exhibited partial understanding of proper Foldables graphic organizer assembly. Student recorded most but not all information related to the chapter in the manner directed by the Foldables graphic organizer. Student demonstrated partial use of the Foldables graphic organizer as a study guide and organizational tool.</td>
</tr>
<tr>
<td>1</td>
<td>Student showed little understanding of proper Foldables graphic organizer assembly. Student recorded only some information related to the chapter in the manner directed by the Foldables graphic organizer. Student demonstrated little use of the Foldables graphic organizer as a study guide and organizational tool.</td>
</tr>
<tr>
<td>0</td>
<td>Student did not assemble Foldables graphic organizer according to instructions. Student recorded little or no information related to the chapter in the manner directed by the Foldables graphic organizer. Student did not use the Foldables graphic organizer as a study guide and organizational tool.</td>
</tr>
</tbody>
</table>
Read each question carefully. Write your answer on the line provided.

1. Which set of figures is congruent?
   - A. \[ \text{figure A} \]
   - B. \[ \text{figure B} \]
   - C. \[ \text{figure C} \]
   - D. \[ \text{figure D} \]
   1. ____

2. Which figure has rotational symmetry?
   - F. \[ \text{figure F} \]
   - G. \[ \text{figure G} \]
   - H. \[ \text{figure H} \]
   - J. \[ \text{figure J} \]
   2. ____

3. Find the perimeter.
   
   \[ \text{rectangle with sides 7 in., 7 in., 7 in., 7 in.} \]
   
   - A. 14 in.
   - B. 21 in.
   - C. 28 in.
   - D. 35 in.
   3. ____

4. Which equation would you use to find the area of the rectangle?
   
   \[ \text{rectangle with sides 9 ft, 4 ft} \]
   
   - F. \[ A = (4 \times 9) + (4 \times 9) \]
   - G. \[ A = 4 + 9 \]
   - H. \[ A = 4 + 4 + 9 + 9 \]
   - J. \[ A = 4 \times 9 \]
   4. ____

5. Find the area.
   
   \[ \text{rectangle with sides 10 in., 12 in., 2 in., 2 in.} \]
   
   - A. 114 sq in.
   - B. 48 sq in.
   - C. 44 sq in.
   - D. 42 sq in.
   5. ____

6. Which letter has bilateral symmetry?
   - F. \[ \text{figure F} \]
   - G. \[ \text{figure G} \]
   - H. \[ \text{figure H} \]
   - J. \[ \text{figure J} \]
   6. ____

7. A table has a length of 8 feet and a width of 3 feet. A congruent table would have a width of 3 feet and a length of ________ feet.
   - A. 8
   - B. 5
   - C. 3
   - D. 2
   7. ____
8. Find the area.
   \[ \text{Area} = 2 \times 5 = 10 \text{ square cm} \]
   - F. 7 sq cm
   - G. 10 sq cm
   - H. 14 sq cm
   - J. 20 sq cm
   \[ \text{Area} = 5 \times 2 = 10 \text{ square cm} \]
   - 8. 10 sq cm

9. Find the perimeter.
   \[ \text{Perimeter} = 2(12 + 16) = 2(28) = 56 \text{ cm} \]
   - A. 28 cm
   - B. 44 cm
   - C. 46 cm
   - D. 56 cm
   \[ \text{Perimeter} = 2(9 + 9) = 2(18) = 36 \text{ in.} \]
   - 9. 56 cm

10. Find the area.
    \[ \text{Area} = \text{Number of square units} \]
    - F. 12 square units
    - G. 25 square units
    - H. 35 square units
    - J. 49 square units
   \[ \text{Area} = 5 \times 5 = 25 \text{ square units} \]
   - 10. 25 square units

11. How many lines of symmetry does the figure below have?
    \[ \text{Figure} \]
    - A. 1
    - B. 2
    - C. 3
    - D. 4
   \[ \text{Figure} \]
   - 11. 1

12. Find the perimeter.
    \[ \text{Perimeter} = 2(9 + 9) = 2(18) = 36 \text{ in.} \]
    - F. 81 in.
    - G. 36 in.
    - H. 18 in.
    - J. 9 in.
   \[ \text{Perimeter} = 2(9 + 9) = 2(18) = 36 \text{ in.} \]
   - 12. 36 in.

13. Taylor has a rug that measures 6 feet by 8 feet. What is the area?
    - A. 14 sq ft
    - B. 24 sq ft
    - C. 28 sq ft
    - D. 48 sq ft
   \[ \text{Area} = 6 \times 8 = 48 \text{ square feet} \]
   - 13. 48 sq ft

14. Sean’s garden has an area of 72 square feet and a perimeter of 36 feet. Find the length and width of Sean’s garden.
    - F. length = 18 ft, width = 4 ft
    - G. length = 12 ft, width = 6 ft
    - H. length = 10 ft, width = 8 ft
    - J. length = 9 ft, width = 9 ft
   \[ \text{Perimeter} = 2(9 + 9) = 2(18) = 36 \text{ in.} \]
   - 14. 9 ft, width = 9 ft
Read each question carefully. Write your answer on the line provided.

1. Which set of figures is congruent?
   A. \[ \triangle \]  \hspace{1cm}  B. \[ \square \]  \hspace{1cm}  C. \[ \square \]  \hspace{1cm}  D. \[ \square \]
   1. ____

2. Find the perimeter.
   \[ 6 \text{ cm} \]
   \[ 6 \text{ cm} \]
   \[ 8 \text{ cm} \]
   \[ 8 \text{ cm} \]
   \[ 6 \text{ cm} \]
   F. 30 cm  \hspace{1cm}  G. 28 cm  \hspace{1cm}  H. 22 cm  \hspace{1cm}  J. 20 cm
   2. ____

3. Which figure has rotational symmetry?
   A. \[ \bigcirc \]  \hspace{1cm}  B. \[ \square \]  \hspace{1cm}  C. \[ \triangle \]  \hspace{1cm}  D. \[ \bigcirc \]
   3. ____

4. Which equation would you use to find the area of the rectangle?
   \[ 1 \text{ m} \]
   \[ 4 \text{ m} \]
   F. \[ A = 4 \times 1 \]  \hspace{1cm}  G. \[ A = (4 \times 1) + (4 \times 1) \]  \hspace{1cm}  H. \[ A = 4 + 1 \]  \hspace{1cm}  J. \[ A = 4 + 4 + 1 + 1 \]
   4. ____

5. Which figure does not have bilateral symmetry?
   A. \[ W \]  \hspace{1cm}  B. \[ A \]  \hspace{1cm}  C. \[ C \]  \hspace{1cm}  D. \[ L \]
   5. ____

6. A television has a length of 21 inches and a width of 18 inches. A congruent television would have a width of 18 inches and a length of _________ inches.
   F. 21  \hspace{1cm}  G. 18  \hspace{1cm}  H. 16  \hspace{1cm}  J. 15
   6. ____

7. Find the area.
   \[ 6 \text{ mm} \]
   \[ 25 \text{ mm} \]
   A. 170 sq mm  \hspace{1cm}  B. 150 sq mm  \hspace{1cm}  C. 120 sq mm  \hspace{1cm}  D. 62 sq mm
   7. ____
8. Find the area.

\[ \text{Area} = 2 \times 6 + 4 \times 2 + 5 + 6 + 4 \]

F. 36 sq m  
G. 32 sq m  
H. 30 sq m  
J. 27 sq m

8. ___

9. Find the area. Express your answer in square units.

\[ \text{Area} = 2 \times 6 = 12 \]

A. 30 square units  
B. 35 square units  
C. 40 square units  
D. 45 square units

9. ___

10. Find the perimeter.

\[ \text{Perimeter} = 2 + 2 + 2 + 2 = 8 \]

F. 8 in.  
G. 4 in.  
H. 12 in.  
J. 16 in.

10. ___

11. How many lines of symmetry does the figure below have?

A. 4  
B. 5  
C. 6  
D. 7

11. ___

12. Diego is moving into a new bedroom, which has a length of 10 feet and a width of 8 feet. His bed measures 6 feet by 3 feet, and his desk has an area of 6 square feet. After his bed and desk are moved in, how much space will be left in his bedroom?

F. 80 sq ft  
G. 74 sq ft  
H. 62 sq ft  
J. 56 sq ft

12. ___

13. Arthur’s yard has an area of 54 square feet and a perimeter of 30 feet. Find the length and width of Arthur’s yard.

A. length = 18 ft, width = 3 ft  
B. length = 9 ft, width = 6 ft  
C. length = 10 ft, width = 5 ft  
D. length = 11 ft, width = 4 ft

13. ___

14. LaToya is buying new carpet for her bedroom. Her bedroom measures 9 feet by 11 feet. How much carpeting should LaToya buy?

F. 40 sq ft  
G. 83 sq ft  
H. 91 sq ft  
J. 99 sq ft

14. ___
Chapter Test, Form 2B

Read each question carefully. Write your answer on the line provided.

1. Which equation shows the area?  

   A. $A = 4 \times 1$  
   B. $A = (4 \times 1) + (4 \times 1)$  
   C. $A = 4 + 1$  

   1. ___

2. Which shapes are congruent?

   F.  
   G.  
   H.  

   2. ___

3. Find the area.

   3. ___

4. Find the perimeter.

   4. ___

5. Which shapes have bilateral symmetry and rotational symmetry?

   A.  
   B.  
   C. A and B  

   5. ___

6. Find the area.

   6. ___

7. Which figure has rotational symmetry?

   A.  
   B.  
   C.  

   7. ___
8. Find the perimeter.

F. 19 cm  
G. 24 cm  
H. 26 cm  
8. ____

9. How many lines of symmetry does the shape have?

A. 5  
B. 6  
C. 7  
9. ____

10. Find the area.

F. 40 square units  
G. 50 square units  
H. 60 square units  
10. ____

11. Seth’s bedroom is 8 ft by 10 ft. What is the area?

A. 80 sq ft  
B. 91 sq ft  
C. 99 sq ft  
11. ____

12. Which letter does not have bilateral symmetry?

F. W  
G. L  
H. C  
12. ____

13. The TV sets are congruent. Find x.

A. 21 in.  
B. 18 in.  
C. 16 in.  
13. ____

14. Jose’s bedroom has a length of 12 feet and a width of 8 feet. His bed is 6 feet by 3 feet, and his desk has an area of 6 square feet. How much space is left in his bedroom?

F. 80 sq ft  
G. 72 sq ft  
H. 56 sq ft  
14. ____
Chapter Test, Form 2C

Read each question carefully. Write your answer on the line provided.

1. Find the perimeter.

2. Find the area.

3. Find the perimeter.

4. Are the figures congruent? Write yes or no.

5. Find the area.

6. How many lines of symmetry does the figure below have?

7. Draw a figure congruent to the figure below.

8. A television has a length of 20 inches and a width of 18 inches. A congruent television would have a width of 18 inches and a length of ____ inches.
9. Find the area.

10. Does the figure have bilateral symmetry, rotational symmetry, both, or neither?

11. Find the area. Express your answer in square units.

12. Write a letter of the alphabet that has both bilateral symmetry and rotational symmetry.

13. Arthur’s yard has an area of 54 square feet and a perimeter of 30 feet. Find the length and width of Arthur’s yard.

14. LaToya is buying new carpet for her bedroom. Her bedroom measures 10 feet by 11 feet. How many square feet of carpet should LaToya buy?

15. A.J. is moving into a new bedroom, which has a length of 11 feet and a width of 9 feet. His bed measures 6 feet by 3 feet, and his desk has an area of 5 square feet. After his bed and desk are moved in, how many square feet of floor space will be left in his bedroom?
Read each question carefully. Write your answer on the line provided.

1. How many lines of symmetry does the shape have?

2. Find the perimeter.

3. Find the area.

4. Find the area.

5. Find the perimeter.

6. Are the shapes congruent? Write yes or no.
7. Find the area.

8. Draw two congruent shapes.

9. The TV sets are congruent. Find x.

10. Find the area.

11. Does the shape have bilateral symmetry, rotational symmetry, both, or neither?

12. Write a letter of the alphabet that has rotational and bilateral symmetry.

13. LaToya’s bedroom is 9 feet by 11 feet. What is the area?

14. Diego’s bedroom has a length of 10 feet and a width of 8 feet. His bed is 6 feet by 3 feet, and his desk has an area of 6 square feet. How much space is left in his bedroom?
Read each question carefully. Write your answer on the line provided.

1. Calculate the perimeter.

   6 cm
   5 cm


2. If one side of a square measures 10 decimeters, what is its area?

3. Determine the perimeter of a rectangle with length 18 inches and width 48 inches.

4. Does the letter z have bilateral symmetry, rotational symmetry, both, or neither?

5. Calculate the area.

   7 m
   5 m
   5 m
   7 m

6. How many lines of symmetry does the figure below have?

7. Read the statement below.
   All quadrilaterals have four lines of symmetry.
   Rewrite this statement to make it true.
8. A television screen has a length of 23 inches and a width of 19 inches. What would be the dimensions a congruent television screen?

9. Are the figures below congruent? Explain why or why not.

8 mm
3 mm
2 mm
5 mm
12 mm
8 mm
24 mm

Use the figure below for Exercises 10 and 11.

10. Determine the perimeter.

11. Determine the area.

12. Aja’s teacher gives her a math puzzle. The classroom, she says, has an area of 96 square feet and a perimeter of 40 feet. From this information, Aja must determine the length and width of the classroom. What is the solution to this puzzle?

13. Reynaldo charges a dime for each square foot of lawn that he mows. Reynaldo’s aunt’s lawn measures 26 feet by 11 feet. How much money will Reynaldo charge to mow her lawn?

14. Tim buys 60 yards of fencing. Using this fencing only, he encloses the largest square or rectangular space possible. Determine the dimensions of this rectangular space.
Demonstrate your knowledge by giving a clear, concise solution to each problem. Be sure to include all relevant drawings and justify your answers. You may show your solution in more than one way or investigate beyond the requirements of the problem. If necessary, record your answer on another piece of paper.

1. What does the term congruent shapes mean?
   a. Are these shapes congruent? Why or why not?
      
      
   b. Draw an example of a congruent shape.
   c. Draw an example of a non-congruent shape.

2. List and explain the two different types of symmetry. Provide examples of each.

3. Explain the definitions of perimeter and area.
   a. Explain two ways to find the perimeter of a rectangle when using grid paper.
   b. Write the formula to find the area of a rectangle.
   c. What is the perimeter and area of the following rectangle?

   15 ft
   10 ft
   15 ft
   10 ft
Student Recording Sheet

Use this recording sheet with pages 464–465 of the Student Edition.
Read each question. Then fill in the correct answer.

1. A B C D

2. F G H J

3. A B C D

4. F G H J

5. A B C D

6. F G H J

7. A B C D

8. F G H J

9. A B C D

10. F G H J
Test Example

Mrs. Henderson lives on a corner lot. The shape of her front lawn is shown below.

What is the area of the front lawn?

A. 49 square feet  
B. 75 square feet  
C. 90 square feet  
D. 124 square feet

Read the Question
You need to find the area of the lawn.

Solve the Question
Step 1 Find the area of the rectangle.
\[ 15 \text{ ft} \times 5 \text{ ft} = 75 \text{ square feet} \]

Step 2 Find the area of the square.
\[ 7 \text{ ft} \times 7 \text{ ft} = 49 \text{ square feet} \]

Step 3 Add the two areas.
\[ 75 + 49 = 124 \]  
The answer is D.

Read each question carefully. Write your answer on the line provided.

1. What is the value of the expression below?

\[ (56 + 7) - (5 \times 2) \]

A. 56  
B. 53  
C. 73  
D. 81  

1. ____
2. Which letter has rotational symmetry?
   F. O   G. T   H. W   J. B   2. _____

3. Erika plans to put a fence around her garden.

   What is the perimeter of the garden?
   A. 28 feet   B. 32 feet   C. 38 feet   D. 88 feet   3. _____

4. Quinn sold 240 magazines. Deirdre said she sold 10 times the number Quinn sold. How many magazines did Deirdre sell?
   F. 240   G. 2,000   H. 2,400   J. 24,000   4. _____

5. What is the perimeter of a rectangle that has an area of 36 square feet and one of its sides is 9 feet long?
   A. 36 feet   B. 32 feet   C. 28 feet   D. 26 feet   5. _____

6. $3\sqrt{1683}$
   F. 561   G. 601   H. 612   J. 651   6. _____

7. Identify the angle shown below.

   A. right   B. obtuse   C. acute   D. scalene   7. _____

8. Kim is making a quilt using fabric squares that measure 1 foot along each side. If she wants the quilt to be 12 feet long and 6 feet wide, how many fabric squares will she need?
   F. 18   G. 36   H. 54   J. 72   8. _____
9. Which pair of figures is congruent?

A.  

B.  

C.  

D.  

Choose the best answer.
What kind of symmetry does the shape have?

10. a paper airplane

11. a football

12. a tennis ball

13. a movie ticket

Find the perimeter or area.

14. A watercolor painting is 20 inches wide and 15 inches tall. What is the perimeter of the painting?

15. The windows in the kitchen need new curtains. There are 2 windows, and each measures 4 feet tall and 3 feet wide. How many square feet of fabric are needed to make the curtains?

16. A square has an area of 81 square centimeters. What is its perimeter?

17. What is the area of a swimming pool that is 10 feet long and 40 feet wide?

18. Bobby had a square ham sandwich with an area of 36 square inches. He then ate off the crust all the way around. If the crust was half an inch thick, what was the perimeter of the sandwich after he ate off the crust?
Answers (Graphic Organizer and Anticipation Guide)

Before you begin Chapter 11

1. Two shapes that have different size and shape are congruent. D
2. An object has symmetry if one side is the mirror image of the other side. A
3. Area is the number of square units needed to cover the inside of a region or plane figure. A
4. A circle is a plane figure in which all points are the same distance from a point called the center. A
5. A hexagon has 8 sides. D
6. A trapezoid has one pair of parallel sides. A
7. A trapezoid is a quadrilateral. A
8. A quadrilateral has 10 sides. A
9. A quadrilateral has 10 sides. D
10. All shapes are congruent. D

After you complete Chapter 11

• Reread each statement and complete the last column by entering an A (agree) or a D (disagree).
• Did any of your opinions about the statements change from the first column?
• For those statements that you mark with a D, use a separate sheet of paper to explain why you disagree. Use examples, if possible.

Term Definition Examples

congruent Two shapes having the same size and the same shape.

symmetry An object has symmetry if one side is the mirror image of the other side.

line of symmetry A line on which a figure can be folded so that its two halves match exactly.

rotational symmetry A figure can be rotated 180° or less and will fit exactly over the original figure.

perimeter The distance around a shape or region.

area The number of square units needed to cover the inside of a region or plane figure.

Use this graphic organizer to take notes on Chapter 11: Geometry and Measurement. Fill in the missing sections of the graphic organizer.

Number, Operations, and Algebraic Thinking

Chapter 11

Chapter Resources
Tell whether the figures are congruent. Write yes or no.

1. no
2. yes
3. yes
4. no
5. no
6. yes
7. no
8. yes
9. no
10. yes

To see if figures are congruent, trace one figure. If it fits exactly on top of the other figure, the two figures are congruent.

Check students’ drawings.

Copy each figure on a separate piece of dot paper.
Then draw one congruent figure.

Check students’ drawings.
Tell whether the figures are congruent. Write yes or no.

1. no
2. no
3. yes
4. yes
5. yes
6. no

Identify the part of the circle shown.

7. radius
8. radius
9. diameter

Name the parts of the circle.

10. SW radius
11. WW radius
12. W center
13. ST diameter

Copy each figure on dot paper. Then draw one congruent figure.

3. Next, Amy drew the right triangle below. On a separate sheet of dot paper, copy the figure. Then, draw one congruent figure.

4. Hamid traced the end of another wooden block onto dot paper. The figure he traced looks like this. On a separate sheet of dot paper, copy the figure. Then, draw one congruent figure.

Check students’ drawings.

5. Inez wants to make two pentagons. On a separate sheet of dot paper, draw two congruent pentagons.

Check students’ drawings.
11–1 Enrich

Cut Ups

Look at the figures below. How can you cut along the grid lines to make two congruent "pieces" from each figure?

Cut out the pieces to test whether each piece is the same size and shape. Or, draw lines where you would cut the figures.

See below

11–2 Reteach

Geometry: Symmetry

Follow these steps to find out if a figure has bilateral symmetry.

Trace Figure A and cut it out. Fold it along one of the dashed lines. The two halves match. The dashed line is a line of symmetry. The figure has bilateral symmetry. Unfold the figure. Fold the figure along the other dashed lines. The halves match, so all the lines are lines of symmetry.

Follow these steps to find out if Figure B has rotational symmetry.

Trace Figure B and cut it out. Place it on top of the original Figure B. Put your pencil point on the dot in the center. Turn the top figure 90°. The top figure matches the original figure. Turn the top figure 180°. The figures match. Figure B has rotational symmetry.

Tell whether each figure has line symmetry. Write yes or no.

1. yes
2. no
3. yes

Tell whether the dashed line is a line of symmetry. Then, tell whether the figure has rotational symmetry. Write yes or no.

4. no; yes
5. yes; yes
6. yes; no
**Answers (Lesson 11-2)**

### Homework Practice

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes/No</th>
<th>Lines of Symmetry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Yes</td>
<td>4 lines</td>
</tr>
<tr>
<td>2.</td>
<td>Yes</td>
<td>5 lines</td>
</tr>
<tr>
<td>3.</td>
<td>Yes</td>
<td>6 lines</td>
</tr>
<tr>
<td>4.</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Tell whether the dotted line is a line of symmetry. Write yes or no.

<table>
<thead>
<tr>
<th>Question</th>
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</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>No</td>
</tr>
<tr>
<td>10.</td>
<td>No</td>
</tr>
<tr>
<td>11.</td>
<td>Yes</td>
</tr>
<tr>
<td>12.</td>
<td>Yes</td>
</tr>
<tr>
<td>13.</td>
<td>No</td>
</tr>
</tbody>
</table>

### Skills Practice

Tell whether each figure has line symmetry. Write yes or no.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Yes</td>
</tr>
<tr>
<td>2.</td>
<td>Yes</td>
</tr>
<tr>
<td>3.</td>
<td>Yes</td>
</tr>
<tr>
<td>4.</td>
<td>Yes</td>
</tr>
<tr>
<td>5.</td>
<td>Yes</td>
</tr>
<tr>
<td>6.</td>
<td>No</td>
</tr>
<tr>
<td>7.</td>
<td>No</td>
</tr>
<tr>
<td>8.</td>
<td>Yes</td>
</tr>
<tr>
<td>9.</td>
<td>No</td>
</tr>
<tr>
<td>10.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Tell whether the dotted line is a line of symmetry. Write yes or no.

<table>
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<tr>
<th>Question</th>
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</thead>
<tbody>
<tr>
<td>9.</td>
<td>No</td>
</tr>
<tr>
<td>10.</td>
<td>No</td>
</tr>
<tr>
<td>11.</td>
<td>Yes</td>
</tr>
<tr>
<td>12.</td>
<td>Yes</td>
</tr>
<tr>
<td>13.</td>
<td>No</td>
</tr>
</tbody>
</table>

Tell whether the figure has rotational symmetry. Write yes or no.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>No</td>
</tr>
<tr>
<td>10.</td>
<td>No</td>
</tr>
<tr>
<td>11.</td>
<td>Yes</td>
</tr>
<tr>
<td>12.</td>
<td>Yes</td>
</tr>
<tr>
<td>13.</td>
<td>No</td>
</tr>
</tbody>
</table>

### Spiral Review

Write yes or no (Lesson 11-1)

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes/No</th>
</tr>
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<tbody>
<tr>
<td>9.</td>
<td>No</td>
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<td>10.</td>
<td>No</td>
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<tr>
<td>11.</td>
<td>Yes</td>
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<td>12.</td>
<td>Yes</td>
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<td>13.</td>
<td>No</td>
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</tbody>
</table>

### Check Students’ Drawings

11. On a separate sheet of paper, draw a figure with rotational symmetry.

12. On a separate sheet of paper, draw a figure with bilateral symmetry.
Solve.

1. The pattern on Beth's floor is in the shape of a plus sign. She copies the shape onto paper and draws a dotted line through the center. Is the dotted line a line of symmetry?
   **yes**

2. Sam is painting a picture of his mother. If he wants to make sure her face is symmetrical in the painting, what can he do to the canvas before he begins? **Sample answer:**
   **Sam can draw a dotted line down the center of his canvas.**

3. Sheila draws this flower with 6 petals. Then she draws a dotted line through the center of her flower as shown here to find out whether the flower is symmetrical. Is the dotted line a line of symmetry on Sheila's flower?
   **yes**

4. How many lines of symmetry can you draw through a square? **4**

5. Mirabel is drawing a picture of a flower she found near their campsite. The flower has 5 petals. She draws a dotted line through her flower. There are 3 petals on one side of the line. Is the dotted line Mirabel drew a line of symmetry? How can you tell without drawing it?
   **no; If there are 3 petals on one side, then there are 2 petals on the other side. So, the line is not showing symmetry.**

Have you ever wondered why kite strings attach to the kite where they do? One of the reasons it is easy to fly a kite, is that kites have bilateral symmetry. This makes them easier to balance and control.

Many things in nature have symmetry too. Think about animals that fly. Name three that have natural bilateral symmetry:

1. **For example; bats, birds, butterflies, bees, etc.**
2. 
3. 

Draw a picture of two things found in nature that have rotational symmetry.

**For example; some leaves, flower, spider, etc.**
Grade 4

11-3

Reteach

Measurement: Perimeter

Perimeter is the distance around a closed figure. To find the perimeter, add the lengths of all the sides.

1. 10 ft
   15 ft
   10 ft
   + 15 ft
   50 ft

The perimeter of the rectangle is 50 ft.

Find the perimeter of each figure

1. 4 in. + 4 in. + 4 in. = 12 in.

2. 5 in. + 5 in. + 5 in. + 5 in. = 20 in.

3. 3 ft + 3 ft = 6 ft
   5 ft

4. 4 in. + 5 in. + 6 in. = 15 in.

5. 7 m + 5 m = 12 m

6. 7 cm + 5 cm + 6 cm + 7 cm = 25 cm

Find the perimeter of each item

10. Gerry plans a rectangular garden plot that is 30 feet long and 15 feet wide. What is the perimeter of the garden plot?
    90 ft

11. A fence around a rectangular coral has a length of 180 feet and a width of 90 feet. What is the perimeter of the fence?
    540 ft

Skills Practice

Measurement: Perimeter

Find the perimeter of each figure.

1. 10 cm + 5 cm = 15 cm

2. 9 mm + 10 mm = 19 mm

3. 8 mm + 8 mm = 16 mm

4. 38 mm + 20 units = 58 mm

5. 34 units

ALGEBRA Find the length of each missing side.

7. 3 in.
   10 in.
   perimeter = 26 in.

8. 8 ft
   4 ft
   perimeter = 24 ft

9. 11 yd
   perimeter = 44 yd

10 in.; 3 in.
8 ft, 4 ft
11 yd; 11 yd

Find the perimeter of each item.

10. Find the perimeter of the fence.
    540 ft

11. Find the perimeter of the garden plot.
    90 ft
Answers (Lesson 11-3)

Find the perimeter of each figure.

1. Jorge is drawing a design for a box car. He draws this rectangle to use as the base of the car. Find the perimeter of the rectangle.

2. The Hitoshi family plans to make a short sidewalk and patio in their backyard. First, they will need to place a frame around the space. This drawing shows the shape and dimensions of the frame they need to place. What is the frame’s perimeter?

3. Jorge uses this rectangle as a pattern for a picture of a building. What is the perimeter of his rectangle?

4. Mrs. Hitoshi decides to plant a flower bed next to the patio. She wants to use an iron border around the flower bed. She uses this grid to find out how many sections of iron border she will need. Find the perimeter of the flower bed.

Tell whether each figure has line symmetry. Write yes or no. If yes, tell how many lines of symmetry the figure has.

5. Yes; 2 lines

6. No

Tell whether the figure has rotational symmetry. Write yes or no.

7. No

8. Yes

9. No
**Problem-Solving Strategy: Solve a Simpler Problem**

Josie and Julia made 16 congruent hexagon-shaped signs for Cara’s surprise birthday party. Julia and Josie put ribbon around the edges of each of the signs. If each side of the hexagons is 13 inches, how much ribbon do Julia and Josie need?

**Step 1. Understand**

Be sure you understand the problem. Read carefully.

What do you know?
- There are **16** signs.
- There are **6** sides to each sign.
- Each side of the sign is **13** inches long.
- Julia and Josie are putting ribbon around the edges of each sign.

What do you need to find?
- You need to find **how much ribbon Julia and Josie need**.

**Step 2. Plan**

Solve a simpler problem.

Use simpler numbers to make up a problem similar to the one you need to solve. Then solve the real problem the same way.

___

**Answers will vary. Check students’ work.**
Step 3. Solve
Carry out your plan.
Create a simpler problem.
Round 16 signs to 20 signs, and 13 inches to 10 inches to make multiplying easier.

6 sides \times \boxed{10} \text{ or } \boxed{60} \text{ inches.}

20 signs \times \boxed{60} \text{ inches} = 1,200 \text{ inches.}

The amount of ribbon used for both signs is about \boxed{1,200} \text{ inches.}

Now solve the real problem the same way.

6 sides \times \boxed{13} \text{ or } \boxed{78} \text{ inches.}

16 signs \times \boxed{78} \text{ inches} = 1,248 \text{ inches.}

The amount of ribbon used for both signs is \boxed{1,248} \text{ inches.}

Step 4. Check
Is the solution reasonable?
Reread the problem.

Does your answer make sense? Explain.

Answers may vary. Possible answer: Yes; the answer to the simpler problem and the real problem are close.

Solve. Use the solve a simpler problem strategy.

1. Robert is going to buy 4 pounds of apples. He is also going to buy 6 pounds of grapes. The apples and grapes are both $2 a pound. What will be the total cost of the fruit? $20

2. Kyle’s CD has 12 songs, and each song is 4 minutes long. Jane’s CD has 15 songs, and each song is 3 minutes long. Whose CD plays longer and by how much? Kyle, 3 minutes

11–4 Reteach (continued)
Problem-Solving Strategy

4MR1.2, 4NS3.0

Solve. Use the solve a simpler problem strategy.

1. Mike’s school is being repainted. They use 225 gallons of white paint. They use 45 gallons fewer green paint than white paint. How many gallons of paint does he use in all? 405 gallons

2. Julia is placing 63 baseball cards in an album. She will put the same number of cards on each of 7 pages. She can put 3 pictures in each row. How many rows will be on each page? 3 rows

3. Six farmers spend 310 hours in all planting corn. One of the farmers spent 60 hours. The rest spent the same amount of time each. How many hours did each spend on planting corn? 50 hours

Solve. Use any strategy.

4. There are 24 plants in a garden. There are 4 more tomato plants than red pepper plants. There are twice as many red pepper plants as green pepper plants. How many of each kind of plant is in the garden? 12 tomato plants, 8 red pepper plants, 4 green pepper plants

Strategy: Guess and check

5. The Yogurt Cart has the following 3 flavors: chocolate, vanilla, and strawberry. Yogurt comes in a cup or a cone. You can have no sprinkles, chocolate sprinkles, or rainbow sprinkles. How many different choices are there? 18 different choices

Strategy: Make a tree diagram

6. An ounce of cheddar cheese has 114 calories. An ounce of Brie cheese has 95 calories. How many more calories does an ounce of cheddar cheese have than an ounce of Brie cheese? 19 calories

Strategy: Write a number sentence
**11-4 Homework Practice**

**Problem-Solving Strategy: Solve a Simpler Problem**

Solve. Use the solve a simpler problem strategy.

1. Nicholas had to make 6 cakes for the party. Each cake takes 12 minutes to mix, 21 minutes to bake, and 27 minutes to cool and decorate. How many hours will it take to make all 6 cakes? **6 hours**

2. Ricardo grows tomatoes in his garden. Each tomato plant yields 22 tomatoes each week. He has 5 tomato plants. How many tomatoes does he have after 4 weeks? **440 tomatoes**

**Spiral Review**

Find the perimeter of each figure. (Lesson 11-3)

3. **20 ft**

4. **36 ft**

5. **60 yd**

6. **12 m**

Find the perimeter of each figure in units.

7. **12 units**

8. **22 units**

---

**11-4 Enrich**

**Picture This**

1. Three congruent squares of concrete are placed next to each other to form a rectangular walkway. The perimeter of the concrete "path" is 24 feet.
   - **A.** What are the dimensions of the rectangular walkway? **3 ft × 9 ft**
   - **B.** How much area does it cover? **27 sq. feet**

2. Centered inside each of the concrete squares is a circle that has a diameter of 2 feet. The circumference of the circle is marked with a wavy line.
   - **A.** About how long is each wavy line? **Each wavy line could be about 7 feet long**
     - **B.** How close to the edge of the concrete square does the wavy line ever get? **At its closest point, the circumference is about 6 inches away from the edge of the square.**
Area is the number of square units needed to cover a region or figure. You can use these two ways to find the area of a rectangle or square.

- Count the number of square units. 
  There are 25 square units. 
  The area is 25 square units.
- Multiply the length times the width. 
  \(5 \times 5 = 25\) 
  The area is 25 square units.

Find the area of each figure.

1. 
   length: 4 units 
   width: 3 units 
   area = \(\frac{12}{12}\) square units 
   21 square units

2. 
   length: 5 units 
   width: 2 units 
   area = \(\frac{10}{10}\) square units 
   20 square units

3. 
   24 square feet

4. 
   28 square inches

5. 
   8 square inches

6. 
   54 square inches

Find the area of each figure.

4. 
   \(4 \text{ ft} \times 4 \text{ ft} = 16 \text{ ft}^2\)

5. 
   \(2 \text{ in.} \times 2 \text{ in.} = 4 \text{ in.}^2\)

6. 
   \(2 \text{ yd} \times 5 \text{ yd} = 10 \text{ yd}^2\)

Use grid paper to draw each of the following squares or rectangles. Tell whether the figure is a square or rectangle. Then find the area.

7. 
   length: 5 cm 
   width: 8 cm 
   rectangle; 40 square cm

8. 
   length: 7 cm 
   width: 7 cm 
   square; 49 square cm

9. 
   length: 7 cm 
   width: 4 cm 
   rectangle; 28 square cm

Find the area and perimeter of each figure.

10. 
    \(12 \text{ cm} \times 10 \text{ cm} = 120 \text{ cm}^2\)

11. 
    \(5 \text{ m} \times 1 \text{ m} = 5 \text{ m}^2\)

12. 
    \(7 \text{ mm} \times 28 \text{ mm} = 196 \text{ mm}^2\)
Homework Practice
Measurement: Area

Find the area of each figure.

1. 20 sq units
2. 6 mm 25 mm 150 sq mm

Use the grid to draw each of the following squares or rectangles. Tell whether the figure is a square or rectangle. Then find the area.

3. Length: 6 units; width: 2 units: See students’ work.
   rectangle; 12 sq units
4. Length: 4 units; width: 4 units: Sample answers given.
   square; 16 sq units

Spiral Review
Solve. Use the solve a simpler problem strategy. (Lesson 11–4)

5. Maria found a store that sells handmade sweaters for $37. She wants to buy one for everyone in her family. She will buy 6 sweaters. How much will this cost? $222

6. James took a job delivering groceries in his neighborhood. He can carry 8 bags with each trip. If he takes 28 trips a day, how many bags does he deliver? 224 bags

7. There are 32 students in Marissa’s class. Each student started the year with 15 pencils. How many pencils did the class start with? 480 pencils

Problem-Solving Practice
Measurement: Area

Find the area of each figure.

1. Lin and her sister are getting a new rug for their bedroom. The rug is 3 feet wide and 5 feet long. Find the area of the rug 15 sq ft

2. Lin wants to use blue tissue paper to decorate the top of a box that is 4 inches square. What is the area of the piece of tissue paper Lin needs? 16 sq in.

3. Ms. Charles wants to carpet the reading nook shown here. How many square meters of carpet will Ms. Charles need for the reading nook? 6 square meters

4. Helena makes a canvas for an oil painting. Use graph paper to draw the shape of her canvas with length 12 centimeters and width 6 centimeters. Tell what shape Helena’s canvas is, and find the area. rectangle; 72 sq cm

5. Mike’s sister wants to make a cover for the gas grill on the deck. She has a piece of waterproof fabric that is 4 feet long and 1 foot wide. Use graph paper to draw a figure with length 4 ft and width 1 ft. Tell what shape the piece of waterproof fabric cover the grill? rectangle; 4 sq ft; square; 4 sq ft; no, the area is the same, but the shape is different.
Jeremy’s family has a square swimming pool. A rope runs from the middle of one side to the middle of the opposite side to divide the shallow half from the deep half. One side of the pool is 30 feet long.

1. What is the perimeter of the swimming pool?
   120 ft

2. What is the surface area of the deep end?
   450 square feet

3. What is the surface area of the entire pool?
   900 square feet

4. What is the perimeter of the shallow end?
   60 feet

5. What is the perimeter of Katie’s pool?
   150 ft

6. What is the surface area of Katie’s pool?
   1,350 square feet

7. What is the perimeter of the shallow end of Katie’s pool?
   120 ft
Reteach (continued)

Problem-Solving Investigation

Use any strategy shown below to solve. Tell what strategy you used.

- Use the four-step plan
- Reasonable answers
- Act it out
- Solve a simpler problem
- Guess and check
- Look for a pattern

1. Steve counted 344 legs at the dog park. If there are 110 guests at the park, how many are people and how many are dogs?

   48 people, 62 dogs

   Strategy: sample answer: guess and check

2. Arrange these 5 polygons to fit into this shape:

   Strategy: sample answer: act it out

3. Sydney earns $1 per square foot that she cleans. If a room were 22 feet by 15 feet, how much would she be paid to clean it?

   $330

   Strategy: sample answer: solve a simpler problem

4. John can ride his bike 15 miles in 1 hour. Is it reasonable to say he could ride his bike 100 miles in 7 hours?

   yes

   Strategy: sample answer: reasonable answer

5. Michael has 88 toy cars. He has 19 more than Javier. Javier has 5 more than Jeff. How many cars does Jeff have?

   64 cars

   Strategy: sample answer: act it out

Skills Practice

Problem-Solving Investigation: Choose the Best Strategy

Use any strategy shown below to solve. Tell what strategy you used.

- Reasonable answers
- Act it out
- Solve a simpler problem
- Guess and check
- Look for a pattern

1. My brother tells me he has five bills in his wallet and they equal $32. If I can guess which bills they are: $20, $10, $5, $1, he will give them to me. What are the five bills in his wallet?

   1 $20, 2 $5, 2 $1; or 3 $10 and 2 $1

   Strategy: sample answer: guess and check

2. Allison cut out this paper to wrap a gift. What shape is the package she will wrap?

   square pyramid

   Strategy: sample answer: act it out

3. Elizabeth sells snacks for $2 after the football games. How much would she earn if she sold 57 snacks at each of four games?

   $456

   Strategy: sample answer: solve a simpler problem

4. Eduardo can complete 6 math problems in 15 minutes. Is it reasonable for him to say he can complete 25 problems in one hour?

   yes.

   Strategy: sample answer: reasonable answer

5. Describe the pattern below and provide the next two numbers.

   2, 9, 16, 23, __, __

   add 7; 30, 37

   Strategy: sample answer: look for a pattern
Answers (Lesson 11-6)

Use any strategy shown below to solve. Tell what strategy you used.

1. A conference center has six rooms. Each room can hold up to 248 people. About how many people can fit in the conference center?
   - Sample answer: reasonable answers
   - Strategy: Look for a pattern

2. Ryan’s school is going on a field trip. If all six classrooms have 27 students going on the trip, how many students from the school are going?
   - Sample answer: solve a simpler problem
   - Strategy: Act it out

3. Cole has 26 trophies. Julia has eight more than Cole. Eric has seven more than Julia. How many trophies does Eric have?
   - Sample answer: act it out
   - Strategy: Reasonable answers

4. Find the area of each figure. (Lesson 11-5)
   - 4 sq yd
   - 3 sq yd
   - 3 yd
   - 37 ft
   - 1,050 sq ft
   - 35 ft
   - 35 feet wide by 42 feet long. What is the area?

5. Mrs. Sanchez’s room has an area of 1,295 square feet. Her room is 35 feet long. How wide is her room?
   - Sample answer: act it out
   - Strategy: Solve a simpler problem

6. Chelsea wants to know the area of the pool deck she’s going to put in her backyard. It is 35 feet wide by 42 feet long. What is the area?
   - 1,050 sq ft

7. On the left below, draw a picture of a cube that would have a surface area of 6 square inches. Use a ruler to measure the line segments to make your drawing as accurate as possible.

8. On the right below, draw a cube that would have four times as much surface area. The cube on the left should have 1 inch height, width and depth. The cube on the right should have 2 inch height, width, and depth.

9. You can draw a picture of a cube by lightly drawing two squares that overlap, and connecting the corners with diagonal lines.

10. On the left below draw a picture of a cube that would have a surface area of 6 square inches. Use a ruler to measure the line segments to make your drawing as accurate as possible.

11. On the right below, draw a cube that would have four times as much surface area. The cube on the left should have 1 inch height, width and depth. The cube on the right should have 2 inch height, width, and depth.

12. Find the area of each figure. (Lesson 11-5)
   - 4 sq yd
   - 3 sq yd
   - 3 yd
   - 37 ft
   - 1,050 sq ft
   - 35 ft
   - 35 feet wide by 42 feet long. What is the area?

13. Mrs. Sanchez’s room has an area of 1,295 square feet. Her room is 35 feet long. How wide is her room?
   - Sample answer: act it out
   - Strategy: Solve a simpler problem

14. Chelsea wants to know the area of the pool deck she’s going to put in her backyard. It is 35 feet wide by 42 feet long. What is the area?
   - 1,050 sq ft

15. Use any strategy shown below to solve. Tell what strategy you used.

16. A conference center has six rooms. Each room can hold up to 248 people. About how many people can fit in the conference center?
   - Sample answer: reasonable answers
   - Strategy: Look for a pattern

17. Ryan’s school is going on a field trip. If all six classrooms have 27 students going on the trip, how many students from the school are going?
   - Sample answer: solve a simpler problem
   - Strategy: Act it out

18. Cole has 26 trophies. Julia has eight more than Cole. Eric has seven more than Julia. How many trophies does Eric have?
   - Sample answer: act it out
   - Strategy: Reasonable answers

19. Find the area of each figure. (Lesson 11-5)
   - 4 sq yd
   - 3 sq yd
   - 3 yd
   - 37 ft
   - 1,050 sq ft
   - 35 ft
   - 35 feet wide by 42 feet long. What is the area?

20. Mrs. Sanchez’s room has an area of 1,295 square feet. Her room is 35 feet long. How wide is her room?
   - Sample answer: act it out
   - Strategy: Solve a simpler problem

21. Chelsea wants to know the area of the pool deck she’s going to put in her backyard. It is 35 feet wide by 42 feet long. What is the area?
   - 1,050 sq ft

22. On the left below, draw a picture of a cube that would have a surface area of 6 square inches. Use a ruler to measure the line segments to make your drawing as accurate as possible.

23. On the right below, draw a cube that would have four times as much surface area. The cube on the left should have 1 inch height, width and depth. The cube on the right should have 2 inch height, width, and depth.

24. You can draw a picture of a cube by lightly drawing two squares that overlap, and connecting the corners with diagonal lines.

25. On the left below draw a picture of a cube that would have a surface area of 6 square inches. Use a ruler to measure the line segments to make your drawing as accurate as possible.

26. On the right below, draw a cube that would have four times as much surface area. The cube on the left should have 1 inch height, width and depth. The cube on the right should have 2 inch height, width, and depth.

27. Find the area of each figure. (Lesson 11-5)
   - 4 sq yd
   - 3 sq yd
   - 3 yd
   - 37 ft
   - 1,050 sq ft
   - 35 ft
   - 35 feet wide by 42 feet long. What is the area?

28. Mrs. Sanchez’s room has an area of 1,295 square feet. Her room is 35 feet long. How wide is her room?
   - Sample answer: act it out
   - Strategy: Solve a simpler problem

29. Chelsea wants to know the area of the pool deck she’s going to put in her backyard. It is 35 feet wide by 42 feet long. What is the area?
   - 1,050 sq ft

30. Use any strategy shown below to solve. Tell what strategy you used.

31. A conference center has six rooms. Each room can hold up to 248 people. About how many people can fit in the conference center?
   - Sample answer: reasonable answers
   - Strategy: Look for a pattern

32. Ryan’s school is going on a field trip. If all six classrooms have 27 students going on the trip, how many students from the school are going?
   - Sample answer: solve a simpler problem
   - Strategy: Act it out

33. Cole has 26 trophies. Julia has eight more than Cole. Eric has seven more than Julia. How many trophies does Eric have?
   - Sample answer: act it out
   - Strategy: Reasonable answers

34. Find the area of each figure. (Lesson 11-5)
   - 4 sq yd
   - 3 sq yd
   - 3 yd
   - 37 ft
   - 1,050 sq ft
   - 35 ft
   - 35 feet wide by 42 feet long. What is the area?

35. Mrs. Sanchez’s room has an area of 1,295 square feet. Her room is 35 feet long. How wide is her room?
   - Sample answer: act it out
   - Strategy: Solve a simpler problem

36. Chelsea wants to know the area of the pool deck she’s going to put in her backyard. It is 35 feet wide by 42 feet long. What is the area?
   - 1,050 sq ft

37. On the left below, draw a picture of a cube that would have a surface area of 6 square inches. Use a ruler to measure the line segments to make your drawing as accurate as possible.

38. On the right below, draw a cube that would have four times as much surface area. The cube on the left should have 1 inch height, width and depth. The cube on the right should have 2 inch height, width, and depth.

39. You can draw a picture of a cube by lightly drawing two squares that overlap, and connecting the corners with diagonal lines.

40. On the left below draw a picture of a cube that would have a surface area of 6 square inches. Use a ruler to measure the line segments to make your drawing as accurate as possible.

41. On the right below, draw a cube that would have four times as much surface area. The cube on the left should have 1 inch height, width and depth. The cube on the right should have 2 inch height, width, and depth.
Measurement: Area of Complex Figures

When you need to find the area of a complex figure, you can break the figure into smaller, simpler parts.

Use this example to learn more about breaking a figure into smaller parts:

9 cm
7 cm
6 cm

3 cm

1. You can break this figure into 2 rectangles:

   1. 9 cm \times 3 cm = 27 \text{ sq cm}
   2. 6 cm \times 4 cm = 24 \text{ sq cm}

This complex figure's area is 27 sq cm + 24 sq cm = 51 sq cm

Find the area of each figure.

1. 5 ft
   6 ft
   7 ft
   38 sq ft

2. 5 cm
   14 cm
   168 sq cm

3. 4 in.
   8 in.
   12 in.
   4 in.
   44 sq in.

4. 15 in.
   7 in.
   10 in.
   126 sq in.

5. 8 yd
   5 yd
   8 yd
   100 sq yd

6. 6 m
   4 m
   32 sq m

7. Caroline wants to make 2 blankets to replace her favorites. One is 3 feet \times 2 feet. The other is 7 feet \times 4 feet. What is the total area of both blankets?
   34 sq ft

8. All the walls in Sam's house are 8 feet high. He has three walls that are 12 feet, 14 feet, and 15 feet to paint. What is the total area of the 3 walls to paint?
   328 sq ft
### Homework Practice

**Measurement: Area of Complex Figures**

Find the area of each figure.

1. 
   
   - 15 ft
   - 7 ft
   - 12 ft
   - 2 ft
   - Area: 115 sq ft

2. 
   
   - 16 cm
   - 20 cm
   - Area: 280 sq cm

3. 
   
   - 16 in.
   - 4 in.
   - 6 in.
   - 124 sq in.

4. 
   
   - 10 in.
   - 18 in.
   - 2 in.
   - Area: 184 sq in.

5. 
   
   - 4 yd
   - 5 yd
   - 15 yd
   - 145 sq yd

6. 
   
   - 6 ft
   - 2 ft
   - 14 ft
   - 7 ft
   - Area: 110 sq ft

### Spiral Review

Use any strategy shown below to solve.

Tell what strategy you used. (Lesson 11–6)

- Reasonable answers
- Guess and check
- Act it out
- Look for a pattern
- Solve a simpler problem

7. My school has 17 classrooms. Each room can hold up to 35 students. How many students can come to my school?
   - **595 students**
   - Strategy: sample answer: solve a simpler problem

8. Justin walks 16 dogs a day. Is it reasonable to say that he walks about 100 dogs in a week?
   - **Yes**
   - Strategy: sample answer: reasonable answers

### Problem-Solving Practice

**Measurement: Area of Complex Figures**

Find the area of each figure.

1. Amanda needs to wrap a gift. The box she has to wrap has 6 sides that are each 4 inches × 4 inches. How much paper does she need to wrap this box?
   - **96 sq in.**

2. Tony's family wants to figure out how big an area of their home is. They discovered they have a large room that is 20 feet × 17 feet and a room that is 12 feet × 15 feet. How large is this area of their home?
   - **520 sq ft**

3. Rosa placed a box that is 25 inches × 36 inches on a table. She discovered that the table is exactly 1 inch larger on all sides. What is the area of the table's top?
   - **1,026 sq in.**

4. Patrick broke his neighbor's window with a baseball. He wanted to find out how much it would cost to replace it. The window was 27 inches × 34 inches on top and 27 inches × 16 inches on the bottom. The store charges 10¢ per square inch for the glass. How much will the glass cost?
   - **$135 sq in.**

5. Emily is helping wallpaper her bathroom. She has a 3 feet × 5 feet wall and a 2 feet × 8 feet area to cover. How much wallpaper does she need?
   - **31 sq ft**

6. Dan has to figure out how much fertilizer he needs for his lawn. His front lawn is 35 feet × 17 feet. His side lawn is 9 feet × 17 feet. His back lawn is 35 feet × 12 feet. How large is his lawn?
   - **1,168 sq ft**
Name _________________________ Date _________________________

11–4 Homework Practice
Problem-Solving Strategy: Solve a Simpler Problem

Solve. Use the solve a simpler problem strategy.

1. Nicholas had to make 6 cakes for the party. Each cake takes 12 minutes to mix, 21 minutes to bake, and 27 minutes to cool and decorate. How many hours will it take to make all 6 cakes? ____________________________

2. Ricardo grows tomatoes in his garden. Each tomato plant yields 22 tomatoes each week. He has 5 tomato plants. How many tomatoes does he have after 4 weeks? ____________________________

Spiral Review

Find the perimeter of each figure. (Lesson 11–3)

3. ______ ft

4. ______ ft

5. ______ yd

6. ______ m

Find the perimeter of each figure in units.

7. ______ units

8. ______ units

11–4 Enrich

Picture This

1. Three congruent squares of concrete are placed next to each other to form a rectangular walkway. The perimeter of the concrete “path” is 24 feet.

A. What are the dimensions of the rectangular walkway? ____________________________

B. How much area does it cover? ____________________________

2. Centered inside each of the concrete squares is a circle that has a diameter of 2 feet. The circumference of the circle is marked with a wavy line.

A. About how long is each wavy line? ____________________________

B. How close to the edge of the concrete square does the wavy line ever get? ____________________________

At its closest point, the circumference is about 6 inches away from the edge of the square.
Use construction paper to cut out a square, circle, rectangle and triangle.

Read each question aloud to the student. Then write the student’s answers on the lines below the question.

1. Can a line of symmetry be drawn on the square?  
   yes.

2. Can a line of symmetry be drawn on the circle?  
   yes.

3. Tell how you got your answer.  
   I know that both sides of each shape would look exactly the same.

4. Can a line of symmetry be drawn on the rectangle?  
   yes.

5. Can a line of symmetry be drawn on the triangle?  
   yes (for most triangles).

6. Tell how you got your answer.  
   Both sides of each shape would look exactly the same.

7. Lin, Amanda, and Ming are drawing quadrilaterals. Lin drew a square with sides 4 inches in length. What is the perimeter of the square?  
   16 inches

8. What is the area of Lin’s square?  
   16 square inches

9. Tell how you found the perimeter and area.  
   Sample answer: I added the 4 sides together to find the perimeter. I multiplied 4 × 4 to get the area.

10. Ming drew a rectangle with one side 8 inches and one side 3 inches. What is the perimeter of her rectangle?  
    22 inches

11. What is the area of Ming’s rectangle?  
    24 square inches

12. Explain your answer.  
    Sample answer: I multiplied 8 by 3 to find the area.
Chapter 11 Assessment Answer Key

Chapter 11 Diagnostic Assessment Page 44

1. octagon
2. pentagon
3. triangle
4. hexagon

5. 18
6. 42
7. 90
8. 102
9. 24
10. 36

11. yes
12. no

Chapter 11 Pretest Page 45

1. no
2. yes
3. line symmetry
4. rotational symmetry
5. 26 cm
6. 16 yd
7. 35 sq m
8. 25 sq in.

11. yes
12. no

Quiz 1 Page 46

1. no
2. yes
3. yes
4. no
5. no
6. yes
7. yes
8. 60 inches

9. no; Sam’s room is bigger.

(continued on the next page)
### Chapter 11 Assessment Answer Key

#### Quiz 2
**Page 47**

1. **12 ft**
2. **34 cm**
3. **24 in.**
4. **30 cm**
5. **20 units**
6. **14 units**
7. **43,000 steps**
8. **8 hours**

#### Quiz 3
**Page 48**

1. **24 sq ft**
2. **25 sq units**
3. **120 sq cm**
4. **40 sq units**
5. **120 sq ft**
6. **the table**
7. **81 students sample answer: act it out**
8. **204 points sample answer: solve a simpler problem**

#### Mid-Chapter Review
**Page 49**

1. **C**
2. **J**
3. **C**
4. yes; 4 lines
5. yes; 1 line
6. no
7. yes
8. **194 ft**
<table>
<thead>
<tr>
<th>Form 1</th>
<th>Page 55</th>
<th>Form 2A</th>
<th>Page 57</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>C</td>
<td>1.</td>
<td>B</td>
</tr>
<tr>
<td>2.</td>
<td>H</td>
<td>2.</td>
<td>G</td>
</tr>
<tr>
<td>3.</td>
<td>C</td>
<td>3.</td>
<td>D</td>
</tr>
<tr>
<td>4.</td>
<td>J</td>
<td>4.</td>
<td>F</td>
</tr>
<tr>
<td>5.</td>
<td>C</td>
<td>5.</td>
<td>D</td>
</tr>
<tr>
<td>6.</td>
<td>J</td>
<td>6.</td>
<td>F</td>
</tr>
<tr>
<td>7.</td>
<td>A</td>
<td>7.</td>
<td>B</td>
</tr>
</tbody>
</table>

(continued on the next page)
Chapter 11 Assessment Answer Key

Form 2A (continued) Page 58

8. H

9. D

10. F

11. B

12. J

13. B

14. J

Form 2B Page 59

1. A

2. H

3. A

4. G

5. C

6. G

7. C

11. A

12. G

13. B

14. G

Page 60

8. H
Chapter 11 Assessment Answer Key

**Form 2C**

1. 38 cm
2. 5 sq m
3. 20 in.
4. yes
5. 182 sq mm
6. 5
7. Sample answer: 
8. 20
9. 16 sq m
10. both
11. 60 square units
12. sample answer: H
13. length = 9 ft, width = 6 ft
14. 110 sq ft
15. 76 sq ft

**Form 2D**

1. 5
2. 20 in.
3. 5 sq m
4. 52 sq m
5. 22 cm
6. yes

(continued on the next page)
Chapter 11 Assessment Answer Key

Form 2D (continued)  Page 64

7. 48 sq units

8. Sample answer:

9. 10 in.

10. 196 sq mm

11. both

12. Sample answer: H

13. 99 sq ft

14. 56 sq ft

Form 3  Page 65

1. 22 cm

2. 100 sq dm

3. 132 inches

4. neither

5. 35 sq m

6. 8

7. All squares have four lines of symmetry.

8. length: 23 in., width: 19 in.

9. yes; they are the same shape and size

10. 74 mm

11. 231 sq mm

12. length = 12 ft, width = 8 ft

13. $28.60

14. $15 yd \times $15 yd
# Chapter 11 Assessment Answer Key

**Page 67, Extended-Response Test**  
**Scoring Rubric**

<table>
<thead>
<tr>
<th>Level</th>
<th>Specific Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>The student demonstrates a <strong>thorough understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student has responded correctly to the task, used mathematically sound procedures, and provided clear and complete explanations and interpretations. The response may contain minor flaws that do not detract from the demonstration of a thorough understanding.</td>
</tr>
<tr>
<td>3</td>
<td>The student demonstrates an <strong>understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student’s response to the task is essentially correct with the mathematical procedures used and the explanations and interpretations provided demonstrating an essential but less than thorough understanding. The response may contain minor errors that reflect inattentive execution of the mathematical procedures or indications of some misunderstanding of the underlying mathematics concepts and/or procedures.</td>
</tr>
<tr>
<td>2</td>
<td>The student has demonstrated only a <strong>partial understanding</strong> of the mathematics concepts and/or procedures embodied in the task. Although the student may have used the correct approach to obtaining a solution or may have provided a correct solution, the student’s work lacks an essential understanding of the underlying mathematical concepts. The response contains errors related to misunderstanding important aspects of the task, misuse of mathematical procedures, or faulty interpretations of results.</td>
</tr>
<tr>
<td>1</td>
<td>The student has demonstrated a <strong>very limited understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student’s response to the task is incomplete and exhibits many flaws. Although the student has addressed some of the conditions of the task, the student reached an inadequate conclusion and/or provided reasoning that was faulty or incomplete. The response exhibits many errors or may be incomplete.</td>
</tr>
<tr>
<td>0</td>
<td>The student has provided a <strong>completely incorrect</strong> solution or uninterpretable response, or no response at all.</td>
</tr>
</tbody>
</table>
In addition to the scoring rubric found on page A27, the following sample answers may be used as guidance in evaluating open-ended assessment items.

1. When figures have the same size and shape, they are congruent.
   
   a. No, the shapes are not congruent. They are not the same shape or size.
   
   b. Answers will vary. Example answer:

   
   C. Answers will vary. Example answer:

2. A figure has line symmetry if it can be folded so that the two parts of the figure match, or are congruent. The fold line is a line of symmetry. An example of line symmetry:

   
   When a figure can be rotated 360° or less and will fit exactly over the original figure it is said to have rotational symmetry.

3. The perimeter of a figure is the distance around a closed figure. Area refers to the number of squares units needed to cover a region or figure.

   a. When using grid paper, you can find the perimeter of a rectangle in two ways. The first way is by counting the number of boxes around the rectangle. The second way is by adding the units around the rectangle. For example, if the dimensions are \(3 \times 4\), you would add \(3 + 4 + 3 + 4\).

   b. The formula to find the area of a rectangle is \(A = L \times W\).

   C. The perimeter of the rectangle is 50 ft. The area of the rectangle is 150 ft.
<table>
<thead>
<tr>
<th></th>
<th>Grade 4</th>
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<tr>
<td><strong>Chapter 11 Assessment Answer Key</strong></td>
<td><strong>STP</strong></td>
<td><strong>Page 69</strong></td>
<td><strong>Page 70</strong></td>
<td><strong>Page 71</strong></td>
</tr>
<tr>
<td>2.</td>
<td>F</td>
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<tr>
<td>4.</td>
<td>H</td>
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<tr>
<td>5.</td>
<td>D</td>
<td></td>
<td></td>
<td>11.</td>
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<tr>
<td>6.</td>
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<tr>
<td>7.</td>
<td>C</td>
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<td>12.</td>
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<td>8.</td>
<td>J</td>
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<tr>
<td>9.</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>line symmetry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>line symmetry</td>
<td></td>
<td></td>
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<tr>
<td>12.</td>
<td>rotational symmetry</td>
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<td></td>
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<tr>
<td>13.</td>
<td>bilateral symmetry</td>
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<tr>
<td>14.</td>
<td>70 inches</td>
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<tr>
<td>15.</td>
<td>24 square feet</td>
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<td>16.</td>
<td>36 centimeters</td>
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<tr>
<td>17.</td>
<td>400 square feet</td>
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<tr>
<td>18.</td>
<td>20 inches</td>
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