Student Guide

Workshop: Area and Perimeter

Questions 1–3 (SG pp. 61–62)

1. Shape A: I agree with the area and perimeter.

   Shape B: The area is correct, but the perimeter is incorrect. Maya forgot two lengths when she turned two corners. Also, it should be larger than Shape C because it is more "spread out."

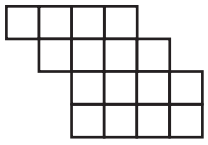
   Shape C: I agree with the area and perimeter except the unit label for perimeter is wrong. Perimeter is measured in centimeters not square centimeters.

2. Possible response: I agree with John. I like his reasoning. Shape C is the most compact and should have the smallest perimeter.

3. **A.** Possible response:

   Perimeter: 16 in. + 16 in. + 2 in. = 34 in. The shape is all spread out so the perimeter is larger.

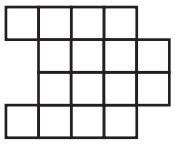
   B. Possible response:



   Perimeter: 20 inches

   The shape is more compact so the perimeter is smaller.

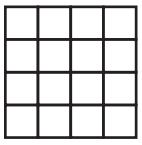
   C. Possible response:



   Perimeter: 20 inches

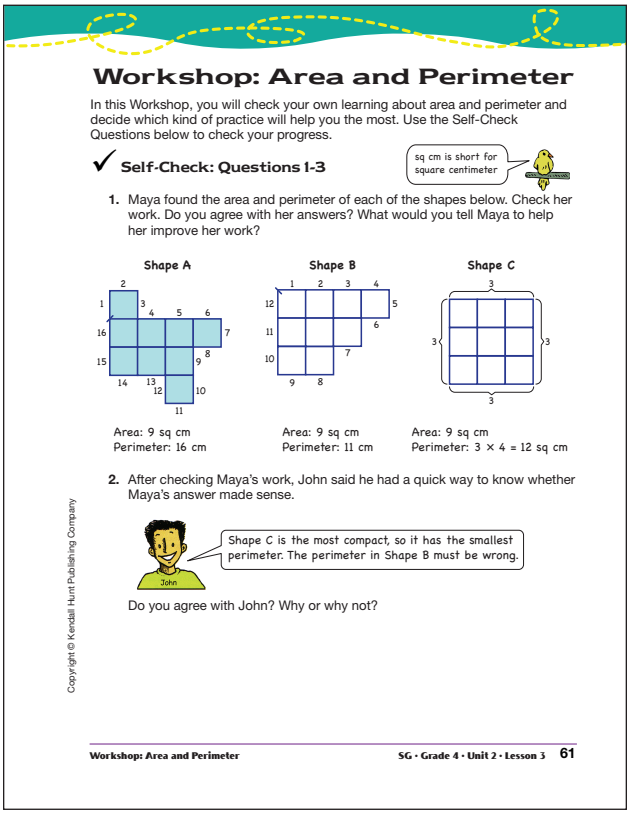
   The shape is different than Shape B, but the perimeter is the same.

   D. Possible response:



   Perimeter: 4 in. × 4 sides = 16 inches

   The shape is the most compact. Therefore, it has the smallest perimeter.



Workshop: Area and Perimeter

In this Workshop, you will check your own learning about area and perimeter and decide which kind of practice will help you the most. Use the Self-Check Questions below to check your progress.

✓ **Self-Check: Questions 1-3**

sq cm is short for square centimeter

1. Maya found the area and perimeter of each of the shapes below. Check her work. Do you agree with her answers? What would you tell Maya to help her improve her work?

Shape A

Area: 9 sq cm
Perimeter: 16 cm

Shape B

Area: 9 sq cm
Perimeter: 11 cm

Shape C

Area: 9 sq cm
Perimeter: 3 × 4 = 12 sq cm

2. After checking Maya's work, John said he had a quick way to know whether Maya's answer made sense.

John: Shape C is the most compact, so it has the smallest perimeter. The perimeter in Shape B must be wrong.

Do you agree with John? Why or why not?

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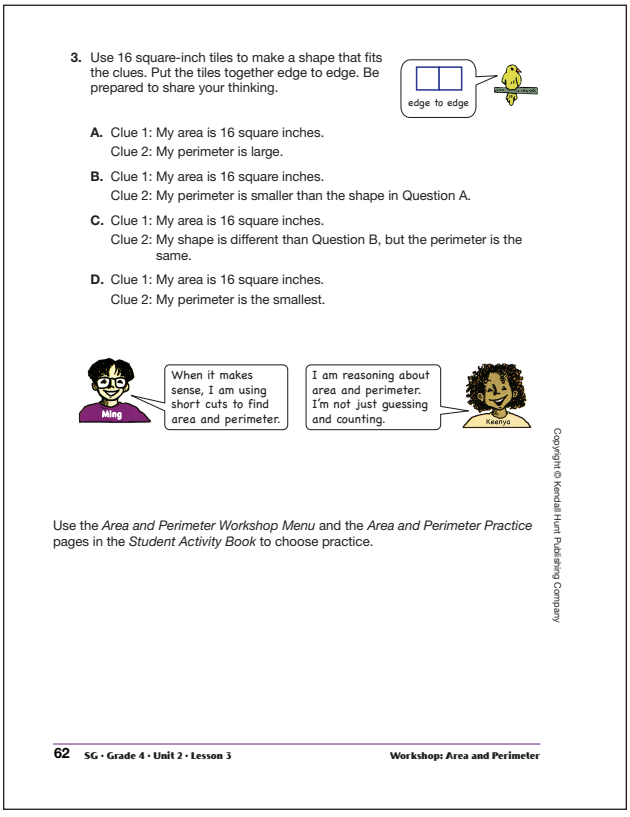

3. Use 16 square-inch tiles to make a shape that fits the clues. Put the tiles together edge to edge. Be prepared to share your thinking.

edge to edge

A. Clue 1: My area is 16 square inches.
Clue 2: My perimeter is large.

B. Clue 1: My area is 16 square inches.
Clue 2: My perimeter is smaller than the shape in Question A.

C. Clue 1: My area is 16 square inches.
Clue 2: My shape is different than Question B, but the perimeter is the same.

D. Clue 1: My area is 16 square inches.
Clue 2: My perimeter is the smallest.

Ming: When it makes sense, I am using short cuts to find area and perimeter.

Keenya: I am reasoning about area and perimeter. I'm not just guessing and counting.

Use the *Area and Perimeter Workshop Menu* and the *Area and Perimeter Practice* pages in the *Student Activity Book* to choose practice.

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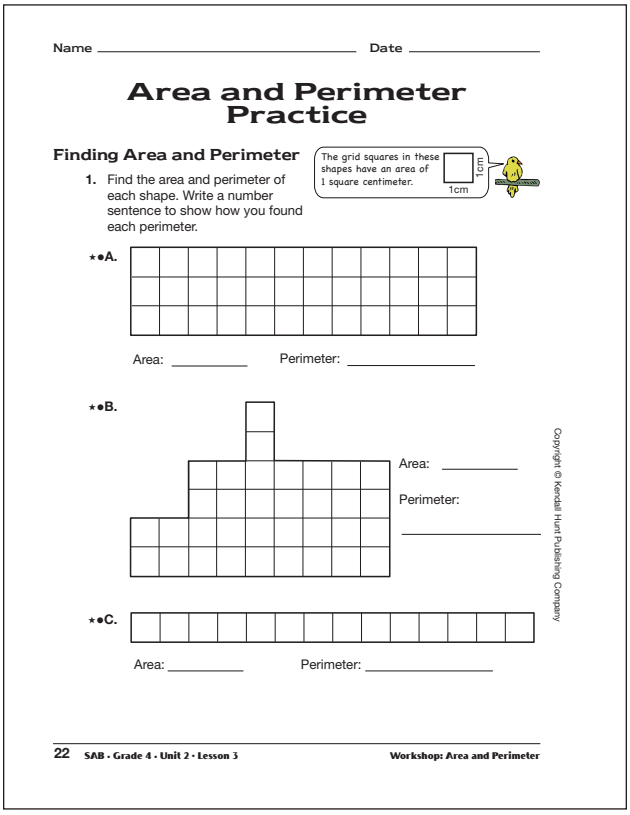

Name _____ Date _____

Area and Perimeter Practice

Finding Area and Perimeter

1. Find the area and perimeter of each shape. Write a number sentence to show how you found each perimeter.

The grid squares in these shapes have an area of 1 square centimeter.

1cm

1cm

★●A.

Area: _____ Perimeter: _____

★●B.

Area: _____

Perimeter: _____

★●C.

Area: _____ Perimeter: _____

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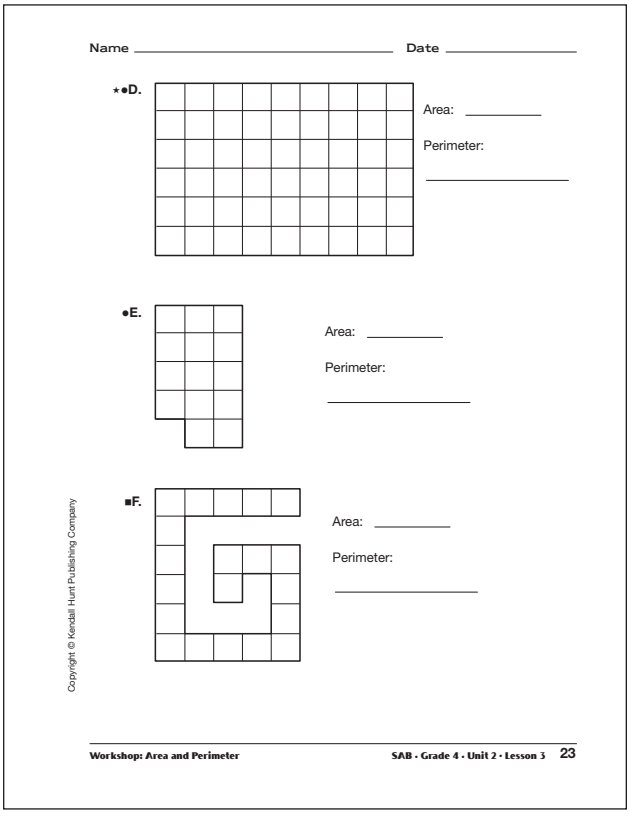

Name _____ Date _____

★●D.

Area: _____

Perimeter: _____

●E.

Area: _____

Perimeter: _____

■F.

Area: _____

Perimeter: _____

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Student Activity Book

Area and Perimeter Practice

Questions 1–11 (SAB pp. 22–34)

1. Number sentences may vary. One possible number sentence is given for each.

A. Area: 36 square centimeters
Perimeter: 30 centimeters
3 + 12 + 3 + 12 = 30 centimeters

B. Area: 34 square centimeters
Perimeter: 30 centimeters
2 + 2 + 2 + 2 + 2 + 1 + 2 + 4 + 4 + 9 = 30 centimeters

C. Area: 14 square centimeters
Perimeter: 30 centimeters
1 + 14 + 1 + 14 = 30 centimeters

D. Area: 54 square centimeters
Perimeter: 30 centimeters
6 + 9 + 6 + 9 = 30 centimeters

E. Area: 14 square centimeters
Perimeter: 16 centimeters
4 + 3 + 5 + 2 + 1 + 1 = 16 centimeters

F. Area: 20 square centimeters
Perimeter: 42 centimeters
20 + 20 + 2 = 42 centimeters

G. Area: 50 square centimeters

Perimeter: 30 centimeters

10 + 10 + 5 + 5 = 30 centimeters

H. Area: 25 × 10 = 250 square centimeters

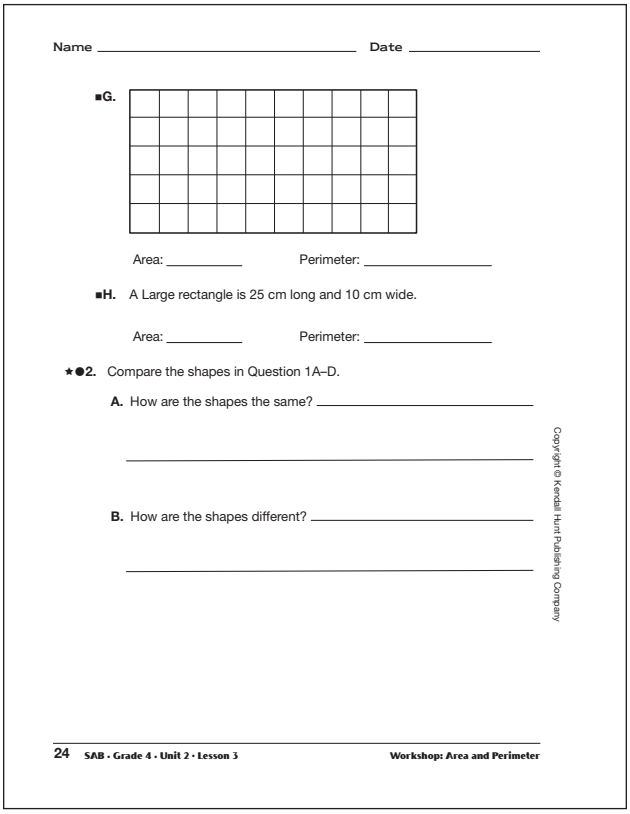
Perimeter: 70 centimeters

25 + 25 + 10 + 10 = 70 centimeters

2. A. Answers will vary. Possible responses: The shapes are all made of square centimeters; they all have the same perimeter.

B. Possible responses: The shapes all have a different shape; three are rectangles, one is not; they all have different areas.

3. Answers will vary. Students should draw two shapes with perimeters of 30 cm and find their areas in sq. cm.



Name _____ Date _____

■G.

Area: _____ Perimeter: _____

■H. A Large rectangle is 25 cm long and 10 cm wide.

Area: _____ Perimeter: _____

★●2. Compare the shapes in Question 1A–D.

A. How are the shapes the same? _____

B. How are the shapes different? _____

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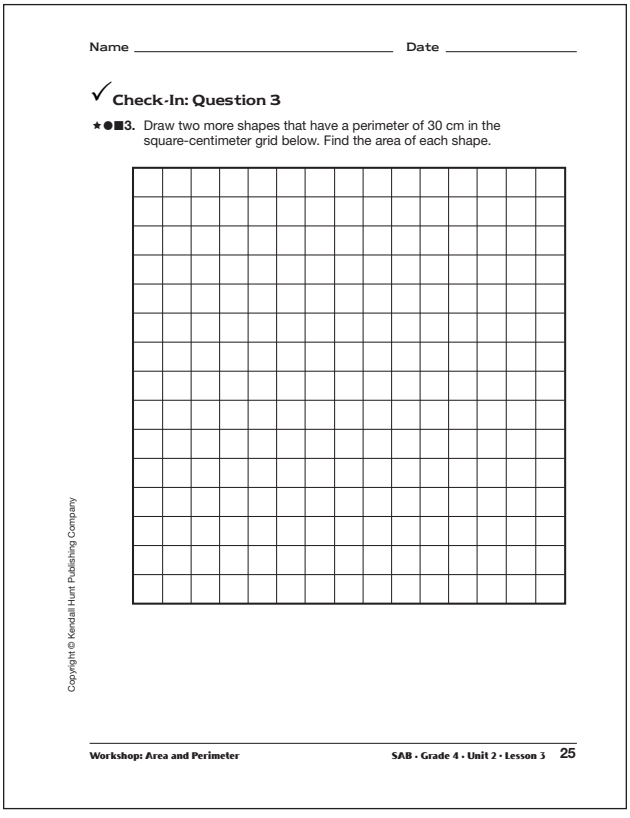

Name _____ Date _____

✓ Check-In: Question 3

★●■3. Draw two more shapes that have a perimeter of 30 cm in the square-centimeter grid below. Find the area of each shape.

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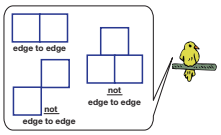
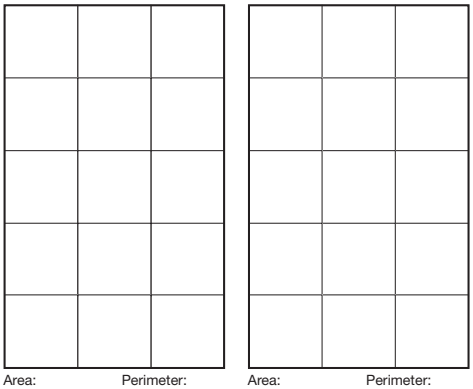
Reasoning About Area and Perimeter

★●**4.** Use square-inch tiles to make a shape that fits on the grid and matches the clues in each riddle. Put the tiles together edge to edge. Draw the shape on the grid. Compare your shape to the clues.



A. Clue 1: My area is 12 sq. in.
Clue 2: My perimeter is 18 in.
Clue 3: I am not a rectangle.

B. Clue 1: My area is 12 sq. in.
Clue 2: I am a rectangle.
Clue 3: My perimeter is 14 in.



Area: _____ Perimeter: _____ Area: _____ Perimeter: _____

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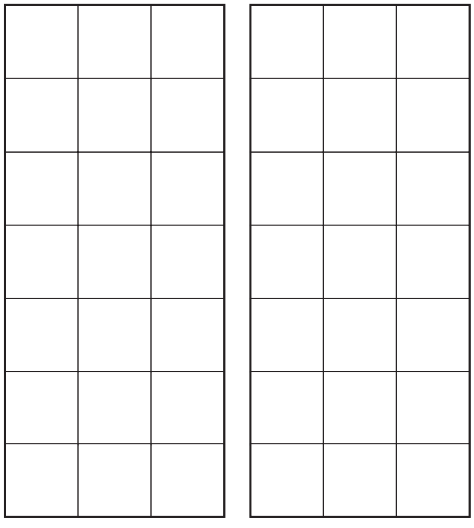
Name _____ Date _____

C. Clue 1: I am a rectangle.
Clue 2: My area is 12 sq. in.
Clue 3: My perimeter is 16 in.

D. Clue 1: I am not a rectangle.
Clue 2: My area is 12 sq. in.
Clue 3: My perimeter is 16 in.



Area: _____ Perimeter: _____ Area: _____ Perimeter: _____

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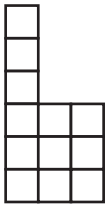
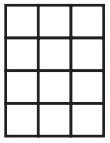
4. Shapes may vary for Parts A–D. One possible shape is shown for each riddle.

A.



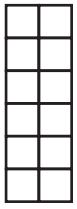
Area: 12 square inches
Perimeter: 18 inches

B.



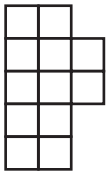
Area: 12 square inches
Perimeter: 14 inches

C.



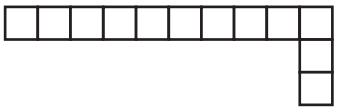
Area: 12 square inches
Perimeter: 16 inches

D.



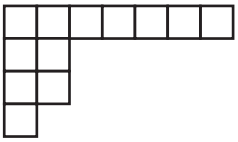
Area: 12 square inches
Perimeter: 16 inches

5. Riddles and answers will vary. Possible shapes include:



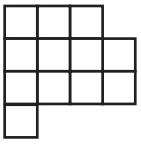
Area: 12 square inches

Perimeter: 26 inches



Area: 12 square inches

Perimeter: 22 inches



Area: 12 square inches

Perimeter: 16 inches

6. A. Area: 6 square inches

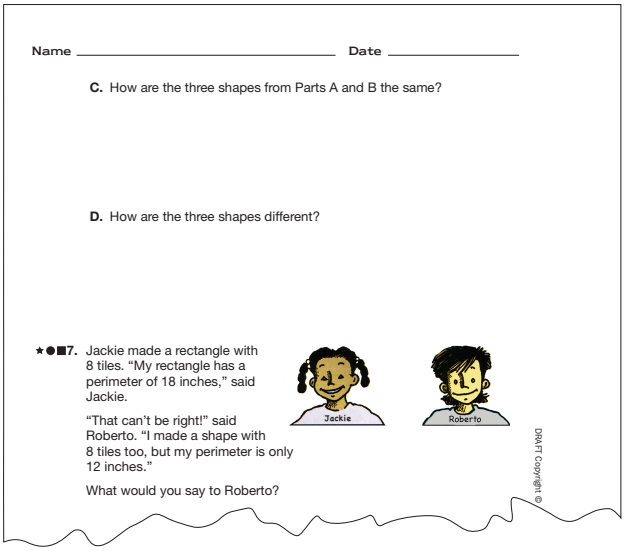
Perimeter: 12 inches

B. Answers will vary.

C. Answers will vary. The areas of all the shapes are the same.

D. The perimeters of all the shapes are different.

7. Explanations will vary. Students may say that two rectangles with the same area can have different perimeters, so both Jackie's and Roberto's rectangles can be correct.



Name _____ Date _____

C. How are the three shapes from Parts A and B the same?

D. How are the three shapes different?

★●■**7.** Jackie made a rectangle with 8 tiles. "My rectangle has a perimeter of 18 inches," said Jackie.

"That can't be right!" said Roberto. "I made a shape with 8 tiles too, but my perimeter is only 12 inches."

What would you say to Roberto?

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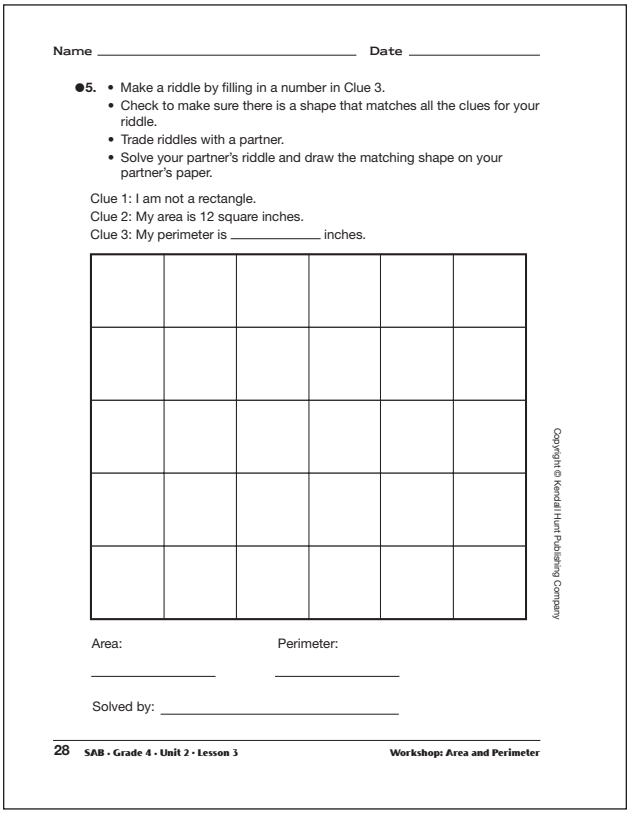

Name _____ Date _____

●**5.** • Make a riddle by filling in a number in Clue 3.
• Check to make sure there is a shape that matches all the clues for your riddle.
• Trade riddles with a partner.
• Solve your partner's riddle and draw the matching shape on your partner's paper.

Clue 1: I am not a rectangle.
Clue 2: My area is 12 square inches.
Clue 3: My perimeter is _____ inches.

Area: _____ Perimeter: _____

Solved by: _____

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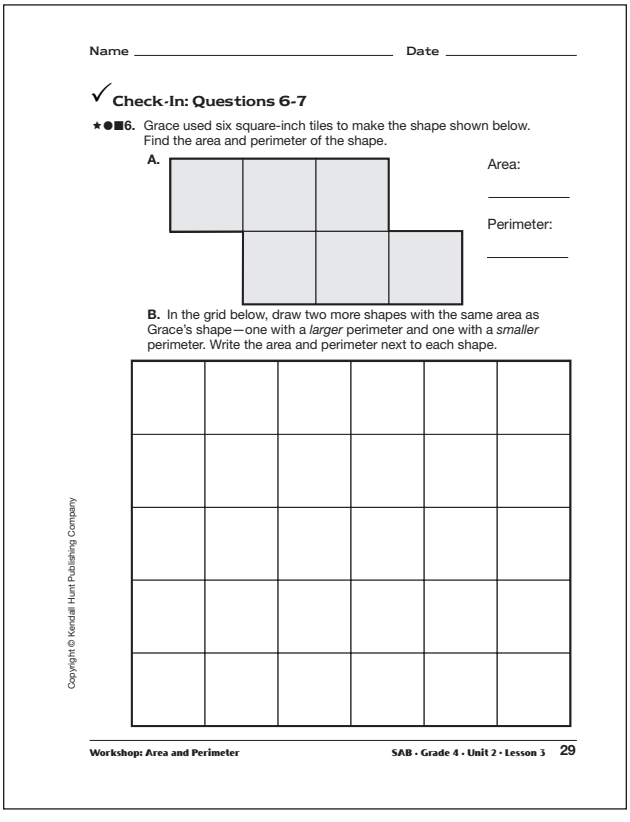

Name _____ Date _____

✓ **Check-In: Questions 6-7**

★●■**6.** Grace used six square-inch tiles to make the shape shown below. Find the area and perimeter of the shape.

A.

Area: _____

Perimeter: _____

B. In the grid below, draw two more shapes with the same area as Grace's shape—one with a *larger* perimeter and one with a *smaller* perimeter. Write the area and perimeter next to each shape.

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Name _____ Date _____

●■8. Using five square-inch tiles, how many shapes can you find that each have different perimeters? Sketch each shape below. Write the area and perimeter next to each shape you draw.

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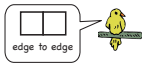
Name _____ Date _____

■9. Roberto has 24 square-centimeter tiles. He started to make a table to find the rectangle with the smallest perimeter. Complete Roberto's table. Draw a sketch of the rectangle with the smallest perimeter.



Length cm	Width cm	Perimeter cm
24	1	50
12	2	28
8	3	
6	4	
4	6	
3	8	
2	12	
1	24	

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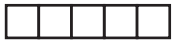
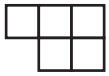
8. Shapes may vary, but only two different perimeters are possible:



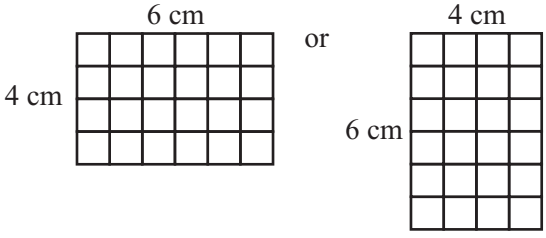
Area: 5 square inches
Perimeter: 12 inches



Area: 5 square inches
Perimeter: 10 inches

9.

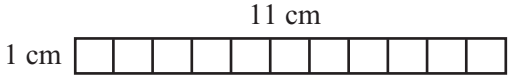
Length cm	Width cm	Perimeter cm
24	1	50
12	2	28
8	3	22
6	4	20
4	6	20
3	8	22
2	12	28
1	24	50



Area: 24 square centimeters
Perimeter: 20 centimeters

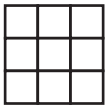
10.

Length cm	Width cm	Perimeter cm	Area sq cm
6	6	24	36
5	7	24	35
4	8	24	32
3	9	24	27
2	10	24	20
1	11	24	11

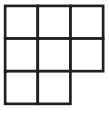


Area: 11 square centimeters
Perimeter: 24 centimeters

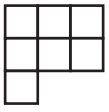
11. Shapes may vary, but only five different areas are possible:



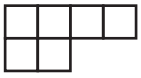
Area: 9 square inches
Perimeter: 12 inches



Area: 8 square inches
Perimeter: 12 inches

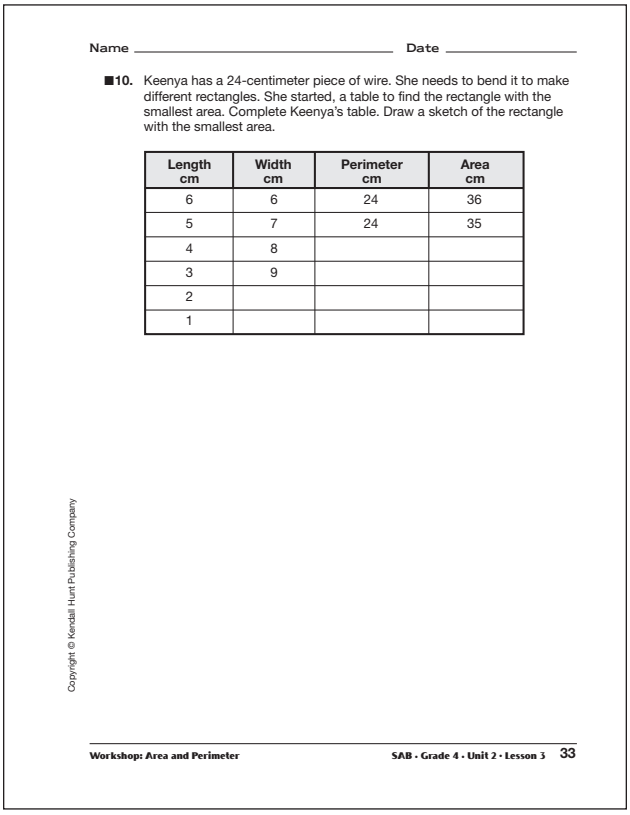


Area: 7 square inches
Perimeter: 12 inches



Area: 6 square inches
Perimeter: 12 inches

Area: 5 square inches
Perimeter: 12 inches



Name _____ Date _____

■**10.** Keenya has a 24-centimeter piece of wire. She needs to bend it to make different rectangles. She started, a table to find the rectangle with the smallest area. Complete Keenya's table. Draw a sketch of the rectangle with the smallest area.

Length cm	Width cm	Perimeter cm	Area cm
6	6	24	36
5	7	24	35
4	8		
3	9		
2			
1			

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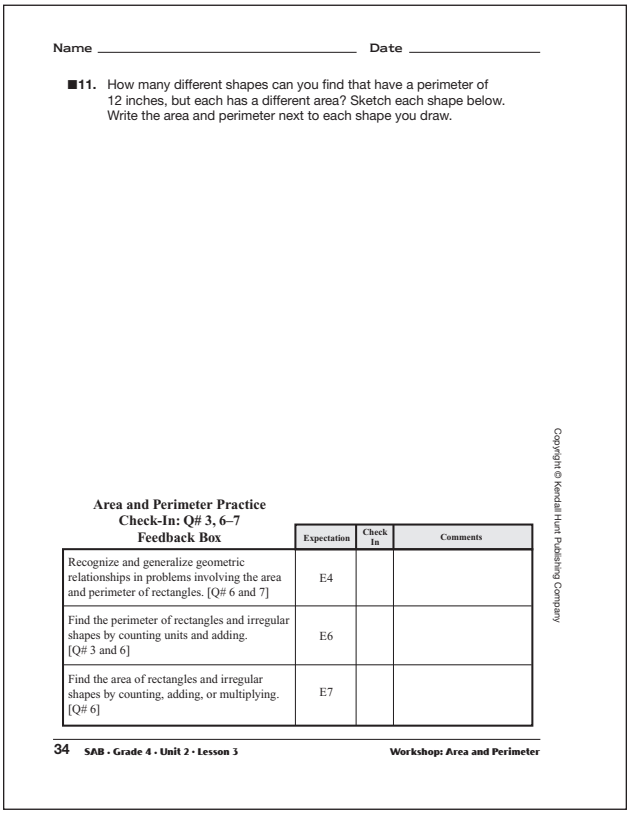

Name _____ Date _____

■**11.** How many different shapes can you find that have a perimeter of 12 inches, but each has a different area? Sketch each shape below. Write the area and perimeter next to each shape you draw.

Area and Perimeter Practice
Check-In: Q# 3, 6–7
Feedback Box

	Expectation	Check In	Comments
Recognize and generalize geometric relationships in problems involving the area and perimeter of rectangles. [Q# 6 and 7]	E4		
Find the perimeter of rectangles and irregular shapes by counting units and adding. [Q# 3 and 6]	E6		
Find the area of rectangles and irregular shapes by counting, adding, or multiplying. [Q# 6]	E7		

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