Lesson 25

Objective: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

Suggested Lesson Structure

■ Fluency Practice   (10 minutes)
■ Concept Development   (40 minutes)
■ Student Debrief   (10 minutes)
  Total Time   **(60 minutes)**

Fluency Practice (10 minutes)

▪ Sprint: Multiply or Divide by 6 **3.OA.7**   (10 minutes)

Sprint: Multiply or Divide by 6 (10 minutes)

Materials: (S) Multiply or Divide by 6 Sprint

Note: This Sprint builds fluency with multiplication and division facts using units of 6.

Concept Development (40 minutes)

Finished Robot Sample

Materials: (S) Problem Sets from Lessons 24 and 25, Evaluation Rubric, centimeter grid paper, glue, ruler, right angle tool, crayons, assorted colors of construction paper, 1 piece of 12" × 18" construction paper, string, scissors
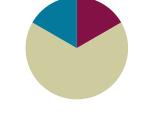
Students use today's Problem Set to map out the robot in its environment. Once they have their maps completed, students create just their robots using the widths and lengths they recorded on the Problem Set in Lesson 24. Give them the option of cutting their rectangles out of centimeter grid paper or creating rectangles on construction paper with a right angle tool and ruler. Once all pieces for the robot are cut, students can glue the pieces to a 12" × 18" piece of construction paper.

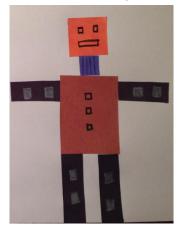Lesson 25:   Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.

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MP.6

To prepare students:

- Inform students that they will sketch a map of their robot in their environment on the Problem Set. The widths, lengths, and perimeters of the rectangles need to be labeled. Circular items should be labeled with their perimeters. This map will be used again in Lesson 26 as students construct their robot's environment.

- Inform students they may use either centimeter grid paper or a right angle tool and ruler to create their rectangular robot pieces. Those who use centimeter grid paper might color their pieces if time allows.

- Let students know that their peers will analyze their work. It is important to glue pieces on the 12" × 18" construction paper without affecting the perimeters of the objects, as in Figure A above. Demonstrate that the measurable perimeter of the tree trunk changes with the placement of the tree top in Figure B.

- Inform students that they will have time during the next lesson to put the finishing touches on their robots if they do not have enough time today.

- Share the Evaluation Rubric (pictured to the right and included at the end of the lesson) with students so they know the expectations for the finished product.

Figure A **Figure B**

Evaluation Rubric

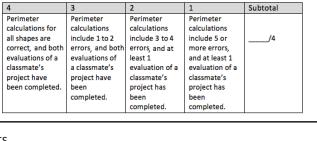| 4	3	2	1	Subtotal
Perimeter calculations for all shapes are correct, and both evaluations of a classmate's project have been completed.	Perimeter calculations include 1 to 2 errors, and both evaluations of a classmate's project have been completed.	Perimeter calculations include 3 to 4 errors, and at least 1 evaluation of a classmate's project has been completed.	Perimeter calculations include 5 or more errors, and at least 1 evaluation of a classmate's project has been completed.	____/4

Note: This Evaluation Rubric is for teacher use. Students use a different form to analyze one another's work for accuracy in Lesson 27. If an anonymous process is preferred for the student analysis, have students identify their work with a number or other symbol, rather than by name.

Student Debrief (10 minutes)

Lesson Objective: Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced.
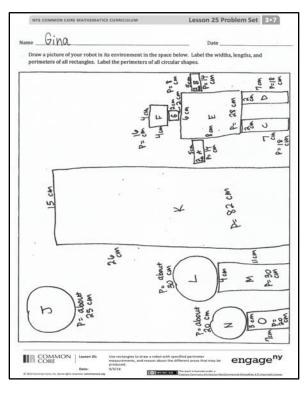
The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

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Any combination of the questions below may be used to lead the discussion.

- Compare your drawing to a partner's. What is similar? What is different?
- Which of your shapes looks most like your partner's? Why?
- Even though you all used the same perimeters for the robot's body parts, your robots all look different. How is this possible?
- What was the most difficult part of creating your robot? Why?
- If you did this again, what would you do differently? Why?

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

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A

Number Correct: _____

Multiply or Divide by 6

1.	$2 \times 6 =$	
2.	$3 \times 6 =$	
3.	$4 \times 6 =$	
4.	$5 \times 6 =$	
5.	$1 \times 6 =$	
6.	$12 \div 6 =$	
7.	$18 \div 6 =$	
8.	$30 \div 6 =$	
9.	$6 \div 6 =$	
10.	$24 \div 6 =$	
11.	$6 \times 6 =$	
12.	$7 \times 6 =$	
13.	$8 \times 6 =$	
14.	$9 \times 6 =$	
15.	$10 \times 6 =$	
16.	$48 \div 6 =$	
17.	$42 \div 6 =$	
18.	$54 \div 6 =$	
19.	$36 \div 6 =$	
20.	$60 \div 6 =$	
21.	___ $\times 6 = 30$	
22.	___ $\times 6 = 6$	

23.	___ $\times 6 = 60$	
24.	___ $\times 6 = 12$	
25.	___ $\times 6 = 18$	
26.	$60 \div 6 =$	
27.	$30 \div 6 =$	
28.	$6 \div 6 =$	
29.	$12 \div 6 =$	
30.	$18 \div 6 =$	
31.	___ $\times 6 = 36$	
32.	___ $\times 6 = 42$	
33.	___ $\times 6 = 54$	
34.	___ $\times 6 = 48$	
35.	$42 \div 6 =$	
36.	$54 \div 6 =$	
37.	$36 \div 6 =$	
38.	$48 \div 6 =$	
39.	$11 \times 6 =$	
40.	$66 \div 6 =$	
41.	$12 \times 6 =$	
42.	$72 \div 6 =$	
43.	$14 \times 6 =$	
44.	$84 \div 6 =$	

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B

Number Correct: _____

Improvement: _____

Multiply or Divide by 6

1.	1 × 6 =		23.	___ × 6 = 12	
2.	2 × 6 =		24.	___ × 6 = 60	
3.	3 × 6 =		25.	___ × 6 = 18	
4.	4 × 6 =		26.	12 ÷ 6 =	
5.	5 × 6 =		27.	6 ÷ 6 =	
6.	18 ÷ 6 =		28.	60 ÷ 6 =	
7.	12 ÷ 6 =		29.	30 ÷ 6 =	
8.	24 ÷ 6 =		30.	18 ÷ 6 =	
9.	6 ÷ 6 =		31.	___ × 6 = 18	
10.	30 ÷ 6 =		32.	___ × 6 = 24	
11.	10 × 6 =		33.	___ × 6 = 54	
12.	6 × 6 =		34.	___ × 6 = 42	
13.	7 × 6 =		35.	48 ÷ 6 =	
14.	8 × 6 =		36.	54 ÷ 6 =	
15.	9 × 6 =		37.	36 ÷ 6 =	
16.	42 ÷ 6 =		38.	42 ÷ 6 =	
17.	36 ÷ 6 =		39.	11 × 6 =	
18.	48 ÷ 6 =		40.	66 ÷ 6 =	
19.	60 ÷ 6 =		41.	12 × 6 =	
20.	54 ÷ 6 =		42.	72 ÷ 6 =	
21.	___ × 6 = 6		43.	13 × 6 =	
22.	___ × 6 = 30		44.	78 ÷ 6 =	

Name _____   Date _____

Draw a picture of your robot in its environment in the space below. Label the widths, lengths, and perimeters of all rectangles. Label the perimeters of all circular shapes.

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Name _____   Date _____

1. Sketch rectangles with the following perimeters. Label the side lengths.

    a. 22 cm

    b. 30 cm

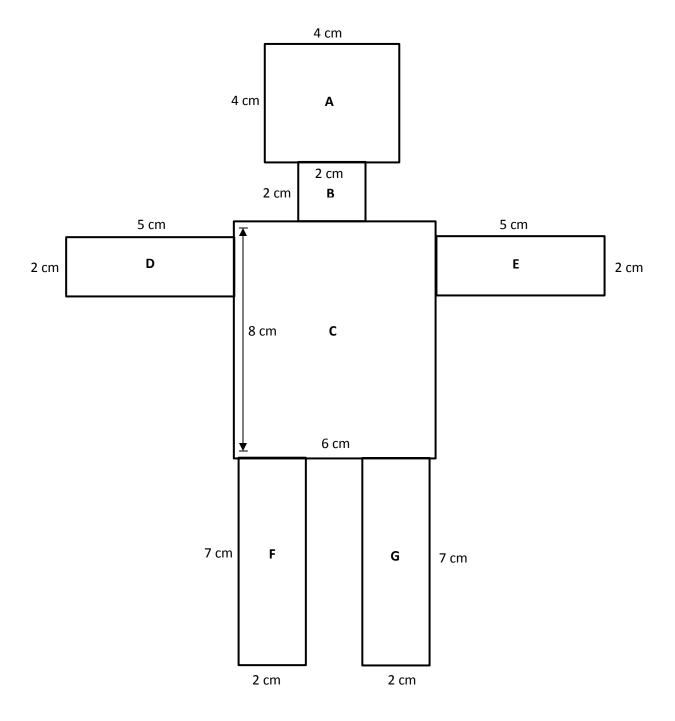2. Explain the steps you took to create the rectangles with the given perimeters.

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The robot below is made of rectangles. The side lengths of each rectangle are labeled. Find the perimeter of each rectangle, and record it in the table on the next page.

4 cm

4 cm   **A**

2 cm

2 cm   **B**

5 cm   **D**   **E**   5 cm

2 cm   2 cm

8 cm   **C**

6 cm

7 cm   **F**   **G**   7 cm

2 cm   2 cm

Rectangle	Perimeter
A	P = 4 × 4 cm P = 16 cm
B	
C	
D	
E	
F	
G	

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Name _____ Date _____

Evaluation Rubric

4	3	2	1	Subtotal
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Name _____ Date _____

Evaluation Rubric

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