Communicating about Measurement

▶ **GOAL**
Describe perimeter and area using appropriate mathematical language.

Communicate about the Math

Sarah says, "I was asked to describe a real-life example of area and perimeter. I remember that my family bought outdoor carpet for part of our deck and fastened it with moulding around the edges. The carpeted area is 10 m long and 2 m wide. I can describe how to calculate the cost of the carpet and the moulding."

Sarah asked Rosa to proofread and comment on her description.

? How can Sarah improve her description?

Sarah's Description

First I measured the perimeter. I got 24 m. Next I calculated the area. I used length × width. The area equalled 20. To calculate the amount of moulding, I multiplied 24 × $0.50. To calculate the amount of carpet, I multiplied 20 × $1.25. The total cost is $37.

Rosa's Questions

How did you measure the perimeter?

Why did you need to calculate the area?

Why did you use length and width to calculate the area?

How did you know which price to use for each measurement?

A. Did Sarah show that she understands how to calculate area and perimeter? Explain.

B. Which of Rosa's questions do you think is most important? Why?

C. What other questions would you ask about Sarah's description?

D. Rewrite Sarah's description. Include answers to Rosa's questions and your questions.

Reflecting

1. Which points in the Communication Checklist did Sarah cover well? Explain your answer.

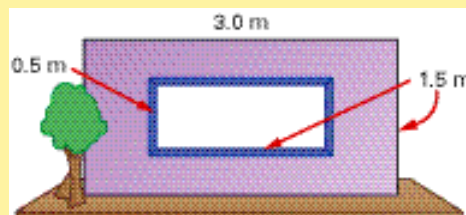2. Why is it important to communicate how you solve a problem?
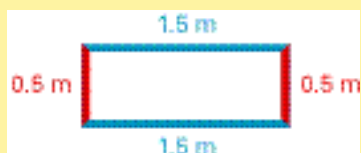
Work with the Math

Example: Writing a complete answer

Ryan and Sandra built a window inside a frame for the school play, as shown. They painted the trim for the window blue and the frame purple.

a) What length of trim is painted?

b) What area of frame is painted? Explain what you did.
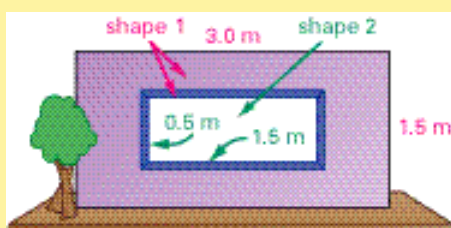

a) Ryan's Solution

To calculate the length of trim, I added the measurements for all four sides of the window. I doubled 0.5 m to get the two ends of the window. I doubled 1.5 m to get the top and bottom of the window.

$2 \times (0.5 \text{ m}) + 2 \times (1.5 \text{ m}) = 4.0 \text{ m}$

4.0 m of trim is painted.

b) Sandra's Solution

I labelled the window and the frame shape 1. I labelled the window shape 2.

Area of shape 1
$3.0 \text{ m} \times 1.5 \text{ m} = 4.5 \text{ m}^2$

The area of shape 1 is length times width, which is 4.5 m².

Area of shape 2
$0.5 \text{ m} \times 1.5 \text{ m} = 0.75 \text{ m}^2$

The area of shape 2 is 0.75 m².

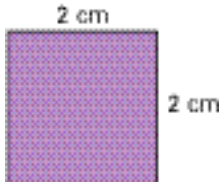Area of frame
$4.5 \text{ m}^2 - 0.75 \text{ m}^2 = 3.75 \text{ m}^2$

Then I subtracted the area of the window (shape 2) from the area of the window and the frame (shape 1).

To the nearest tenth, 3.8 m² of frame is painted.

I rounded to the nearest tenth because the measurements are given in tenths.
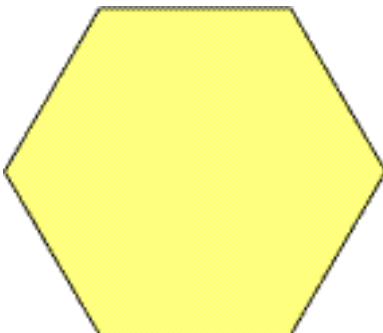
Ⓐ Checking

3. A Grade 5 student asks you to explain how to calculate the perimeter and area of a square with sides that are 2 cm long. Write your explanation.
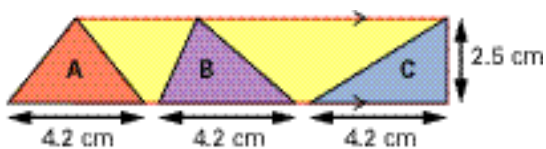

2 cm
2 cm

Ⓑ Practising

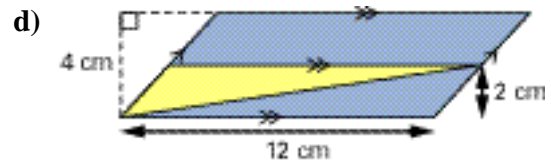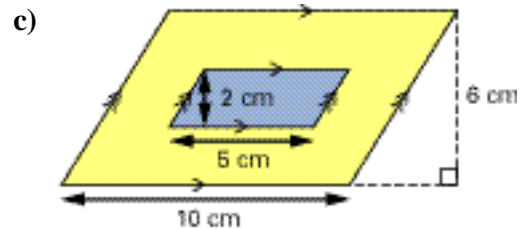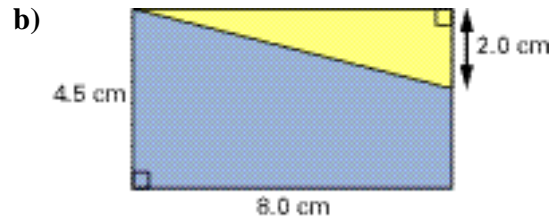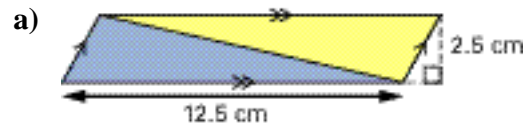Use the Communication Checklist to help you write clear and complete explanations.

4. Determine all the different rectangles that have an area of 36 m². The sides must be whole numbers of metres. Use words, numbers, and pictures to explain what you did.

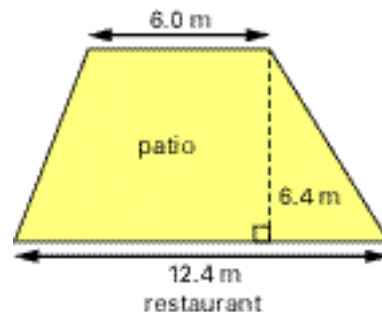**5.** Calculate the area of the top face of a yellow pattern block (hexagon). Explain what you did.

6. Calculate the area of triangles A, B, and C. Explain why triangles A, B, and C have the same area.

A   B   C   2.5 cm
4.2 cm   4.2 cm   4.2 cm

7. Calculate the area of the yellow shape in each diagram. Explain what you did.

a)

2.5 cm
12.5 cm

b)

2.0 cm
4.5 cm
8.0 cm

c)

2 cm
5 cm
6 cm
10 cm

d)

4 cm
2 cm
12 cm

8. Jean-Pierre drew the following diagram to show the patio that will be built beside the Adventurepark restaurant. Jean-Pierre has a budget of $1500 for patio tiles. The price of the tiles is $22/m².

6.0 m
patio
6.4 m
12.4 m
restaurant

a) What is the area of the patio? Explain what you did.

b) How much will the patio tiles cost?

c) Will Jean-Pierre be over budget? Explain how you know.