Perimeters and Areas of Rectangles

You will need
- a ruler
- 1 cm grid paper

GOAL
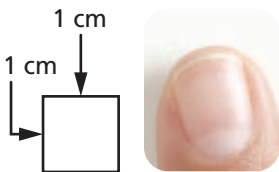
Compare rectangles with the same perimeter or the same area.

area

The number of square units needed to cover a surface

square centimetre (cm²)

A unit of measurement for area

1 cm

1 cm

For example, the area of a fingernail is about 1 cm².

Tyler says he likes the photo that has a perimeter of 40 cm. Sam says she likes the photo that has an **area** of 96 **cm² (square centimetres)** .

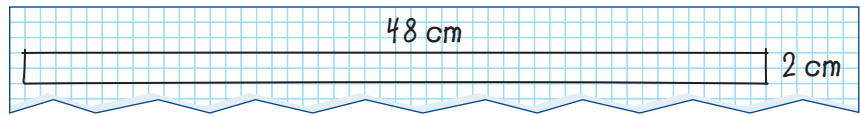**Could Tyler and Sam be talking about the same photo?**

Jolie's Solution

I'll draw some rectangles that cover 96 cm² on 1 cm grid paper. Then I'll see if any of them have a perimeter of 40 cm.

The rectangle could have 2 rows of 48 squares.

48 cm
2 cm

The perimeter is 48 cm + 48 cm + 2 cm + 2 cm.
That's more than 40 cm!
Next I'll try 4 rows of 24 squares.

A. Sketch a rectangle with 4 rows of 24 squares on 1 cm grid paper. What is the perimeter of this rectangle?

B. How do you know that the area of the rectangle is 96 cm^2?

C. Sketch some other rectangles that have an area of 96 cm^2. Your rectangles should have whole-centimetre sides.

D. What is the perimeter of each rectangle you sketched in Part C? Show how you figured out the perimeter.

E. Could Tyler and Sam be talking about the same photo? Explain how you know.

Reflecting

F. Why do you think Jolie tried rectangles with 2 rows of 48 squares and 4 rows of 24 squares?

G. What happened to the perimeter as the rectangles got more and more like a square?

Checking

1. a) Sketch two different rectangles with a perimeter of 60 cm on 1 cm grid paper. Label the side lengths.
   b) Which rectangle has the greater area?

2. a) Sketch two different rectangles with an area of 20 cm² on 1 cm grid paper.
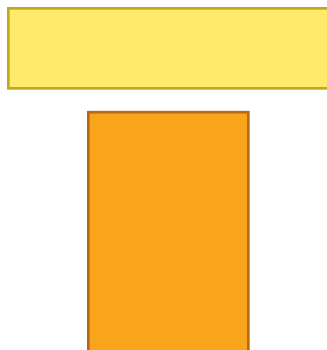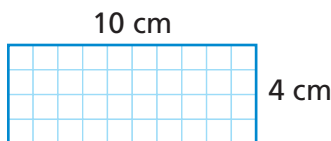
b) Which rectangle has the lesser perimeter?

Practising

For Questions 3 to 6, use only rectangles with sides you can measure in whole centimetres.

3. a) Sketch a rectangle that is 3 cm wide and 12 cm long on 1 cm grid paper. Determine the perimeter and the area.

b) Repeat part a) with a 5 cm by 10 cm rectangle.

c) Repeat part a) with a 7 cm by 8 cm rectangle.

d) Describe what happens to the area of a rectangle when the perimeter stays the same and the shape gets closer to a square.

e) A square and a long thin rectangle have the same perimeter. Which has the greater area? Explain how you know.

4. a) Determine the perimeter and the area of the blue rectangle at the left.

b) Sketch a rectangle with the same perimeter as the blue rectangle, but with a greater area.

c) Sketch a rectangle with the same area as the blue rectangle, but with a greater perimeter.

10 cm

4 cm

5. Sydney wants to make a rectangular play area for her dog. She has 36 m of fencing.

a) Sketch the rectangle that will give her dog the greatest area to play in.

b) Explain how you know that the rectangle you sketched in part a) has the greatest area.

6. Jan has a rectangular picture with a perimeter of 100 cm.

a) What else would you need to know before you could sketch an outline of the rectangle on 1 cm grid paper?

b) Suppose that each rectangle at the left has a perimeter of 100 cm. Which has the lesser area? Explain how you know.