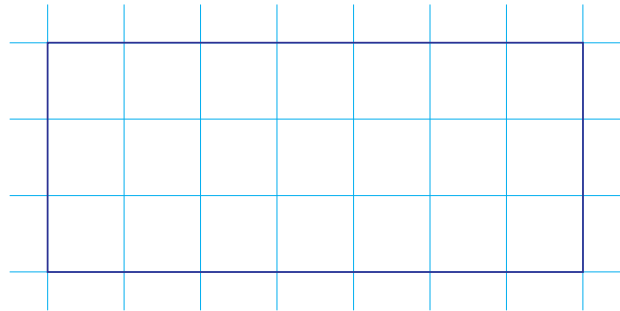


3

# Exploring Rectangles with Equal Perimeters

What is the perimeter of this rectangle?  
 What is its area?  
 How do you know?



**Explore**



You will need a geoboard, geobands, and 1-cm grid paper.

Simon wants to build a rectangular pen in his backyard for his potbelly pig, Smiley. Simon has 22 m of wire mesh for a fence to enclose the pen. Simon wants the greatest possible area for the pen.

- Use a geoboard to make models of all possible rectangles. Draw each model on grid paper.
- Find the area of each pen.
- Write the perimeter of each pen.
- Record your work in a table.
- Find the pen with the greatest area.



## Show and Share

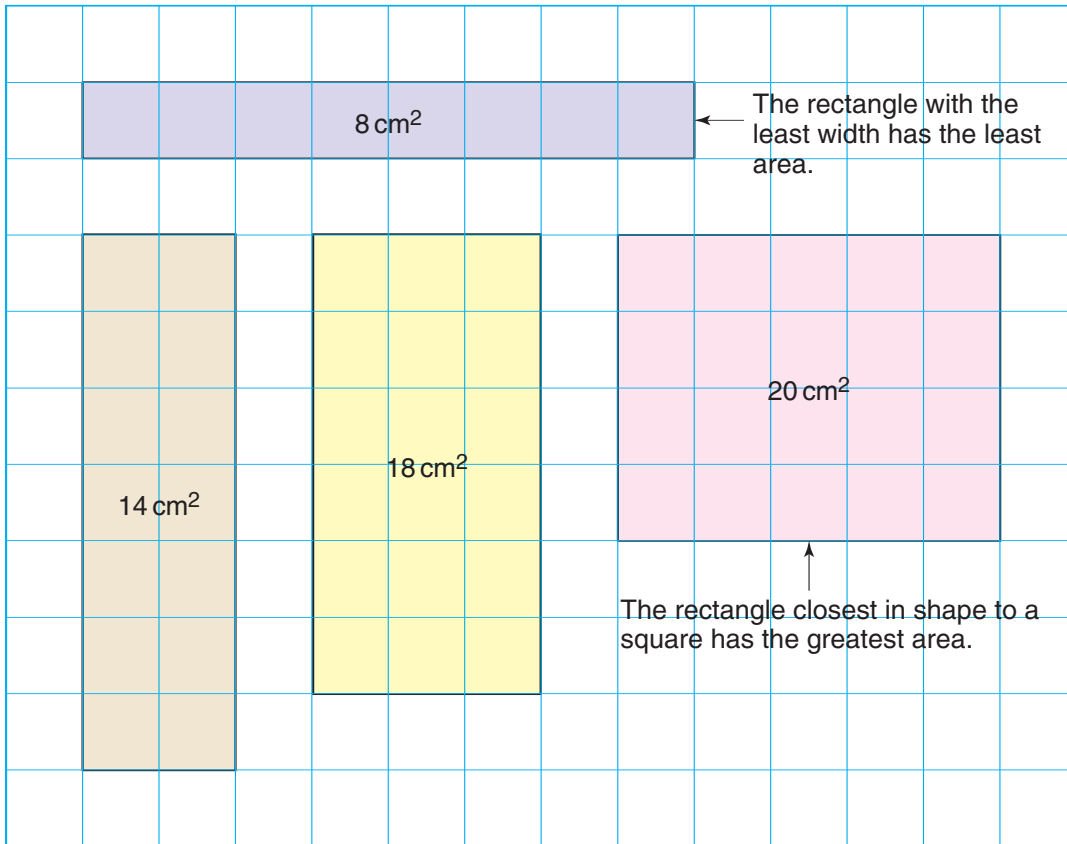
Share your work with another pair of students.  
 What do you notice about the shape of the rectangle with the greatest area?

What do you notice about the width of the rectangle with the least area?

Length	Width	Area	Perimeter

## Connect

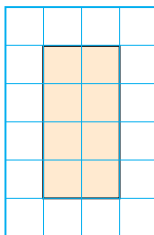
Rectangles with equal perimeters can have different areas.  
Each rectangle below has perimeter 18 cm.



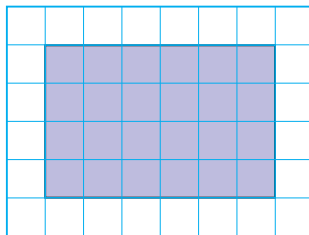
## Practice

- Copy each rectangle onto 1-cm grid paper. For each rectangle:
  - Find the perimeter.
  - Draw a rectangle with the same perimeter but greater area.
  - Draw a rectangle with the same perimeter but lesser area.
  - Find the area of each rectangle you draw.

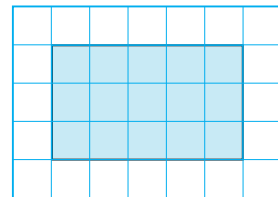
a)



b)



c)



2. Use 1-cm grid paper.  
Draw all possible rectangles with each perimeter.  
Find the area of each rectangle.
- a) 16 cm                      b) 20 cm                      c) 14 cm

3. Draw 2 different rectangles with each perimeter below.  
One rectangle has the least area.  
The other rectangle has the greatest area.  
Find the area of each rectangle you draw. Use a geoboard to help you.
- a) 10 cm                      b) 12 cm                      c) 8 cm



4. Suppose you want to make a rectangular garden with a perimeter of 24 m.
- a) The garden must have the greatest possible area.  
What should the dimensions of the garden be?
- b) Which garden would you design if you do not like garden work?  
Explain your design.  
Show your work.



5. Describe a situation where both area and perimeter are important.
6. Use a geoboard to make a rectangle with each perimeter and area.  
Record your work on dot paper.
- a) perimeter 24 units and area 32 square units  
b) perimeter 14 units and area 10 square units  
c) perimeter 8 units and area 4 square units
7. Xavier has 16 m of fencing to put around his square flower garden.
- a) What are the side lengths of Xavier's garden? How do you know?  
b) What is the area of his garden?
8. Sarah has 100 cm of trim for each rectangular placemat she is making.
- a) List the lengths and widths of 6 possible placemats.  
b) Which placemat in part a would be the best size?  
Give reasons for your choice.

## Reflect

Write a letter to a friend to explain the difference between area and perimeter.

# Who Can Fill the Page?



You will need 2 sheets of 1-cm grid paper, and a number cube labelled 1 to 6.

The goal of the game is to cover the grid paper with rectangles.

- Each of you has a sheet of grid paper. Take turns to roll the number cube twice. Multiply the numbers. The product is the perimeter of a rectangle in centimetres.
- On the grid lines, draw as many different rectangles as you can with that perimeter. The rectangles must not overlap. If it is not possible to draw a rectangle, roll again.
- Play then passes to your partner.
- The first person to cover her grid paper with rectangles is the winner.

