

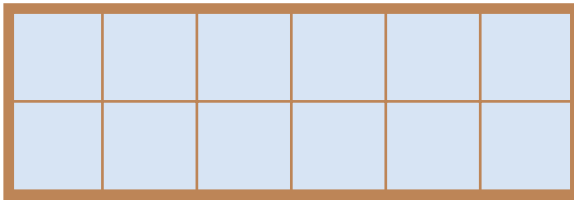
Fenced In

You need ✓ square grid paper
✓ a classmate

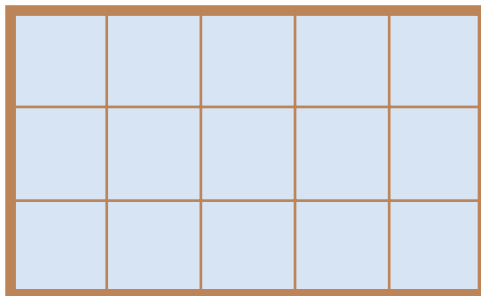
✓ a geoboard and rubber bands

Activity

Sam is helping his dad to make a fenced run for his puppy. They draw plans that use 16 metres of fencing wire as the perimeter of the run:



Dad's plan



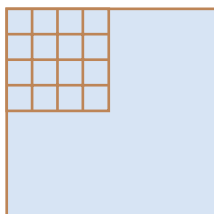
Sam's plan



1. Sam thinks his puppy run is better than Dad's one. What makes Sam think this?
2. Dad challenges Sam to find the dimensions of a run that will give the puppy the most room possible, using only 16 metres of fencing wire.
 - a. Draw on square grid paper or use a geoboard and rubber bands to find the largest rectangle possible for Sam's puppy run.
 - b. What is special about the shape of the largest puppy run possible?
 - c. If Dad and Sam used just 12 metres of fencing wire, what rectangular shape would the largest run be?
3. Sam predicts that the largest area of a rectangular run made with 40 metres of fencing wire would be 100 square metres.
 - a. How might he have worked this out?
 - b. Is he right?

4. When Dad and Sam get to the shop, there is a “2 for the price of 1” deal, so they get 32 metres of fencing wire instead of 16. They decide to make each side of the 4 x 4 run twice as long to give the puppy even more space.

- a. With a classmate, investigate what happens to the area of the puppy run when the lengths of the sides are doubled.



- b. Does this always happen? Try doubling the sides of some different-sized rectangles. Organise your information into a table like the one below.

Original run			Bigger run		
Length (m)	Width (m)	Area (m ²)	Length (m)	Width (m)	Area (m ²)
4	4	16	8	8	
3	5		6	10	



- c. Explain why this happens. (You might like to use a diagram.)

5. a. What would you expect to happen to the area of a rectangle if you halved the length of each side?
 b. Investigate this on square grid paper and record your results in another table.

Investigation

What happens to the area of a rectangle if you:

- a. triple the length of each side?
 b. divide each side by 3?