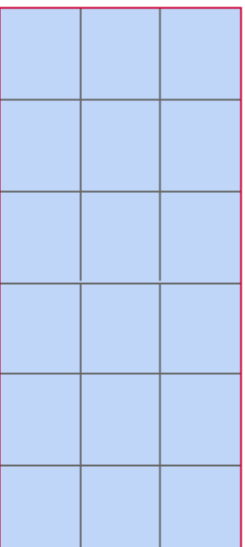


Investigation

Pete's pond problem

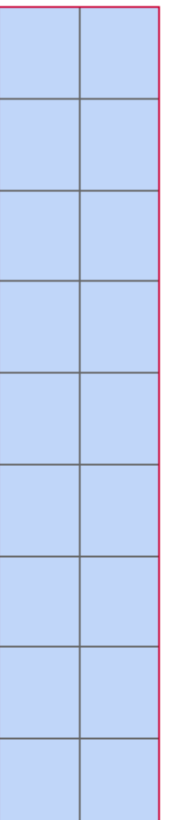
1. Pete is digging a rectangular pond in his garden. To stop the herons eating his fish, he is going to put a fence all the way around the pond.



This pond has an area of **18 squares**. Each square is a metre long, so the perimeter of this pond is **18m**.

If Pete changes the shape of the pond into a different rectangle, does the perimeter change too?

For example:



Are these the only two rectangles Pete could create for an area of 18 squares?

2. To save money, Pete wants to use a minimum length of fencing. Which rectangle should he use?
3. Try creating rectangular ponds with these areas: 20 squares, 16 squares, 30 squares, and 25 squares. Investigate all of the possible rectangles with that area, and always note which pond uses the least fencing.
4. Have you noticed anything interesting?

Can you make a **generalisation** about the relationship between the length of the rectangle and its perimeter?

How might you record all of the combinations you try?

Organising your recording will help you **systematically** try all possibilities and spot **patterns** in the results.

Challenge

If you are allowed to use half-squares for the pond, can you use what you have discovered to make an even smaller perimeter for an area of 20 squares?