Pete's pond problem

Children apply knowledge of perimeter and area to make a generalisation.

Skill practised:

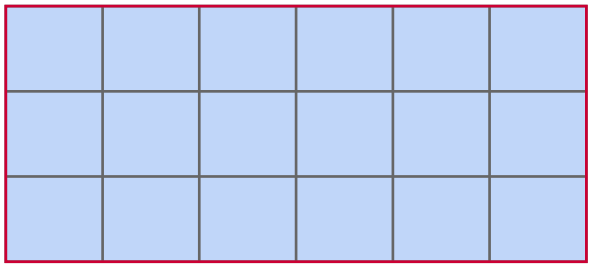
- Finding perimeter and area of rectangles

Conjecture: *Different rectangles with the same area can have different perimeters.*

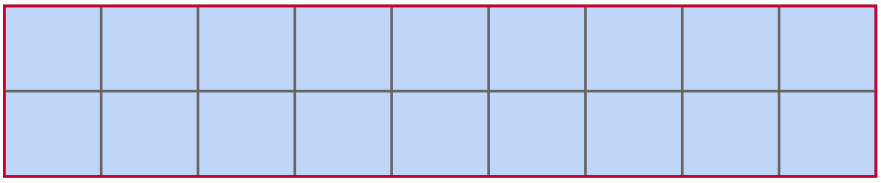
What to do:

Children work individually or in pairs.

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, always investigating all of the possible rectangles with that area, and always noting which pond uses the least fencing:
   area – 20 squares, 16 squares, 30 squares, and 25 squares.
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?

HINT: Try to complete this statement: The _____ a rectangle, the _____ its perimeter.

Aims:

- To make links between measurements of area and perimeter
- To use a collection of specific examples to make a generalisation

Minimum number of calculations expected

24

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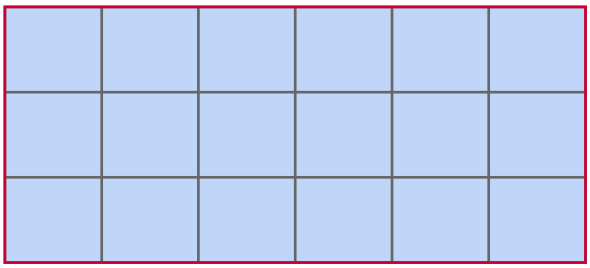

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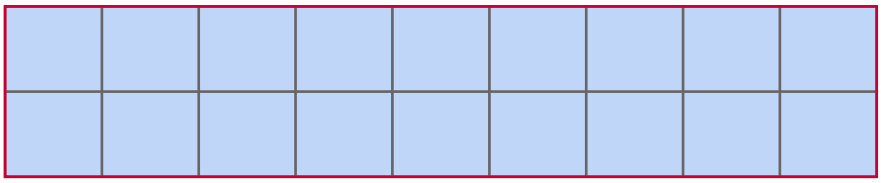

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Can you make a ***generalisation*** about the relationship between the length of the rectangle and its perimeter?

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?