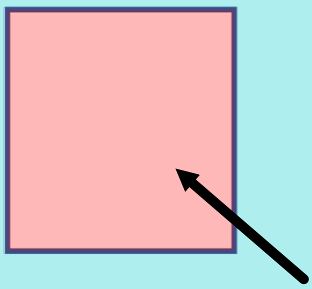
Year 4: Measurement

Area

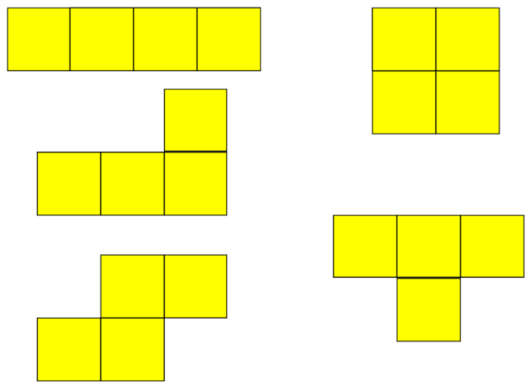
- In Year 4, children encounter area for the first time.
- They learn that area is the **amount of space taken up by a 2D shape** or surface.



- Area is found by practically **counting squares**.

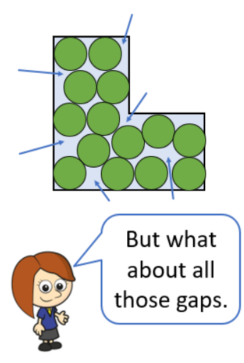
Examples:

The area of the shape is _7_ squares.

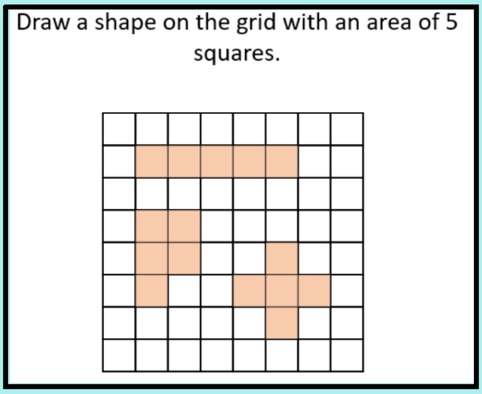


These shapes have the same area. 4 squares

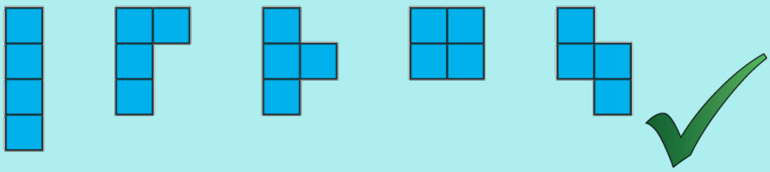
- Children explore the idea that counters are not suitable for finding area, as the whole area cannot be covered.

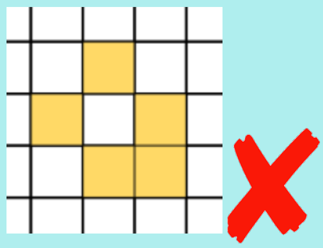


- Children make **rectilinear shapes** using a given number of squares.



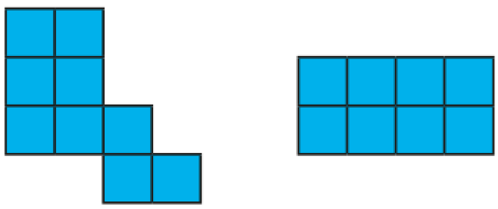
- A **rectilinear shape** is a shape that has only straight sides and right angles. Rectilinear shapes need to touch at the sides and not just at the corners. For example:





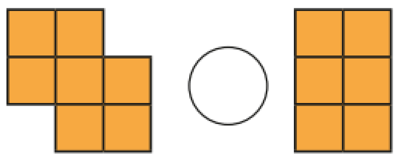
- Children **compare the areas** of rectilinear shapes.
- They use the symbols **<, > and =** to compare the areas of different shapes.
- They **put shapes in size order.**

Which shape has the smaller area?

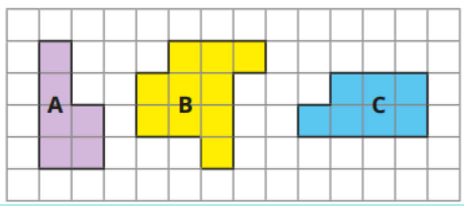


How did you find your answer?

Write <, > or = to compare the areas of the shapes.

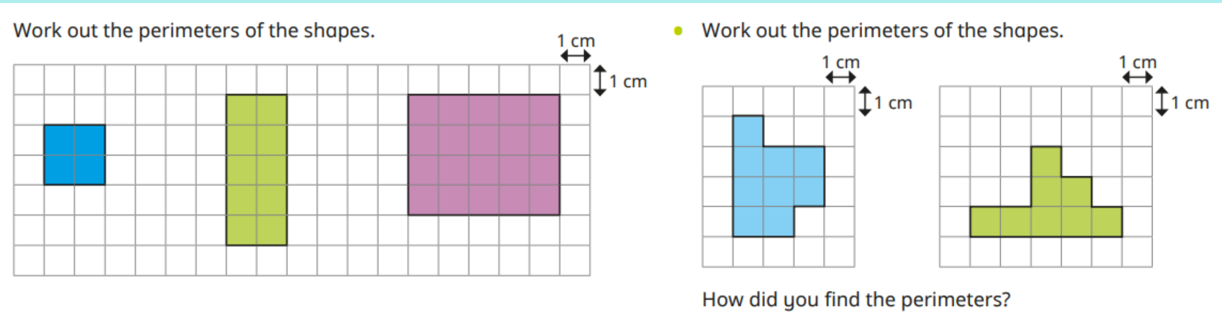


Put the shapes in order of size starting with the smallest area.



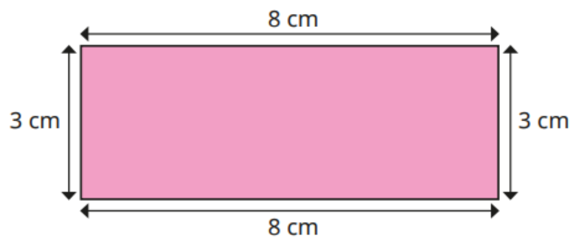
Perimeter

- Children explore perimeter with a focus on rectilinear shapes, where all sides meet at right angles.
- To start with, these rectilinear shapes will be drawn on squared grids, mainly centimetre squared grids.
- The children count squares to measure the length of each side of a shape. They label the lengths of the sides and mark off each side as they add the lengths together.



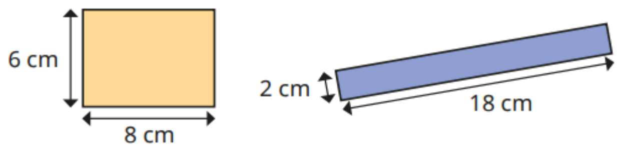
- Children move on to calculating the perimeter of rectangles using the side lengths, rather than counting the squares.

Work out the perimeter of the rectangle.



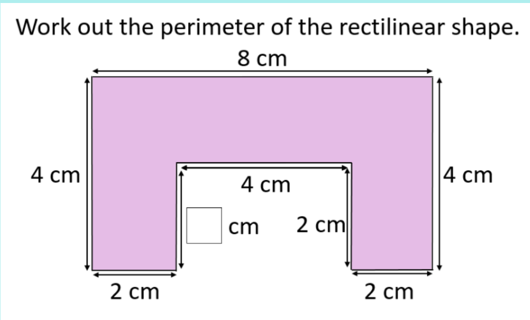
- Children explore rectangles with only one length and width given.
- They explore different methods for working out the perimeter of rectangles, such as adding double the length to double the width or doubling the sum of the length and the width.

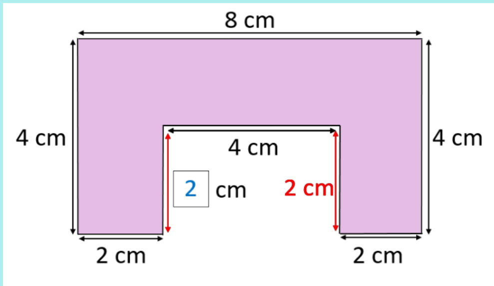
Work out the perimeters of the rectangles.



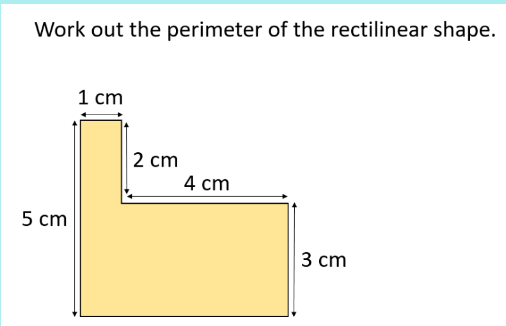
Compare methods with a partner.

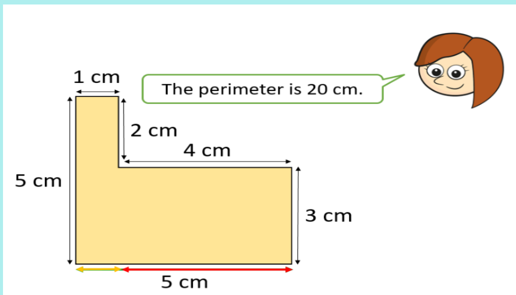
- Children find the perimeter of rectilinear shapes, including finding missing side lengths. For example:





8 cm + 8 cm + 4 cm + 8 cm = 28 cm

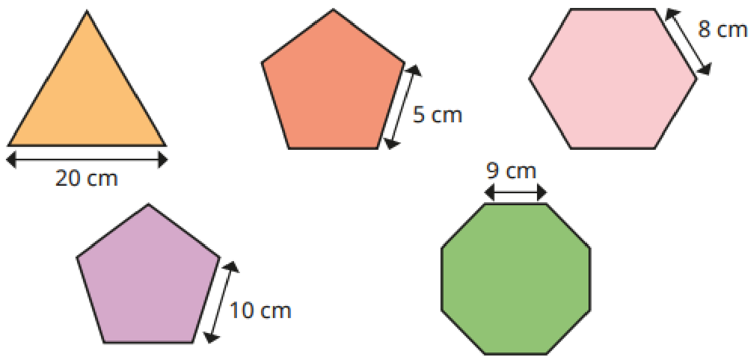




- Children are introduced to the term “regular polygon” for the first time. In a regular polygon, all sides are equal in length and the angles are equal in size.
- A polygon is a flat 2D shape with straight sides that are fully closed. The sides must be straight, not curved. However, polygons can have any number of sides.

perimeter = number of sides × length of one side

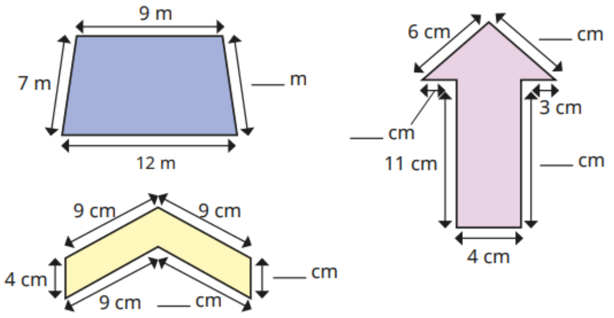
Use this rule to work out the perimeters of these regular polygons.



- Children learn the word “irregular” to describe polygons that are not regular.
- Children continue to add the side lengths together to find the perimeter.
- Children are encouraged to use number bonds to add related sides (for example, 4 cm + 6 cm = 10 cm) when working out the perimeter, as this will make calculating more efficient.
- They also use symmetry and properties of shapes to label lengths that are not given to help them calculate perimeters of shapes that are partially labelled.

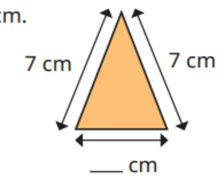
All the shapes have one line of symmetry.

Work out the perimeters of the shapes.



The perimeter of this triangle is 19 cm.

Work out the unknown length.



RPS - Area

Year 4

Reasoning and problem solving

Rosie and Dexter each find the area of the same table.

They use different-sized sticky notes.

The area of the tabletop is 6 sticky notes.

Rosie

The area of the tabletop is 9 sticky notes.

Dexter

Who has the larger sticky notes?

How do you know?

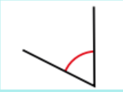
Rosie

Geometry

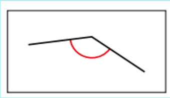
Year 4

- Children learnt about right angles being quarter turns in Year 3.

- In Year 4, they classify angles as acute and obtuse.
- Any angle that is less than a right angle is called an acute angle.

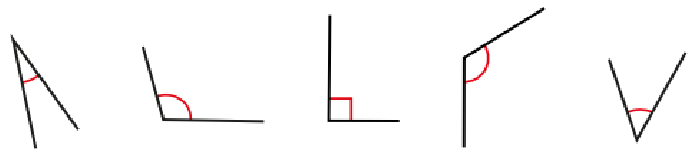


- An angle greater than a right angle, but less than a half turn, is called an obtuse angle.



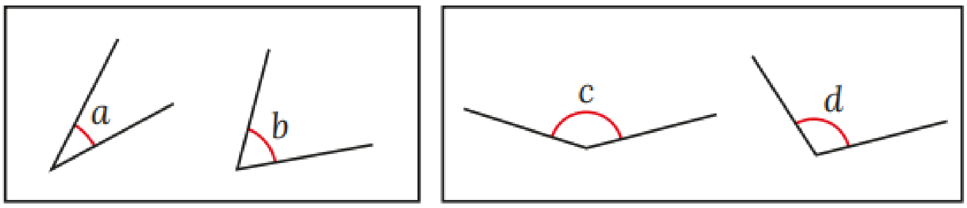
Example of a question the children could be asked:

Write **acute**, **obtuse** or **right angle** to label each angle.

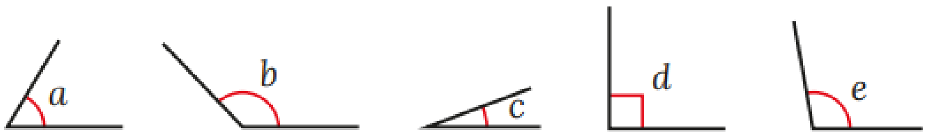


- Children compare and order angles:

- Which angle is greater in each pair?



- Write **acute**, **obtuse** or **right angle** to label each angle.

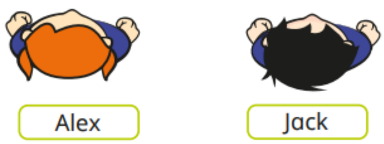


Order the angles from smallest to greatest.

RPS

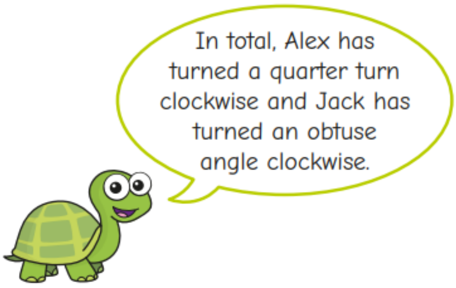
Year 4

Alex and Jack are both facing the same direction.



Alex turns two acute angles clockwise.

Jack turns three acute angles clockwise.



Do you agree with Tiny?

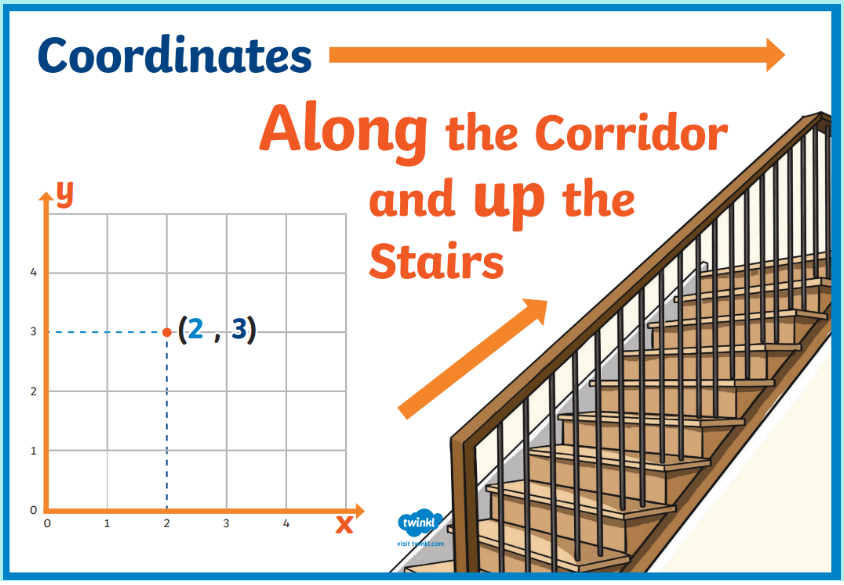
Explain your answer.

No

Both children could have turned small acute angles, still totalling an acute angle.

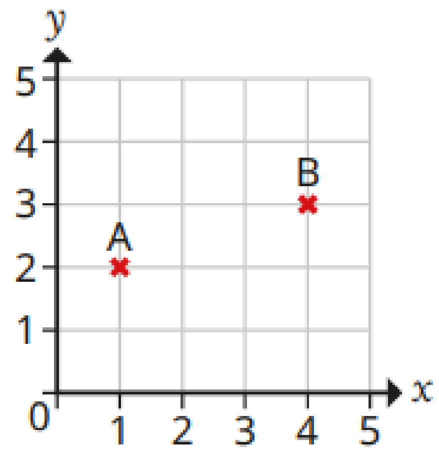
Position and direction Year 4

- Children are introduced to coordinate grids and begin to describe the positions of points on a grid.
- They learn that the x-axis is horizontal and the y-axis is vertical.
- The point where the axes meet has the coordinates (0, 0) and the numbers increase on both axes.



For example:

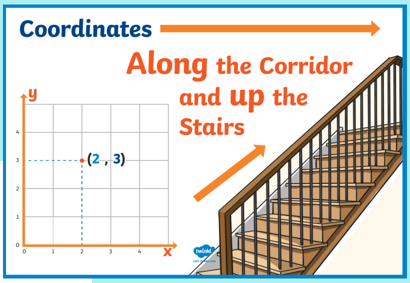
Here is a coordinate grid.



- The coordinates of point A are (1, 2).

  What do the numbers 1 and 2 represent?
- What are the coordinates of point B?

- Children plot points with given coordinates on a grid.



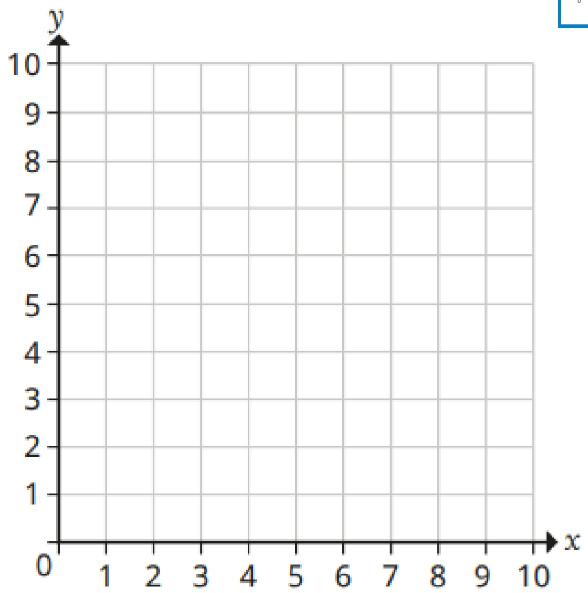
Plot and label the points on the grid.

A (2, 1)

B (6, 5)

C (10, 2)

D (2, 10)

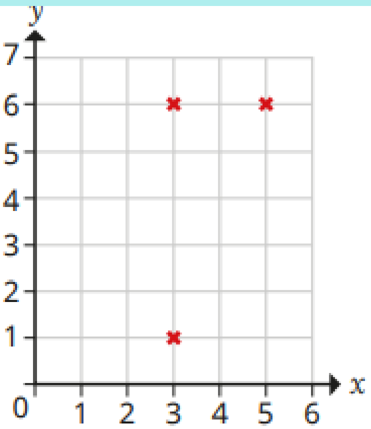


- Children gain more experience of reading and plotting points by drawing 2-D shapes on a coordinate grid.

Three vertices of a rectangle have been plotted on a coordinate grid.

Draw the fourth vertex.

What are its coordinates?

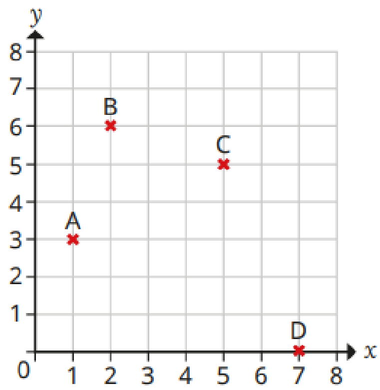


Translation

- Children translate points and shapes on a coordinate grid for the first time.
- They start by translating one point horizontally or vertically.
- The children understand that the word "translate" in this context means "move", but that the points can only move along grid lines.
- Once they are confident in translating a point either left/right or up/down, we introduce the idea of translating a point **both** left/right and up/down.

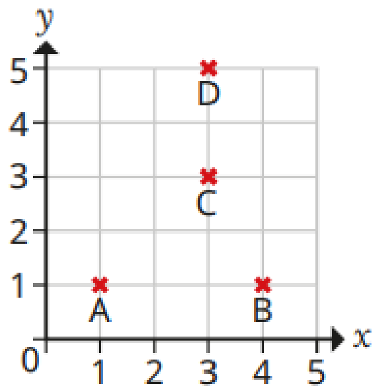
Translate the points.

- point A 3 squares to the right
- point B 5 squares down
- point C 2 squares to the left and 1 square down
- point D 5 squares to the left and 7 squares up



- Children use their understanding from the previous step to describe the translation that has taken place when they are given a pair of points or shapes.

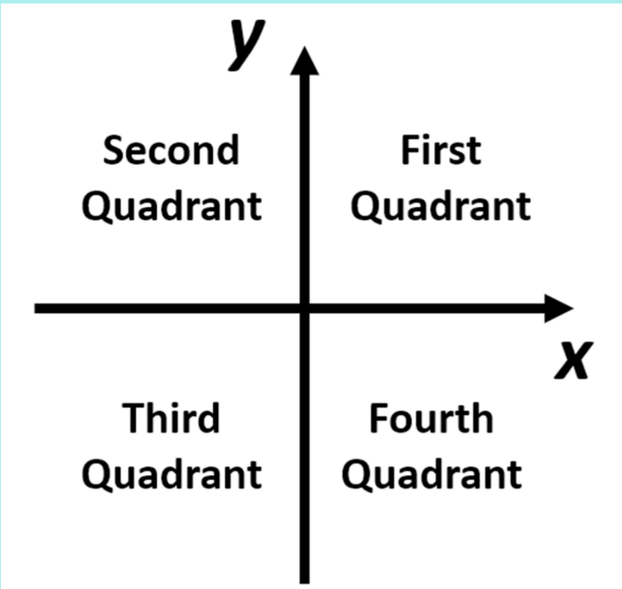
Four points are plotted on a coordinate grid.



- Describe the translation from point A to point B.
- Describe the translation from point C to point D.

The four quadrants are labelled as shown – the **First Quadrant**, the **Second Quadrant**, the **Third Quadrant** and finally the **Fourth Quadrant**.

Only in the first quadrant will both the ***x*** and ***y*** co-ordinates be **positive**.



Our focus is on the First Quadrant in Year 4.

RPS

Year 4

Is the statement always true, sometimes true or never true?

If one of the values in a set of coordinates is zero, then the point must be plotted on the x-axis.

Explain your answer to a partner.

sometimes true