Year 6 – Maths – Geometry: Position and Direction

Key vocabulary

- translate
- translation
- reflect
- reflection
- up
- down
- right
- left
- coordinates
- quadrant
- x-axis
- y-axis
- horizontal
- vertical

Links to other learning

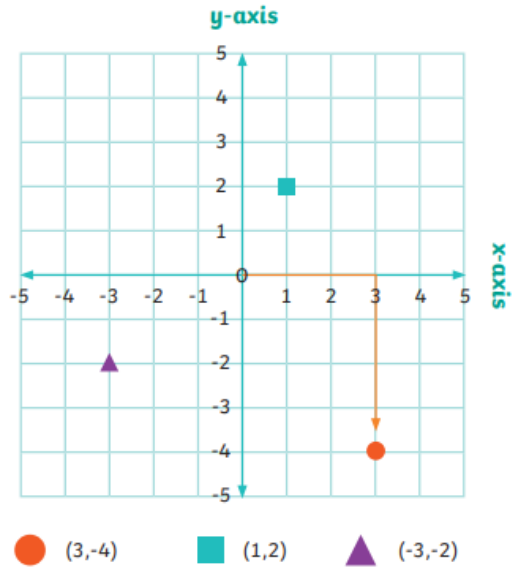
Year 5 - Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.

Key questions

Which axis do you refer to first when working with coordinates?
Can you record coordinates that when mapped onto a grid, form a right-angled triangle?
What is the difference between translation and reflection?

Four quadrants

Coordinates can use positive and negative numbers. Whether positive or negative, the x-axis coordinate is written first, followed by the y-axis coordinate.

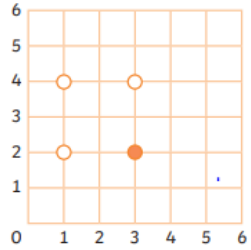


Look at the circle. It is 3 units along the x-axis and 4 down the y-axis. Its coordinates are (3,-4).

Completing shapes

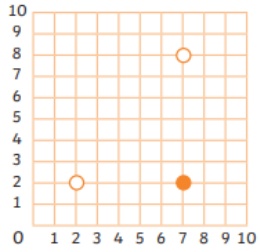
Using the properties of a shape, a polygon can be completed on a grid.

To make a square, think of the square's properties.



All of a square's sides are the same length. If the completed sides are 2 units in length, the missing point must complete two more sides of 2 units.

To make a right-angled triangle, think of the triangle's properties.



A right-angled triangle should have three sides with one 90° angle.

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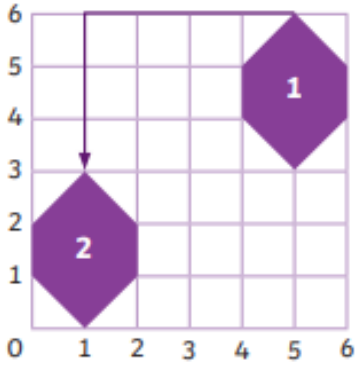
Translation

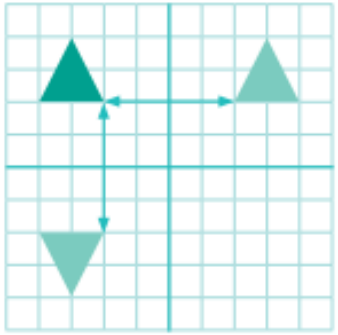
A shape is translated when it is moved without being rotated or resized. Every point of the shape moves the same distance and in the same direction.



Shape 1 has been translated 4 units left and 3 units down.

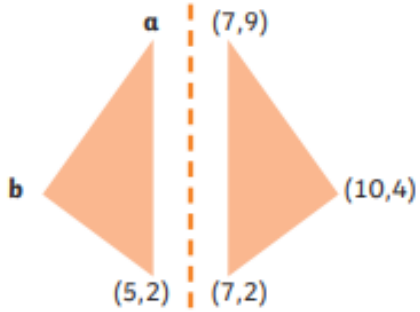
Reflections

A shape is reflected when it is flipped over a line which acts as a mirror. Every point on the original shape is the same distance from the mirror line as the same point on the reflected shape. The original triangle has been reflected in the x-axis and in the y-axis.



Missing Coordinates

Shapes can be shown on unmarked grids.



Point a is in the same position along the x-axis as (5,2) and in the same position on the y-axis as (7,9).

Point a (5,9)

Point b is in the same position on the y-axis as (10,4). Both triangles will have the same width. The width of the right-hand triangle is 3. This means that the width of the left-hand triangle is also 3.

Point b (2,4)