Maths Knowledge Organiser

Year 6: Position and Direction

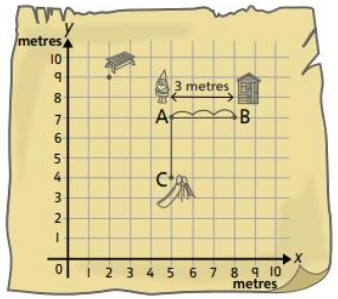
Prior Knowledge (Y5 Unit 15)

- Identify, describe and represent the position of a shape following a reflection
- Identify, describe and represent the position of a shape following a translation
- Use the appropriate language

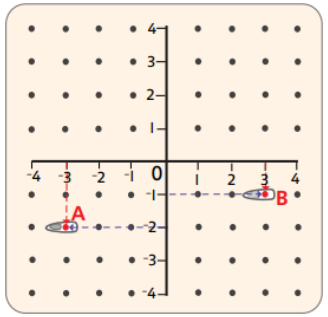
- → plotting, coordinates, quadrant, point, axis, grid, x, y
- → vertices, vertex
- → square, side, rectangle, triangle, equilateral, oblong, shape, irregular, hexagon, identical, similar, parallelogram
- → perimeter, metre (m), length, long
- → horizontal, vertical
- → halfway, line, properties, value, reason
- → negative, positive
- → translation, reflection, original, left, down, up, right, mirror, away, diagonal

Structures & Representations

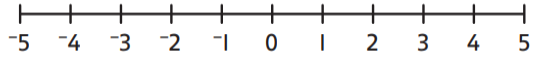
One Quadrant Grid



Four Quadrant Grid



Zero-centred Number Line



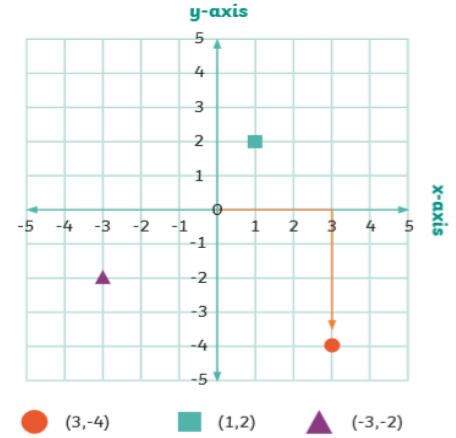
Read and Plot Coordinates

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

Along the corridor and up the stairs!

(x, y)

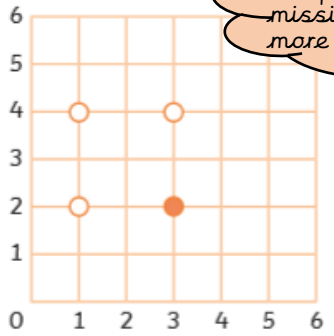
Look at the circle.
It is 3 units along the x-axis and 4 down the y-axis.
Its coordinates are (3,-4)



Completing Shapes

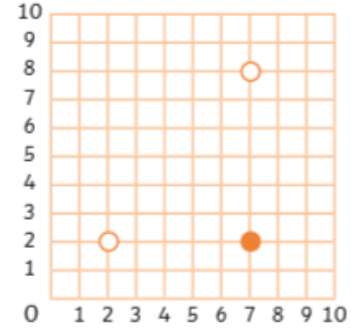
Using the properties of a shape, a polygon can be completed on a grid;

A square



All sides are the same length. If the completed sides are 2 units, the missing point must complete two more sides of 2 units.

It should have three sides with one 90° angle.



A right-angled triangle

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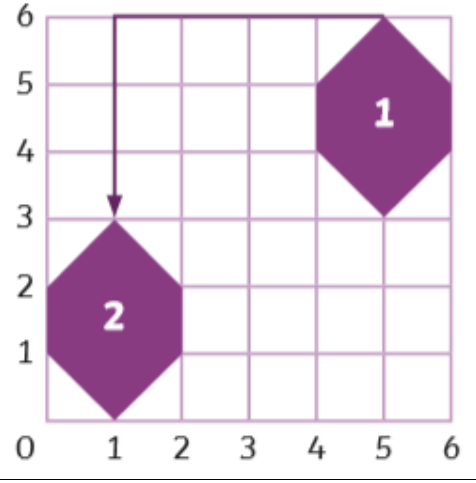
Translation

TRANSLATE = SLIDE

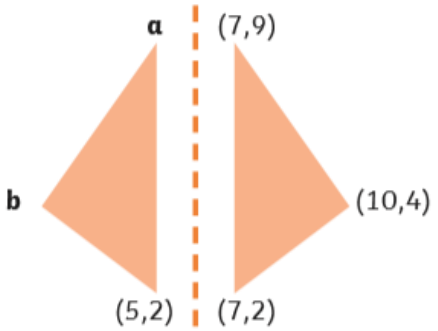
Every point of the shape moves the same distance and in the same direction without being rotated or resized.

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



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)

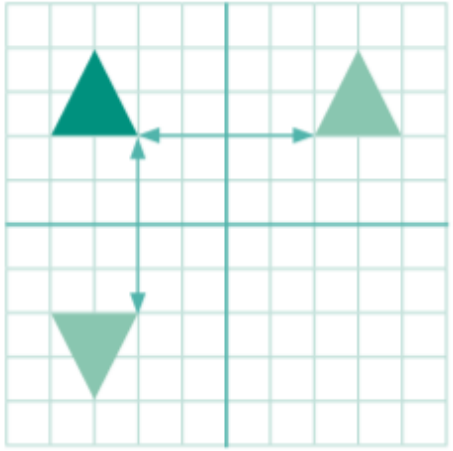
Point b is in the same position on the y-axis as (10,4). Both triangles will have the same width. The width of the right-hand triangle is 3. This means that the width of the left-hand triangle is also 3.
Point b (2,4)

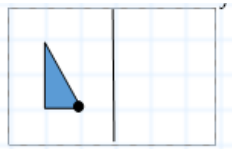
Reflection

REFLECT = FLIP

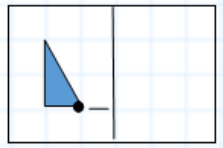
A shape is **flipped** over a line which acts as a **mirror**. Every point on the original shape is the **same distance** from the mirror line as the same point on the reflected shape.

The original triangle has been reflected in the x-axis and in the y-axis

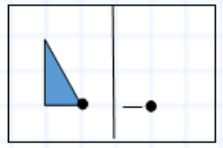




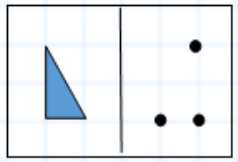
1) Choose a point



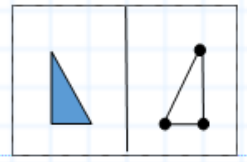
2) Count the units from the point to the mirror line



3) Count the same number out the other side and draw a dot.



4) Repeat with the other points.



5) Join the points using a ruler