Plotting points to make polygons (1)

National Curriculum attainment target

- Plot specified points and draw sides to complete a given polygon

Lesson objective

- Plot specified points and draw sides to complete a given polygon

Previous related lesson

Unit 2, Week 3, Lesson 3

Prerequisites for learning

Pupils need to:

- plot specific points on a coordinate grid in the first quadrant
- apply their knowledge of 2-D shapes to locate the position of a missing vertex and complete the polygon

Vocabulary

coordinates, intersection, point, *x*-axis, *y*-axis, *x*-coordinate, *y*-coordinate

Future related lesson

Unit 11, Week 3, Lesson 4

Success criteria

Pupils can:

- plot the points and draw the sides to complete a given polygon

Getting Started

- Choose an activity from Geometry – Position and direction.

Collins Connect
Year 4, Unit 11, Week 3

Teach

- Display: the Coordinates tool. Set the *x* and *y* axes to start at 0 and end at 9.
- Plot the points: A (0, 2) B (5, 9) C (9, 2).
- Ask: **If I draw lines to join these three points what shape will I make?** (triangle)
- Write these coordinates on the board: D (0, 7) E (9, 7) F (5, 0).
- Taking each point in turn, ask: **Who can come to the board and show me where this point is on the grid?** Recall the mnemonic 'along the corridor and up the stairs' when identifying the horizontal and vertical coordinates.
- Display: the Coordinates tool. Set the *x* and *y* axes to start at 0 and end at 9, plotting the points D, E and F.
- Say: **Tell your partner the name of the shape of the two overlapping triangles make.** (star)
- Clear the grid and plot the points: A (3, 2) B (3, 8) C (7, 8). Draw lines joining A to B and B to C. Get them to recognise that the lines form a right angle.
- Say: **A, B and C are three vertices of a rectangle.**
- Ask: **Who can give me the coordinates of point D?** (7, 2) Establish that D must have the same *x*-coordinate as C, and the same *y*-coordinate as A, and that the angle ADC must be a right angle.
- Plot point D and draw lines to complete the rectangle ABCD.
- Say: **Look at the rectangle. Imagine a line joining B to D and a line joining C to A.**
- Say: **Tell your partner the location of the point where the two lines intersect.** (5, 5) Plot the point I. (5, 5)
- Point to the intersection 1 (5, 5) and say: **The point E is five squares to the left of point 1.** Ask: **What are the coordinates of E?** (0, 5) Say: **The point F is four squares to the right.** Get them to work out the coordinates (9, 5)
- Ask: **Can you tell me which points I could join to form a hexagon?**
- Say: **Tell your partner how many different hexagons can be formed.**
- Elicit that there are seven possible hexagons; one using the outer six points A, E, B, C, F, D, and six using the intersection I and five of the outer points each time.

Individualised Learning

Refer to Activity 2 from the Learning activities on page 428.

Pupil Book 4C: – Page 37: Constellation coordinates
Resources: Resource 15: 9 × 9 coordinate grid (per child), red pencil (per child), ruler (per child)

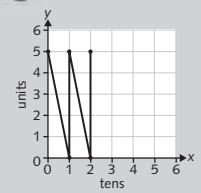
Progress Guide 4: – Extension: Year 4, Unit 11, Week 3, Lesson 2: Mission to Mars
Resources: 2 × 1–6 dice (per pair), 10 small counters each in 2 colours (per pair)

Plenary

Resources

Resource 14: 6 × 6 coordinate grids (per child), ruler (per child)

- Display: the Coordinates tool showing a 9 × 9 coordinate grid. Plot the pairs of points (2, 2) (7, 7) and (3, 7) (8, 2) and join them
- Ask: **What are the coordinates of the point at which these lines intersect?** (5, 5)
- Say: **Tell your partner the name of the quadrilateral you make when you join the four points.** (trapezium) The shape is a trapezium because it has one pair of opposite sides parallel.
- Get them to look at multiples of five: 5, 10, 15, 20, 25. Explain how they can be written as coordinates: (0, 5) (1, 0) (1, 5) (2, 0) (2, 5).
- Display: Slide 1 showing the table.



Multiple	Coordinates
5 × 1 = 5	(0, 5)
5 × 2 = 10	(1, 0)
5 × 3 = 15	(1, 5)
5 × 4 = 20	(2, 0)
5 × 5 = 25	(2, 5)

- Distribute the 6 × 6 coordinate grids. Ask the children to plot the points and join them with straight lines.
- Display: Slide 2 showing the coordinate grid.
- Ask them for the coordinates of × 5 table from 6 to 10 and complete the grid.
- Ask pairs to discuss the pattern and where it repeats.

Homework Guide 4
Year 4, Unit 11, Week 3, Lesson 2: Plot the multiples
Resources: ruler, coloured pencils (per child)