# Plotting points to make polygons (2)

## 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 (2), make use of ICT tools

#### Previous related lessons

Unit 11, Week 3, Lesson 2; Unit 11, 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, origin, x-axis, y-axis, x-coordinate, y-coordinate

#### Future related lesson

None

#### Success criteria

Pupils can:

• plot specified points and join them to make a 2-D shape



# Getting Started

• Choose an activity from Geometry – Position and direction.



### Teach

#### Resources

the Coordinates tool



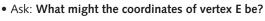
- Display: the Coordinates tool. Set the x and y axes to start at 0 and end at 6.
- Plot these points: A (2, 2) B (2, 6) C (6, 6) D (6, 2) E (4, 5) F (4, 1).
- Ask: Which pairs of points can we join with straight lines to make 2 / 3 parallel lines? Display the lines AB, CD and EF.



- Say: Tell your partner a set of three points that can be joined to make a right angle.
- Say: We have found four right angles with vertices at A, B, C and D. Ask: If we join these points with straight lines what shape will we make? (square)



- Ask: How do we know that the shape ABCD is a square and not a rectangle? (equal sides)
- Ask: Who can name the shape ABEF? (parallelogram) Which pairs of sides are parallel? (AB//FE and BE//AF)
- Clear the grid and plot the points: A (4, 1) B (1, 1) C (1, 5) D (4, 5)
- Join the points AB, BC and CD to draw three sides of a 2-D shape.
- Say: The shape I am drawing is a pentagon. You can see three of its sides.





- Ask: Who can give me a different pair of coordinates for vertex E? Elicit the six possible answers: (5, 2) (5, 3) (5, 4) (6, 2), (6, 3) and (6, 4).
- Say: The pentagon ABCDE will have a horizontal line of symmetry. Ask: What might the coordinates of vertex E be? ((5, 3) or (6, 3))
- Using the two possible coordinates for E draw each shape in turn.



• Ask: Who can see pentagon ABCDE as a concave shape that still has a horizontal line of symmetry? What might the coordinates of vertex E be? ((2, 3) or (3, 3))

# Individualised Learning

Refer to Activity 4 from the Learning activities on page 429.

**Pupil Book 4C:** – Page 39: Plotting points and making shapes

 Resources: Resource 14: 6 × 6 coordinate grids (per child), ruler (per child), or the Coordinates tool (per child)

Progress Guide 4: - Support: Year 4, Unit 11, Week 3, Lesson 4: Making shapes

Resources: ruler (per child) or the Coordinates tool

## Plenary

#### Resources

the Coordinates tool



- Display: the Coordinates tool showing Display a 6 × 6 coordinate grid.
- Plot these as used in the Teach section: A (2, 2) B (2, 6) C (6, 6) D (6, 2) E (4, 5) F (4, 1).
- Ask: Which pairs of points can we join with straight lines to make:
  - two horizontal parallel lines? (B to C and A to D)
  - two vertical parallel lines? (A to B and D to C)
- Ask: Which lines can we join to make a right angle? (any combination that gives the right angle at points A, B C or D)
- Point to the grid and say: In your head join A to E and A to F. The points F, A and E are three vertices of a kite.



- Ask: What are the coordinates of the fourth vertex? (at the point D (6, 2))
- Ask: Which points could I join to make a square / parallelogram / pentagon / hexagon?
- Say: Tell your partner three points that can be joined to make a right-angled triangle.
  (A, B, C or B, C, D or C, D, A or D, A, C)



#### Homework Guide 4

Year 4, Unit 11, Week 3, Lesson 4: Change the shape

Resources: ruler (per child)