Translating shapes into all four quadrants

National Curriculum attainment target

• Draw and translate simple shapes on the coordinate plane, and reflect them in the axes

Previous related lessons

Unit 2, Week 3, Lesson 3; Unit 2, Week 3, Lesson 4

Prerequisites for learning

Pupils need to:

• be able to identify, describe and represent the position of a shape following a translation in the first quadrant of a coordinates grid

Vocabulary

image, translate, quadrant, negative, x-axis, y-axis

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Lesson objective

 Use coordinates to translate shapes into all four quadrants; use the properties of shapes to predict missing coordinates

Future related lesson

Unit 11, Week 3, Lesson 4 Success criteria

Pupils can:

- translate shapes into all four quadrants using coordinates
- use the properties of shapes to predict missing coordinates



Getting Started

• Choose an activity from Geometry – Position and direction.

Connect Year 6, Unit 11, Week 3

Teach

Resources

Resource 12: 4-quadrant coordinate grids (per child); ruler (per child)



- Plot the points A (-3, 2), B (-5, -2), C (-2, -1). Join the points to form triangle ABC.
- Say: Tell your partner the coordinates of the points when triangle A'B'C' is translated six squares to the right. [(A' (3, 2), B' (1, -2), C' (4, -1)]
- Plot the points A' (3, 2), B' (1, -2), C' (4, -1).
- Write on the board: the coordinates for the vertices of triangles ABC and A'B'C'.
- Point to the symbol ' after the letters A, B and C and ask: Who can remember how we read this symbol? (dash)
- Say: Tell your partner how we read the vertices of A'B'C'. (A dash, B dash, C dash)
- Say: This table shows the coordinates for the vertices of triangles ABC and A'B'C' following a translation of six squares to the right.
- Ask: Who can spot a pattern in the table? Can you describe it to the class? Elicit that while the y-coordinates are unchanged, six has been added to the x-coordinate each time.
- Say: In this translation only the x-coordinates have been changed. We can write this as a rule: x + 6.
- Clear the screen. Plot the points D (-3, 4), E (1, 4), F (1, 1), G (-3, 1). Join the points to form the rectangle DEFG. Then plot the points D' (-3, -1), E' (1, -1), F' (1, -4), G' (-3, -4). Join the points to form rectangle D'E'F'G'.
- Write on the board: the coordinates for the vertices of rectangles DEFG and D'E'F'G'.
- Ask: Who can describe the translation of rectangle DEFG to rectangle D'E'F'G'? (5 squares down)





- Display: Slide 1 showing the coordinates for the vertices of parallelograms KLMN and K'L'M'N'.
- Give each child a copy of Resource 12: 4-quadrant coordinate grids, and a ruler.
- Ask the children to plot the points for parallelograms KLMN and K'L'M'N'.
- Say: For each parallelogram, join the points in order, K to L, L to M and so on.

- Allow time for this then ask pairs to compare their drawings for accuracy.
- Display: the Coordinates tool. Plot the points shown on Slide 1 for the two parallelograms.
- Ask: How have the x-coordinates / y-coordinates of parallelogram KLMN been translated? (7 squares to the right / 4 squares down)
- Elicit that both the x-coordinates and the y-coordinates of the vertices of KLMN have been changed.
- Ask: Who can come to the board and write this translation as a rule? (x + 7, y 4)
- Discuss how the knowledge of the properties of a shape can be used when drawing the translation of the shape.

Individualised Learning

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Refer to Activity 3 from the Learning activities on page 447.

Pupil Book 6C – Page 72: Using coordinates to translate shapes (2) Resources: Resource 12: 4-quadrant coordinate grids (per child); ruler (per child)

Plenary

- Ask the children to reflect on what they have learned about translating shapes into all four quadrants.
- Ask: If you know the properties of the shape, how does this help you when you are making a translation of the shape?
- Display: the Coordinates tool showing a 4-quadrant coordinate grid.
- Plot the points E (-2, 4), F (1, 4), G (1, 1), H (-2, 1) and join them in order to form square EFGH.
- Ask: Who can come to the screen and show the class where the square EFGH will be after translation using the rule (x + 4)? ... after translation using the rule (y 5)? ... after translation using the rule (x + 4, y 5)?
- Repeat, as above, by using the Coordinates tool to plot other shapes.