



Essential Knowledge	Teaching Points
<ul style="list-style-type: none">• Identify congruent shapes by eye;• Understand clockwise and anticlockwise;• Understand that rotations are specified by a centre, an angle and a direction of rotation;• Find the centre of rotation, angle and direction of rotation and describe rotations;• Describe a rotation fully using the angle, direction of turn, and centre;• Rotate a shape about the origin or any other point on a coordinate grid;• Draw the position of a shape after rotation about a centre (not on a coordinate grid);• Identify correct rotations from a choice of diagrams;• Understand that translations are specified by a distance and direction using a vector;• Translate a given shape by a vector;• Describe and transform 2D shapes using single translations on a coordinate grid;• Use column vectors to describe translations;• Understand that distances and angles are preserved under rotations and translations, so that any figure is congruent under either of these transformations.• Understand that reflections are specified by a mirror line;• Identify correct reflections from a choice of diagrams;• Understand that reflections are specified by a mirror line;• Identify the equation of a line of symmetry;• Transform 2D shapes using single reflections (including those not on coordinate grids) with vertical, horizontal and diagonal mirror lines;• Describe reflections on a coordinate grid;• Scale a shape on a grid (without a centre specified);• Understand that an enlargement is specified by a centre and a scale factor;• Enlarge a given shape using (0, 0) as the centre of enlargement, and enlarge shapes with a centre other than (0, 0);• Find the centre of enlargement by drawing;• Describe and transform 2D shapes using enlargements by:<ul style="list-style-type: none">• a positive integer scale factor;• a fractional scale factor;• Identify the scale factor of an enlargement of a shape as the ratio of the lengths of two corresponding sides, simple integer scale factors, or simple fractions;	<ul style="list-style-type: none">• Emphasise the need to describe the transformations fully, and if asked to describe a 'single' transformation they should not include two types.• Include rotations with the centre of rotation inside the shape.• Use trial and error with tracing paper to find the centre of rotation.• It is essential that the students check the increments on the coordinate grid when translating shapes.• Students may need reminding about how to find the equations of straight lines, including those parallel to the axes.• When reflecting shapes, the students must include mirror lines on or through original shapes.• As an extension, consider reflections with the mirror line through the shape and enlargements with the centre of enlargement inside the shape. <p style="text-align: center;">NB enlargement using negative scale factors is not included.</p>

<ul style="list-style-type: none"> • Understand that distances and angles are preserved under reflections, so that any figure is congruent under this transformation; • Understand that similar shapes are enlargements of each other and angles are preserved 		
Assumed Prior Knowledge/ Links / Interleaving		
<ul style="list-style-type: none"> • Students should recall basic shapes. • Students should be able to plot points in all four quadrants • Students should have an understanding of the concept of rotation. • Students should be able to draw and recognise lines parallel to axes • Students should be able to draw and recognise lines $y = x$ and $y = -x$. 		
Potential Barriers to Access /Misconceptions		Opportunities for Reasoning/Problem Solving/Proofs
<ul style="list-style-type: none"> • The directions on a column vector often get mixed up. • Student need to understand that the 'units of movement' are those on the axes, and care needs to be taken to check the scale. • Correct language must be used: students often use 'turn' rather than 'rotate'. 	<ul style="list-style-type: none"> • Students should be given the opportunity to explore the effect of reflecting in two parallel mirror lines and • Students should be given the opportunity to explore the effect of combining transformations and practice writing them as a single transformation. 	
Key Mathematical Vocabulary	Transformation, rotation, reflection, enlargement, translation, single, combination, scale factor, mirror line, centre of rotation, centre of enlargement, column vector, vector, similarity, congruent, angle, direction, coordinate, describe	