



The Sutton Academy

Knowledge Rich Curriculum Plan

Year 7 Core – Similarity, Congruency and Transformations

Lesson objective	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success	Feedback
To learn how to identify congruent and similar shapes.	<ul style="list-style-type: none"> Students will know how to identify congruent shapes. Students will know how to identify similar shapes. 	<p>Congruent – the same</p> <p>Similar - having a resemblance in appearance without being identical.</p> <p>Similar Shapes – two shapes are similar when one is an enlargement of the other. When a shape is enlarged, the image is similar to the original shape. It is the same shape but a different size.</p>	<ul style="list-style-type: none"> Students need to know properties of 2D shapes. 		
To learn how to calculate missing lengths in similar shapes.	<ul style="list-style-type: none"> Students will know how to calculate the length scale factor for a shape that has been enlarged. Students will know how to use the length scale factor to find missing lengths in similar shapes. <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to use the length scale factor to find missing lengths in similar triangles, where 1 triangle is sitting on top of another. 	<p>Scale factor – how much the shape has been enlarged, the scale factor tells us what the corresponding measures have been multiplied by</p>	<ul style="list-style-type: none"> Students need to know how to identify similar and congruent shapes. 	<p>Steps to success – Finding missing lengths of similar shapes</p> <p>Step one: Check that your two shapes are similar.</p> <p>Step two: Find the each pair of corresponding sides of the two shapes.</p> <p>Step three: Divide the larger length by the smaller length in order to find the scale factor.</p> <p>Step four: Find the pair of corresponding sides you need in order to find your answer.</p> <p>Step five: Multiply or divide your known corresponding length by your scale factor.</p>	
To learn how to translate shapes.	<ul style="list-style-type: none"> Students will know how to translate a shape by given units to the left/right up/ down. Students will know how to use a column vector to write movements. Students will know how to translate a shape by a given column vector. 	<p>Transform – change</p> <p>Transformation – in maths, a transformation is a process that manipulates a polygon or other two-dimensional object on a plane or coordinate system</p> <p>Translation – the process of moving something from one place to another.</p>	<ul style="list-style-type: none"> Students need to know and understand directions E.g. up, down, left or right. 	<p>Steps to Success – Translating a Shape</p> <p>Step 1: Interpret the column vector. The top number means left (-) or right (+), the bottom number means up (+) or down (-).</p> <p>Step 2: Pick one vertex of the original shape and translate this coordinate the given number of spaces to the left/right and up/down.</p> <p>Step 3: Repeat for all other vertices of the shape and then join them up using a ruler and pencil.</p>	
To learn how to describe translations.	<ul style="list-style-type: none"> Students will know how to describe a translation of a shape using units to the left/right up/ down. Students will know how to write movements as column vectors. Students will know how to describe a translation using a column vector. 		<ul style="list-style-type: none"> Students need to know how to translate 2D shapes. 	<p>Steps to Success – Describing a translation</p> <p>Step 1: Write down that the shape has been translated</p> <p>Step 2: Chose one vertex on the original shape and work out how many spaces that vertex has been moved left/right and up/down to arrive at its new position. Remember to ensure you work this out for the corresponding vertex on the transformed shape.</p> <p>Step 3: Write this movement as a column vector</p>	

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To learn how to reflect shapes in a mirror line.	<ul style="list-style-type: none"> Students will know how to reflect a 2D shape using a horizontal or vertical mirror line. Students will know how to reflect a 2D shape in a diagonal line. Students will know how to reflect a shape in the x-axis or y-axis. Opportunity for challenge: <ul style="list-style-type: none"> Students will know how to reflect a shape in a line in the form $x = a$, $y = b$. 	<p>Reflection – In maths, a reflection is a type of transformation where each point in a shape appears at an equal distance on the opposite side of a given line - the line of reflection</p> <p>Symmetry – the quality of being made up of exactly similar parts facing each other or around an axis.</p>	Students need to know how to use a simple mirror line.	<p>Steps to Success – Reflecting a Shape</p> <p>Step 1: Draw the mirror line stated in the question</p> <p>Step 2: Reflect each vertex in the mirror line</p> <p>Step 3: Join them up using a ruler and pencil</p> <p>Step 4: Check that the shape you are giving as your answer is the same size as the original shape</p>	
To learn how to describe reflections.	<ul style="list-style-type: none"> Students will know how to identify where a mirror line would be when a shape has already been reflected. Students will know how to describe a reflection fully involving the x-axis and y axis as the line of reflection. Opportunity for challenge: <ul style="list-style-type: none"> Students will know how to describe a reflection fully involving parallel lines to the axes ($x = a$, $y = b$) as the lines of reflection. 		<ul style="list-style-type: none"> Students need to know how to reflect 2D shapes. 	<p>Steps to Success – Describing a reflection</p> <p>Step 1: Write down that the shape has been reflected</p> <p>Step 2: Identify the mirror line and write down its equation as the line that the shape has been reflected in</p>	
To learn how to rotate shapes.	<ul style="list-style-type: none"> Students will know how to rotate a shape around the origin. Students will know how to rotate shapes around other given centres. E.g. (3,5) Opportunity for challenge: <ul style="list-style-type: none"> Students will know how to describe a rotation that has already happened. 	<p>Rotate – turn</p> <p>Clockwise – in the same direction as the hands move around a clock (to the right)</p> <p>Anti-clockwise – in the opposite direction as the hands move around a clock (to the left)</p> <p>Origin – The origin is located at the intersection of the vertical and horizontal axes at the coordinates (0, 0)</p>	<ul style="list-style-type: none"> Students need to know how to plot and write coordinates. 	<p>Steps to Success – Rotating a Shape</p> <p>Step 1: Place your tracing paper over the shape you are rotating and trace over it</p> <p>Step 2: Place your pencil on top of the tracing paper over the coordinate that is the centre of the rotation</p> <p>Step 3: Rotate the tracing paper the appropriate degrees and in the correct direction (clockwise or anti-clockwise)</p> <p>Step 4: Remove the tracing paper and draw the shape in its new position</p> <p>Steps to Success – Describing a rotation</p> <p>Step 1: Has the shape been turned around? Is it on its side or upside-down? If so then it has been rotated.</p> <p>Step 2: Write down that the shape has been rotated.</p> <p>Step 3: Identify how many degrees the shape has been rotated and in which direction. Write both of these pieces of information down.</p> <p>Step 4: Identify the centre of rotation using tracing paper – place the tracing paper over the original shape, trace over it and then test out different possible coordinates as the centre of rotation until you identify the coordinates that when used, rotate the shape to the correct orientation and place on the coordinate grid. Write down the coordinates.</p>	

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				Check you have included all required pieces of information: the type of transformation, the degrees it has been rotated, the direction of the rotation and the centre of rotation.	
To learn how to enlarge shapes.	<ul style="list-style-type: none"> Students will know how to enlarge a shape by a positive scale factor. <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to enlarge a shape by a positive scale factor from a given centre of enlargement. 	<p>Enlarge – change the size</p> <p>Enlargement – a type of transformation where we change the size of the original shape to make it bigger or smaller by multiplying it by a scale factor</p> <p>Scale factor – how much the shape has been enlarged, the scale factor tells us what the corresponding measures have been multiplied by</p>	<ul style="list-style-type: none"> Students will need to know how to identify similar shapes. 	<p>Steps to Success – Enlarging a Shape with a Positive Scale Factor</p> <p>Step 1: Identify the centre of enlargement</p> <p>Step 2: Choose one of the vertices on the shape you are enlarging and count how many spaces you need to move horizontally and vertically to get from the centre of enlargement to that vertex. Jot this down if it helps you.</p> <p>Step 3: Multiply the horizontal and vertical distances by the scale factor of the enlargement, write this down if it helps</p> <p>Step 4: Go back to the centre of enlargement and move horizontally and vertically the scaled-up movements you worked out in step 3 and mark this point as the new location of that vertex and repeat this for all other vertices</p> <p>Step 5: Join up all of the points you have marked using a ruler and a pencil</p> <p>Step 6: Check that your new shape is the correct size by multiplying each of the lengths for the original shape by the scale factor and checking that the corresponding side on the new shape is that length. Do this for all lengths to be sure.</p>	
Mini-Assessment 10					