Knowledge Rich Curriculum Plan

Year 11 Higher – Geometry 4

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Steps to Success	Prior Knowledge: *In order to know this students, need to already know that…*	Feedback
To learn how to calculate missing lengths in similar shapes	• Students will know that two triangles are similar if all of the angles are the same size or if the corresponding sides are in the same ratio. They will know that either of these conditions will prove two triangles are similar. • Students will know that when a shape is enlarged, the image is similar to the original shape. It is the same shape but a different size. • 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 • Students will know how to find missing lengths in similar triangles and will know how to prove that two triangles where one is inside another are similar by identifying corresponding angles • Students will know when two triangles that are vertically opposite each other are similar and will know how to prove it by identifying alternate angles	Similar - having a resemblance in appearance, character, or quantity, without being identical. 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. Similar triangles – two triangles are similar if all of the angles are the same size or if the corresponding sides are in the same ratio. Either of these conditions will prove two triangles are similar. Scale factor – how much the shape has been enlarged, the scale factor tells us what the corresponding measures have been multiplied by	•	• Students will need to know how to identify alternate angles between parallel lines • Students will need to know how to identify corresponding angles in parallel lines	
To learn how to calculate similar areas and volumes	• Students will know the effect of enlargement on an area and volume. • Students will know that the area scale factor = (length scale factor)^2 • Students will know that the volume scale factor = (length scale factor)^3 • Students will know that to determine the length scale factor from the area scale factor we square root and that to find the length scale factor from the volume scale factor we cube root • Students will know how to find the area or volume of an enlarged shape given two corresponding lengths and the area or volume of one of the shapes. • Students will know how to solve problems involving similar areas and volumes • Students will know how to solve ratio problems involving the area and volume of similar shapes		•	• Students will need to know how to identify the length scale factor for an enlargement and calculate missing lengths in similar shapes	

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Steps to Success	Prior Knowledge: *In order to know this students, need to already know that…*	Feedback
To learn how to prove congruence	• Students will know the criteria for congruent triangles. (SSS, SAS, ASA and RHS) • Students will know how to prove that two triangles are congruent by proving that one of the criteria for congruence is met. (SSS, SAS, ASA and RHS)	**Congruent** – the same **Hypotenuse** – the longest side in a right-angled triangle. It can always be found opposite the right angle **Parallel** – parallel lines are two lines that are side by side and have the same distance continuously between them **Isosceles Triangle** – a triangle with two equal sides and two equal angles **Corresponding** – matching **Co-interior Angles** – angles that lie between two lines and on the same side of a transversal	•	• Students will need to know how to find missing angles in parallel lines • Students will need to know how to identify vertically opposite angles • Students will need to know the angle properties of special triangles	
To learn how to represent and interpret column vectors	• Students will know how to represent a column vector on a coordinate grid • Students will know how to write a column vector given one drawn on a coordinate grid • Students will know that a negative vector has the same magnitude but the opposite direction. • Students will know how to calculate the magnitude of a vector using Pythagoras' theorem • Students will know how to combine column vectors by adding or subtracting them and draw resulting vectors • Students will know how to multiply column vectors by a scalar • Students will know how to solve substitution problems and equations involving column vectors	**Vector** – A vector describes a movement from one point to another. A vector quantity has both direction and magnitude. **Magnitude** – size	•	• Students will need to know how to use Pythagoras' theorem to calculate the hypotenuse of a right-angled triangle	
To learn how to translate, reflect and rotate shapes.	• Students will know how to translate a shape by a given column vector • Students will know how to reflect a shape in a line in the form x = a, y = a, y = x, y = -x • Students will know how to reflect a shape in the x-axis or y-axis • Students will know how to rotate a shape about a centre •	**Transform** – change **Transformation** – in maths, a transformation is a process that manipulates a polygon or other two-dimensional object on a plane or coordinate system **Translation** – the process of moving something from one place to another.	•	• Students will need to know how to write down the equation of a line in the form y = a, x = a • Students will need to know how to draw lines in the form y = a, x = a	Swap translations and reflections around.

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Steps to Success	Prior Knowledge: *In order to know this students, need to already know that…*	Feedback
To learn how to describe translations, reflections and rotations.	• Students will know how to describe a translation using a column vector • Students will know how to describe a reflection fully • Students will know how to describe a rotation fully	**Rotate** – turn **Clockwise** – in the same direction as the hands move around a clock (to the right) **Anti-clockwise** – in the opposite direction as the hands move around a clock (to the left)	•	• Students will need to know how to interpret column vectors as a movement left/right and up/down	
To learn how to enlarge shapes	• Students will know how to enlarge a shape by a positive scale factor from a given centre of enlargement • Students will know how to enlarge a shape by a fractional scale factor from a given centre of enlargement • Students will know how to enlarge a shape by a negative scale factor from a given centre of enlargement	**Enlarge** – change the size **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 **Scale factor** – how much the shape has been enlarged, the scale factor tells us what the corresponding measures have been multiplied by	•	• Students will need to know how to identify the length scale factor for enlargement	
To learn how to describe enlargements	• Students will know how to describe positive, fractional and negative enlargements fully		•	•	