Scheme of Learning: Year 9 Summer Term

Topic Sequence: Reasoning with Proportion

12	13	14
Enlargement and Similarity	**Solving Ratio and Proportion problems**	**Rates**

Topic Overview: Enlargement and Similarity

Students will develop their knowledge of transformations to include enlargement and learning the mathematical meaning of the word similar. Students will be able to work out missing sides on the original or enlarged shape.

Learning Sequence:

Recognise enlargement and similarity
Students already know that if all pairs of sides of a shape are in the same ratio, a shape is similar. This knowledge will be used to define enlargement. Students will then apply this knowledge to spot shapes that are similar or have been enlarged, noting that the scale factor can be greater than 1 and also between 0 and 1. Students will also look at how during an enlargement, the angles within a shape will remain the same.

Enlarge a shape by a positive integer scale factor
Students will practise drawing accurate enlargements. Students will start with shapes with straight horizontal and vertical lines, before moving onto diagonal lines, where students can describe how to get from the start to the end of the diagonal, and then applying the scale factor of this to accurately draw the enlarged diagonal line.

Enlarge a shape by a positive integer scale factor from a point
Students will now enlarge a shape from a given point using the knowledge gained enlarging diagonals. Students can count the distance from the centre on enlargement to a vertex, and use the scale factor to find the location of the vertex after enlargement. This process can be linked to vectors in future topics.

Enlarge a shape by a positive fractional scale factor
Students will build upon previous steps, but using a scale factor between 0 and 1. Students will notice than scale factors greater than 1 will make a shape bigger, and a scale factor between 0 and 1 will make the shape smaller.

Enlarge a shape by a negative scale factor (H)
Students will build upon their knowledge of enlargements, and begin to compare enlargements such and using a scale factor of 2 and -2. This can be down on the cartesian plane, using the origin as the centre of enlargement. Students can also compare an enlargement with a scale factor of -1 to a 180° rotation.

Work out missing sides and angles in a pair of given similar shapes
Students will now compare similar shapes to identify the scale factor of enlargement, and apply this to find out missing sides of both the original and enlarged shape.

Solve problems with similar triangles (H)
Students will have identified missing sides in pairs of similar triangles in the previous step, however they will now look at more complex questions that might be seen in a GCSE paper. Students will need to be careful to accurately label vertices and sides to show the method and working they have used, which is a vital step in exam questions.

Explore ratio in right-angled triangles (H)
Students will look at right angled triangles with 30° and 60° angles before formally learning trigonometry. They will look at the ratio of the length of the Hypotenuse, the adjacent and the opposite, as well as learning the definitions of the three sides. Using these findings students will be able to work out missing sides.

Sequence of Learning:

1	Recognise enlargement and similarity
2	Enlarge a shape by a positive integer scale factor
3	Enlarge a shape by a positive integer scale factor from a point
4	Enlarge a shape by a positive fractional scale factor
5	Enlarge a shape by a negative scale factor (H)
6	Work out missing sides and angles in a pair of given similar shapes
7	Solve problems with similar triangles (H)
8	Explore ratio in right-angled triangles (H)

Topic Resources:

Knowledge Maps:	Transformations Congruence and Simliarity

Assessment

Knowledge:	End of Topic test
Application of Knowledge:	Termly mixed topic assessment

Supportive Reading:

	Sparx Maths www.sparxmaths.co.uk
	Corbett Maths : www.corbettmaths.com
	AQA Revision Guide