

# Scheme of Learning: Year 10 Autumn Term

## Topic Sequence: Similarity

1	2
<b>Congruence, Similarity and Enlargement</b>	<b>Trigonometry</b>

### Topic Overview:

This unit looks more formally at dealing with topics such as similar triangles. Parallel line angle rules are revisited to support establishment of similarity. Congruency is introduced through considering what information is needed to produce a unique triangle. Students will extend and formalise their knowledge of ratio and proportion in working with measures and geometry in order to compare lengths, areas and volumes using ratio notation and/or scale factors; make links to similarity. Content extends enlargement to explore negative scale factors and also looks at establishing that a pair of triangles are congruent through formal proof

### Learning Sequence:

Enlarge a shape by a positive and a fractional scale factor (R): Students start year 10 with a review of the transformation, Enlargement. This understanding will be built on as similar shapes are introduced. Students consider how a whole number scale factor produces an image that is bigger than the object, but a fractional scale factor produces an image that is smaller than the object.

Enlarge a shape by a negative scale factor (H): Students investigate how enlarging by a negative scale factor produces an image that appears rotated and on the other side of the Centre of Enlargement.

Identify similar shapes: Students apply their knowledge of enlargement to identifying similar shapes. They should relate the ideas of proportionate corresponding lengths and the fact that the angles remain unchanged. It is helpful for students to understand ratio within this context as this will be useful later when introduced to trigonometry.

Work out missing sides and angles in a pair given similar shapes: Students will calculate missing lengths and angles. They should be encouraged to look at scale factors both within and between shapes. They should see similar shapes in a range of orientations and therefore have practice to ensure they correctly identify corresponding points. Careful labelling will assist this.

Use parallel line rules to work out missing angles (R): Students to show pairs are triangles are similar in the following step. Students are encouraged to explain their reasoning for their steps and review angle and side notation. It will be useful to distinguish between 'corresponding angles' (that are equal because of parallel lines) and 'angles that correspond' (matching pairs of angles in two shapes).

Establish a pair of triangles are similar: Students use their understanding of angles in parallel lines to show that a pair of triangles are similar. They may need support to work out which vertex in one triangle corresponds to which in the other and to distinguish this from 'corresponding angles' in parallel lines. Students should also recognise that using side ratios is an equally valid method of establishing similarity.

Similar Triangles: Students explore ratios within triangles as well as between them

Explore areas of similar shapes (H): Students explore how area changes as the scale factor between two shapes changes, considering squaring the linear scale factor to find the area scale factor

Volumes of similar shapes (H): This small step leads on from the previous for students to consider how volume scale factors need to be derived from the linear scale factor, cubed

Similar shape problems (H): This small step brings together the previous steps to consolidate and extend student understanding of the topics while interleaving other topics, considering reasoning skills

Understand the difference between congruence and similarity:

Students bring together the ideas of similarity and congruence and through categorising are able to distinguish between them

Understand and use conditions for congruent triangles:

The conditions for congruence are formalised within this step. Students will have come across the language of SSS, ASA etc. in previous years, but will not have used them to show congruence of triangles. Students should understand the minimum information needed to establish congruence between triangles.

Prove triangles are congruent: (H) Students prove that triangles are congruent using the conditions of congruence.

Sequence of Learning:		Topic Resources:	
1	Enlarge shapes with a positive and fractional scale factor (R)	<b>Knowledge Maps:</b>	Congruence and Similarity 2D shapes Transformations
2	Enlarge shapes with a negative scale factor (H)		
3	Identify similar shapes		
4	Work out missing sides and angles in a pair of given similar shapes		
5	Use parallel line rules to work out missing angles		
6	Establish a pair of triangles are similar		
		<b>Assessment</b>	
7	Similar triangles	<b>End of Topic Tests</b>	End of Topic Test – 8 questions, 20 marks
8	Explore areas of similar shapes	<b>Application of Knowledge:</b>	Termly Summative Assessments
		<b>Supportive Reading:</b>	
10	Similar shape problems		Sparx Maths <a href="http://www.sparxmaths.co.uk">www.sparxmaths.co.uk</a>
11	Understand the difference between congruence and similarity		Corbett Maths : <a href="http://www.corbettmaths.com">www.corbettmaths.com</a>
12	Understand and use conditions for congruent triangles		
13	Prove triangles are congruent		AQA Revision Guide