Scheme of Learning: Year 10 Autumn Term

1	2
Congruence, Similarity and Enlargement	**Trigonometry**

Topic Overview: Similarity

Trigonometry is introduced as a special case of similarity within right-angled triangles. Emphasis is placed throughout the steps on linking the trig functions to ratios, rather than just functions. For the Higher tier, calculation with trigonometry is covered now in year 10 and graphical representation is covered in year 11

Learning Sequence:

Explore ratio in right angled triangles
Students explore the ratio of two side-lengths in a right-angled triangle, given a specific angle. This facilitates understanding of a constant ratio between a pair of side lengths in relation to a specific angle.

Work fluently with the hypotenuse, opposite and adjacent sides:
Students need to be able to name the different sides of a right-angled triangle in relation to given angles. Labelling the hypotenuse first is a useful strategy. They should have opportunities to name sides in differently orientated right-angled triangles.

Use sine, cosine and tangent to find missing side lengths:
This step starts with how to choose between tangent, sine and cosine to find a missing length. Teachers should emphasise that this is dependent on which side lengths are involved in the question.

Use sine, cosine and tangent to find missing angles:
When introducing the inverse, students might start by practising using their calculators to solve equations such as sin $\theta = 0.33$ It's important to expose students to different notation such as angle ABC and angle x. Ensure students are given examples where all 3 lengths of a right-angled triangle are given so that they can explore different methods of finding the same angle

Calculate sides in right angled triangles using Pythagoras' Theorem (R):
This step reviews prior knowledge to ensure students are confident in applying Pythagoras' Theorem

Select the appropriate method to solve right-angled triangle problems:
Students make decisions about when to use trigonometric ratios and when to use Pythagoras' Theorem to solve problems. They also realise that in some situations, either can be used

Key angles in trigonometry
Students focus on the exact trigonometric values of 30^0, 60^0, 45^0, 0^0 and 90^0 being introduced to methods to help them remember these key values

Use trigonometry in 3d shapes (H)
Students start by recognising 3D right-angled triangles in a 3D shape, considering cones and cylinders also.

Area of a non-right angled triangle: (H)
Students derive the area of a triangle producing the formula Area = ½ ab sinC

Sine Rule (H)
Students derive the sine rule and apply it to finding lengths and also angles in non-right angled triangles

Cosine Rule: (H)
Students derive the cosine rule and apply it to finding lengths and angles in triangles

Choosing the sine or cosine rule (H)
Students explore problems where they must choose between the sine and cosine rule and extend to problem solving where application of other mathematical concepts, such as ratio, is necessary

Sequence of Learning:	
1	Explore ratio in right angled triangles
2	Work fluently with the hypotenuse, opposite and adjacent sides
3	Use the sine, consine and tangent ratio to find missing side lengths
4	Use sine, cosine and tangent ratios to find missing angles
5	Calculate sides in right angled triangles using Pythagoras' Theorem (R)
6	Select the appropriate method to solve right-angled triangle problems
7	Work with key angles in right-angled triangles
8	Use trigonometry in 3D shapes
9	Area of a non-right angled triangle
10	Sine rule
12	Cosine rule
12	Choosing between the sine rule or cosine rule

Topic Resources:	
Knowledge Maps:	Ratio and scale Angles Congruence and Similarity 2D shapes Pythagoras and Trigonometry Straight Line graphs
Assessment	
Knowledge	End of Topic Test – 8 questions, 20 marks
Application of Knowledge:	Termly Summative Assessments
Supportive Reading:	
	Sparx Maths www.sparxmaths.co.uk
	Corbett Maths : www.corbettmaths.com
	AQA Revision Guide