

Scheme of Learning: Year 9 Spring Term

Topic Sequence: Reasoning with Geometry

9	10	11
Deduction	Rotation and Translation	Pythagoras' Theorem

Topic Overview: Pythagoras' Theorem

Students will revise square and square roots before moving on to investigate the relationship between the sides of a right – angled triangle. The converse of the theorem is emphasized so that students are aware that if the sides of a triangle satisfy the rule $a^2 + b^2 = c^2$ then the triangle must be right-angled. Students explore using the theorem in a variety of context, including on co-ordinate axes, and a higher step is included using 3-D shapes.

Lesson Sequence:

Squares and square roots

This small step provides an opportunity for retrieval on squaring and square roots from earlier in KS3.

Identify the hypotenuse of a right-angled triangle

This is a key prerequisite for students before they meet Pythagoras' theorem. Students will be given plenty of exposure to examples/non – examples with triangles in various orientations.

Determine whether a triangle is right-angled

This small step provides an opportunity for students to use Pythagoras' theorem without moving straight to calculating unknown sides.

Calculate the hypotenuse of a right-angled triangle

Students will now move on to calculating the length of a hypotenuse meeting both integer and non-integer answers. Knowing the hypotenuse is the longest side provides a check. Using non-standard right -angled triangles in various orientations provides opportunity for students to correctly identify the hypotenuse. Exploring the lengths of diagonals within 2D shapes widens the network of applications of Pythagoras' theorem.

Calculate missing sides in right-angled triangle

Students will have practice of using Pythagoras' theorem to calculate the unknown sides which are not the hypotenuse as well as calculating the unknown side which is the hypotenuse. They should check their answers using the knowledge that the hypotenuse must be the longest side.

Use Pythagoras' theorem on co-ordinate axes

This small step interleaves learning on the Cartesian plane working in all four quadrants.

Explore proofs of Pythagoras' theorem

This small step requires students to explore some of the hundreds of proofs that exist.

Use Pythagoras' theorem in 3-D shapes

This small step expands on the previous step where the students will apply their knowledge of Pythagoras' theorem in a new context by looking at 3-D shapes.

Sequence of Lessons:

1	Squares and square roots
2	Identify the hypotenuse of a right-angled triangle
3	Determine whether a triangle is right-angled
4	Calculate the hypotenuse of a right-angled triangle
5	Calculate missing sides in right-angled triangle
6	Use Pythagoras' theorem on co-ordinate axes
7	Explore proofs of Pythagoras' theorem
8	Use Pythagoras' theorem in 3-D shapes

Topic Resources

Knowledge Maps	Pythagoras
Assessment:	
Knowledge:	End of Topic test
Application of Knowledge:	Termly mixed topic assessment
Supportive Reading:	
	Sparx Maths: www.sparxmaths.co.uk Corbettmaths: www.corbettmaths.com AQA Revision Guide