<u>Mathematics Scheme of Learning</u> <u>Year 7 – Term 6</u> <u>Construction/Graphs & Equations/Pythagoras' Theorem</u>

Intent – Rationale This term the students have an opportunity to make explicit links between topics. Perigal's puzzle provides an opportunity to discover Pythagoras' theorem using learnt knowledge from the year. Students will improve their confidence in using a compass in preparation for Year 8 topics such as bearings and loci. Students will retrieve knowledge of plotting and drawing straight line graphs in preparation for commencing study of non-linear graphs.			
Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?		
 Year 7 Term 4 draw and measure angles accurately Year 7 Term 2 substitution, Term 4 straight line graphs Year 7 Term 2 substitution, Term 3 Squares and Roots 	 Year 8 Term 3 bearings, Term 4 construction including Loci Year 8 Term 2 straight line graphs Year 8 Term 1 Powers, Term 5 Pythagoras' Theorem 		
What are the links with other subjects in the curriculum?	What are the links to SMSC, British Values and Careers?		
 Business Interpretation and use of quantitative data in business contexts to support, inform and justify business decisions, including information from graphs and charts. Design and Technology Translate information between graphical and numeric form- Extracting information from technical specifications. Use angular measures in degrees - Measurement and marking out, creating tessellated patterns. Geography Graphical skills 	 SMSC (C/SO) - Trigonometry and it's foundation in Greek culture, as well as it's wider contribution to the development of the world as we know it. GB4a)d)e)f)g)I) 		

	What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	V	What are the opportunities for developing mathematical skills?
•	'Alex's Adventure in Numberland' - Alex Bellows	•	Use of mathematical equipment including a compass to
٠	'The Math Book' - Clifford Pickover		construct and a protractor to measure when checking
•	What's Your Angle, Pythagoras? (Charlesbridge Math	٠	Identifying any misconceptions around x and y axis and plotting
	Adventures) by Julie Ellis and Phyllis Hornung		with negative values
•	Pythagoras: Mathematician and Mystic (Greatest Greek	٠	Research famous Mathematician, Pythagoras
	Philosophers) by Louis C Coakley and Dimitra Karamanides	٠	Research careers/applications of Pythagoras

Mathematics Scheme of Learning

<u>Year 7 – Term 6</u>

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?

National Curriculum 2014 Programme of Study Reference:

- develop algebraic and graphical fluency, including understanding linear and simple quadratic functions
- extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations
- identify variables and express relations between variables algebraically and graphically
- model situations or procedures by translating them into algebraic expressions or formulae and by using graphs
- recognise, sketch and produce graphs of linear and quadratic functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane
- begin to reason deductively in geometry, number and algebra, including using geometrical constructions
- apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras' Theorem, and use known results to obtain simple proofs
- use Pythagoras' Theorem and trigonometric ratios in similar triangles to solve problems involving right-angled triangles

 derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line

<u>Know</u>

Construct a circle of given radius/diameter. Construct an equilateral triangle and isosceles triangle. Construct a triangle given an angle and two side lengths.

Draw a straight-line graph and a non-linear graph using a table of values. Know how to draw a graph of the form x + y = c, using when x = 0 and y=0.

State Pythagoras' theorem. Identify the hypotenuse of a triangle and label the sides accurately. Use Pythagoras' theorem to find the hypotenuse length.

<u>Apply</u>

Construct compound triangles to form an image

Identify the y intercept from a graph and an equation of the form y = mx + c

Extend

Students begin to recognise the gradient from an equation

Using knowledge from balance equations, students can find the shorter side lengths

What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?		
 Compass, construct, protractor, scale drawing, accurately, equilateral, linear equation, y-intercept, Pythagoras' theorem, quadrant, coordinate, x axis, y axis, variables, table of values, vertical, horizontal, equation, hypotenuse 	 End of year summary homework issued followed by teacher www/ebi comments with a week built in for pupils to digest and follow up on feedback. Formative assessment occurs throughout lessons and will address, although not be limited to, the following common misconceptions: Incorrect identification of x and y axis Incorrect use of (x,y) coordinates and interchanging these Incorrect use of inner and outer scale on protractor Recognition of hypotenuse in a right angle triangle 		

	R	А	G
Construction			
Construct a circle of given radius/diameter			
Construct an equilateral triangle			
Construct an isosceles triangle			
Construct a triangle given an angle and two			
side lengths (SAS triangle)			

	R	А	G
Graphs & Equations			
Recall: Drawing a straight-line graph using a table of values			
Draw the graph for an equation of the form x			
+ y = c			

Identify the y intercept		
Draw a graph for a non-linear equation using		
a table of values		

	R	А	G
Pythagoras' Theorem			
Recap: Use BIDMAS in calculations, square numbers and roots			
State Pythagoras' Theorem			
Identify the hypotenuse and label the triangle			
Use Pythagoras' Theorem to find the length			
of the hypotenuse			