

Year 11 GCSE Mathematics Foundation tier Curriculum Sequence

Subject Intent: For every learner to be confident and fluent mathematicians who enjoy and succeed in mathematics, leaving school with a solid foundation of mathematical skills, knowledge and understanding, primed for their chosen fields in the 21st century.

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Big idea/Theme	Unit 16 – Quadratic equations and graphs	Unit 19 – Congruence, similarity and vectors	Focused revision and exam preparation	Focused revision and exam preparation	Focused revision and exam preparation	
Big Idea/Theme	Unit 18 – Fractions, Indices and standard form	Unit 20 – More algebra				
Knowledge that needs to stick	<ul style="list-style-type: none"> • Know the characteristic shape of a graph of a quadratic function • Know how to solve quadratic equations by factorising • Know the meaning of roots, intercepts and turning points • Know that $a^0 = 1$ 	<ul style="list-style-type: none"> • Know the conditions for congruent triangles • Know how to use different notations and representations for vectors • Know the characteristic shape of the graph of a cubic function 				

	<ul style="list-style-type: none"> • Know how to interpret the display on a scientific calculator when working with standard form 	<ul style="list-style-type: none"> • Know the characteristic shape of the graph of a reciprocal function • Know that the point of intersection of two lines represents the solution to the corresponding simultaneous equations 				
Demonstration of Knowledge (Assessment)	<ul style="list-style-type: none"> • Live assessment in the classroom • Analysis of students' written work and verbal responses • Spaced retrieval • Stage and age appropriate exam questions 	<ul style="list-style-type: none"> • Live assessment in the classroom • Analysis of students' written work and verbal responses • Spaced retrieval • Stage and age appropriate exam questions 				

	<ul style="list-style-type: none"> • Strategic questioning • Misconception checks 	<ul style="list-style-type: none"> • Strategic questioning • Misconception checks 				
Links to key stage 3/ prior knowledge needed	<p>Students should be able to square negative numbers.</p> <p>Students should be able to substitute into formulae.</p> <p>Students should be able to plot points on a coordinate grid.</p> <p>Students should be able to expand single brackets and collect 'like' terms.</p>	<p>Students should be able to use column vectors when dealing with translations.</p> <p>Students should be able to recall and apply Pythagoras' Theorem on a coordinate grid.</p> <p>Students should be able to recognise and enlarge shapes and calculate scale factors.</p> <p>Students should know how to calculate area and volume in</p>				

	<p>Students should know how to do the four operations with fractions.</p> <p>Students should be able to write powers of 10 in index form and recognise and recall powers of 10, i.e. $10^2 = 100$.</p> <p>Students should recall the index laws.</p>	<p>various metric measures.</p> <p>Students should be able to measure lines and angles and using compasses, ruler and protractor, and construct standard constructions.</p> <p>Students should be able to draw linear graphs.</p> <p>Students should be able to plot coordinates and sketch simple functions with a table of values.</p> <p>Students should be able to substitute into and solve equations.</p>				
--	---	---	--	--	--	--

		<p>Students should have experience of using formulae.</p> <p>Students should recall and use the hierarchy of operations and use of inequality symbols.</p>				
Skill set development	<p>Problem solving</p> <p>Mathematical reasoning</p> <p>Quantitative reasoning</p> <p>Ability to manipulate</p> <p>Communication</p> <p>Representation</p> <p>Independence</p> <p>Teamwork</p>	<p>Spatial sense</p> <p>Problem solving</p> <p>Mathematical reasoning</p> <p>Quantitative reasoning</p> <p>Ability to manipulate</p> <p>Construct logical arguments</p> <p>Communication</p> <p>Representation</p> <p>Independence</p> <p>Teamwork</p>				
Key Vocabulary (Tier 2/ Tier 3)	<p>Quadratic, function, solve, expand, factorise, simplify, expression, graph,</p>	<p>Vector, direction, magnitude, scalar, multiple, parallel, collinear, ratio, column vector, congruence, side, angle, compass,</p>				

	<p>curve, factor, coefficient, bracket</p> <p>Add, subtract, multiply, divide, mixed, improper, fraction, decimal, indices, standard form, power, reciprocal, index</p>	<p>construction, shape, volume, length, area, volume, scale factor, enlargement, similar, perimeter</p> <p>Reciprocal, linear, gradient, functions, direct, indirect, estimate, cubic, subject, rearrange, simultaneous, substitution, elimination, proof</p>				
Reading and Oracy	<p>Students need to be able read, speak and think in mathematical language, identifying key concepts and processes of the wordier questions. Teachers will improve students' verbal communication skills, to enable them to show their understanding of mathematics accurately. Common strategies within lessons are:</p> <ul style="list-style-type: none"> - giving students sufficient time to read and process information from wordier questions - asking open questions - expanding and justifying answers - repetition of a correctly modelled sentence, to practice oracy skills - using the correct vocabulary and terms within discussions - referring to definitions and meanings when using tier 2 and 3 mathematical vocabulary - addressing common misconceptions. 					

Numeracy	Addition Subtraction Multiplication Division Arithmetic Algebra Graphs Numbers Quadratic equations Symbols	Addition Subtraction Multiplication Angles Length Ratio & proportion Shape Symbols Algebra Graphs Proportion Quadratic equations Simultaneous equations				
Opportunities						
Careers	Economists Biologists Astronomers Engineers	Drafters Technicians Aeronautics Navigation Engineers Graphic designers Manufacturers Physicists				
SMSC including British Values, Culture and Diversity	<p>The mathematics curriculum helps prepare pupils for life in a modern Britain by developing their personal qualities and social skills with the chance to discuss, argue and challenge other people's ideas in a safe environment. Everyone is encouraged to express their own personal views on the mathematical topics. Alongside everyone learning how to be accepting of other people's views, students gain realisation that there is not always one route to an answer but several different ways.</p> <p>Spiritual - pupils are encouraged to use their imagination and creativity to break problems down and solve them by thinking out side of the box.</p>					

	<p><u>Moral</u> – pupils look at consequences and what happens if rules are not followed. Will an action to one number apply to all numbers?</p> <p><u>Social</u> – developing personal qualities and social skills. Being able to work with others, show perseverance, being able to ask for help and not being afraid to try something new.</p> <p><u>Cultural</u> – understanding others students’ views and being able to express their own views. Exploring problems from a range of cultures.</p>
Relationship and Sex Education and Health Education	<p>The mathematics curriculum aims to provide pupils with the knowledge and understanding that will enable them to lead a happy, healthy and successful adult life. All pupils are supported to develop resilience, to know how and when to ask for help, and to know where to access support. This develops their capacity to make sound decisions when facing risks, challenges and complex contexts in their lives. Character traits such as perseverance and self-belief, together with personal attributes such as honesty, integrity, tolerance and kindness, will be actively cultivated and celebrated.</p>