


<p>Year: 11 Subject: Maths</p>	<p>Curriculum Intent: The curriculum seeks to develop on prior learning and therefore students will continue to build upon their knowledge and skills across all elements of the curriculum. Students will be given the opportunity to solve problems and develop their reasoning skills, which encourages them to be more fluent in their mathematical thinking. This will develop their resilience whilst also igniting their curiosity for using mathematics outside of the curriculum. Students will also be given support to maximise their performance in an exam and achieve the highest grade possible.</p>		
	<p>Term 1</p>	<p>Term 2</p>	<p>Term 3</p>
<p>Number</p>	<p>Indices All – Basic laws of indices (including brackets) Most – Know and apply the laws of indices (including negative powers) Some – As above but use fractional indices to represent roots</p>	<p>Rounding/Significant figures (11M9–11M10) All – Round to a given degree of accuracy (decimal places or significant figures). Most – Estimation of a calculation using approximations (rounding numbers to 1 significant figure). Some – Understand that bounds are the result of a number being ‘rounded’ and are able to identify upper and lower bounds with the given accuracy.</p>	
	<p>Standard Form All – Write numbers in standard form and vice versa Most – Multiply and divide numbers in standard form for without a calculator and add/subtract numbers in standard form with a calculator Some – Calculations in standard form with and without a calculator</p>	<p>Roots and Surds All – Recap positive integer powers and exact roots. Most – Estimate powers and roots to the nearest whole number/1 decimal place Some – Know what a surd is, simplify surds, calculate with surds and rationalise the denominator.</p>	
	<p>BIDMAS (11M5 – 11M10) All – Calculations using basic operations (add/subtract/multiply/divide) with positive and negative integers Most – Apply the order of operations with multiple calculations Some – Understand symbols used with inequalities and represent inequalities on a number line</p>		
	<p>Decimals (11M5 – 11M10) All – Add and subtract positive and negative decimals without a calculator Most – Multiply and divide decimals without a calculator</p>		

	<p>Some – Using knowledge of place value and multiples of 10 to derive related multiplication and division of numbers with decimals</p>		
	<p>Factors All – Know the definition of a factor, multiple and prime number, providing examples where necessary. Find common factors or multiples of two numbers. Most – Find the HCF and LCM of two small numbers and find the product of prime factors. Some – Using prime factorisation, find the HCF and LCM of two/three numbers. Solve problems in a real-life context using LCM.</p>		
	<p>Fractions All – Simplify and find equivalent fractions. Convert between basic fractions, decimals and percentages (e.g. $\frac{1}{2} = 0.5 = 50\%$). Calculate with fractions (add/subtract/multiply/divide). Most – Calculate with algebraic fractions and mixed numbers. Convert between more complex fractions, decimals and percentages (e.g. $\frac{1}{8} = 0.125 = 12.5\%$) Some – Simplify algebraic fractions and convert recurring decimals into fractions.</p>		
	<p>Rounding/Significant figures (11M1–11M8) All – Round to a given degree of accuracy. Most – Estimation of a calculation using approximations (rounding numbers to 1 significant figure). Understand that bounds are the result of a number being ‘rounded’ and are able to identify upper and lower bounds with the given accuracy. Some – Calculations with upper and lower bounds.</p>		
Algebra	<p>Substitution All – Understand what substitution is and substitute into a basic expression Most – Able to apply substitution into a real-life situation and substitute into a formulae (such as volume and surface area of a sphere/cone)</p>		<p>Function machines, rearrangement and proof All – Understand how a function machine works and how to rearrange a basic formula to change the subject. Most – Rearranging more complex formulae with multiple steps.</p>

	Some –Substitute into more complex formulae (such as quadratic and kinematics) and finding approximate solutions using an iterative formula		Some – Be able to use algebraic manipulation to create a proof (both tiers). Understand how to work with composite functions and inverse functions (Higher tier).
	<p>Sequences</p> <p>All – Recognise basic sequences and generate terms of a sequence with a given rule</p> <p>Most – Find the nth term of a linear sequence and use the rule to find a given term number or prove whether a number is in a sequence</p> <p>Some –Find the nth term of a quadratic and a basic geometric sequence</p>		<p>Plotting and sketching graphs</p> <p>All – Plot and draw linear and quadratic graphs.</p> <p>Most – Plot & Draw and recognise & sketch most graphs (including cubic, reciprocal and exponential). Demonstrate understanding of the equation of a line ($y=mx+c$).</p> <p>Some – Solving equations, including simultaneous, using graphs. Representing</p> <p>Recognise parallel and perpendicular lines. Representing inequalities in a graph and identifying regions</p>
	<p>Expanding and Factorising</p> <p>All – Expanding single brackets and factorise basic expressions</p> <p>Most – Expand double brackets and factorise a quadratic expression where the coefficient of x^2 is 1 ($a=1$). Recognise difference of two squares.</p> <p>Some – Expand triple brackets and factorise any quadratic expression</p>		<p>Real life Graphs</p> <p>All – Construct and interpret graphs in real-world contexts (e.g. money conversion).</p> <p>Most – Recognise & interpret graphs of direct & inverse proportion and solve problems</p> <p>Some – Calculate or estimate areas under graphs and interpret in contexts such as distance-time graphs, velocity-time graphs and financial graphs.</p>
	<p>Solving equations and inequalities</p> <p>All – Solve linear equations and inequalities.</p> <p>Most – Solve linear simultaneous equations. Solve a simple quadratic equation using factorisation (and/or using the quadratic formula for Higher tier only).</p> <p>Some – Solve algebraic fractions (both tiers). Solve non-linear simultaneous equations and solve quadratic equations by completing the square (Higher only).</p>		
Geometry		<p>Angles</p> <p>All – Know and use basic angle facts (e.g. angles on a straight line) to work out the size of angles.</p> <p>Most – Know and understand more complex angle facts (e.g. sum of interior angles and angles in parallel lines). Solve complex and multi-step angle problems and give reasons for an answer.</p>	<p>Trigonometry (11M3 – 11M8)</p> <p>All – Find the side length of a right-angled triangle using the trigonometric ratios, with a calculator</p> <p>Most – Find the angle of a right-angled triangle using the trigonometric ratios, with a calculator. Know the exact values of trigonometric ratios (0/30/45/60 and 90)</p>

	Some – Apply knowledge and understanding of Circle Theorems. Formal angle proofs. (Higher tier only)	Some – Use trigonometric ratios of a right-angled triangle in 3D shapes. Find size of lengths, angle or area of a non-right-angled triangle. (Higher tier only)
	<p>Measures</p> <p>All – Conversion between metric (mm/cm/m/km) and standard units (e.g. time)</p> <p>Most – Answer compound measures questions (speed/density/pressure)</p> <p>Some – Solve complex compound problems (e.g. the base units need to be converted)</p>	<p>Area and Volume</p> <p>All – Find the area of all rectilinear shapes (including compound shapes)</p> <p>Most – Find the volume and surface area of 3D shapes (formulae given for spheres and cones).</p> <p>Some – Find the volume of a Frustum (higher tier) and volume problems linked to density and rates of flow.</p>
	<p>Pythagoras</p> <p>All – Know how to apply Pythagoras' Theory</p> <p>Most – Demonstrate understanding by applying Pythagoras' into a range of contexts.</p> <p>Some – Find the distance between two points on a grid using Pythagoras' and apply the theorem in more complex situations (e.g. 3D shapes)</p>	<p>Circles</p> <p>All – Know the parts of a circle and calculate the circumference and area of a circle with and without a calculator.</p> <p>Most – Calculate the length of an arc and the area and perimeter of a sector.</p> <p>Some – Solve more complex problems involving the perimeter and area of a circle, linked to other parts of the curriculum (e.g. area of a segment – use of trigonometry)</p>
	<p>Scales/Similar Shapes</p> <p>All – Use and interpret scale drawings/maps</p> <p>Most – Calculate the scale of two similar shapes and apply to find length of corresponding sides</p> <p>Some – Demonstrate knowledge and understanding of the relationships between linear, area and volume scale factors of two similar shapes/solids.</p>	<p>Plans and 3D shapes</p> <p>All – Construct plans and elevations of simple 3D solids. Representation (e.g. using isometric paper) of solids from plans and elevations.</p> <p>Most – Interpret plans and elevations of simple 3D solids. Be able to sketch 3D solids on plain paper. Solve simple surface area and volume problem from diagrammatic information provided in plan and elevation diagrams.</p> <p>Some – Solve complex surface area & volume problems from diagrammatic information provided in plan & elevation diagrams</p>
	<p>Trigonometry (11M1/11M2 and 11M9/11M10)</p> <p>All – Find the side length of a right-angled triangle using the trigonometric ratios, with a calculator</p> <p>Most – Find the angle of a right-angled triangle using the trigonometric ratios, with a calculator. Know the exact values of trigonometric ratios (0/30/45/60 and 90)</p>	<p>Shape Properties, Congruence and Loci</p> <p>All – Identify 2D and 3D shapes and the faces, surfaces, edges and vertexes of a 3D shape</p> <p>Basic constructions (perpendicular line and angle bisector)</p> <p>Most – Apply constructions into a Loci problem. Apply congruent triangles in calculations and</p>

		Some – Use trigonometric ratios of a right-angled triangle in 3D shapes. Find size of lengths, angle or area of a non-right-angled triangle. (Higher tier only)	simple proofs (e.g. the base angles of an isosceles triangle are equal). Some – Prove that two triangles are congruent using the cases: SSS/SAS/ASA/RHS.
			Transformations All – Be able to describe and identify each of the four transformations. Most – Describe and draw single transformations. Some – Be able to describe and draw fractional (both tiers) and negative (Higher tier) enlargement.
			Vectors (11M1 – 11M4a) All – Understand that the column vector is the movement that takes place and is able to add and subtract column vectors. Most – Use vectors in simple geometric arguments and proofs (e.g. Define different routes between stated vertices). Some – Use vectors in complex geometric arguments and proofs (e.g. Use vectors to solve geometric proof with vector defined in ratios).
Ratio and Proportion		Percentages All – Calculate the percentage of a number and find what a number is as a percentage of another number. Most – Calculate a percentage increase (including compound growth/decay) and able to calculate original quantities following a percentage change. Some – Able to solve complex percentage problems (e.g. reverse compound growth/decay)	
		Proportion, Ratio and Proportionality All – Write and apply basic ratio's to real life context. Most – Understand and apply basic proportionality (direct/inverse proportion) Some – Express a multiplicative relationship between two quantities and solve problems involving algebra using ratio. Solve compound ratio problems.	
	Probability (11M1/11M2)	Probability (11M3 – 11M10)	Collecting and representing discrete data

Probability and Data	<p>All – Calculate probabilities expressed as fractions, decimals and percentages. Use of sample space diagrams to calculate probability of two events.</p> <p>Most – Complete/construct Venn (and Carroll) diagrams to classify outcomes and calculate probabilities. Complete/draw frequency and basic probability trees and use to calculate probabilities.</p> <p>Some – As above but also to include probability of events that are independent/conditional and/or include non-replacement.</p>	<p>All – Calculate probabilities expressed as fractions, decimals and percentages. Use of sample space diagrams to calculate probability of two events.</p> <p>Most – Complete/construct Venn (and Carroll) diagrams to classify outcomes and calculate probabilities. Complete/draw frequency and basic probability trees and use to calculate probabilities.</p> <p>Some – As above but also to include probability of events that are independent/conditional and/or include non-replacement.</p>	<p>All – Calculating the mean, median, mode and range from raw data.</p> <p>Most – Construct and interpret different charts and graphs (e.g. bar charts and scattergraphs).</p> <p>Some – Calculate moving averages.</p>
			<p>Interpreting grouped data</p> <p>All – Find the mean, median and mode from frequency tables (especially grouped).</p> <p>Most – Compare two different sets of data.</p> <p>Some – Construct and interpret more complex charts and graphs (e.g. cumulative frequency diagram, box plot and histogram)</p>
Assessment	<p>5 a day completed in every single Maths lesson upon entry (Low Stakes Testing)</p> <p>Homework set every week (One exam paper a week for all Year 11 students starting in January)</p> <p>Topic Tests (Optional for Year 11) – Students will receive written feedback and a percentage (not a grade)</p>		
	<p>Progress Test (Full paper)</p> <p>Higher – Grade 4 to 9</p> <p>Foundation – Grade 1 to 5</p>	<p>Progress Test (Full paper)</p> <p>Higher – Grade 4 to 9</p> <p>Foundation – Grade 1 to 5</p>	GCSE exams (May/June)
	<p>Pre-Public Examinations (Full series – 3 papers)</p> <p>Higher – Grade 4 to 9</p> <p>Foundation – Grade 1 to 5</p>	<p>Pre-Public Examinations (Full series – 3 papers)</p> <p>Higher – Grade 4 to 9</p> <p>Foundation – Grade 1 to 5</p>	