Year 9 ~ Curriculum Map for Maths

What are the intended aims for this year's curriculum? To consolidate KS3 topics in order to prepare for KS4

	Term 1		Term 2		Term 3		Term 4		Term 5	Term 6	
	Topic(s): **Numbers** Arithmetic Powers and roots Fractions, decimals and percentages	Aim of A&R	Topic(s): **Algebra** Algebraic manipulation Coordinates and graphs	Aim of A&R	Topic(s): **Geometry** 2D shapes 3D shapes	Aim of A&R	Topic(s): **Algebra** Solving equations Sequences	Aim of A&R	Topic(s): **Numbers** Percentages Proportions **Statistics** : Populations	Topic(s): **Geometry** Construction, loci and bearings	Aim of EoY exam
'Big idea(s)' / fundamental concepts	**Numbers**: Arithmetic with integers, decimals and negative numbers Repeated operations including powers, roots and BIDMAS Standard form notation for very big and very small numbers Fractions, decimals and percentages as representations of numbers and how to use them	To assess term 1 content 70% and cumulative assessment of year 8 content 30%	**Algebra**: Understand and use mathematics from an algebraic perspective as notations and rules to follow Use graphical representations on a coordinate grid to show links and relationships between two variables	To assess term 2 content 60% and cumulative assessment of term 1 40%	**Geometry**: Main properties and measurements of 2D shapes Properties of right-angle triangles (Pythagoras and trigonometry) Main properties and measurements of 3D shapes	No A&R	**Algebra**: Find unknown value(s) when given an equation Learn to solve multi-step processes Find patterns and links between terms in a sequence in order to predict the next terms in the sequence	To assess term 3 and 4 content 50% and cumulative assessment of terms 1 and 2 50%	**Numbers**: Use percentages to define quantities and changes in values Use ratios and proportion to link values including direct and inverse proportion **Statistics**: Capture/recapture methods in statistics	**Geometry**: Draw geometric shapes from descriptions accurately Loci problems Scaled diagrams and maps	To assess units 1 to 9
Knowledge to be learnt	**Numbers**: - Multiplication tables and number bonds - Understand and use place values including link with powers of 10 - Sign rules - BIDMAS - Index laws - Link between power and roots and notations - Standard form - Fraction, decimal and percentage notations, and equivalent representations - Ordering numbers - Recurring decimal notation and meaning		**Algebra**: - Use algebraic notations in formulas to form expressions as well as to calculate values given a value for a variable - Main features of a coordinate grid including x-axis, y-axis and origin - Interpreting geometric features such as midpoints and parallel lines graphically on a coordinate grid - Link between linear relationships and equation of a line including definition of gradient and y-intercept		**Geometry**: - Properties and characteristics of 2D shapes - Lengths and perimeter - Area of 2D shape formulas (triangle, rectangle, parallelogram, trapezium, circle) - Interior angles in a triangle and quadrilateral - Pythagoras' Theorem ***Higher***: Trigonometric ratios - Properties and characteristics of 3D shapes - Nets, plans and elevation of 3D shapes - Volume of 3D shape formulas (cuboid, prism, cylinder) - Similar shapes in 3D ***Higher*:** familiarity with formula for volume of pyramid, cone, frustum, sphere		**Algebra**: - Understand algebraic notations - Relate operations to their inverse operations - Different types of sequences including linear, geometric, Fibonacci and sequences linked to number types (prime, even, odd, square, cube, triangle numbers…)		**Numbers**: - Understand percentages - Vocabulary for percentage increases and decreases including interest/ increases in value and depreciation/ decreases in value - Unitary ratios - Direct and inverse proportion linking variables **Statistics**: - Capture recapture method for population estimates using samples	**Geometry**: - Congruent triangle descriptions (ASA, SAS and SSS) - Bisector of lines and angle definitions - Loci and distance from lines or points ***Higher***: Key characteristics of bearings from a point to describe direction	
Key vocabulary	**Numbers**: place value, square, cube, square root, cube root, index, standard form, ordinary number, simplest form, improper fraction, mixed number, recurring		**Algebra**: term, expression, formula, identity, substitute, factorise, expand, proof, coordinates, plot, graph, parallel, gradient, y-intercept, intersection		**Geometry**: perimeter, circumference, area, Pythagoras, hypothenuse, right-angle triangle, isosceles triangle, equilateral triangle		**Algebra**: linear equation, coefficient, solve, simultaneous equation, variables, substitution, term, term-to-term rule, n-th term, n-th term rule, sequence, Fibonacci, linear, geometric		**Numbers**: percentage of, percentage increase, percentage decrease, original value, interest, growth, decay, multiplier, direct, unitary ratios, proportion, inverse proportion **Statistics**: population, sample	**Geometry**: congruent, similar, bisector, perpendicular, loci, scale factors, scale, equidistant, region ***Higher***: bearing	
The role of reading and comprehension	Interpret worded problems mathematically using operations and fractions		Interpret worded problems using algebraic notations		Interpreting labelled diagrams of 2D and 3D shapes		Interpret worded problems using algebraic notations and equations		Interpret worded problems into percentage and proportion problems	Interpret written descriptions of a diagram including multi-step descriptions	
The role of independent extended writing	n/a		Construct complete algebraic proof with a logical progression between arguments		Develop geometric proof with logical progression between arguments		Develop multi-step algebraic reasoning with logical progression between arguments		Explain statistical methods in detail	n/a	
The role of maths/ numeracy	Consolidation and extension of arithmetic		Consolidation and extension of understanding of rules and notations in mathematics		Consolidation and extension of shapes and measurements of lengths, area and volume		Consolidation and extension of understanding of rules and notations in mathematics		Make links with numerical methods and real life	Consolidation and extension of understanding of 2D shapes	

Links to careers/ aspirations	Finance, Business, Shopkeeper, Scientist	Finance, Business, Computer Science, Product development and production	Surveyor, Cartographer, Architect, Builder, Carpenter, Packaging manufacturer, Graphic Designer	Finance, Business, Computer Science, Product development and production, Graphic Design	Finance, Banking, Scientist, Sociology, Statistics, Natural Sciences, Business and Marketing, Shopkeeping	Product design, Architecture, Building, Construction, Cartography, Landscaping, City planning, Vehicle design and construction
Core skills *A skill is a performance built on what a person knows*	To be able to: **Numbers**: Multiply and divide using formal written method (mixed integers and decimals) Add, subtract, multiply and divide positive and negative numbers Find integer powers and roots Use index laws for multiplication and division Solve BIDMAS calculations and simplify expressions using BIDMAS Convert ordinary numbers and standard form Multiply and divide numbers in standard form ***Higher***: Add and subtract in standard form Solve problems with addition, subtraction, multiplication, and division of fractions including mixed numbers and improper fractions Calculate exact values with fractions Convert and order fractions, decimals, and percentages Convert fractions and recurring decimals	To be able to: **Algebra**: Form and simplify expressions Substitute numbers into expressions Expand brackets Factorise expressions Prove identities ***Higher***: work with quadratics including difference of two squares, and algebraic fractions Solve problems using a coordinate grid Link coordinate of two points with coordinate of midpoint Use a table of values to plot a graph Interpret y=mx+c graphically including interpretation of gradient and y-intercept Identify parallel lines using y=mx+c ***Higher***: equation of a line going through two points, perpendicular lines using y=mx+c	To be able to: **Geometry**: Identify and classify 2D shapes Find missing angles in triangles and quadrilaterals Find missing lengths given a perimeter or area Find the area of 2D shapes Use Pythagoras' theorem to find missing lengths and prove a triangle is a right-angle triangle ***Higher***: Apply trigonometry in real life problems. Use trigonometric ratios to find missing lengths and angles in right-angle triangles Identify and classify 3D shapes Construct and interpret nets, plans and elevations Calculate surface area of 3D shapes Calculate volumes of 3D shapes Solve problems with volume and surface area ***Higher***: composite solids, parts of solids, spheres, cones, and frustrum. Pythagoras in 3D and similarity in 3D	To be able to: **Algebra**: Construct linear equations from worded or geometric problems Solve one-step, two-step linear equations and equations with unknown on both sides Check solutions with substitution Solve two linear equations simultaneously ***Higher***: change the subject of a formula, factorise quadratics Find missing term in a sequence including number and diagrammatic sequences Find the term-to-term rule Find the n-term rule ***Higher***: extend to quadratic and geometric sequences	To be able to: **Numbers**: Find the percentage of a quantity Solve percentage change problems Use multipliers to solve percentage change problems Calculate simple interest ***Higher***: Calculate compound interest and problem solve interest, growth and decay problems Solve best value problems including using unitary methods Solve recipe problems Solve direct and inverse proportion problems **Statistics** Apply statistics to capture and recapture problems Use statistics to describe a population ***Higher***: Problem solving using direct and inverse proportions	To be able to: **Geometry**: Use a ruler, protractor and compass accurately Construct congruent triangles (ASA, SAS and SSS) Construct perpendicular bisectors of a line Construct perpendicular lines through a point or at a point Construct angle bisectors Use constructions in loci problems Use scale factors for diagrams and maps ***Higher***: find bearings and solve bearing problems
Dept. enrichment activities						
Home learning opportunities	Number facts and basic calculations without a calculator practice including times tables Percentages in the press, tax calculations	Changing recipes Using maps and grids at home and linking with coordinates Battleship	Measuring length, area and volume of objects around the house or rooms Finding 2D shapes or 3D shapes in everyday life Drawing or computer art projects using 2D and 3D shapes	Understanding basic accounting including profits and losses Understanding energy bills Calculating what can be bought with a given amount of money Budgeting	Understanding credit and mortgages Calculating prices after discount or before discounts in shops Calculating amount of tax paid Understanding inflation and depreciation UK Butterfly Monitoring Scheme	Map reading and taking bearings when going for a walk Scale drawings and models Artistic drawings using compass and ruler