Year 9 Mathematics Curriculum Map

NUMBER

SHAPE, SPACE AND MEASURE

ALGEBRA

RATIO AND PROPORTION

STATISTICS AND PROBABILITY

Year 9 Unit of work	Skills learnt	
Number	- Use the concepts of prime factorisation, including using product notation and the unique factorisation theorem - Apply systematic listing strategies - Calculate with roots and with integer indices - Use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate - Apply systematic listing strategies including use of the product rule for counting - Estimate powers and roots of any given power - Find the LCM and HCF of two numbers, by listing, Venn diagrams and using prime factors - Solve simple problems using HCF, LCM and prime numbers - Use an extended range of calculator functions - Calculate with roots and with integer and fractional indices - Simplify and calculate with surds - Calculate with and interpret standard form - Evaluate calculations using indices including positive, fractional and negative indices - Solve problems using index laws; - Use calculators for all range of calculations	- Counting combinations in real-life contexts - Problems involving large numbers (e.g. heartbeats in an average lifetime) - Scientific questions involving standard form
Assessment 1		
Algebra	- Use notation and symbols correctly - Manipulate and simplify algebraic expressions by collecting 'like' terms - Multiply together simple algebraic expressions - Simplify expressions by cancelling - Multiply a single number term over a bracket. - Recognise factors of algebraic terms involving single brackets - Factorise algebraic expressions by taking out common factors - Substitute positive and negative numbers into expressions; - Use function machines; - Show inequalities on number lines - Write down whole number values that satisfy an inequality - Argue mathematically to show algebraic expressions are equivalent.	- Kinematics formulas – simple *suvat* - Braking distances - Word problems

	- Set up simple equations from word problems and derive simple formulae - Substitute numbers into expressions involving brackets and powers - Derive a simple formula, including those with squares, cubes and roots - Substitute numbers into a (word) formula - Expand the product of two linear expressions - Factorise quadratic expressions - Solve angle or perimeter problems using algebra. - Use the correct notation to show inclusive and exclusive inequalities - Solve an inequality and show the solution set on a number line; - Solve two inequalities in x, find the solution sets and compare them - Solve linear equations - Set up and solve linear equations to solve a problem; - Derive a formula and set up simple equations from word problems, then solve these equations, interpreting the solution in the context of the problem; - Substitute positive and negative numbers into a formula, solve the resulting equation including brackets, powers or standard form. - Use and substitute formulae from mathematics and other subjects, including kinematics formulae - Change the subject of a formula - Simple proofs and use of ≡ in "show that" style questions - Use iteration to find approximate solutions to equations, for simple equations in the first instance, then quadratic and cubic equations.	
Assessment 2		

Statistics	- Design and use data-collection sheets for grouped, discrete and continuous data
	- Use correct notation for time, 12- and 24-hour clock and work out time taken for a journey from a timetable;
	- Construct tables for time–series data;
	- Design, complete and use two-way tables for discrete and grouped data;
	- Identify values and averages from a frequency table
	- Produce and interpret:
	  o pictograms;
	  o composite bar charts;
	  o dual/comparative bar charts for categorical and ungrouped discrete data;
		- Crime statistics in different cities

	○ bar-line charts; ○ vertical line charts; ○ line graphs; ○ line graphs for time–series data; ○ stem and leaf (including back-to-back); - Recognise simple patterns, characteristic and relationships in bar charts and line graphs; - Interpret and discuss any data. - Calculate mean and range, find median and mode from a small data set; - Use a spreadsheet to calculate mean and range, and find median and mode; - Compare two distributions from stem and leaf diagrams (mode, median, range) - Interpret histograms with equal class intervals - Interpret tables; represent data in tables and charts - Construct pie charts for categorical data and discrete/continuous numerical data - Interpret pie charts using fractions and percentages - Draw and interpret scatter graphs with understanding of the line of best fit - Recognise the advantages and disadvantages between measures of average	
Assessment 3		
Fractions/decimals/ percentages/ratio	- Express a given number as a fraction of another - Write a fraction in its simplest form and find equivalent fractions - Convert between mixed numbers and improper fractions - Find a percentage of a quantity or measurement - Compare and order fractions, decimals and integers, using inequality signs - Apply all four operations to fractions and decimals - Express a given number as a percentage of another number - Use decimals to find quantities - Understand the multiplicative nature of percentages as operators - Convert a fraction to a recurring decimal and vice versa - Find the reciprocal of an integer, decimal or fractions - Compare two quantities using percentages, including a range of calculations and contexts such as those involving time or money - Understand the multiplicative nature of percentages as operators - Using a multiplier find the percentage of a quantity, increase or decrease by a percentage in any scenario and find the original amount given the final amount after a percentage increase or decrease	- Income tax - VAT - Profit and loss - Other examples from business

	- Use percentages in real-life situations, including: o Percentages greater than 100% o Price before and after VAT o Value of profit or loss o Simple interest o Income tax calculations - Use calculators for reverse percentage calculations by doing an appropriate division - Use percentages in real-life situations, including percentages greater than 100% - Describe percentage increase/decrease with fractions, - Write ratios in their simplest form - Share in a given ratio - Write a ratio as a fraction and as a linear function - Identify direct proportion from a table of values, by comparing ratios of values; - Use a ratio to compare a scale model to real-life object; - Use a ratio to convert between measures and currencies - Scale up recipes	
Assessment 4		
Sequences	- Recognise simple sequences: even, triangular, square and cube numbers and Fibonacci-type sequences - Use function machines to find terms of a sequence - Understand term-to-term and position-to-term rules and use these to solve problems - Find and use the *n*th term of an arithmetic sequence to solve problems - Continue a quadratic sequence, find and use the *n*th term to generate terms - Distinguish between arithmetic and geometric sequences - Use finite/infinite and ascending/descending to describe sequences - Recognise and use simple geometric progressions - Continue geometric progression and find term to term rule, including negative, fraction and decimal terms; - Solve problems involving sequences from real life situations.	- Paying off a loan - Bank account and interest - Comparison between compound interest and simple interest - Hexagonal numbers (stacking cables)
Assessment 5		
Angles	- Identify parallel lines on a diagram and use their properties - Understand and use the angle properties of parallel lines - Classify quadrilaterals by their geometric properties and name all quadrilaterals that have a specific property - Identify quadrilaterals from everyday usage	- Bearings activities - Floor tiling using polygons

	- Understand and use the angle properties of quadrilaterals - Understand and use the angle properties of triangles - Understand and use the angle properties of intersecting lines - Use geometrical language appropriately, give reasons for angle calculations and show step-by-step deduction when solving problems. - Identify shapes which are congruent - Explain why some polygons fit together and others do not - Understand the proof that the angle sum of a triangle is 180°, and derive and use the sum of angles in a triangle - Find the size of each interior angle, or the size of each exterior angle, or the number of sides of a regular polygon, and use the sum of angles of irregular polygons - Calculate the angles of regular polygons and use these to solve problems - Use the side/angle properties of compound shapes made up of triangles, lines and quadrilaterals, including solving angle and symmetry problems for shapes in the first quadrant, more complex problems and using algebra - Use angle facts to demonstrate how shapes would 'fit together', and work out interior angles of shapes in a pattern - Understand, recall and use Pythagoras' Theorem in 2D - Given three sides of a triangle, justify if it is right-angled or not - Apply Pythagoras to calculate a missing length of a right-angled triangle including answers in surd form - Calculate the length of a line segment AB given pairs of points - Understand, use and recall the trigonometric ratios sine, cosine and tan, and apply them to find angles and lengths in general triangles in 2D figures - Use the trigonometric ratios to solve 2D problems - Find angles of elevation and depression - Know the exact values of sin θ, cos θ and tan θ for given angles	
Assessment 6 – End of year Exam		