



Scheme of Work		SUBJECT: Mathematics			YEAR: 9 sets 1 & 2 ~ Autumn term 1	
	Basic number	Factors and multiples	Angles	Scale drawings and bearings	Basic algebra review	Basic fractions
Key concepts	1) Order numbers 2) Use inequality symbols 3) Apply the four operations, to integers – both positive and negative 4) Understand and use place value 5) Recognise and use relationships between operations	1) Prime numbers, factors, multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, 2) Apply systematic listing strategies	1) Use conventional terms and notations: 2) Apply the properties of basic angle. 3) Angles in parallel lines	1) Use scale factors, scale diagrams and maps 2) Measure line segments and angles in geometric figures 3) Bearings	1) Use and interpret algebraic notation 2) Use conventional notation for priority of operations. 3) understand and use the concepts and vocabulary of expressions, equations, formulae, <u>identities</u> , inequalities, terms and factors 4) Simplify and manipulate	1) Order fractions 2) Apply the four operations, to simple fractions 3) Calculate exactly with fractions



	including inverse operations 6) Estimate answers				algebraic expressions	
Themes	Consolidation of basic number skills using integers	Types of number	Basic angle properties	Maps, scales and bearings	Basic algebra skills	Four operations with fraction
Challenge	1) Order both positive and negative 3) Questions set in context (knowledge of terms used in household finance, for example profit, loss, cost price, selling price, debit, credit and balance, income tax, VAT, interest rate)	1) Prime factor decomposition including product of prime factors written in index form 1) Use venn diagrams to identify LCM and HCF of 2 or 3 numbers 2) Product rule for counting	1) Know the correct notation for lines (AB) and angles (<ABC) 1) Use the standard conventions for labelling and referring to the sides and angles of triangles 3) Understand and use correct notation for angles on parallel lines, (alternate,	1) Use of map scales in the format 1:100 000 etc 3) Link the 8 points of a compass to equivalent bearings 3) Point location using scales and bearings 3) Solve more complex problems involving bearings	1) Using coefficients written as fractions rather than as decimals 1) Including bracket 2) Including brackets, powers, roots and reciprocals 4) Including those involving surds 4) Collecting like terms, involving powers	1) Order positive and negative fractions 2) Apply the four operations, to mixed numbers



	<p>4) Use place value to support calculations when calculating with large and small numbers together</p> <p>5) Including cancellation to simplify calculations and expressions</p> <p>6) Estimating answers by rounding to 1 significant figure. Check answers by estimation</p>		<p>corresponding and co-interior/allied angles)</p>		<p>4) Multiplying and simplifying single brackets</p> <p>4) Taking out common factors, with involve 2 or more terms and/or powers</p>	
Support	<p>1) Ordering using a number line</p> <p>2) Know the meaning of the following symbols =, ≠, <, >, ≤, ≥</p>	<p>1) Student must be able to identify multiples and factors of a number.</p>	<p>1) Know how to identify parallel lines and lines of equal length.</p> <p>2) Angles at a point, angles on a straight line,</p>	<p>1) Use map scales to work out real distances and vice versa</p> <p>2) Accurate use of measuring equipment, i.e. measuring line</p>	<p>2) Including brackets, powers and roots</p> <p>4) Collecting like terms 2 or 3 different letters.</p>	<p>1) Order positive fractions, by writing over a common denominator</p> <p>2) Apply the four operations, to</p>



	<p>3) Extra support given on long multiplication and division</p> <p>4) Use of place value with very large and small numbers</p> <p>5) Remember $a + b = b + a$ $a \times b = b \times a$ $a - b \neq b - a$ $a \div b \neq b \div a$</p> <p>6) Round to significant figures</p>	<p>1) List prime numbers up to 50</p> <p>1) Identify LCM by listing multiples. Identify HCF by listing factors</p> <p>1) Complete factor trees</p> <p>2) Apply systematic listing strategies: using lists, tables and diagrams</p>	<p>vertically opposite angles</p> <p>3) Identify alternate and corresponding angles on parallel lines</p>	<p>segments with a rule and measuring angles inside a 2D shape using a protractor.</p> <p>3) know the bearings of the main four points of a compass</p> <p>3) Understand how to measure and draw bearings</p>	<p>4) Multiplying a single term over a bracket</p> <p>4) Taking out common factors, either just a single number or letter</p>	<p>simple fractions, proper and improper</p> <p>3) Calculate exactly with unit fractions</p>
Literacy focus	<p>Key words: integer, positive, negative, greater than (or equal to), less than (or equal to), place value, inverse, simplify, approximate, estimate, ascending,</p>	<p>Key words: factor, multiple common, lowest common multiple (LCM), highest common factor (HCF), prime, prime factor, product,</p>	<p>Key words: Angle, Degree, Calculate, Polygon, Parallel, Perpendicular, Isosceles, Corresponding, Alternate, Co-interior</p>	<p>Key words: Scale/scale diagram, three-figure bearing, clockwise, anticlockwise, compass, north, east, south, west, north-east, north-west, south-east, south-west, estimate, key</p>	<p>Key words: Divide, Powers, Indices, Brackets, Multiply out, Expand, Simplify, Factor, Factorise, Algebra, Expression, Equation, Formula, identity, Collecting like terms</p>	<p>Key words: Mixed Number, Improper Fraction, Common denominator</p>



Scheme of Work		SUBJECT: Mathematics		YEAR: 9 sets 1 & 2 ~ Autumn term 2	
	Basic Decimals	Coordinates and linear graphs	Rounding	Perimeter and area	Sequences
Key concepts	1) Order decimals 2) Apply the four operations, to decimals 3) Understand and use place value 4) Convert between decimals and fractions	1) Work with co-ordinates in all four quadrants 2) Solve geometrical problems on co-ordinate axes 3) Plot graphs of equations that correspond to straight line graphs 4) Understand the significance of m and c in the form $y = mx + c$	1) Round numbers and measures to an appropriate degree of accuracy 2) Error intervals using truncation and rounding 3) Limits of accuracy	1) Identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres 2) Calculate the perimeter of a 2D shapes 3) Know and apply formulae to calculate area of triangles, parallelograms and trapeziums 4) Find the surface area of 3D shapes	1) Generate terms of a sequence from either a term-to-term or a position-to-term rule 2) Recognise and use; sequences of triangular, square and cube numbers 3) Arithmetic and geometric progressions 4) Fibonacci type sequences 5) nth term of a sequence



		5) Find the equation of a line			
		6) Identify and interpret gradients and intercepts of linear functions graphically and algebraically			
Themes	Calculating with decimals	Introduction to $y = mx + c$	All measurements have been rounded	Must know the formulas	Generating sequences
Challenge	1) Order decimals, fractions and integers 2) Multiplying and dividing a decimal by a decimal 3) Use place value to help mental calculations with decimals 4) Change recurring decimals into their corresponding fractions and vice	2) Complete 2D shapes on a coordinate grid from given information. 4) Use the form $y = mx + c$ to identify parallel lines and perpendicular lines 5) Find the equation of the line through two given points, or through one point with a given gradient	1) to a specified number of significant figures 2) Use inequality notation to specify simple error intervals due to truncation or rounding 3) Apply and interpret limits of accuracy including upper and lower bounds	2) Calculate the perimeter of a 2D shapes including composite shapes where measurements are missing 4) Surface area of pyramids and composite shapes	3) Identify geometric & arithmetic sequences 4) Use algebra to identify missing terms in a Fibonacci type sequence 5) Quadratic sequences



	versa (higher tier only)				
Support	<p>1) Order positive and negative decimals</p> <p>2) Apply the four operations, including formal written methods, to decimals</p> <p>4) including decimals and fractions greater than 1</p>	<p>1) Remember the correct way to read coordinates</p> <p>4) Use the form $y = mx + c$ to identify parallel lines</p> <p>5) Find the equation of a line from its graph</p>	<p>1) to a specified number of decimal places</p> <p>2/3) Identify upper and lower bounds of rounded values</p>	<p>2) Calculate the perimeter of a 2D shapes including composite shapes where all measurements are given</p> <p>3) Ensure students can recall formulas for areas of triangles, parallelograms and trapeziums</p> <p>4) Surface area of cuboids and prisms</p>	<p>3) Continue arithmetic and geometric sequences</p> <p>4) Continue a Fibonacci sequence</p> <p>5) Linear sequences</p>
Literacy focus	<p>Key words: Decimals Negative and positive Ordering of mixed numbers Place value</p>	<p>Key words: Axis, axes, coordinate, point, vertex, vertices, parallel, midpoint, gradient, y intercept, equation, horizontal, vertical,</p>	<p>Key words: Round; Decimal places; Significant figures; Integer; Estimate; Upper and lower bounds</p>	<p>Key words: Faces, Edges, Vertices, Cube, Cuboid, Prisms, Pyramids, Cylinders Spheres, Cones, Square, Triangles Rectangles, Area Composite, Length Parallelogram, Width Trapezium, Height Perimeter, Base Formulae, Parallel</p>	<p>Key words : Sequence, Pattern Rule, Term, Term-to-term rule Position-to-term rule n^{th} term</p>

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Cross-curricular links		Science ~ drawing straight line graphs to represent and interpret results collected			Science ~ looking for patterns in data collected
SMSC & MBV					
ASSESSMENTS	Assessment 2 ~ December	Assessment 2 ~ December	Assessment 2 ~ December	Assessment 2 ~ December	Assessment 2 ~ December
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class



Scheme of Work		SUBJECT: Mathematics		YEAR: 9 sets 1 & 2 ~ Spring term 1	
	Basic percentages	Real life graphs	Circumference and area		
Key concepts	1) Define percentage as 'number of parts per hundred 2) Convert percentages into fractions and decimals 3) Express one quantity as a percentage of another 4) Compare two quantities using percentages 5) Work with percentages greater than 100% 6) Interpret fractions and percentages as operators	1) Plot and interpret graphs 2) Graphs of non-standard functions in real contexts 3) Interpret the gradient of a straight-line graph as a rate of change	1) Identify and apply circle definitions and properties 2) Circumference of a circle 3) Area of a circle 4) Surface area 5) Sectors and arc lengths		



Themes	An understand of what percentages are	Real life graphs	Circles
Challenge	<p>2) include top heavy fractions</p> <p>6) Using multipliers to calculate percentages and percentage change</p>	<p>1) Including reciprocal graphs and exponential graphs</p> <p>2) To find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration</p> <p>3) Calculate gradient of a curve by drawing a tangent at a given point. Interpret this as rate of change or acceleration at this point of time</p>	<p>1) Tangent, arc, sector and segment</p> <p>2) Calculate the perimeters of 2D shapes including circles and composite shapes</p> <p>3) Calculate areas of circles and composite shapes</p> <p>4) Calculate surface area of spheres, cones and composite solids</p> <p>5) Calculate arc lengths, angles and areas of sectors of circles</p>
Support	<p>4) Compare two quantities using percentages ~ percent means per 100 hence we can make a direct comparison</p> <p>6) Use multiple method to calculate percentage of a quantity</p>	<p>1) Plot and interpret graphs ~ quadratic and cubics</p> <p>2) Time-distance and velocity-time graphs</p>	<p>1) Centre, radius, chord, diameter, circumference</p> <p>2&3) Must memorise formulas</p> <p>4) Can calculate area of a semi or quarter circle</p> <p>5) Know the terms arc and sectors and is able to identify them on a diagram.</p>



			4) Understand that an arc or a sector is a fraction of a circle.
Literacy focus	Key words: Add Subtract Multiply Divide Percentage Fraction Decimal Factor Multiplier Equivalent fraction	Key words: Coordinates, axes, gradient, quadratic, cubic, reciprocal, exponential, approximate, solution, speed, distance, time, velocity, acceleration, tangent, rates of change	Key words: Centre Radius Chord Diameter Circumference Tangent Arc Sector Segment Area Perimeter Semi-circle
Cross-curricular links	Business, Science, Geography, Statistics	Science	Design technology and Art
SMSC & MBV			
ASSESSMENTS	Assessment 3 ~ February	Assessment 3 ~ February	Assessment 3 ~ February
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class



Scheme of Work		SUBJECT: Mathematics		YEAR: 9 sets 1 & 2 ~ Spring term 2	
	Equations	Ratio and proportion	Measures	Indices	
Key concepts	1) Substitute numerical values into formulae and expressions 2) Solve linear equations in one unknown algebraically	1) Express one quantity as a fraction of another 2) Use ratio notation, including reduction to simplest form 3) Divide a given quantity into a given ratio of 2 or more parts 4) Apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing and concentrations)	1) Apply and interpret limits of accuracy 2) Use standard units of measure and related concepts (length, area, volume / capacity, mass, time, money etc) 3) Use standard units of mass, length, time, money and other measures 4) Change freely between related standard units	1) Use positive integer powers and associated real roots 2) Recognise powers of 2, 3, 4, 5 3) Estimate powers and roots of any given positive number 4) Calculate with roots, and with integer indices ~ basic rules of indices	



		<p>5) Express a multiplicative relationship between two quantities as a ratio or fraction</p> <p>6) Understand and use proportion as equality of ratios</p> <p>7) Relate ratios to fractions and to linear functions</p>	<p>5) Use compound units such as speed, rates of pay, unit pricing</p>	
Themes	Equations ~ inverse operations	Ratio and proportion	Metric and imperial units of measurement	Indices
Challenge	<p>1) including scientific formulae</p> <p>2) Including those with the unknown on both sides of the equation and brackets</p>	<p>1) Where the fraction is greater than 1</p> <p>2) Simplify ratios which are not in the same units</p> <p>4) Including better value or best buy problem</p> <p>7) Create equations from ratios and use and apply the equation to solve problems</p>	<p>1) Recap error intervals and how to write using inequalities</p> <p>3) Including standard compound measures</p> <p>4) Change freely between related compound units including density & pressure</p> <p>5) Including density and pressure</p>	<p>4) Including fractional and negative indices</p>



Support	<p>1) Recap algebraic notation</p> <p>1) Substitute numerical values into expressions</p> <p>2) Recap inverse operations</p> <p>2) Include equations with brackets on one side</p>	<p>1) Where the fraction is less than 1</p> <p>2) Writing everyday situations as a ratio of equal parts</p> <p>6) Understand that proportion is comparing two quantities measured in the same units, hence ratio can be used as a method of comparing proportion</p> <p>7) Create fractions from ratios and understand the meaning of the fractions</p>	<p>1) Recap upper and lower bounds and the fact that measurements are all rounded</p>	<p>1) Must know square numbers up to 15 x 15</p> <p>3) Understand how to calculate the power of any number on a calculator</p> <p>4) know and apply the basic rules of indices</p>
Literacy focus	<p>Key words: Substitute, formula, expression, sequence, term, positive number, negative number, integer, equation, solve, solution, unknown, variable, algebraically, graphically, approximate solution, inverse operations, coefficient, brackets</p>	<p>Key words: Multiply Divide Ratio Fraction Scaling Simplify Unitary Form Linear Function Convert Compare Simplest Form</p>	<p>Key words: Metric, imperial, length, mass, capacity, area, volume, time, money, units, compound units, speed, distance, time, density, mass, pressure, force, error intervals, inequalities, upper bound, lower bound</p>	<p>Key words: Positive, negative, integer, indices, powers, roots, estimate, fractional, square numbers</p>
Cross-curricular links			Design technology	
SMSC & MBV				
ASSESSMENTS	Assessment 4 ~ April	Assessment 4 ~ April	Assessment 4 ~ April	Assessment 4 ~ April

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Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class
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Scheme of Work		SUBJECT: Mathematics		YEAR: 9 sets 1 & 2 ~ Summer term 1	
	Standard form	Transformations	Introduction to quadratics and rearranging formulae		
Key concepts	1) Understand and use place value (e.g. when working with very large or very small numbers) 2) Calculate with and interpret standard form	1) Rotate shapes 2) Reflect shapes 3) Translate shapes 4) Enlargement 5) Identify and describe a transformation which has taken place 6) Know the difference between congruent shapes and similar shapes and understand which transformation results in which. 7) Describe the changes and invariance achieved by	1) Expanding products of two binomials 2) Factorising quadratic 3) Simplifying expressions involving sums, products and powers, including the laws of indices 4) Understand and use standard mathematical formulae 5) Rearrange formulae to change the subject		



		combinations of rotations, reflections and translations	
Themes	Interpreting numbers written in standard form	Transformations	More algebra
Challenge	2) Applying standard form to worded problems in unfamiliar situations	1) Rotate a shape on a coordinate grid using a centre of rotation 2) Reflect a shape in lines parallel to the x and y axis 3) Describe a translation using column vectors 4) Enlarge a shape on a coordinate grid from a centre of enlargement. 4) Enlarge by a fractional and negative scale factor 7) Understand what is meant by the term invariant and can identify the invariant points for each of the different types of transformations.	1) Expanding 3 brackets 2) Including the difference of two squares 3) Substitute in both positive and negative values 5) Make connections to methods for solving equations 5) Including the difference of two squares
Support	2) Understanding how to convert between the different forms	1) Identify when a shape has been rotated. 2) Identify when a shape has been reflected 3) Understand a translation is a shift left or right and up or down	1) Using methods of FOIL and Grid 2) Link into HCF 3) Recap algebraic notation 4) Recall order of operations



		4) Identify when a shape has been enlarged. 4) Enlarge a shape given the scale factor	5) Use Flow chart method, reinforcing inverse operations
Literacy focus	Key words: Place value Standard index form Powers of 10 Ordinary numbers	Key words: congruent, similar, co-ordinates, co-ordinate axes, x -axis, y -axis, line $y = x$, line $y = -x$, rotation, reflection, translation, enlargement, scale factor, centre of rotation, centre of enlargement, vector, column vector, horizontally, vertically, origin, angle of rotation, mirror line, line of reflection, ratio, direction of rotation, clockwise, anticlockwise, reverse transformation.	Key words: Expand, brackets, product, sum, binomial, factorise, quadratics, formulae, rearrange, substitute, positive, negative, HCF, algebraic notation order of operations change the subject inverse operations FOIL Difference of two squares
Cross-curricular links	Science ~ representing very large or very small numbers	Design technology, Art and design, photography	
SMSC & MBV			
ASSESSMENTS	End of year 9	End of year 9	End of year 9
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class	Weekly homework based on work covered in class



Scheme of Work		SUBJECT: Mathematics	YEAR: 9 sets 1 & 2 ~ Summer term 2
	Pythagoras and basic trigonometry	Calculating with percentages	
Key concepts	1) Pythagoras Theorem 2) Trigonometry ~ right angled triangles 3) Exact trig values 4) Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides including Pythagoras' Theorem and use known results to obtain simple proofs 5) Compare lengths using ratio notation; make links to trigonometric ratios	1) Percentage increase/decrease 2) Finding the original amount after a percentage change 3) Simple interest	
Themes	Pythagoras and trigonometry	Calculating with percentages	



Challenge	<p>1) Apply Pythagoras's theorem to problem solving questions which involves knowledge of other areas of mathematics to be able to solve fully</p> <p>2) Apply methods of trigonometry to problem solving questions which involves knowledge of other areas of mathematics to be able to solve fully</p> <p>3) Students must memorise the exact values for Sin, Cos, Tan 0, 30, 45, 60 & 90 (not Tan 90)</p>	<p>1) Use multiplier methods for calculating percentage change</p> <p>2) Wordy style questions, combining different types of percentage style questions</p> <p>3) Compound interest</p>
Support	<p>1) Understand the relationship between the sides of a right angled triangle, using diagrams to help explain</p> <p>1) Know and apply formula for Pythagoras theorem</p> <p>2) Students must know the ratios for Sin, Cos and Tan</p> <p>2) Apply ratios to find missing sides and angles</p>	<p>1) Understand the percentage increase is when the percentage is added to the original amount and percentage decrease is when it is subtracted from the original amount</p> <p>2) Always start off with what percentage the value given represents, then work out 1% then 100% using proportion methods</p>
Literacy focus	<p>Key words: Square numbers, square roots, Pythagoras, right angled triangles, Trigonometry, sine, cosine, tangent, opposite, adjacent, hypotenuse, angle</p>	<p>Key words: Percentage, increase, decrease, multiplier, original Percentage change, interest, simple, compound</p>
Cross-curricular links	Construction	Science, Business and Geography
SMSC & MBV		
ASSESSMENTS	End of year 9	End of year 9

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Out of school
learning

Weekly homework based on work covered in class

Weekly homework based on work covered in class