



Scheme of Work	SUBJECT: Mathematics		YEAR: 10 Higher (set 1) ~ Autumn term 1	
	Number recap and review	Algebra recap and review	Construction and loci	Properties of polygons
Key concepts	<p><b>1) Change recurring decimals into their corresponding fractions and vice versa</b></p> <p><u>2) Apply and interpret limits of accuracy including upper and lower bounds</u></p> <p>3) Deduce expressions to calculate the nth term of linear <b>and Quadratic</b> sequences</p> <p>4) Recognise and use <u>simple geometric progressions</u> (<math>r^n</math> where <math>n</math>)</p>	<p>1) <u>Use the form</u> <math>y = mx + c</math> <u>to identify parallel lines and perpendicular lines</u></p> <p>2) <u>Find the equation of the line through two given points, or through one point with a given gradient</u></p> <p>3) Identify and interpret gradients and intercepts of linear functions graphically and algebraically</p> <p>4) Plot and interpret graphs (including <u>reciprocal graphs and exponential graphs</u>) and graphs of non-</p>	<p>1) <u>Use the standard ruler and compass constructions:</u></p> <ul style="list-style-type: none"> <li><u>perpendicular bisector of a line segment</u></li> <li><u>constructing a perpendicular to a given line from / at a given point</u></li> <li><u>bisecting a given angle</u></li> </ul> <p>2) <u>Know that the perpendicular distance from a point to a line is the shortest distance to the line</u></p>	<p>1) Derive and use the sum of angles in a triangle (e.g. to deduce and use the angle sum in any polygon, and to derive properties of regular polygons)</p> <p>2) Derive and apply the properties and definitions of:</p> <ul style="list-style-type: none"> <li>special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus</li> <li>Special triangles</li> </ul>



	<p><u>is an integer and <math>r</math> is a surd</u>)</p> <p>5) <u>Calculate with roots and with integer and fractional indices</u></p>	<p>standard functions in real contexts, to find approximate solutions to problems such as simple kinematics problems involving distance, speed and acceleration</p> <p>5) Solve linear equations in one unknown algebraically <u>Including those with the unknown on both sides of the equation</u></p>	<p>3) <u>Use these to construct given figures and solve loci problems</u></p>	<ul style="list-style-type: none"> <li>Other plane figures using appropriate language</li> </ul>
Themes	<b>Fractions</b>	<b>Graphs</b>	<b>Constructions and loci</b>	<b>Properties of polygons</b>
Challenge	<p>1) Convert recurring decimals greater than 1 into mixed fractions and vice versa</p> <p>2) Identify error intervals, write using inequalities</p> <p>3) nth term of a quadratic sequence of the form</p>	<p>1) Discuss the relationship between the gradients of perpendicular lines</p> <p>2) Find the equation of perpendicular lines</p> <p>2) Find the equation of lines given in geometric problems involving circles</p>	<p>1) Construct points of a compass (N, NE, E, SE, S, SW, W, NW) by just using a compass and a straight edge</p> <p>3) Solve practical problems using loci</p> <p>3) Solve loci problems when the answer is a region</p>	<p>1) Solve geometric multi-step problems using properties of polygons</p>



	$ax^2 + bx + c$  5) Solve problems using a variety of the rules of indices	4) Calculate distance from a speed-time graph, by calculating area under the graph  4) Estimate distance from a curved speed-time graph by splitting into rectangles and trapeziums  4) Understand, calculate and interpret acceleration.		
Support	1) Convert fractions to decimals, leading on to recurring decimals as answers.  1) Convert terminating decimals to fractions  2) Rounding to significant figures  2) Identify greatest and least values which can be rounded to a given value  3) Focus on finding the nth term of a linear sequence  4) Can Identify arithmetic and geometric sequences	1) Recap drawing straight line graphs using the gradient and intercept  2) Calculate the gradient of a line segment  3) Identify gradient and intercept from an equation  3) Work out the equation of a straight line on a graph  4) Plot quadratic and cubic graphs and estimate solutions from the graphs	3) Focus on basic loci which involve one or two simple rules <ul style="list-style-type: none"> <li>• Locus of a point from a fixed point</li> <li>• Locus of a point which is always the same distance from two fixed points</li> <li>• Locus of a point from a line</li> <li>• Locus of a point which is always the same distance from two fixed lines</li> </ul>	1) Find missing angles in polygons and more complex problems by recapping over the basic rules of angle properties



	4) Create geometric sequences from rules  5) Recap the basic rules of indices, multiplying, dividing and brackets	5) Recap methods for solving equations with one unknown.		
Literacy focus	Key words: Fractions, decimals, recurring, terminating, limits, accuracy, bounds, upper, lower, linear, quadratic, sequence, expression, term, arithmetic, geometric, surds, rationalise, denominator, indices, operations	Key words: Gradient, intercept, parallel, perpendicular, equation, linear, quadratic, cubic, reciprocal, exponential, speed, distance, time, acceleration	Key words: Constructions, perpendicular, bisector, loci, locus, equidistant	Key words: Polygons, triangles, quadrilaterals, pentagons, hexagons, octagons, decagons, equilateral, isosceles
Cross-curricular links	Science, Design technology, Geography, Business		Design technology Art	Design technology Art
SMSC & MBV				
ASSESSMENTS	Assessment 1 ~ October	Assessment 1 ~ October	Assessment 1 ~ October	Assessment 1 ~ October
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



Scheme of Work		SUBJECT: Mathematics		YEAR: 10 Higher (set 1) ~ Autumn term 2	
	<b>Linear and quadratic equations and their graphs</b>	<b>Congruence and similarity</b>	<b>Surds and indices</b>		
Key concepts	<p>1) Solve linear equations in one unknown algebraically, including:</p> <ul style="list-style-type: none"> <li>• <u>those with the unknown on both sides of the equation</u></li> <li>• Find approximate solutions using a graph</li> </ul> <p>2) <u>Solve quadratic equations algebraically by factorising</u></p> <ul style="list-style-type: none"> <li>• <u>Find approximate solutions using a graph</u></li> </ul> <p>3) <u>Translate simple situations or procedures into algebraic expressions</u></p>	<p>1) <u>Use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS)</u></p> <p>2) <u>Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides including the base angles of an isosceles triangle are equal, and use known results to obtain simple proofs</u></p> <p>3) <u>Apply and use the concepts of congruence and similarity, including the relationships between lengths, areas and volumes in similar figures</u></p>	<p><b>1) Calculate exactly with surds</b></p> <p><b>2) Simplify surd expressions involving squares eg</b></p> $\sqrt{12} = \sqrt{4 \times 3}$ $\sqrt{12} = \sqrt{4} \times \sqrt{3}$ $\sqrt{12} = 2\sqrt{3}$ <p><b>3) Rationalise denominators</b></p> <p>4) Recognise and use <u>simple geometric progressions (<math>r^n</math> where <math>n</math> is an integer and <math>r</math> is a surd)</u></p>		



	<u>or formulae; derive an equation and the solve the equation and interpret the solution</u>		
Themes	<b>Linear and quadratic equations</b>	<b>Congruence and similarity</b>	<b>Surds</b>
Challenge	<p>1) Solving equations involving fractions on both sides of the equation</p> <p>1) Solving equations using the 6-step method, i.e.</p> $\frac{3x + 4}{5} + \frac{4x - 1}{3} = 14$ <p>2) Recap methods of factorising quadratics of the form <math>ax^2 + bx + c</math></p> <p>2) Solving quadratics of the form <math>ax^2 + bx + c</math></p> <p>2) Use the graph to solve quadratic equations where <math>y \neq 0</math></p> <p>3) Multi-step questions involving other areas of mathematics</p>	<p>1) Begin to understand how to prove two shapes are congruent</p> <p>2) Exam questions to prove two triangles are congruent, using geometry properties and circle theorems.</p> <p>3) Understand the relationship between the ratios of area and volume of similar shapes and their scale factors Length ~ scale factor Area ~ (scale factor)<sup>2</sup> Volume ~ (scale factor)<sup>3</sup></p> <p>3) Multi-step questions involving similar shapes</p>	<p>1) Perform the four operations with surds in the following format <math>a\sqrt{b} + c\sqrt{d}</math></p> <p>2) Focus on larger numbers which may take several steps to simplify</p> <p>3) Rationalise denominators including brackets</p> <p>3) Solve multi-step problems involving surds and linking to other areas of mathematics</p>



Support	<p>1) Using inverse operations to solve equations</p> <p>1) When unknowns are on both sides they need to collect all the unknowns on one side.</p> <p>1) Show the link/visual representations between an equation and a graph and how to use the graph to solve an equation.</p> <p>2) Recap methods of factorisation</p> <p>2) Recap methods of factorising quadratics of the form <math>x^2 + bx + c</math></p> <p>2) Plotting quadratic graphs</p> <p>2) Make the link between the roots of the graph and the factorised form of the equation.</p>	<p>1) Ensure students understand the difference between congruent shapes and similar shapes.</p> <p>1) Understand the notation SSS, SAS, ASA, RHS</p> <p>2) Properties of angles and sides of special triangles and quadrilaterals</p> <p>3) Understand that similar shapes are enlargements of one another</p> <p>3) Know that angles in similar shapes are the same.</p>	<p>1) Recap square numbers</p> <p>1) Focus on the methods for performing the four operations with surds, but leaving answers in un-simplified form</p> <p>2) Focus on smaller numbers, i.e. multiples of 4, 9, 25, 100 etc</p> <p>4) Can Identify arithmetic and geometric sequences</p> <p>4) Create geometric sequences from rules</p>
Literacy focus	Key words: Linear, quadratic, equation, algebraically, graphs, factorise	Key words Congruent, congruence, similarity, scale factor, enlargement, triangles, quadrilaterals	Key words: Surds, rationalise, sequences, geometric, square numbers, multiples, denominators, multiply, divide
Cross-curricular links			
SMSC & MBV			
ASSESSMENTS	Assessment 2 ~ December	Assessment 2 ~ December	Assessment 2 ~ December

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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
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Scheme of Work		SUBJECT: Mathematics		YEAR: 10 Higher (set 1) ~ Spring term 1	
	<b>2D representations of 3D shapes</b>	<b>Sketching graphs</b>	<b>Volume</b>	<b>Inequalities</b>	<b>Numerical methods</b>
Key concepts	1) <u>Construct and interpret plans and elevations of 3D shapes</u>	1) Recognise, sketch and interpret graphs of: <ul style="list-style-type: none"> <li>• linear functions,</li> <li>• quadratic functions,</li> <li>• <u>simple cubic functions</u></li> <li>• <u>reciprocal function where</u> <math display="block">y = \frac{1}{x}</math> <u>with <math>x \neq 0</math></u></li> </ul>	1) Compare lengths, areas and volumes using ratio notation. Link to scale factors and <u>similarity</u>  2) Know and apply the formulae to calculate the volume of cuboids and other right prisms (including cylinders)  3) <u>Calculate the volume of spheres.</u>	1) <u>Solve linear inequalities in one or two variables and quadratic inequalities in one variable</u>  2) <u>Represent the solution set on a number line, using set notation and on a graph</u>	1) <b>Find approximate solutions to equations numerically using iteration</b>



			<p><u>pyramids, cones and composite solids</u></p> <p>4) <u>Calculate exactly with multiples of <math>\pi</math></u></p>		
Themes	<b>Plans and elevations</b>	<b>Sketching graphs</b>	<b>Volume</b>	<b>Inequalities</b>	<b>Iteration</b>
Challenge	1) Drawing 3D shapes from plans and elevations	<p>1) Identify key points on the graph, ie y-intercepts, roots and turning points on their graphs</p> <p>1) Include exponential graphs and are aware that they always cut y-axes at 1 and why.</p> <p>1) Interpret graphs in real life situations</p> <p>1) Give examples of variables which would produce graphs given</p>	<p>2) Multi-step problems involving volume of cubes, cuboids and other right prisms (including cylinders)</p> <p>3) Volume of frustums</p>	<p>1) Solve linear inequalities in two variables</p> <p>1) Solve quadratic inequalities in the form <math>x^2 + bx + c</math> (helps to draw a graph of the equation first)</p> <p>2) Represent 2 or more linear inequalities on the same graph and shade the region which satisfies all inequalities.</p> <p>2) Use graphs to show region satisfied by two inequalities, one quadratic and one linear.</p>	1) Rearrange equation into its iterative formula



Support	1) Nets of 3D shapes	1) Aware of the basic shapes for each type of graph and what the equation would look like. Matching exercises	1) Recap link between the scale factors for length, area and volume Length ~ scale factor Area ~ (scale factor) <sup>2</sup> Volume ~ (scale factor) <sup>3</sup>  3) Recap methods of substitution, reminding students that BIDMAS applies to algebra as well.  3) These formulas will be provided in the exam	1) Solve linear inequalities with one unknown on one side using the same methods as used for solving equations.  2) Represent solution on a number line, understanding the difference between a clear circle and a shaded circle  2) Recap drawing linear graphs using the gradient and y-intercept.  2) Represent a single inequality on a graph	1) Simple formulas  1) Understand that the solution is when the answers converge
Literacy focus	Key words: Plans, front elevation, side elevation, net,	Key words: Linear, quadratic, cubic, reciprocal, exponential, graphs, y-intercept, roots, turning point	Key words: Volume, area, similarity, cube, cuboids, prisms, spheres, pyramids, cylinders, cones, frustums, substitute	Key words: Inequality, equation, graph, linear, quadratic, region, solution	Key words: Iteration, iterative, substitute, solution

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Cross-curricular links	Design and technology	Science, Geography, Business		Science	
SMSC & MBV					
ASSESSMENTS	Assessment 3 ~ February	Assessment 3 ~ February	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	Weekly homework based on work covered in class	Weekly homework based on work covered in class



Scheme of Work		SUBJECT: Mathematics	YEAR: 10 Higher (set 1) ~ Spring term 2
	<b>Simultaneous equations</b>	<b>Trigonometry recap and extension</b>	
Key concepts	1) <u>Solve two simultaneous equations in two variables (linear / linear or linear/quadratic) algebraically</u>  2) <u>Find approximate solutions using a graph</u>  3) <u>Translate simple situations or procedures into algebraic expressions or formulae</u>  4) <u>Derive two simultaneous equations, then solve the equations and interpret the solution</u>	1) <u>Know the formula for Pythagoras' Theorem</u> $a^2 + b^2 = c^2$  <u>Apply it to find length in right angled triangles and, where possible, general triangles in two and three dimensional figures</u>  2) <u>Know and use the trigonometric ratios</u>  $\sin \theta = \frac{\textit{opposite}}{\textit{Hypotenuse}}$  $\cos \theta = \frac{\textit{Adjacent}}{\textit{Hypotenuse}}$  $\tan \theta = \frac{\textit{Adjacent}}{\textit{Opposite}}$	



		<p><u>Apply them to find angles and lengths in right-angled triangles and, where possible, general triangles in two and three dimensional figures</u></p> <p>3) <u>Know the exact values of</u></p> <p><u>Sin <math>\theta</math> and Cos <math>\theta</math> <math>0^\circ</math>, <math>30^\circ</math>, <math>45^\circ</math>, <math>60^\circ</math> and <math>90^\circ</math></u></p> <p><u>Know the exact value of</u></p> <p><u>Tan <math>\theta</math> <math>0^\circ</math>, <math>30^\circ</math>, <math>45^\circ</math> and <math>60^\circ</math></u></p> <p>4) <u>Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides including Pythagoras' Theorem, use known results to obtain simple proofs</u></p> <p>5) Compare lengths using ratio notation; <u>Make links to trigonometric ratios</u></p>
Themes	<b>Simultaneous equations</b>	<b>Trigonometry and Pythagoras</b>
Challenge	<p>1) Use method of elimination to solve 2 linear simultaneous equations</p> <p>1) Use the method of substitution to solve 2 simultaneous equations</p>	<p>1) Calculate missing side lengths in 3D shapes</p> <p>1) Multi-step questions involving Pythagoras</p> <p>2) Calculate missing side lengths and angles in 3D shapes</p> <p>2) Multi-step questions involving Trigonometry</p>



	<p>1) Solve two simultaneous equations, one linear and one quadratic using the method of substitution</p> <p>2) Represent graphically two linear equations and estimate the solution</p> <p>2) Represent graphically one linear one quadratic and estimate the solution</p> <p>4) Create a pair of simultaneous equations and then solve using a variety of methods covered above.</p>	
Support	<p>1) Solve simultaneous equations using the elimination method, slowly building up to multiplying both equations</p> <p>2) Recap constructing graphs of linear and quadratic equations, using table method and gradient and y-intercept method</p> <p>3) Create and solve linear equations from worded descriptions</p>	<p>1) Calculate missing sides in right angled triangles using Pythagoras's Theorem</p> <p>1) Calculate missing sides in special triangles</p> <p>2) Calculate missing sides and angles in right angled triangles</p> <p>2) Calculate missing sides and angles in special triangles</p> <p>3) Need to be able to recall these, Trig song on 'You tube' is useful</p>
Literacy focus	<p>Key words: Simultaneous, equations, linear, quadratic, graphically, solution</p>	<p>Key words: Pythagoras, theorem, trigonometry, sine, cosine, tangent, opposite, adjacent, hypotenuse, triangles, isosceles, equilateral</p>

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Cross-curricular links		Design Technology
SMSC & MBV		
ASSESSMENTS	Assessment 4 ~ Easter	Assessment 4 ~ Easter
Out of school learning	Weekly homework based on work covered in class	Weekly homework based on work covered in class





Scheme of Work		SUBJECT: Mathematics		YEAR: 10 Higher (set 1) ~ Summer term 1	
	Direct and inverse proportion	Vectors	Sine and cosine rule		
Key concepts	<p>1) Solve problems involving direct and inverse proportion, including graphical and algebraic representations</p> <p>2) Understand that <b>X</b> is inversely proportional to <b>Y</b> is equivalent to <b>X</b> is proportional to <math>\frac{1}{Y}</math></p> <p>3) <b>Construct and interpret</b> equations that describe direct and inverse proportion</p> <p>4) Recognise and interpret graphs that illustrate direct and inverse proportion</p>	<p>1) <u>Apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representation of vectors</u></p> <p>2) <b>Use vectors to construct geometric arguments and proofs</b></p>	<p>1) <b>Know and apply the Sine rule</b></p> $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ <p>and Cosine rule</p> $a^2 = b^2 + c^2 - 2bc \cos A$ <p>to find unknown lengths and angles</p> <p>2) Know and apply <math>= \frac{1}{2} ab \sin C</math> to calculate the area, sides or angles of any triangle</p>		
Themes	Direct and inverse proportion	Vectors	Sine and cosine rule		



Challenge	<p>1) Sketch graphs of direct and inverse proportion involving squares and cubes</p> <p>3) Use algebraic notation for creating equations to represent direct and inverse proportion.</p>	<p>1) Four operations with vectors involving negatives</p> <p>2) Diagrams involving fractions of vector, i.e. using midpoints</p> <p>2) Mixing vectors and ratios to solve more complex geometric arguments and proofs</p>	<p>1) Student derive rules for angles</p> <p>1) Identify which rule to use in different situations</p> <p>2) Identify when to use rules for area of triangles</p>
Support	<p>1) Basic wordy problems using direct and inverse proportion, by calculating unitary proportion</p> <p>1) Sketch graphs of simple direct and inverse proportion, i.e. not squares or cubes</p>	<p>1) Link vectors to translations</p> <p>1) Four operations with simple vectors</p> <p>2) Simple basic diagrams involving addition and subtraction of whole vector</p>	<p>1) Provide rules for angles</p> <p>2) Recap rule for calculating area of triangles when height is known</p>
Literacy focus	<p>Key words Direct, inverse, proportion,</p>	<p>Key words Vectors</p>	<p>Key words Sine, Cosine, corresponding side/angle</p>
Cross-curricular links			
SMSC & MBV			
ASSESSMENTS	Assessment 5 ~ Year 10 mock	Assessment 5 ~ Year 10 mock	Assessment 5 ~ Year 10 mock
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: 10 Higher (set 1) ~ Summer term 2
	Catch up time	Revision for year 10 Mocks
Key concepts	Use this time to either; <ul style="list-style-type: none"> <li>• Catch up on anything not done</li> <li>• Go back over anything the teacher feel needs redoing</li> </ul>	Revision for Mock examinations ~  At class teachers' discretion
Themes		
Challenge		
Support		
Literacy focus	Key words	Key words
Cross-curricular links		
SMSC & MBV		
ASSESSMENTS	Assessment 5 ~ Year 10 mock	Assessment 5 ~ Year 10 mock

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Out of school learning	Revision for year 10 mocks	Revision for year 10 mocks
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