

Scheme of Work	SU SU	BJECT: Mathematics	YEAR: 10 Higher (	set 2) ~ Autumn term 1
	Number recap and review	Construction and loci	Basic probability	Properties of polygons
Key concepts	Number recap and review1) Change recurring decimals into their corresponding fractions and vice versa2) Apply and interpret limits of accuracy including upper and lower bounds3) Deduce expressions to calculate the nth term of	Construction and loci         1) Use the standard ruler         and compass constructions:         • perpendicular bisector of a line segment         • constructing a perpendicular to a given line from / at a given point         • bisecting a given angle         2) Know that the	Basic probability1) Record, describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees2) Apply the property that the probabilities of an exhaustive set of outcomes sum to 13) Apply the property that	<ol> <li>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)</li> <li>Derive and apply the properties and definitions of:</li> <li>special types of quadrilaterals, including</li> </ol>
linear <b>and Quadratic</b> sequences 4) Recognise and use <u>simple geometric</u> <u>progressions (`r<sup>n</sup>` where `n`</u>	perpendicular distance from a point to a line is the shortest distance to the line	<ul> <li>the probabilities of an exhaustive set of mutually exclusive events sum to 1</li> <li>4) Construct theoretical possibility spaces for single and combined experiments</li> </ul>	square, rectangle, parallelogram, trapezium, kite and rhombus • Special triangles	



	is an integer and `r` is a	3) <u>Use these to construct</u>	with equally likely outcomes and use these to calculate	Other plane figures     using appropriate
	surd)	given figures and solve loci		using appropriate
	5) Calculate exactly with surds	problems	theoretical probabilities	language
	6) Simplify surd expressions involving squares eg			
	$\sqrt{12} = \sqrt{(4 \times 3)}$			
	$\sqrt{12} = \sqrt{4} \times \sqrt{3}$			
	$\sqrt{12} = 2\sqrt{3}$			
	7) Rationalise			
	denominators			
	8) Calculate with roots and			
	with integer and			
	fractional indices			
Themes	Fractions and surds	Constructions and loci	Basic probability	Properties of polygons
Challenge	1) Convert recurring decimals greater than 1 into	1) Construct points of a compass (N, NE, E, SE, S, SW, W, NW) by just using a	1) Introduce the term 'Relative frequency' and know the best estimate of probability from an	1) Solve geometric multi- step problems using properties of polygons







Support	<ul> <li>8) Solve problems using a variety of the rules of indices</li> <li>1) Convert fractions to decimals, leading on to recurring decimals as answers.</li> <li>1) Convert terminating decimals to fractions</li> <li>2) Rounding to significant figures</li> <li>2) Identify greatest and least values which can be rounded to a given value</li> <li>3) Focus on finding the nth term of a linear sequence</li> <li>4) Can Identify arithmetic and geometric sequences</li> <li>4) Create geometric sequences</li> <li>5) Recap square numbers</li> <li>5) Focus on the methods for performing the four operations with surds, but</li> </ul>	<ul> <li>3) Focus on basic loci which involve one or two simple rules</li> <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>	<ol> <li>Frequency trees are new addition; hence students will not have come across them before now.</li> <li>&amp; 3) Calculate probability from equally likely outcomes</li> <li>Listing all possible outcomes in lists and tables</li> </ol>	1) Find missing angles in polygons and more complex problems by recapping over the basic rules of angle properties
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	leaving answers in un- simplified form			
	6) Focus on smaller numbers, i.e. multiples of 4, 9, 25, 100 etc			
	8) Recap the basic rules of indices, multiplying, dividing and brackets			
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: Constructions, perpendicular, bisector, loci, locus, equidistant	Key words: Probability, events, outcomes, equally likely, sample space diagrams, experiment, theoretical, exhaustive, mutually exclusive, frequency trees	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	SUE	SUBJECT: Mathematics		YEAR: 10 Higher (set 2) ~ Autumn term 2	
	Collecting and representing discrete data. BC & PC	Scatter diagrams	Linear and quadratic equations and their graphs	Congruence and similarity	
Key concepts	<ol> <li>Interpret and construct tables, charts and diagrams including, for categorical data:         <ul> <li>frequency tables</li> <li>bar charts</li> <li>pie charts</li> <li>pictograms</li> <li>vertical line charts</li> </ul> </li> <li>for ungrouped discrete numerical data</li> <li>Tables and line graphs for time series data know their appropriate use</li> </ol>	<ol> <li>Use and interpret scatter graphs of bivariate data</li> <li>Recognise correlation <u>and know that it</u> <u>does not indicate causation</u></li> <li><u>Draw estimated lines of</u> <u>best fit.</u></li> <li><u>Make predictions</u> <u>Interpolate and extrapolate</u> <u>apparent trends whilst</u> <u>knowing the dangers of</u> <u>doing so</u></li> </ol>	<ol> <li>Solve linear equations in one unknown algebraically, including:         <ul> <li>those with the unknown on both sides of the equation</li> <li>Find approximate solutions using a graph</li> </ul> </li> <li>Solve quadratic equations algebraically by factorising</li> </ol>	<ol> <li><u>Use the basic</u> congruence criteria for triangles (SSS, SAS, ASA, RHS)</li> <li><u>Apply angle facts,</u> 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</li> </ol>	



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	3) Interpret, analyse and		Find approximate	3) Apply and use the
	compare distributions of		solutions using a	concepts of congruence and
	data sets from univariate		<u>graph</u>	similarity, including the
	empirical distributions			relationships between
	through appropriate		3) <u>Translate simple</u>	lengths, areas and
	graphical representation		situations or procedures into	volumes in similar figures
	involving discrete,		algebraic expressions or	
	continuous and grouped		formulae; derive an	
	data, <b>including boxplots</b>		equation and the solve the	
			equation and interpret the	
	4) Construct and interpret		solution	
	diagrams for grouped			
	discrete data and			
	continuous data, i.e.			
	histograms with equal			
	and unequal class			
	intervals and cumulative			
	frequency graphs, and			
	know their appropriate			
	use			
Themes	Representing data	Scatter diagrams	Linear and quadratic equations	Congruence and similarity
Challenge	1) Construct composite and	4) Interpret scatter diagrams	1) Solving equations	1) Begin to understand how
	comparative bar charts	in relation to the original	involving fractions on both	to prove two shapes are
		context of the question	sides of the equation	congruent
	2) Calculate and plot			
	moving average to			



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represent overall trend of a	4) Know the dangers of	1) Solving equations using	2) Exam questions to prove
time series graph (Moving	making predictions outside	the 6-step method, i.e.	two triangles are congruent,
average on assessed in	the range of the data.		using geometry properties
maths but it is in statistics		$\frac{3x+4}{5} + \frac{4x-1}{3} = 14$	and circle theorems.
GCSE, but students need to		5 3	
be aware of the method for		2) Recap methods of	<ol> <li>Understand the relationship between the</li> </ol>
smoothing out time series		factorising quadratics of the	ratios of area and volume of
data)		form $ax^2 + bx + c$	similar shapes and their
			scale factors
3) Introduce interquartile		2) Solving quadratics of the	Length ~ scale factor
range to use alongside		form $ax^2 + bx + c$	Area ~ (scale factor) <sup>2</sup> Volume ~ (scale factor) <sup>3</sup>
Median when comparing			
two or more data sets.		2) Use the graph to solve	3) Multi-step questions
		quadratic equations where y	involving similar shapes
4) Estimate the number of		i ≠ 0	
values that are less than or			
greater than a given value		3) Multi-step questions	
using a cumulative		involving other areas of	
frequency curve		mathematics	
4) Compare two sets of data			
using box plots, compare			
the medians and then the			
range or IQR			





	<ul> <li>4) Calculate frequencies from a histogram</li> <li>4) Solve problems such as calculating the mean, proportion of responses above a certain value etc.</li> </ul>			
Support	<ol> <li>Aware that when drawing a bar chart there should be gaps between the bars</li> <li>Interpret frequency tables</li> <li>When comparing data sets, use two statements one based of the average, mean or median and the other based on spread of the data, range or interquartile range.</li> <li>When constructing frequency polygons, cumulative frequency curves and histograms ensure students use a continuous scale along the horizontal axes.</li> </ol>	<ol> <li>Understands that a scatter diagram is used to represent two pieces of data from each subject and we the tables as coordinates.</li> <li>Recap plotting coordinates</li> <li>Can describe in words the relationship between the variables and not just say it is positive or negative correlation.</li> </ol>	<ol> <li>Using inverse operations to solve equations</li> <li>When unknowns are on both sides they need to collect all the unknowns on one side.</li> <li>Show the link/visual representations between an equation and a graph and how to use the graph to solve an equation.</li> <li>Recap methods of factorisation</li> <li>Recap methods of factorising quadratics of the form x<sup>2</sup> + bx + c</li> <li>Plotting quadratic graphs</li> </ol>	<ol> <li>Ensure students understand the difference between congruent shapes and similar shapes.</li> <li>Understand the notation SSS, SAS, ASA, RHS</li> <li>Properties of angles and sides of special triangles and quadrilaterals</li> <li>Understand that similar shapes are enlargements of one another</li> <li>Know that angles in similar shapes are the same.</li> </ol>





			2) Make the link between the roots of the graph and the factorised form of the equation.	
Literacy focus	Key words Bar charts, composite, comparative, pie charts, angles, sectors, pictograms, cumulative frequency, histograms, box plots, interquartile range	Key words: Scatter diagrams, coordinates, correlation, negative, positive, line of best fit, estimate, predict, interpolate, extrapolate	Key words: Linear, quadratic, equation, algebraically, graphs, factorise	Key words Congruent, congruence, similarity, scale factor, enlargement, triangles, quadrilaterals
Cross-curricular links	Science, Geography, Business	Science, Geography, Business		
SMSC & MBV				
ASSESSMENTS	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





Scheme of Work	f Work SUBJECT: Mathematics		YEAR: 10 Higher (set 2) ~ Spring term 1	
	2D representations of 3D shapes	Statistical measures	Sketching graphs	Volume
Key concepts	1) <u>Construct and interpret</u> <u>plans and elevations of</u> <u>3D shapes</u>	Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through: 1) Appropriate measures of central tendency (median, mean, mode and modal class) 2) spread (range, including consideration of outliers, <b>quartiles and inter-</b> <b>quartile range</b> )	1) Recognise, sketch and interpret graphs of: • linear functions, • quadratic functions, • simple cubic functions • reciprocal function where $y = \frac{1}{x}$ with $x \neq 0$	<ol> <li>Compare lengths, areas and volumes using ratio notation. Link to scale factors and <u>similarity</u></li> <li>Know and apply the formulae to calculate the volume of cuboids and other right prisms (including cylinders)</li> <li><u>Calculate the volume of spheres, pyramids, cones and composite solids</u></li> <li><u>Calculate exactly with multiples of `pi`</u></li> </ol>





Themes	Plans and elevations	<ul> <li>3) Apply statistics to describe a population</li> <li>4) <u>Infer properties of</u> <u>populations or distributions</u> <u>from a sample, whilst knowing</u> <u>the limitations of sampling</u></li> <li>Averages</li> </ul>	Sketching graphs	Volume
Challenge	1) Drawing 3D shapes from plans and elevations	<ol> <li>1) Interpret answers in context of the question</li> <li>1) Identify which type of average is best and why</li> <li>1) Calculate median of a frequency table</li> <li>2) Calculate quartiles and interquartile range of a frequency table</li> </ol>	<ol> <li>Identify key points on the graph, i.e. y-intercepts, roots and turning points on their graphs</li> <li>Include exponential graphs and are aware that they always cut y-axes at 1 and why.</li> <li>Interpret graphs in real life situations</li> <li>Give examples of variables which would produce graphs given</li> </ol>	<ul> <li>2) Multi-step problems involving volume of cubes, cuboids and other right prisms (including cylinders)</li> <li>3) Volume of frustums</li> </ul>
Support	1) Nets of 3D shapes	1) Calculate averages of raw data,	1) Aware of the basic shapes for each type of graph and what the	1) Recap link between the scale factors for length, area and volume



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		<ol> <li>Calculate mean and mode of ungrouped and grouped frequency tables</li> </ol>	equation would look like. Matching exercises	Length ~ scale factor Area ~ (scale factor) <sup>2</sup> Volume ~ (scale factor) <sup>3</sup>
		<ul><li>2) Calculate quartiles and interquartile range of raw data</li><li>3) When comparing data sets</li></ul>		<ol> <li>Recap methods of substitution, reminding students that BIDMAS applies to algebra as well.</li> </ol>
		always give two statements, one based on the average and one based on the spread of the data		3) These formulas will be provided in the exam
Literacy focus	Key words: Plans, front elevation, side elevation, net,	Key words: Mode, median, mean, range, quartiles, interquartile range, raw data, frequency tables	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
Cross-curricular links	Design and technology	Science, Geography, Business	Science, Geography, Business	
SMSC & MBV				
ASSESSMENTS	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



Scheme of Work	SUBJECT: Mathematics YEAR: 10 Higher (set 2) ~ Spring term 2		
	Collecting and representing continuous data CF & Histograms	Simultaneous equations	Inequalities
Key concepts	1) Construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and know their appropriate use	<ol> <li>Solve two simultaneous equations in two variables (linear / linear or linear/quadratic) algebraically</li> <li>Find approximate solutions using a graph</li> <li><u>Translate simple situations or</u> procedures into algebraic expressions or formulae</li> <li><u>Derive two simultaneous</u> equations, then solve the</li> </ol>	<ol> <li>Solve linear inequalities in one or two variables and quadratic inequalities in one variable</li> <li>Represent the solution set on a number line, using set notation and on a graph</li> </ol>
Themes		equations and interpret the solution	



	Cumulative frequency and histograms	Simultaneous equations	Inequalities
Challenge	1) Estimate the number of values that are less than or greater than a given	<ol> <li>Use method of elimination to solve</li> <li>2 linear simultaneous equations</li> </ol>	1) Solve linear inequalities in two variables
	value using a cumulative frequency curve	1) Use the method of substitution to solve 2 simultaneous equations	1) Solve quadratic inequalities in the form $x^2 + bx + c$ (helps to draw a graph of the equation first)
	1) Compare two sets of data using box plots, compare the medians and then the range or IQR	1) Solve two simultaneous equations, one linear and one quadratic using the method of substitution	2) Represent 2 or more linear inequalities on the same graph and shade the region which satisfies all inequalities.
	<ol> <li>Calculate frequencies from a histogram</li> <li>Solve problems such as calculating the mean, proportion of responses above a certain value etc.</li> </ol>	<ul> <li>2) Represent graphically two linear equations and estimate the solution</li> <li>2) Represent graphically one linear one quadratic and estimate the solution</li> </ul>	2) Use graphs to show region satisfied by two inequalities, one quadratic and one linear.
		<ol> <li>Create a pair of linear equations and then solve using any of the methods covered above</li> </ol>	
Support	1) When constructing frequency polygons, cumulative frequency curves and histograms ensure students use a continuous scale along the horizontal axes.	1) Solve simultaneous equations using the elimination method, slowly building up to multiplying both equations	1) Solve linear inequalities with one unknown on one side using the same methods as used for solving equations.



		<ul> <li>2) Recap constructing graphs of linear and quadratic equations</li> <li>3) Create and solve linear equations from worded descriptions</li> </ul>	<ul> <li>2) Represent solution on a number line, understanding the difference between a clear circle and a shaded circle</li> <li>2) Recap drawing linear graphs using the gradient and y-intercept.</li> <li>2) Represent a single inequality on a graph</li> </ul>
Literacy focus	Key words Frequencies, cumulative, box plot, median, upper and lower quartiles, histograms, frequency density	Key words: Simultaneous, equations, linear, quadratic, graphically, solution	Key words: Inequality, equation, graph, linear, quadratic, region, solution
Cross-curricular links			Science
SMSC & MBV			
ASSESSMENTS	Assessment 4 ~ Easter	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	Weekly homework based on work covered in class



Scheme of Wo	ork SUBJECT: Ma	athematics YEAR: 10	Higher (set 2) ~ Summer term 1
	Algebra recap and review	Trigonometry recap and extension	Sine and cosine rule
Key concepts	1) <u>Use the form</u>	1) Know the formula for	1) Know and apply the Sine rule
	y = mx + c	Pythagoras' Theorem	
	to identify parallel lines and	$a^2 + b^2 = c^2$	a b c
	perpendicular lines		$\frac{a}{Sin A} = \frac{b}{Sin B} = \frac{c}{Sin C}$
		Apply it to find length in right	
	2) Find the equation of the line	angled triangles and, where	and Cosine rule
	through two given points, or through	possible, general triangles <u>in</u>	2 12 2 21 6 4
	one point with a given gradient	two and three dimensional figures	$a^2 = b^2 + c^2 - 2bc \cos A$
	3) Identify and interpret gradients and	2) Know and use the trigonometric	to find unknown lengths and angles
	intercepts of linear functions	ratios	2) Know and apply $=\frac{1}{2}abSinC$ to
	graphically and algebraically	onnosite	calculate the area, sides or angles
		$Sin \ \theta = rac{opposite}{Hypotenuse}$	of any triangle
	4) Plot and interpret graphs (including	nypotenuse	of any thangle
	reciprocal graphs and exponential	Adjacent	
	graphs) and graphs of non-standard	$Cos \ \theta = \frac{Adjacent}{Hypotenuse}$	
	functions in real contexts, to find		
	approximate solutions to problems		





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such a	s simple kinematics problems	$Tan \theta = \frac{Adjacent}{2}$	
involvi	ng distance, speed and	Tun o = Opposite	
accele	ration		
		Apply them to find angles and	
5) Solv	ve linear equations in one	lengths in right-angled	
unknov	wn algebraically <u>Including those</u>	triangles and, where possible,	
	e unknown on both sides of the	general triangles <u>in two</u> and	
equation		three dimensional figures	
<u>oquan</u>	<u></u>		
		3) Know the exact values of	
		<u>Sin θ and Cos θ 0°, 30° 45°,</u>	
		<u>60° and 90°</u>	
		Know the exact value of	
		<u>Tan θ 0°, 30°, 45° and 60°</u>	
		4) 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	





Thomas	Orenha	5) Compare lengths using ratio notation; <u>Make links to trigonometric</u> <u>ratios</u>	
Themes	Graphs	Trigonometry and Pythagoras	Sine and cosine rule
Challenge	<ol> <li>Discuss the relationship between the gradients of perpendicular lines</li> <li>Find the equation of perpendicular lines</li> </ol>	<ol> <li>Calculate missing side lengths in 3D shapes</li> <li>Multi-step questions involving Pythagoras</li> </ol>	<ol> <li>Student derive rules for angles</li> <li>Identify which rule to use in different situations</li> <li>Identify when to use rules for area of triangles</li> </ol>
	<ul> <li>2) Find the equation of lines given in geometric problems involving circles</li> <li>4) Calculate distance from a speed-time graph, by calculating area under the graph</li> <li>4) Estimate distance from a curved speed-time graph by splitting into rectangles and trapeziums</li> <li>4) Understand, calculate and interpret acceleration.</li> </ul>	<ul> <li>2) Calculate missing side lengths and angles in 3D shapes</li> <li>2) Multi-step questions involving Trigonometry</li> </ul>	
Support	1) Recap drawing straight line graphs using the gradient and intercept	1) Calculate missing sides in right angled triangles using Pythagoras's Theorem	1) Recap rules for substitution and reiterate importance of BIDMAS in algebra



	2) Colouloto the gradient of a line	1) Calculate missing sides in special	1) Drovido rulos for onglos
	2) Calculate the gradient of a line segment	triangles	1) Provide rules for angles
	<ul> <li>3) Identify gradient and intercept from an equation</li> <li>3) Work out the equation of a straight line on a graph</li> <li>4) Plot quadratic and cubic graphs and estimate solutions from the graphs</li> </ul>	<ul> <li>2) Calculate missing sides and angles in right angled triangles</li> <li>2) Calculate missing sides and angles in special triangles</li> <li>3) Need to be able to recall these, Trig song on 'You tube' is useful</li> </ul>	2) Recap rule for calculating area of triangles when height is known
	5) Recap methods for solving equations with one unknown.		
Literacy focus	Key words: Gradient, intercept, parallel, perpendicular, equation, linear, quadratic, cubic, reciprocal, exponential, speed, distance, time, acceleration	Key words: Pythagoras, theorem, trigonometry, sine, cosine, tangent, opposite, adjacent, hypotenuse, triangles, isosceles, equilateral	Key words Sine, Cosine, corresponding side/angle
Cross-curricular links		Design Technology	
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 2) ~ Summer term 2
	Catch up time	Revision for year 10 Mocks
Key concepts	Use this time to either;	
	Catch up on anything not done	Revision for Mock examinations ~
	Go back over anything the teacher feel needs redoing	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



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