Mathematics Year 11 Higher

Term	1			2				3			4	5	6
Topic	**Algebra 1**	**Statistics 1**	**Ratio**	**Geometry 1**	**Statistics 2**	**Algebra 2**	**Geometry 2**	**Algebra 3**	**Number**	**Geometry 3**	**Algebra 4**	**Revision and Exam Practise**	**Revision and Exam Practise**
Detail		Extend current knowledge of probability to include probability tree diagrams, Venn diagrams and set notation.	Understand the concepts of direct and inverse proportion and how it is applied to a graph. Understand and apply compound measures into scientific contexts.	Recall and extend use of Pythagoras' Theorem in both 2D and 3D situations. Develop skills in trigonometry inlcuding SOHCAHTOA, Sine and Cosine rule. Understand	Draw and interpret cumulative frequency diagrams,box plots and histograms to compare data sets. Understand and perform random sampling,	revision and extension of expanding brackets to three binomials. Extend inequalities to identifying and describing regions on a graph. Investigate roots and turning	Recall, apply and prove all the circle theorems	Manipulate algebra to change the subject and use and apply function notation.	Manipulate surds and rationalise the denominator of a fraction containing a surd.	Know, use and apply vector notation to find the resultant of two vectors and prove that two lines can be parallel and/or collinear.	Represent direct and inverse proportion graphically and algebraically. Find an estimate for the area under a non-linear graph. Transform graphs of functions including	Revision and exam practise to fill any knowledge gaps.	Revision and exam practise to fill any knowledge gaps.
Grade 8-9	Solve quadratic equations by completing the square. Create and solve simultaneous equations with one quadratic equation.			Apply upper and lower bounds with right angled trigonometry. Apply Pythagoras' Theorem and Trigonometry to 3D situations.		Find the coordinates of turning points using completing the square. Reason whether a quadratic equation has no roots, two roots or a repeated root.		Solving and simplifying algebraic fractions. Use function notation including composite and inverse functions. Algebraic proof.	Expand and simplify expressions involving surds. Rationalise the denominator of a fraction which contains a surd.	Introduction to vector notation, finding the magnitude of a vector, represent vectors graphically and vector arithmetic. Calculate the resultant of two vectors. Solve problems	Represent direct and inverse proportion graphically and algebraically. Estimate the area under a non-linear graph.	Revision and exam practise of appropriate topics	Revision and exam practise of appropriate topics
Grade 6-7	Solve quadratic equations using the quadratic formula.	Understand and use Venn diagrams and set notation. Use Venn diagram to find probability.	Use multipliers for compound interest, growth and decay. Calculate rates of change. Create and use formulae for direct and inverse proportion. Use similarity with areas and volumes of shapes.	Know and use the sine, cosine and tangent graphs. Know and use the Sine and Cosine rules to find an angle or a side. Know and use the area of a triangle using sine.	Draw,use and interpret cumulative frequency tables and diagrams. Draw and compare box plots for data sets. Draw, interpret and compare data represented in a histogram with unequal bar widths.	Represent inequalities on a graph. Identify and describe regions represented by inequalities. Solve a quadratic equation using an iterative process. Expand the product of three binomials.	Identify, use, problem solve and prove circle theorems.				Recognise and sketch graphs of exponential functions. Calculate the gradient of a tangent at a point on a graph. Transforming graphs of functions.	Revision and exam practise of appropriate topics	Revision and exam practise of appropriate topics
Grade 5	Factorise expressions up to quadratic expressions. Find the roots or solution of a quadratic function. Solve simultaneous equations algebraically. Create and solve linear simultaneous equations.	Create and use probability tree diagrams for dependent events.		Investigate, explore and calculate with right angled trigonometry. Know the exact values of sine, cosine, tangent of 0, 30, 45, 60, 90 degrees. Identify and prove congruent triangles (SSS, SAS, ASA, RHS). Use known facts such as angle facts, similarity, congruency and properties of	Understand and perform a stratified sample. Find estimates using the capture-recapture model of data collection.	Factorise a quadratic expression in the form x^2 + bx + c. Factorise a quadratic expression in the form ax^2 + bx + c. Explain, reason and prove using expanding and factorising. Create an expression or formula to describe a		Change the subject of a formula where the subject appears twice.				Revision and exam practise of appropriate topics	Revision and exam practise of appropriate topics
Grade 4	Solve linear equations up to the variable on both sides and including expanding brackets. Solve inequalities and represent the solution set on a number line.	Create and use probability tree diagrams for independent events.	Calculate using compound measures such as distance, speed and time., density, mass and volume and pressure, force and area. Convert between units of compound measures. Know the meanings of congruent and similar relating to shapes. Identify and find missing	Use and apply Pythagoras' Theorem in a 2D context.	Understand and use random sampling.	Expand and simplify the addition or subtraction of two of more brackets. Multiply two linear expressions of the form (xxa)(xxb). Multiply two linear expressions of the form (x ± a)(x ± b). Expand the expression (x ± a)^2						Revision and exam practise of appropriate topics	Revision and exam practise of appropriate topics
Grade 2-3	Solve equations with variable on one side. Factorising into one bracket.	List outcomes of events and define their probability. Draw and use sample space diagrams. Recall and use the fact of mutually exclusive events adding to 1 include use of	Recognise direct and inverse proportion through points on a graph.		Know and understand key vocabulary for sampling.	Revise drawing straight line graphs and quadratic functions.							
Keywords	unknown, solve, solution set, interval, iteration, simultaneous equations, substitution, elimination, equivalent, expression, expand, linear, quadratic, difference of two squares,	outcome, equally likely outcomes, event, independent, dependent, tree diagrams, random, bias, unbiased, fair, enumerate, set, conditional probability, Venn diagrams	perpendicular bisector, scale factor, similar, congruence, invariance, percentage change, percentage increase, percentage decrease, compound interest, simple interest, growth, decay,	Opposite, adjacent, hypotenuse, trigonometry, function, ratio, sine, cosine, tangent, angle of elevation, angle of depression	categorical data, discrete data, continuous data, grouped data, axis, axes, population, sample, cumulative frequency, box plot, central tendency, mean, mode, median, spread,	Linear, inequality, variable, manipulate, solve, solution set, integer, set notation, region	Radius, radii, tangent, chord, theorem, conjecture, derive, prove, proof, counterexample	equivalent, equation, expression, expand, linear, quadratic, algebraic fraction, difference of two squares, binomial, factorise	power, root, index, indices, surd, simplify, rationalise	vector, scalar, constant, magnitude	direct proportion, inverse proportion, multiplier, function, equation, linear, non-linear, quadratic, cubic. Reciprocal, exponential, parabola, asymptote, gradient, y-intercept, x-		
Resource Links	KM: Introduce (interest, keystone by challenging students to find your chosen number (between 1 and 1000000 when the only clue is 'bigger' or smaller' after each guess. Compare the final	CIMT: Venn Diagrams	KM: Stick on the Maths SSM1: Congruence and similarity	KM: From set squares to trigonometry	Hwb: Stick on the Maths HD1: Statistics_HD2: Comparing Distributions	KM: Linear programming with Lego	KM: Right angle Challenge	KM: Simplifying algebraic fractions	Hwb: Q3 Manipulating s	KM: Vectors	KM: Graphing proportion		
	KM: Babylonian square roots – an introduction to iterative processes	OCR: Check In: Combined Events and Probability Diagrams	KM: Convinced? Congruence and Similarity	KM: Trigonometry flowchart	KM: Cumulative Frequency and Box Plots	KM: Linear programming (Autograph)	KM: Thales Theorem	Hwb: Maths to Infinity: Brackets and Quadratics	Standards Unit: N11 Ma	NRICH: Vectors	KM: Investigating proportionality 2		
	KM: Iteration	AQA: Bridging Unit: Set notation, number lines and Venn diagrams	NRICH: Surface Area and Volume and Nicely Similar	NRICH: Trigonometric protractor	NRICH: The Live of Presidents	KM: Stick on the Maths 8: Inequalities	KM: 6 point circles, 8 point circles, 12 point circles	KM: Stick on the Maths: Quadratic sequences	NRICH: Surds	CIMT: Vectors	KM: Stick on the Maths NNS1: Understanding Proportionality		
	KM: Stick on the Maths: ALG2 Simultaneous linear equations		Hwb: Summerhouse and Radiators	NRICH: Sine and cosine	NRICH: Olympic Triathlon	KM: Convinced?: Inequalities in two variables	KM: Dynamic diagrams	NRICH: What's possible?		AQA: Bridging Units: Ve	KM: Stick on the Maths CALC1: Proportional Change and multiplicative methods		
	KM: Convinced?: ALG2 Simultaneous linear equations		OCR: Congruence Check In and Similarity Check In	Hwb: Greenhouse	NRICH: Box Plot Match	NRICH: Which is bigger?	NRICH: Circle theorems	NRICH: Finding Factors			KM: Convinced: NNS1: Understanding Proportionality		
	NRICH: Matchless		KM: Stick on the Maths 8: Repeated Proportional Change		OCR: Sampling_Analysing Data	Hwb: How do we know?	Hwb: Cadair Idris	Algebra Tiles			KM: Convinced: CALC1: Proportional Change and multiplicative methods		
	AQA: Bridging Units Resource Pocket 4 (Skills builder 2 and 3)		KM: Convinced?: Repeated Proportional Change			MAP: Defining regions using inequalities	Hwb: Cyclic quadrilaterals				Hwb: Inverse or direct?		
	KM: Maths to Infinity: Brackets and Quadratics		NRICH: Repetitiously			CIMT: Inequalities					NRICH: In Proportion		
	KM: Stick on the Maths: Quadratic sequences		Hwb: Borrowing money: APR_ Too good to be true?_Double your money! and Comparing interest								KM: Autograph: Pre-Calculus Activity		
	NRICH: What's possible?										KM: Autograph: The numerical gradient		
	NRICH: Finding Factors										NRICH: What's that graph?		
	Algebra Tiles (external site)										Hwb: The 100m race		
	Learning review										MAP: Representing functions of everyday situations		
	NRICH: How old am I?										ILIM: Interpreting Distance Time Graphs		
	NRICH: Golden thoughts										GCSE: Subject Knowledge Check - Tangents to a curve and Areas under a curve		
	Hwb: Algebra Fails												