Mathematics Year 11 Foundation

Term	1			2		3		4		5	6
Topic	Ratio 1	Geometry 1	Statistics	Ratio	Geometry 2	Algebra 1	Geometry 3	Number 1	Geometry 4	Algebra 2	Revision
Detail	Know and apply aspects of ratio into contexts.	Know and apply Pythagoras' Theorem and right-angled trigonometry including knowing and using some exact values.	Calculate probabilities from a variety of representations including propbability tree diagrams and Venn diagrams.	Calculating with percentages extended to include growth and decay. Working with compound measures in a scientific context.	Constructing and calculating 2D shapes and scale diagram using bearings. Explore the links between graphs and factorising. **Students will need pencil, ruler, rubber, protractor, coloured pencils or pens**	Know and use expanding and factorising expressions. Explore the links between graphs and factorising expressions.	Recall and use the formulae for area and circumference of a circle and how it connects to finding the volume and surface area of a cylinder. Recall and use the formulae for calculating the surface area and volume of spheres, cones and pyramids.	Multiplication and division of fractions and mixed numbers. Understand and use the laws of indices to calculate with standard form.	Know, use and represent vectors and find resultant vectors. Perform vector arithmetic. Use congruency to solve problems involving lengths of shapes.	Plot and use non-linear graphs to solve problems. Solve simultaneous equations both graphically and algebraically including in context. Rearrange scientific formulae	
Grade 8-9											
Grade 6-7											
Grade 5		Recall and apply trigonometric ratios to right angled triangles. Recall and use some exact trigonometric values.	Create and use probability tree diagrams with dependent events.	Use multiplier for repeated percentage change such as compound interest, growth and decay. Use direct and inverse proportion algebraically.	Construct loci to solve problems.	Use quadratic graphs to identify turning points and roots. Factorise and solve a quadratic expression in the form x^2 ± bx ± c. Find the difference of two squares in algebra.	Use and calculate the perimeter and area of sectors. Calculate and solve problems with the area of composite shapes including circles. Find and use the surface and volume of pyramids, spheres and cones. Find the volume and surface area of composite 3D shapes	Evaluate negative indices and reciprocals including on a calculator.	Use congruency to find missing lengths. Add and substract vectors. Find resultant vectors. Multiply a vector by a scalar.	Plot graphs of cubic and reciprocal functions. Use non-linear graphs to solve problems. Solve simultaneous equations algebraically. Proof using algebra.	Revision of appropriate GCSE topics in preparation for the exams.
Grade 4		Investigate, explore and apply Pythagoras' Theorem in context including on graphs.	Create and use simple probability tree diagrams to work out the probability of different outcomes.	Reall and use compound measures such as speed, distance and time. Convert compound units. Use Kinematic formulae in a scientific context.	Accurately construct triangles and other 2D shapes using a ruler and pair of compasses. Construct a polygon inside a circle. Construct a perpendicular bisector of a line and a	Expand and simplify with more than one single bracket. Expand two binomial brackets. Prove and reason with expanding brackets.		Know and use the laws of indices.		Solve simultaneous equations graphically. Rearrange formulae including in a scientific context.	Revision of appropriate GCSE topics in preparation for the exams.
Grade 2-3	Writing and simplifying ratios. Divide an amount into a ratio. Compare quantities using a ratio. Know, use and apply direct proportion. Apply ratio and proportion to graphs.		Create and use two tables to calculate probabilities. Create and use sample space diagrams to list outcomes and find probabilities. Represent information in a Venn diagram and use the diagrams to	Find an amount as a percentage of another amount. Increase or decrease an amount by a percentage. Find an original amount using reverse percentages. Calculate percentage change.	Recognise 3D shapes and their properties. Identify and sketch planes of symmetry. Understand and draw plans and elevations. Accurately construct triangles	Simplify algebraic terms by adding, subtracting or multiplying. Expand single brackets. Plot straight line graphs and quadratic functions using a table of values.	Use and calculate the circumference and area of a circle. Find and use the surface area and volume of cylinders and prisms.	Multiplying fractions and mixed numbers. Dividing fractions and mixed numbers. Use index notation with numbers. Convert numbers to and from standard form. Perform arithmetic with numbers in stadnard form.			Revision of appropriate GCSE topics in preparation for the exams.

| **Keywords** | ratio, proportion, compare, comparison, part, simplify, common factor, cancel, lowest terms, unit | similar, opposite, adjacent, hypotenuse, trigonometry, function, ratio, sine, cosine, tangent, angle of elevation, angle of depression | outcome, equally likely outcomes, event, independent event, dependent event, tree diagrams, theoretical probability, experimental probability, random, bias, inbiased, fair, relative frequency, enumerate, | direct proportion, inverse proportion, multiplier, fraction, percentage changem percentage increase, percentage decrease, compound interest, simple interest, growth, decay, exponential | Compasses, arc, line segment, perpendicular, bisect, perpendicular bisector, locus, loci, bearings, clockwise, corresponding, alternate, angles, protractor | function, equation, linear, non-linear, quadratic, cubic, reciprocal, parabola, asymptote, gradient, y-intercept, x-intercept, root | composite, solid, sphere, pyramid, cone, perpendicular, slant, height, surface area, volume | Power, root, index, indices, standard form | vector, scalar, constant, magnitude, resultant | unknown, solve, simultaneous equations, substitution | |

Resource Links

Ratio 1	Geometry 1	Statistics	Ratio	Geometry 2	Algebra 1	Geometry 3	Number 1	Geometry 4	Algebra 2	Revision
KM: Division in a ratio and checking spreadsheet	KM: From set squares to trigonometry	KM: Stick on the Maths: Tree diagrams	KM: Graphing proportion	KM: Construction instruction	NRICH: What's that graph?	NRICH: Surface Area and Volume	KM: Maths to Infinity: Standard form Maths to Infinity: Indices	KM: Vectors	KM: Stick on the Maths: ALG2 Simultaneous linear equations	
KM: Maths to Infinity: FDPRP	KM: Trigonometry flowchart	KM: Stick on the Maths: Relative frequency	KM: Investigating proportionality 2	KM: Construction challenges	NRICH: How old am I?	Hwb: Summerhouse and Radiators	NRICH: Powers and Roots – Short Problems	NRICH: Vectors	KM: Convinced?: ALG2 Simultaneous linear equations	
KM: Stick on the Maths: Ratio and proportion	NRICH: Trigonometric protractor	KM: The drawing pin experiment	KM: Stick on the Maths NNS1: Understanding Proportionality	KM: Napoleonic challenge	NRICH: Golden thoughts		NRICH: Power Countdown	CIMT: Vectors	NRICH: Matchless	
NRICH: Toad in the hole	NRICH: Sine and cosine	KM: Stick on the Maths HD2: Frequency polygons and scatter diagrams	KM: Stick on the Maths CALC1: Proportional Change and multiplicative methods	KM: Circumcentre etcetera	Hwb: Algebra Fails		Powers of 10	AQA: Bridging Units: Vectors	AQA: Bridging Units Resource Pocket 4 (Skills builder 2 and 3)	
NRICH: Mixing lemonade			KM: Convinced: NNS1: Understanding Proportionality	KM: Locus hocus pocus						
NRICH: Food chains			KM: Convinced: CALC1: Proportional Change and multiplicative methods	KM: The perpendicular bisector						
NRICH: Tray bake			Hwb: Inverse or direct?	KM: Topple						
			NRICH: In Proportion	KM: Gilbert goat						
			KM: Stick on the Maths 8: Repeated Proportional Change							
			KM: Convinced?: Repeated Proportional Change							
			NRICH: Repetitiously Hwb: Borrowing money: APR, Too good to be true!, Double your money! and Comparing interest							