

Mathematics Year 9 Foundation Sets 3,4 and 5

Term	1		2		3		4		5		6		
Topic	Number 1	Number 2	Geometry	Statistics	Algebra	Ratio and Proportion	Algebra	Geometry	Ratio and Proportion	Algebra	Geometry	Algebra	Statistics
Detail	Investigate and use prime factorisation to find the HCF and LCM of 2 or more numbers. Estimate calculations by rounding to a specific degree of accuracy. Explain the links between ordinary numbers and standard form.	Consolidate use of all four operations including powers, brackets, negative numbers, powers and roots.	Explore enlargement, representation of 3D shapes, bearings, and scale diagrams. Students will need protractor, ruler, compass, set square.	Understand the meaning of probability, explore experiments and outcomes, develop an understanding of probability	Develop the use of algebra to interpret multiplying terms, factoring an expression, simplifying expressions, using the laws of indices and algebraic substitution	Explore connections between fractions, decimals, percentages, ratio, proportion and how these can be applied to compound units.	Investigate sequences and interpret a link to algebraic notation for sequences.	Explore angles in parallel lines and regular polygons.	Develop use of percentages in a variety of situations including brackets and set in a context.	Solve linear equations up to unknown on both sides including those with brackets and set in a context.	Investigate and apply the circumference and area of a circle, identifying this to finding the volume of a prism including cylinders.	Explore graphs, looking at gradients, coordinates, lines, quadratics and real life graphs.	Develop knowledge of averages, representing data and comparing data sets.
Grade 8-9													
Grade 6-7			Design 2D shapes by a negative scale factor. Describe an enlargement by a negative scale factor.										
Grade 5	Write upper and lower bounds as an error interval.												
Grade 4	Identify upper and lower bounds.		Design 2D shapes by a positive and fractional scale factor. Describe enlargements with a positive and fractional scale factor.		Know and use the laws of indices: addition and subtraction use that negative powers can arise. Substitute the correct index in formulae. Change the subject of a simple formulae.	Write a decimal or a fraction as a percentage and vice versa. Identify proportions and fractions. Identify similar figures involving ratio or proportion. Draw the connection between speed, distance and time.	Use the nth term of a sequence to make connections about a sequence.	Establish the use of an interior angle in a regular polygon. Solve angle chase problems with parallel lines.	Solve problems that require least calculation involving fractions. Solve finance problems including compound interest and depreciation.	Solve linear equations (can include brackets) with the unknown on both sides when the solution can be a negative integer or fraction. Draw and label equations representing area and perimeter of squares and angles. Recognise that the point of intersection of two graphs corresponds to the solution of a connected equation.	Plot and interpret graphs of linear and quadratic functions in real life contexts. Find intercepts on graphs or speed-time graphs. Find approximate solutions to simultaneous problems involving speed and distance.	Use theoretical and experimental probability to calculate expected outcomes. Draw and interpret histograms with equal class intervals, for grouped data. (Frequency diagrams) Plot and interpret scatter diagrams of bivariate data.	
Grade 2-3	Find the HCF and LCM of two or more numbers. Use BIDMAS with more than one operation in a calculation. Calculate using long multiplication and long division. Know prime square numbers up to 15 x 15, cube numbers up to 125. Find the square root of the square numbers up to 225. Find the cube root of numbers up to 125.	Perform all four operations with integers. Perform all four operations with negative numbers. Use BIDMAS with more than one operation in a calculation. Calculate using long multiplication and long division. Know prime square numbers up to 15 x 15, cube numbers up to 125. Find the square root of the square numbers up to 225. Find the cube root of numbers up to 125.	Draw, measure and interpret bearings and scale diagrams. Represent 2D shapes as plans and elevations.	Know and use the vocabulary of probability. Understand the use of the D to calculate the probability. List all the outcomes for an experiment which describing the probabilities of the outcomes. Work out theoretical and experimental probability for events. Know the probabilities for an outcome is 1.	Simplify algebraic notation by multiplying. Simplify an expression involving terms with coefficients that include a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z. Use a calculator to change any fraction to a decimal. Express a simple expression by using set notation. Describe a situation. Interpret the meaning of compound units.	Convert a fraction to a decimal and identify a fraction as terminating or recurring. Write a decimal as a fraction. Convert a fraction to a decimal by using a calculator to change any fraction to a decimal. Express a simple expression by using set notation. Describe a situation. Interpret the meaning of compound units.	Generate a sequence from a term-to-term rule. Identify and describe the meaning of a position-to-term rule. Generate a sequence. Find the position to term rule for a given sequence using algebra.	Identify alternate and corresponding angles. Know the total of the exterior angles in any polygon and use this to find the exterior angle in a regular polygon.	Find the percentage of an amount. Identify the multiplier for a percentage increase or decrease including when the percentage is greater than 100%. Use calculations to increase an amount by a percentage greater than 100%. Solve to find the original value when working with percentages. Solve finance problems including simple interest.	Solve linear equations with the unknown on one side, when the solution can be a negative integer or fraction. Use substitution to check solutions to linear equations. Use calculations to increase an amount by a percentage greater than 100%. Solve to find the original value when working with percentages. Solve finance problems including simple interest.	Know the vocabulary of circles. Find a connection between the circumference and diameter of a circle. Calculate the circumference of a circle when the radius or diameter is known. Draw and use the formulae for the area of a circle. Know and use the formulae for finding the volume of a prism. Find the volume of a cylinder.	Plot graphs of functions of the form y = ax + b. Understand the concept of and find the gradient of a straight line. Find the gradient and y-intercept of a straight line. Sketch a linear graph. Plot graphs of quadratic functions in the form y = a(x-h) ² + k. Sketch a simple quadratic graph.	Use tree diagrams to list the elements of a set and their probabilities. Use outcomes of a set systematically by using simple tree diagrams and find probabilities. Use frequency trees to record outcomes of probability experiments and make conclusions. Explain different types of data. Collect data and construct a grouped frequency table. Find the mode, median and range from a frequency table of discrete data. Find the mean of a set of data and use the mean to find a missing number in a set of data. Draw and use lines of best fit on a scatter diagram. Find the modal class, class boundaries, median and mode and estimate for the range and mean of a set of grouped data. Know the different types of variation in a scatter diagram.

Keywords	1		2		3		4		5		6	
prime, prime factor, prime factorisation, product, Venn diagrams, highest common factor, lowest common multiple, standard form, significant figure	negative number, divided number, operation, inverse long multiplication, short division, power, index, brackets, significant figure	similar, similarity, enlarge, enlargement, representation of 3D shapes, bearings, scale drawing, bearing, scale, elevation	probability, theoretical probability, event, outcome, impossible, certain, even chance, likely, certain, equally likely, mutually exclusive, exhaustive, possibility space	product, variable, term, coefficient, common factor, factors, power, indices, formula, formulae, subject, change the subject	Fraction, mixed number, top heavy fraction, percentage, decimal, proportion, terminating, recurring, simple, mixed, decimal, time, compound units, multiplier, set notation, units	sequence, linear, term, difference, term-to-term rule, position-to-term rule, ascending, descending	degrees, right angle, acute, obtuse, reflex, vertically opposite, alternate, corresponding, parallel, alternate angles, corresponding angles, interior angle, exterior angle, regular polygon	Simply, cancel, lowest terms, percent, percentage, percentage change, integral amount, multiple, simple interest, event	Algebra, algebraic, algebraically, unknown, equation, operation, solve, solution, brackets, symbol, substitute, graph, point of intersection	Circle, centre, radius, diameter, arc, circumference, π, prism, cross section, cylinder, polygon, prisms, solid	Plot, equation, function, formula, coordinate plane, gradient, y-intercept, substitute, quadratic, piece-wise linear, model, linear, speed, theoretical probability, vector, Bar, Diagram, volume	Outcome, event, experiment, combined experiment, frequency tree, measurement, set, Venn diagrams, probability, simple space, equally likely outcomes, theoretical probability, vector, Bar, Diagram, volume

Resource Links	Use the number 1000 when writing prime factorisations	EM: Summing up	EM: Outdoor Leisure 13	EM: Probability word problems for revision	EM: Missing powers	EM: FDP conversion - Templates for index rules	EM: Spreadsheet	EM: Alternate and corresponding angles	EM: Stick on the Maths: Proportional reasoning	EM: Solving equations	EM: Circle connections - Circle connections v2	EM: Plotting graphs	EM: Sample spaces
	EM: Bee News	EM: Developing... strategies	EM: Algorithms and strategies	EM: Probability loop cards	EM: Lines of indices - Some useful questions	EM: Fraction sign - Tasks and two parts	EM: Generalising... sequences	EM: Parosizing parallel...	EM: Stick on the Maths: Multiplicative methods	EM: Stick on the Maths: Constructing and solving equations	EM: Circle circumference... Circle problems	EM: Matching graphs	EM: Race game
	EM: Astronomical numbers	EM: Sorting calculations	EM: Plans and elevations	EM: Dice and spinners interactive	EM: Maths to Infinity: Indices	EM: Maths to Infinity: Fractions, decimals, percentages, ratio, proportion	EM: Brackets and sequences	EM: Investigating polygons	EM: Percentage identifying	EM: Circumference, searching	EM: Autograph 1	EM: Autograph 1	EM: Stick on the Maths: Lead 3
	EM: Interesting standard form	EM: Maths to Infinity: standard numbers	EM: Transformation template	EM: Scientific substitution (Note that page 2 is hard)	EM: Scientific substitution	EM: Maths to Infinity: Sequences	EM: Maths to Infinity: Lines and Angles	EM: Stick on the Maths: Antiques roadshow	EM: One or both	EM: Maths to Infinity: Area and Volume	EM: Autograph 2	EM: Autograph 2	EM: Stick on the Maths: Lead 3
	EM: Powers of ten	EM: Standards Unit: NS Developing... number statements	EM: Enlargement 1	EM: Enlargement 2	EM: Proportion for real life	EM: Stick on the Maths: Linear sequences	EM: Investigation proportional	EM: Stick on the Maths: Antiques roadshow	EM: Stick on the Maths: Multiplicative methods	EM: Stick on the Maths: Antiques roadshow	EM: The hare and the tortoise	EM: Stick on the Maths: Right prisms	EM: Stick on the Maths: Lead 3
	EM: Maths to Infinity: Standard form	EM: Working with... directed numbers	EM: Enlargement 2	EM: Scientific substitution	EM: Investigation proportional	EM: Stick on the Maths: Linear sequences	EM: Investigation proportional	EM: Stick on the Maths: Antiques roadshow	EM: Stick on the Maths: Multiplicative methods	EM: Stick on the Maths: Antiques roadshow	EM: The hare and the tortoise	EM: Stick on the Maths: Right prisms	EM: Stick on the Maths: Lead 3
	EM: Powers of ten film (external site)	EM: Standards Unit: NS Developing... number statements	EM: Enlargement 2	EM: Scientific substitution	EM: Investigation proportional	EM: Stick on the Maths: Linear sequences	EM: Investigation proportional	EM: Stick on the Maths: Antiques roadshow	EM: Stick on the Maths: Multiplicative methods	EM: Stick on the Maths: Antiques roadshow	EM: The hare and the tortoise	EM: Stick on the Maths: Right prisms	EM: Stick on the Maths: Lead 3
	The scale of the universe animation	EM: Standards Unit: NS Developing... number statements	EM: Enlargement 2	EM: Scientific substitution	EM: Investigation proportional	EM: Stick on the Maths: Linear sequences	EM: Investigation proportional	EM: Stick on the Maths: Antiques roadshow	EM: Stick on the Maths: Multiplicative methods	EM: Stick on the Maths: Antiques roadshow	EM: The hare and the tortoise	EM: Stick on the Maths: Right prisms	EM: Stick on the Maths: Lead 3
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