

Subject : Maths Foundation		Year Group:	
Scheme title	Half term 1 - June	Half term 2 - September	Half term 3 - November
Purpose of scheme	To develop fluency, problem solving and reasoning skills across the 6 key areas of number, algebra, geometry and measures, statistics, probability and ratio and proportion	To develop fluency, problem solving and reasoning skills across the 6 key areas of number, algebra, geometry and measures, statistics, probability and ratio and proportion	To develop fluency, problem solving and reasoning skills across the 6 key areas of number, algebra, geometry and measures, statistics, probability and ratio and proportion
	Number - Types of Number •Use hierarchy of operations to carry out calculations (BODMAS/BIDMAS) (P) •Understand positive and negative integers (P) •Add and subtract positive and negative numbers (P) •Multiply and divide positive and negative numbers (P) •Find the factors of a number •Find the least common multiple (LCM) of two numbers •Find the highest common factor (HCF) of two numbers •Recognise prime numbers (P) •Write a number as a product of prime factors •Use Venn diagrams ENTRY LEVEL MATHS: Component 1 – Properties of Number (For nurture students only) ENTRY LEVEL MATHS: Component 2 – The Four Operations (For nurture students only) Algebra - Sequences •Find a term in a sequence with positive numbers (P) •Write the term-to-term rule in a sequence with positive numbers •Find a term in a sequence with negative or fractional numbers (P) •Write the term-to-term rule in a sequence with negative or fractional numbers •Write the terms of a sequence or a series of diagrams given the nth term •Write the nth term of a sequence or a series of diagrams •Recognise and use sequences or triangular, square and cube numbers, Fibonacci type sequences, quadratic sequences and geometric sequences. Geometry and Measure - Trigonometry •Recap Pythagoras' Theorem •Use sine, cosine and tangent to calculate a side in a right angled triangle •Use sine, cosine and tangent to calculate an angle in a right angled triangle •Use trigonometry to solve problems, including those involving bearings (P) •Know exact values of sin/cos/tan at the key angles 0, 30, 45, 60, 90 Ratio and Proportion and rates of change – Compound Measures •Read values from conversion graphs (P) •Calculate measures such as speed, density and pressure. •Read a value from a conversion graph for a negative value •Construct linear functions from real-life situations and plot their corresponding graphs •Interpret horizontal lines on a distance-time graph •Carry out simple interpretation of graphs such as finding a distance from distance-time graphs •Carry out more advanced interpretation of real-life graphs, such as finding simple average speed from distance-time graphs and recognising when the fastest average speed takes place •Find the average speed in km/h from a distance-time graph over time in minutes	Algebra - Working with Symbols •Simplify an expression such as $3x + 2x - x$ (P) •Understand the rules of arithmetic as applied to algebra, such as $x - y$ is not the same as $y - x$ •Work out the value of an expression such as $4y - 3y$ when $x=1$ and $y=2$ •Work out the value of an expression such as $5x - 3y$ when $x = -2$ and $y = -3$ (P) •Expand brackets such as $x(x + 2)$ in context •Expand double brackets •Expand and simplify an expression such as $x(2x+1) - x(2x - 3)$ (P) •Factorise an expression such as $x^2 + 4x$ •Factorise quadratic functions Number - Percentages •Understand that percentage means 'number of parts per 100' and use this to compare proportions •Work out a percentage of a given quantity (P) •Increase or decrease by a given percentage •Express one quantity as a percentage of another •Work out a percentage increase or decrease and reverse percentages. •Set up, solve and interpret the answers in growth and decay problems including compound interest. •Interpret graphs showing direct and indirect proportion problems Ratio, proportion and rates of change - Ratio •Use ratio notation, including reduction to its simplest form and its links to fraction notation •Explain relationship between two quantities as a ratio or a fraction(*) •Solve ratio and proportion problems, such as finding and simplifying a ratio (P) •Solve more complex ratio and proportion problems (See resource bank for suggestions) •Solve ratio and proportion problems using the unitary method •Compare lengths, areas and volumes using ratio notation – make links to similarity (including trig ratios) •Solve direct and indirect proportion problems ENTRY LEVEL MATHS: Component 3 – Ratio (For nurture students only) Geometry and Measure - Area and Perimeter •Find the perimeter and area of a shape by counting (P) •Estimate the area of an irregular shape by counting squares and part squares (P) •Work out the area and perimeter of a simple rectangle, such as 5m by 4m •Work out the area and perimeter of a harder rectangle, such as 2.6m by 8.3m •Find the area of a triangle, parallelogram and trapezium (P) •Find the area and perimeter of shapes made from triangles and rectangles and semi-circles •Name the parts of a circle (P) •Calculate the circumference and area of a circles ENTRY LEVEL MATHS: Component 7 – Geometry (For nurture students only) Algebra - Linear Graphs •Produce a table of values for equations such as $y = 3x - 5$ or $x + y = 7$ and draw their graphs •Solve problems such as finding where the line $y = 3x - 5$ crosses the line $y = 4$ •Find the gradients of straight-line graphs (P) •Interpret the gradient of a straight line graph as a rate of change •Use $y=mx+c$ to identify parallel lines •Find the equation of the line through two given points, or through one point with a given gradient. Statistics – Statistical Measures •Find the mode for a set of numbers/ modal class for grouped data (P) •Find the median for an odd set of numbers •Find the median for an even set of numbers (P) •Work out the range for a set of numbers (P) •Calculate the mean for a set of numbers •Compare the mean and range of two distributions •Calculate the 'fx' column for a frequency distribution •Calculate the mean for a frequency distribution •Find the mean for grouped data •Find the median class for grouped data	Probability •Understand and use the vocabulary of probability •Understand and use the probability scale (P) •Express a probability as a fraction •Understand the differences between experimental and theoretical probability •Use a two-way table to find probability •Understand mutually exclusive events •Identify different mutually exclusive events and know, if they cover all possibilities, then the sum of their probabilities is 1 •Use probability to estimate outcomes for a population •Understand and use relative frequency •Use tree diagrams to solve probability questions ENTRY LEVEL MATHS: Component 4 – Money (For nurture students only) Algebra - Equations •Solve a simple equation such as $5x = 10$ or $x + 4 = 7$ (P) •Solve an equation involving fractions such as $x/3 = 4$ or $2x - 3 = 8$ •Solve more complicated equations such as $3x + 2 = 6 - x$ •Solve more complicated equations such as $4(2x - 1) = 20$ •Solve an equation such as $4x + 5 = 3(x + 4)$ (P) •Solve an equation such as $x/2 - x/8 = 9$ or $(2x - 7)/4 = 1$ ----- •Represent and interpret inequalities on a number line •Solve an inequality such as $2x - 7 < 9$ (P) •Find the integer solutions of an inequality such as $-8 < 2n \leq 5$ •Solve simultaneous equations algebraically •Find approximate solutions to simultaneous equations graphically Number - Fractions and Decimals •Add and subtract negative numbers (P) •Multiply and divide negative numbers ----- •Put integers and simple fractions in order (P) •Find equivalent fractions and simplify fractions •Calculate fractions of quantities including diagrams •Add and subtract fractions and mixed numbers (P) •Solve problems involving fractions ----- •Find the reciprocal of a number (P) •Multiply and divide fractions •Express fractions as decimals and percentages (P) ENTRY LEVEL MATHS: Component 5 – the calendar and time (For nurture students only) Geometry and Measure - Transformations •Reflect shapes in lines parallel to the axes, such as $x = 2$ and $y = -1$, the axes and lines such as $y = x$ and $y = -x$ •Describe fully reflections in any line parallel to the axes, $y = x$ or $y = -x$ •Give the order of rotational symmetry of a 2-D shape (P) •Rotate shapes about the origin/any point •Find the centre of rotation and describe it fully •Translate a shape using a description such as 4 units right and 3 units down/vector (P) •Enlarge a shape by a positive scale factor and state the scale factor of an enlargement •Enlarge a shape by a positive scale factor/fractional scale factor from a given centre •Find the ratio of corresponding lengths in similar shapes and identify this as the scale factor of enlargement ----- •Use ratios in similar shapes to find missing lengths •Test triangles for congruence (SSS, SAS, ASA, RHS)
Skills			
Key Words	BIDMAS Negative Integer HCF LCM Product Primes Sequence Term Trigonometry Hypotenuse	Parallelogram Trapezium Rhombus Interior Quadrilateral Polygon Sum Expression Factorise Expand Quadratic Ratio Proportion Direct Indirect Significant figure Terminating Recurring	Quadratic Cubic Reciprocal Equation Integer Inequality Approximate Simultaneous Negative Integer Equivalent Reciprocal Reflect Rotate Translate Enlarge
End Point	Students are able to understand and apply the skills identified above.	Students are able to understand and apply the skills identified above.	Students are able to understand and apply the skills identified above.
Assessment method	After each topic in bold (listed opposite), students complete a reflection grid which is marked in class then later teacher marked. This will be stuck in books to record progress and support revision. Students complete one GCSE style assessment once per term. Results are recorded centrally by teachers on a central spreadsheet. Students complete RAG analysis to identify their strengths and areas for development. Assessments are cumulative and grade boundaries reflect GCSE Maths.	After each topic in bold (listed opposite), students complete a reflection grid which is marked in class then later teacher marked. This will be stuck in books to record progress and support revision. Students complete one GCSE style assessment once per term. Results are recorded centrally by teachers on a central spreadsheet. Students complete RAG analysis to identify their strengths and areas for development. Assessments are cumulative and grade boundaries reflect GCSE Maths.	After each topic in bold (listed opposite), students complete a reflection grid which is marked in class then later teacher marked. This will be stuck in books to record progress and support revision. Students complete one GCSE style assessment once per term. Results are recorded centrally by teachers on a central spreadsheet. Students complete RAG analysis to identify their strengths and areas for development. Assessments are cumulative and grade boundaries reflect GCSE Maths.

Half term 4 - January	Half term 5 - March
To develop fluency, problem solving and reasoning skills across the 6 key areas of number, algebra, geometry and measures, statistics, probability and ratio and proportion Algebra - Formulae • Use a formula written in words such as: Total pay = rate per hour $\times$ no. of hours + bonus • Derive simple expressions (P) • Derive expressions and formulae and know the difference between an equation and identity. • Derive more complex expressions and formulae • Substitute positive numbers into a simple formula such as $P = 2L + 2W$ • Use a formula such as $P = 2L + 2W$ to find W given P and L • Substitute negative numbers into a simple formula (P) • Use formulae from mathematics and other subjects • Substitute numbers into more complicated formulae such as $C = ((A+1))/9$ • Distinguish between an expression, an equation and a formula • Rearrange linear formula such as $p = 3q + 5$ (P) Number - Indices • Work out or know simple squares and square roots (P) • Work out or know simple cubes and cube roots • Use the terms square, positive square root, negative square root, cube and cube root • Recall integer squares from 2×2 to 15×15 and the corresponding square roots (P) • Recall the cubes of 2, 3, 4, 5 and 10 and the corresponding cube roots • Use index notation and index laws for multiplication and division for positive integer powers • Use standard form (P) Geometry and Measure - Scales • Decide which is the most appropriate unit of measurement to use in everyday situations • Measure the length of a line (P) • Make sensible estimates of lengths • Measure and scale a line (P) • Recognise that measurements to the nearest unit may be inaccurate by up to one half unit in either direction ENTRY LEVEL MATHS: Component 6 – Measures (For nurture students only) Geometry and Measure – Volume and Surface Area • Find the volume of a shape by counting cubes (P) • Find the volume of a cuboid • Convert between cube units such as changing 3.7 m^3 to cm^3 (P) • Find the volume of prisms including cylinders • Convert between square units such as changing 2.6 m^2 to cm^2 (P) • Find the surface area of simple prisms • Find corresponding lengths in similar shapes • Surface area and volumes of spheres, pyramids, cones and composite solids	To develop fluency, problem solving and reasoning skills across the 6 key areas of number, algebra, geometry and measures, statistics, probability and ratio and proportion Statistics - Representing Data • Understand the data – handling cycle • Construct and interpret a dual bar chart • Interpret a pie chart/Construct a pie chart (P) • Construct a histogram for data with equal class intervals • Interpret a line graph • Construct and interpret a scatter graph ENTRY LEVEL MATHS: Component 8 – Statistics (For nurture students only) Algebra - Co-ordinates and Graphs • Use co-ordinates in all four quadrants, such as $(2, -1)$, $(-2, -3)$ and $(-2, 1)$ • Draw lines such as $x=3$, and $y=4$ (P) • Use simple real-life graphs, such as read values from conversion graphs • Use real-life graphs to find values, such as distances from distance-time graphs • Make simple interpretations of real-life graphs including distance time graphs • Sketch quadratic, simple cubic functions and the reciprocal function Geometry and Measures - Loci • Understand the idea of a locus • Construct the locus of points equidistant from two fixed points • Construct the locus of points equidistant from two fixed lines • Solve loci problems, for example the locus of points less than 3 cm from a point Algebra - Quadratics • Draw graphs of simple quadratics such as $y = x^2$, $y = x^2 - 4$ and $y = 3x^2$ • Draw graphs of harder quadratics such as $y = x^2 + 2x + 1$ • Identify and interpret roots, intercepts and turning points of quadratic functions graphically Geometry and Measure - Pythagoras • Use Pythagoras' theorem to find the third side of a right-angled triangle (P) • Use Pythagoras' theorem to prove that a triangle is right-angled Geometry and Measure - Vectors • Addition and Subtraction of Vectors • Multiplication of a vector by a scalar • Represent vectors on a diagram Geometry and Measure - Angles • Recognise acute, obtuse and right angles and name shapes such as parallelogram, trapezium and rhombus (P) • Estimate angles and measures them accurately (P) • Use angles properties of triangles/straight line including the sum of 180 (P) • Recognise and Calculate interior and exterior angles of a quadrilateral/regular polygons
Formula Expression Equation Indices Rate of change Linear Compound measure Surface area Volume	Construct Interpret Locus Bisect Construct Median Mean Mode Probability Quadratic Vector
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