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| **Curriculum Long Term Planning Overview** | **Key Stage 3** | **Subject Area: Maths** |  |

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| **Year** | **Autumn Term 1** | **Autumn Term 2** | **Spring Term 1** | **Spring Term 2** | **Summer Term 1** | **Summer Term 2** |
| **Year 7**  **Set 2** | **Number 1 and Calculating**  **This unit builds upon from KS2**   * Know the meaning of a prime number * Recall prime numbers up to 50 * Understand the use of notation for powers * Know how to round to the nearest whole number, 10, 100, 1000 and to decimal places * Multiply and divide numbers by powers of 10 * Know how to identify the first significant figure in any number * Approximate by rounding to the first significant figure in any number * Calculate with negative numbers * Apply the correct order of operations   **This unit introduces**   * Recall prime numbers up to 100 * Understand the meaning of prime factor * Write a number as a product of its prime factors * Use a Venn diagram to sort information * Use prime factorisations to find the highest common factor of two numbers * Use prime factorisations to find the lowest common multiple of two numbers * Solve worded questions involving hcf and lcm * Know how to identify any significant figure in any number * Approximate by rounding to any significant figure in any number * Add or subtract from a negative number * Add (or subtract) a negative number to (from) a positive number * Add (or subtract) a negative number to (from) a negative number * Multiply positive numbers by a negative number * Multiply negative numbers by a negative number * Divide positive numbers by a negative number * Divide negative numbers by a negative number * Know how to square (or cube) a negative number * Enter negative numbers into a calculator * Use a scientific calculator to calculate with fractions, both positive and negative * Interpret a calculator display when working with negative numbers * Understand how to use the order of operations including powers * Understand how to use the order of operations including roots | **Algebraic Manipulation 1**  **This unit builds upon from KS2**   * Use symbols (including letters) to represent missing numbers * Substitute numbers into worded formulae * Substitute numbers into simple algebraic formulae * Know the order of operations   **This unit introduces**   * Know the meaning of expression, term, formula, equation, function * Know basic algebraic notation (the rules of algebra) * Use letters to represent variables * Identify like terms in an expression * Simplify an expression by collecting like terms * Know how to multiply a (positive) single term over a bracket (the distributive law) * Substitute positive numbers into expressions and formulae * Given a function, establish outputs from given inputs * Given a function, establish inputs from given outputs * Use a mapping diagram (function machine) to represent a function * Use an expression to represent a function   Use the order of operations correctly in algebraic situations | **Exploring FDP and Calculating with FDP**  **This unit builds upon from KS2**   * Add and subtract fractions with different denominators * Add and subtract mixed numbers with different denominators * Multiply a proper fraction by a proper fraction * Divide a proper fraction by a whole number * Simplify the answer to a calculation when appropriate * Use non-calculator methods to find a percentage of an amount * Convert between fractions, decimals and percentages   **This unit introduces**   * Identify if a fraction is terminating or recurring * Recall some decimal and fraction equivalents (e.g. tenths, fifths, eighths) * Write a decimal as a fraction * Find equivalent fractions and write a fraction in its lowest terms by cancelling common factors * Identify when a fraction can be scaled to tenths or hundredths * Convert between FDP * Convert between mixed numbers and improper fractions   Apply all four operations to fractions and mixed numbers.   * Recognise when a fraction (percentage) should be interpreted as a number * Recognise when a fraction (percentage) should be interpreted as an operator * Identify the multiplier for a percentage increase or decrease when the percentage is greater than 100% * Use calculators to increase an amount by a percentage greater than 100% * Solve problems involving percentage change * Solve original value problems when working with percentages * Solve financial problems including simple interest * Understand the meaning of giving an exact solution   Solve problems that require exact calculation with fractions | **Proportional Reasoning**  **This unit builds upon from KS2**   * Find a relevant multiplier in a situation involving proportion * Plot the graph of a linear function * Understand the meaning of a compound unit * Convert between units of length, capacity, mass and time   **This unit introduces**   * Identify ratio in a real-life context * Write a ratio to describe a situation * Find equivalent ratios and understand how to simplify a ratio * Divide an amount by a given ratio * Understand the connections between ratios and fractions * Understand the meaning of a compound unit * Convert between compound units * Know the connection between speed, distance and time * Solve problems involving speed   Identify when it is necessary to convert quantities in order to use a sensible unit of measure  **Sequences 1**  **This unit builds upon from KS2**   * Use a term-to-term rule to generate a sequence * Find the term-to-term rule for a sequence * Describe a sequence using the term-to-term rule   **This unit introduces**   * Use a term-to-term rule to generate a linear sequence * Use a term-to-term rule to generate a non-linear sequence * Find the term-to-term rule for a sequence * Describe a number sequence * Solve problems involving the term-to-term rule for a sequence * Solve problems involving the term-to-term rule for a non-numerical sequence | **Algebraic Manipulation 2, Formulae and Solving Equations 1**  **This unit builds upon**  Year 7, Number 1 and Calculating, Algebraic Manipulation 1  **This unit introduces**   * Know how to write products algebraically * Use fractions when working in algebraic situations * Simplify an expression involving terms with combinations of variables (e.g. 3a²b + 4ab2 + 2a2 – a2b) * Identify common factors (numerical and algebraic) of terms in an expression * Factorise an expression by taking out common factors * Simplify an expression involving terms with combinations of variables (e.g. 3a²b + 4ab2 + 2a2 – a2b) * Know the multiplication, division, power and zero law of indices * Know the negative and fractions law of indices. * Understand that negative powers can arise * Substitute positive and negative numbers into formulae * Be aware of common scientific formulae * Know the meaning of the ‘subject’ of a formula * Change the subject of a formula when one step is required   Change the subject of a formula when a two steps are required   * Building equations * Choose the required inverse operation when solving an equation * Identify the correct order of undoing the operations in an equation * Solve one-step equations when the solution is a whole number (fraction) * Solve two-step equations (including the use of brackets) when the solution is a whole number * Solve two-step equations (including the use of brackets) when the solution is a fraction * Solve three-step equations (including the use of brackets) when the solution is a whole number * Solve three-step equations (including the use of brackets) when the solution is a fraction * Check the solution to an equation by substitution | **Investigating angles**  **This unit builds upon from KS2**   * Use angles at a point, angles at a point on a line and vertically opposite angles to calculate missing angles in geometrical diagrams * Know that the angles in a triangle total 180°   **This unit introduces**   * Identify alternate angles and know that they are equal * Identify corresponding angles and know that they are equal * Use knowledge of alternate and corresponding angles to calculate missing angles in geometrical diagrams * Establish the fact that angles in a triangle must total 180° (apply to algebraic problems) * Solve missing angle problems involving alternate angles * Solve missing angle problems involving corresponding angles * Use the fact that angles in a triangle total 180° to work out the total of the angles in any polygon * Establish the size of an interior angle in a regular polygon * Know the total of the exterior angles in any polygon * Establish the size of an exterior angle in a regular polygon   Solve missing angle problems in polygons  **Constructions 1**  **This unit builds upon from KS2**   * Measure distances to the nearest millimetre * Create and interpret scale diagrams * Use compasses to draw circles * Interpret plan and elevations   **This unit introduces**   * Use compasses to construct clean arcs * Use ruler and compasses to construct an equilateral triangle * Use ruler and compasses to construct an isosceles triangle * Use ruler and compasses to construct a right angled triangle * Know how to deal with a change in depth when dealing with plans and elevations * Construct a shape from its plans and elevations * Construct the plan and elevations of a given shape |
| Open book end of topic assessment | Closed book end of term test | Open book end of topic assessment | Open book end of topic assessment | Open book end of topic assessment | Closed book end of term test |

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| **Year 8**  **Set 1** | **Calculating Space**  **This unit builds upon**   * Calculating the area of simple 2D shapes (from KS2)   Year 7, Exploring Fraction, Decimal, Percentages  **This unit introduces**   * Calculate the area of a trapezium * Know the vocabulary of circles * Know that the number π (pi) = 3.1415926535… * Recall π to two decimal places * Know the formula circumference of a circle = 2πr = πd * Calculate the circumference of a circle when radius (diameter) is given * Calculate the radius (diameter) of a circle when the circumference is known * Calculate the perimeter of composite shapes that include sections of a circle * Know the formula area of a circle = πr² * Calculate the area of a circle when radius (diameter) is given * Calculate the radius (diameter) of a circle when the area is known * Calculate the area of composite shapes that include sections of a circle * Know the formula for finding the volume of a right prism (cylinder) * Calculate the volume of a right prism   Calculate the volume of a cylinder  **Straight Line Graphs**  **This unit builds upon**  Year 7, Algebra Manipulation 1 & 2, including Solving equations  **This unit introduces**   * Know that graphs of functions of the form y = mx + c, x ± y = c and ax ± by = c are linear * Plot graphs of functions of the form y = mx + c (x ± y = c, ax ± by = c) * Plot graphs of functions of the form ax ± by = c * Draw and recognise the graphs of y = c and x = c * Understand the concept of the gradient of a straight line * Find the gradient of a straight line on a unit grid * Find the y-intercept of a straight line * Sketch a linear graph * Distinguish between a linear and quadratic graph * Plot graphs of quadratic functions of the form y = x2 ± c * Sketch a simple quadratic graph * Plot and interpret graphs of piece-wise linear functions in real contexts * Plot and interpret distance-time graphs (speed-time graphs) * Find approximate solutions to kinematic problems involving distance and speed | **Straight Line Graphs cont’d**  **This unit introduces**   * Know that graphs of functions of the form y = mx + c, x ± y = c and ax ± by = c are linear * Plot graphs of functions of the form y = mx + c (x ± y = c, ax ± by = c) * Plot graphs of functions of the form ax ± by = c * Draw and recognise the graphs of y = c and x = c * Understand the concept of the gradient of a straight line * Find the gradient of a straight line on a unit grid * Find the y-intercept of a straight line * Sketch a linear graph * Distinguish between a linear and quadratic graph * Plot graphs of quadratic functions of the form y = x2 ± c * Sketch a simple quadratic graph * Plot and interpret graphs of piece-wise linear functions in real contexts * Plot and interpret distance-time graphs (speed-time graphs) * Find approximate solutions to kinematic problems involving distance and speed   **Solving Equations 2**  **This unit builds upon**  Year 7, Algebra Manipulation 1 & 2, including Solving equations  **This unit introduces**   * Solve linear equations with the unknown on both sides when the solution is a whole number * Solve linear equations with the unknown on both sides when the solution is a fraction * Solve linear equations with the unknown on both sides when the solution is a negative number * Solve linear equations with the unknown on both sides when the equation involves brackets * Recognise that the point of intersection of two graphs corresponds to the solution of a connected equation   Check the solution to an equation by substitution  **Transformations**  **This unit builds upon**  Year 7, Exploring FDP, Plotting coordinates (KS2)  **This unit introduces**   * Translate a shape given a vector * Reflect shapes in the x and y axis * Rotate a shape about a point, given an angle and direction * Use the centre and scale factor to carry out an enlargement of a 2D shape with a fractional scale factor * Find the scale factor of an enlargement with fractional scale factor * Find the centre of an enlargement with fractional scale factor * Perform a sequence of transformations on a 2D shape * Find and describe a single transformation given two congruent 2D shapes * Solve problems involving similarity | **Algebraic Manipulation 3**  **This unit builds upon**  Year 7, Algebra Manipulation 1 & 2, including Solving equations  **This unit introduces**   * Understand the meaning of an identity * Multiply two linear expressions of the form (x + a)(x + b) * Multiply two linear expressions of the form (x ± a)(x ± b) * Expand the expression (x ± a)2 * Simplify an expression involving ‘x2’ by collecting like terms * Identify when it is necessary to remove factors to factorise a quadratic expression * Identify when it is necessary to find two linear expressions to factorise a quadratic expression * Factorise a quadratic expression of the form x² + bx + c | **Presentation of Data**  **This unit introduces**   * Construct and interpret pie charts * Construct graphs of time series * Interpret graphs of time series * Construct and interpret compound bar charts * Interpret a wider range of non-standard graphs and charts * Understand that correlation does not indicate causation * Interpret a scatter diagram using understanding of correlation * Construct a line of best fit on a scatter diagram * Use a line of best fit to estimate values * Know when it is appropriate to use a line of best fit to estimate values   **Number 2**  **This unit builds upon**  Year 7, Number 1  **This unit introduces**   * Calculate with positive indices (roots) using written methods * Calculate with negative indices in the context of standard form * Use a calculator to evaluate numerical expressions involving powers (roots) * Interpret a number written in standard form * Add (subtract) numbers written in standard form * Multiply (divide) numbers written in standard form * Convert a ‘near miss’ into standard form; e.g. 23 × 107 * Enter a calculation written in standard form into a scientific calculator * Interpret the standard form display of a scientific calculator * Understand the difference between truncating and rounding * Identify the minimum and maximum values of an amount that has been rounded (to nearest x, x d.p., x s.f.) * Use inequalities to describe the range of values for a rounded value * Solve problems involving the maximum and minimum values of an amount that has been rounded | **Triangles**  **This unit builds upon**  Year 7, Number 1, Algebra Manipulation 1 & 2, including Solving equations  **This unit introduces**   * Know Pythagoras’ theorem * Identify the hypotenuse in a right-angled triangle * Know when to apply Pythagoras’ theorem * Calculate the hypotenuse of a right-angled triangle using Pythagoras’ theorem   Calculate one of the shorter sides in a right-angled triangle using Pythagoras’ theorem  **Sequences 2**  **This unit builds upon**  Year 7, Sequences 1  **This unit introduces**   * Understand the meaning of a position-to-term rule * Use a position-to-term rule to generate a sequence * Find the position-to-term rule for a given sequence * Use algebra to describe the position-to-term rule of a linear sequence (the nth term)   Use the nth term of a sequence to deduce if a given number is in a sequence  **Constructions 2**  **This unit builds upon**  Year 7, Constructions 1  **This unit introduces**   * Use ruler and compasses to construct the perpendicular bisector of a line segment * Use ruler and compasses to bisect an angle * Use a ruler and compasses to construct a perpendicular to a line from a point (at a point) * Understand the meaning of locus (loci) * Know how to construct the locus of points a fixed distance from a point (from a line) * Identify when to use the locus of points a fixed distance from a point (from a line) * Identify when a perpendicular bisector is needed to solve a loci problem * Identify when an angle bisector is needed to solve a loci problem | **Measuring Data**   * Find the modal class of set of grouped data * Find the class containing the median of a set of data * Calculate an estimate of the mean from a grouped frequency table * Estimate the range from a grouped frequency table * Analyse and compare sets of data, appreciating the limitations of different statistics (mean, median, mode, range)   Choose appropriate statistics to describe a set of data  **Probability**  **This unit builds upon**  Year 7, Exploring FDP 1, Understanding simple ideas of probability (KS2)  **This unit introduces**   * Know that probability is a way of measuring likeliness * Know and use the vocabulary of probability * Understand the use of the 0-1 scale to measure probability * Assess likeliness and place events on a probability scale * List all the outcomes for an experiment * Identify equally likely outcomes * Work out theoretical probabilities for events with equally likely outcomes * Know how to represent a probability * Recognise when it is not possible to work out a theoretical probability for an event * Know that the sum of probabilities for all outcomes is 1   Apply the fact that the sum of probabilities for all outcomes is 1   * List all elements in a combination of sets using a Venn diagram * List outcomes of an event systematically * Use a table to list all outcomes of an event * List outcomes of an event using a grid (two-way table) * Calculate probabilities using a possibility space * Use theoretical probability to calculate expected outcomes * Use experimental probability to calculate expected outcomes |
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