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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 1** | **Number 1 and Calculating**  **This unit builds upon from KS2**   * Know the meaning of powers * Know the meaning of roots * Know the multiplication and division laws of indices * Understand and use standard form to write numbers * Round to a given number of decimal places or significant figures   Know the meaning of the symbols <, >, ≤, ≥  **This unit introduces**   * Calculate with negative numbers * Solve a calculation following the correct order of operations * Calculate with positive indices (roots) using written methods * Calculate with negative indices in the context of standard form * Know the multiplication, division, power and zero law of indices * Know the negative and fractional law of indices * 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 | **Algebraic Manipulation 1**  **This unit builds upon from KS2**   * Know basic algebraic notation (the rules of algebra) * Simplify an expression by collecting like terms * Know how to multiply a single term over a bracket * Substitute positive numbers into expressions and formulae * Calculate with negative numbers   **This unit introduces**   * Know how to write products algebraically * Use fractions when working in algebraic situations * Simplify an expression involving terms with combinations of variable sand and collecting like terms (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 * 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 | **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**   * Apply addition and subtraction to proper fractions and improper fractions * Apply addition and subtraction to mixed numbers * Multiply proper and improper fractions * Multiply mixed numbers * Divide a proper fraction by a proper fraction * Apply division to improper fractions and mixed numbers * Apply the four operations to simplifying algebraic fractions * Use calculators to find a percentage of an amount using multiplicative methods * Identify the multiplier for a percentage increase or decrease * Know how to find an amount after an investment with simple interest * Use calculators to increase (decrease) an amount by a percentage using multiplicative methods * Compare two quantities using percentages * Know that percentage change = actual change ÷ original amount * Calculate the percentage change in a given situation, including percentage increase / decrease | **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**   * Know the difference between direct and inverse proportion * Recognise direct proportion in a situation * Know the features of a graph that represents a direct proportion situation * Recognise inverse proportion in a situation * Know the features of a graph that represents an inverse proportion situation * Know the features of an expression, or formula, that represents a direct proportion situation * Know the features of an expression, or formula, that represents an inverse proportion situation * Understand the connection between the multiplier, the expression and the graph * Solve problems involving direct and inverse proportions * Identify congruence of shapes in a range of situations * Identify similarity of shapes in a range of situations * Finding missing lengths in similar shapes * Solve problems involving compound units, such as density, pressure, population density and speed   Convert between compound units of density and speed  **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**   * Generate a sequence from a term-to-term rule * 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 * Generate a sequence using a spreadsheet | **Algebraic Manipulation 2, Formulae and Solving Equations I**  **This unit builds upon from KS2**  Year 7, Number 1 and Calculating, Algebraic Manipulation 1  **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 * Know how to set up a mathematical argument * Work out why two algebraic expressions are equivalent * Create a mathematical argument to show that two algebraic expressions are equivalent * Identify variables in a situation * Distinguish between situations that can be modelled by an expression or a formula * Create an expression or a formula to describe a situation * Building equations * Identify the correct order of undoing the operations in an equation * Solve linear equations with the unknown on one side when the solution is a negative number * 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 | **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° (link to solving algebraic equations) * Solve missing angle problems involving alternate angles (link to algebraic problems) * Solve missing angle problems involving corresponding angles (link to algebraic problems) * 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 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 * Choose techniques to construct 2D shapes; e.g. rhombus * Combine techniques to solve more complex loci problems * 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, Key Assessment | Open book end of topic assessment | Open book end of topic assessment | Open book end of topic assessment | Closed book, Key Assessment |

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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**   * 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     * 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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