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| **SUBJECT:** | **Mathematics** | **YEAR GROUP:** | **7** |

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| **Term** | **Topic** | **Content Outline** | **Learning Outcomes** |
| Term 1 | **Number**  **Equation and formulae**    **Working with powers**    **2D shapes and 3D solids** | * Negative Numbers * Prime factorization * Index notation * Order of Operations * One step Equations * Two-step equations * Complex Equations * Substitute into the formulae * Simplifying expressions * Simplifying Algebraic expressions * Factorising Expressions * Expanding and Factorsinig * Substitution * Area of 2D shapes * Area of compound shapes * 3D figures,Solids * Surface area of 3D shapes * Volume and units of Volume * Units of Area * Elevation * Word problems about 3D shapes | * Recognize the Negative numbers * Use number line and compare the negative numbers * Use Order of operations to solve negative number questions * Recall Prime number * Apply prime factorization * Write the prime number decomposition to find HCF and LCM * Recall law of indices * Explain zero and negative powers * Use laws of indices for division and multiplication * Identify square and cube roots * Use BIDMAS and work out the questions * Calculate questions involving Roots and Indices * Identify one-side linear equations * Write and Solve simple equations * Solve geometrical problems involving equations * Discuss two step linear equations * Expand the brackets in the equations * Solve geometrical problems involving * Identify complex equations * Write and Solve equations with letters * Solve geometrical involving equations * Identify difference between formulae and equation * Substitute numbers into formulae * Solve problems by using Formulae * Identify Expressions * Expand and collect the like terms * Simplify expressions involving * Use the index laws in Algebraic expressions * Simplify expressions with powers * Understand the meaning of an Identity * Recognize the meaning of Factor * Find the common factor for the terms * Factorise an algebraic expressions * Identify Expanding brackets and factorizing * Simplify expressions involving brackets and powers * Write a simplified expressions for the perimeter and area of shapes * Recall substitution into the expressions * Substitute integers into the expressions * Construct and solve equations. * Identify 2D shapes * Derive and use the formula for the area of a triangle and parallelogram * Calculate the area of trapezium * Recognize area of shapes * Use area of triangle and rectangle * Calculate area of compound shapes * Identify nets form of different shapes * Know the properties of 3D shapes * Construct 3D shapes * Recall the faces of solid shapes * Calculate the area of faces * Find the surface area of the cube and cuboid. * Identify Volume of 3D shapes * Calculate volume of cube and cuboid * Convert cm^3 ,ml and liters * Recognize units of Area * Convert between metric units for area and volume * Calculate the Volume and convert the units * Illustrate plan ,side and front elevations * Use isometric paper to draw plans and elevations of 3D shapes * Use 2D representation of 3D solids * Understand and Derive a formula * Solve problems involving area, surface area and volume * Find the volume of complex 3D shapes |
| Term 2 | **Graphs**  **Fractions, decimals, ratio and proportion**  **Probability**  **Percentages and ratios** | * Direct Proportion * STEM: Interpreting graphs * Distance-time graphs * Rates of change * Misleading graphs * Rounding decimals * Multiplying and dividing decimals * Converting fractions to decimals * Multiplying fractions * Dividing by fractions * Adding and subtracting fractions * Calculating with mixed numbers * Solving problems with fractions and decimals * Experimental probability * Estimating probability * Equivalent fractions, decimals and percentages * Writing percentages * Percentage of amounts * Compound interest * Ratios * Working with ratios | * Recognise when values are in direct proportion. * Plot graphs and read values to solve problems * Use values from the graphs and create an equation * Interpret graphs from different sources * Understand financial graphs * Create a solution by sketching graphs * Draw and read distance-time graphs * Use distance-time graphs to solve problems * Create bar charts and tables from graphs * Recall interpreting graphs * Interpret graphs that are curved * Illustrate real life graphs * Understand when graph are misleading * Analyse bar charts and pie charts * Compare the data by investigating charts and graphs * Recall to convert fractions to decimals * Understand rounding to decimal places * Round decimals to two or three decimal places * Multiply and divide any number by 0.1, 0.01 and 0.001 * Multiply decimals using a written method * Apply division rule to decimals * Identify method to convert fractions to decimals * Recognize recurring decimals * Convert recurring decimals to fractions by algebraic methods * Multiply integers and fractions by fractions * Use appropriate way to multiply fractions * Create an answer by using fraction wall * Identify reciprocal of a fraction * Recall multiplying fractions by fractions * Divide fractions by applying division rule * Recall LCM and HCF * Define common denominator for two or three fractions * Subtract and add fractions with any size of denominator * Describes mixed numbers as an improper fractions and vice versa * Recall four operations with fractions * Apply operations to mixed numbers * Solve problems involving fractions and decimals * Use estimates to check answers * Create a solution by using four operations to fractions/decimals/integers * Record data from a simple experiment * Compute data based on a simple experimental data * Conclude answers based on the results * Calculate the relative frequency of a value * Use relative frequency to make estimates * Use relative frequency to estimate the probability      * Recall percentage of amounts * Convert between fractions, decimals and percentages. * Use the equivalence of fractions, decimals and percentages to comparisons. * Express one number as a percentage of another. * Work out a percentage increase or decrease * Use mental methods to find 10% and 15% of a quantity. * Recall the way to find percentage of an amount * Calculate decrement and increment of an amount by multiplier method * Define and calculate profit and loss * Define compound interest and calculate * Use repeated percentage change * Identify new amount for more than one year * Define ratio and understand why we use it * Identify simplest form of ratios involving decimals * Write and compare unit ratios * Understand the way to divide an amount into two/three parts * Define proportion * Solve simple word problems involving ratio and proportion |
| Term 3 | **Shapes and angles**  **Charts and diagrams**  **Straight-line graphs** | * Quadrilaterals * Angles and parallel lines * Angles in polygons * Using tables * Stem and leaf diagrams * Pie charts * Comparing data * STEM: Scatter graphs and correlation * Plotting linear graphs * The gradient * *y = mx + c* | * Identify properties of quadrilaterals. * Use properties of quadrilaterals. * Justify if shapes tesselate or not * Identify alternate and corresponding angles know that they are equal. * Solve problems using properties of angles in intersecting and parallel lines and in Polygons. * Formulate sums of the interior and exterior angles of an irregular or regular polygon. * Calculate the interior and exterior angles of an irregular or regular polygon. * Solve geometric problems using side and angle properties of quadrilaterals and other polygons. * Recall the calculation of the mean from a frequency table. * Design and use two-way tables. * Tabulate and use tables for grouped data. * Draw stem and leaf diagrams for data. * Interpret stem and leaf diagrams * Deduce the best average * Define the pie chart * Draw and interpret pie charts. * Tabulate two-ways table according the pie chart * Compare two sets of data using statistics or the shape of the graph. * Construct line graphs. * Choose the most appropriate average to use. * Interpret and draw scatter graphs. * Describe the correlation between two measures. * Draw a line of best fit and use it to estimate values * Plot straight-line graphs. * Find the y-intercept of a straight-line graph. * Derive the equation of a straight line graph in the form y = mx + c. * Find the gradient of a straight-line graph. * Plot graphs using the gradient and y-intercept. * Deduce the equation of a straight line graph in the form y = mx + c. * Use y = mx + c. * Find the equation of a straight line graph in the form y = mx + c. * Work out the gradient of a linear graph. |