

	Unit 1	Unit 2	Unit 3	Unit 4
Topic(s)	<p>Non-calculator arithmetic BIDMAS Using a calculator Estimation Indices Percentages Standard form Surds</p>	<p>Substitution Simplifying Expressions – incl. Products and quotients Expand single &amp; double brackets Factorise single brackets Solving equations Rearranging formulae Sequences Linear graphs – incl. Parallel &amp; perpendicular Quadratic, cubic, reciprocal, exponential graphs Real life graphs</p>	<p>Properties of shape – polygons, polyhedra Plans &amp; Elevations Constructions &amp; Loci Area &amp; Perimeter – incl. Circles, arcs and sectors Surface area &amp; volume Pythagoras in 2D and 3D Compound measures</p>	<p>Questionnaires &amp; misleading graphs Frequency Diagrams &amp; Pie charts Two-way tables Averages Mean from grouped data Comparing two data sets Scatter diagrams Cumulative Frequency &amp; Box Plots Venn diagrams &amp; sets</p>
Topic Objectives	<p>Review and develop fluency of core numeracy skills. Focus on non-calculator arithmetic. Developing confidence with negative number operations. Applications of BIDMAS as an acronym for the order of operations. Using rounding methods as a means of estimation. Encouraging estimation as a means to check answers for reasonability. Calculating percentages, with use of decimal multipliers. Applications for repeated percentage movements (compound). Introduction to standard form and its use in extremely large and small values. To include calculations for all 4 operations. Use of surds as accurate irrational values. Simplifying surds, rationalising denominators, calculations.</p>	<p>Introduce algebraic notation.  Algebraic manipulation including simplify expressions, expanding &amp; factorising brackets. To understand use of inverse functions within algebra. Substitution. Multi-step solving of equations including fractions.  Arithmetic &amp; quadratic sequences, both as patterns and number sequences. Use of correct terminology. Defining sequences in terms of algebra, nth term.  Plotting linear graphs of the form <math>y=mx+c</math>. Interpreting values for gradient and the y intercept. Calculating parallel and perpendicular lines through a given point. Sketching non-linear graphs. Applications of graphs in real life, as distance-time or for conversion between units.</p>	<p>Review properties of shapes for 2 and 3 dimensions. Recap facts for quadrilaterals and different types of triangle. Consider types of prism and pyramids. Interpret symmetry for 2D shapes, including order of rotational symmetry. Also planes of symmetry in 3D. Applications of Pythagoras in both 2D &amp; 3D.  Calculate surface area and volume for types of 3D shape. Applications for compound shapes and parts of a circles &amp; cylinders.  Interpreting 3-dimensional space through accurate drawing of plans and elevations.  Developing skills in using mathematical equipment for both geometric construction and loci.</p>	<p>Recap of various methods of graphical representation. Diagrams to include, but not limited to, pictograms, bar charts, time series graphs. Drawing pie charts to represent proportion. Interpreting results. Grouping data. Use of two-way tables. Analysing data with appropriate measures of average and spread. Including calculating the mean average from grouped data and understanding when it is an estimate. Making appropriate commentary for when comparing data sets based on the analysis completed. Drawing scatter graphs for bivariate data. Use of interpolation and extrapolation. Presenting grouped data using Cumulative frequency diagrams and box and whisker plots. Use of Venn diagrams and notation.</p>

<p>Acquired Knowledge/Skills</p>	<p>Recap of core skills of number and use of calculators. Apply numeracy skills to multi-step questions. Realise applications to real world problems.</p> <p>Percentage movements for appreciation and depreciation. Including monetary and population changes.</p> <p>Use of surds for accuracy. Looking at applications across topics, including Pythagoras.</p>	<p>Recap of core skills and terminology for algebraic problems. Extending possibilities of forming algebraic expressions and equations to aid solutions of complex problems.</p> <p>Develop understanding of fluency through reasoning, justification of answers through estimation and substitution, evaluation and choice of mathematical methods.</p>	<p>Recap core skills that allow mathematical methods to be applied to solve geometric problems. Develop key terminology for shape in order to describe and differentiate between types.</p>	<p>Develop understanding of statistical analysis to incorporate reasoning, undertaking of more complex calculations, comparisons to be made and supporting arguments to be given.</p> <p>Application of skills to a mini-project on student data. Giving students the opportunity to consolidate understanding through use. Further focus on grouping of data and its limitations</p>
<p>Assessments</p>	<p>Unit 1 assessment</p>	<p>Cumulative unit 2 assessment, including all topics to date</p>	<p>Cumulative unit 3 assessment, including all topics to date</p>	<p>Cumulative unit 4 assessment, including all topics to date</p>