



Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Inequalities	Understand the inequality symbol Find integer values Solve inequalities Represent inequalities on number lines	(Linear) inequality Unknown Manipulate Solve Solution set Integer	1) Ordering numbers and using inequality symbols 2) Solving 2 step inequalities and writing possible solutions 3) Solving more complex inequalities and writing possible solutions with balancing 4) Writing inequalities on number lines inc after solving 5) Writing inequalities from number lines 6) Forming and solving inequalities	Solving equations Number lines Negative numbers	One written and one retrieval piece on inequalities
Upper and lower bounds and truncation	Understand rounding Understand what an upper and lower bound is Calculate with bounds Truncate a number	Inequality Truncate Round Minimum, Maximum Interval Decimal place Significant figure	1) Finding the upper and lower bounds and writing as an inequality 2) Calculating with bounds – addition and multiplication 3) Calculating with bounds – subtraction and division 4) Basic problem solving with bounds and truncation	Rounding Multiplication and division of decimals	One written and one retrieval piece on bounds



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Pythagoras	To understand Pythagoras theorem Calculate missing sides of a right angled triangle	Hypotenuse Pythagoras' theorem Right angle Square root	1) Exploring right angled triangles 2) Calculating the hypotenuse 3) Calculating the shorter sides 4) Calculating a mixture 5) Worded problems involving Pythagoras 6) Pythagoras involving basic bearings 7) Multi step Pythagoras 8) Complex Pythagoras questions involving algebra	Square numbers and roots Area Substitution Rearranging	One written and one retrieval piece on Pythagoras
Laws of indices and standard form	Work with indices Understand basic index laws Understand negative indices Write in standard form Convert from standard form Calculate with standard form	Power Root Index, Indices Positive Negative Standard form Inequality	1) Basic rules of indices (5 of them) 2) Basic rules of indices (5 of them) 3) Index rules with coefficients and combined laws 4) Exploring basic negative indices 5) Positive powers from and into standard form 6) Negative powers from and into standard form 7) Choosing which method to apply to a given problem 8) Calculating with standard form – Multiplication and division 9) Calculating with standard form – addition and subtraction 10) Worded or exam style questions	Powers and roots Powers of 10 Calculate with decimals	One written and one retrieval piece on indices



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Graphs	<p>Understand basic lines on graphs</p> <p>Plot linear graphs using a variety of methods</p> <p>Plot quadratic graphs</p> <p>Plot cubic graphs</p> <p>Plot reciprocal graphs</p>	<p>Plot</p> <p>Equation</p> <p>Linear</p> <p>Coordinate</p> <p>(Positive/negative) gradient</p> <p>y-intercept</p> <p>Horizontal</p> <p>Vertical</p> <p>Substitute</p> <p>Quadratic</p> <p>Cubic</p>	<p>1) Horizontal, vertical and variations of $y=x$</p> <p>2) Plotting table of values including negative gradients</p> <p>3) Plotting using $y=mx+c$ (positive gradients)</p> <p>4) Plotting using $y=mx+c$ (fractional and negative gradients)</p> <p>5) Equation of a graph from the line</p> <p>6) Plotting graphs in the form $ax+by = c$</p> <p>7) Plotting quadratic graphs</p> <p>8) Plotting cubic graphs</p> <p>9) Plotting reciprocal graphs</p> <p>10) Recognising types of graphs and consolidation</p>	<p>Substitution</p>	<p>One written and one retrieval piece on graphs</p>
Arcs and Sectors	<p>Calculate area and perimeter of parts of circles</p> <p>Solve problems involving circles</p>	<p>Circle, Pi</p> <p>Radius</p> <p>Diameter</p> <p>Circumference</p> <p>Area</p> <p>Sector</p> <p>Arc</p>	<p>1) Investigating area of a sector for understanding of proportionality</p> <p>2) Area of a sector including problems</p> <p>3) Arc length including problems</p> <p>4) Mixture of arc length and area of a sector</p> <p>5) Reverse calculations involving arcs and sectors</p>	<p>Area and circumference of circles</p> <p>Fractions and proportion</p>	<p>One written and one retrieval piece on arcs and sectors</p>



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Expanding and factorising with double brackets in basic solving	Develop understanding of quadratic equations Work interchangeably between expanded and factorised form Solve basic quadratic equations	Product Expand Linear Quadratic Variable Term Coefficient Common factor Factorise Power Indices	1) Recap basic expanding and factorising 2) Expanding double brackets 3) Expanding double brackets with $2x$ or $3x$ etc 4) Expanding with more complex double brackets 5) Factorising quadratics 6) Factorising more complex quadratics 7) Factorising more complex quadratics 8) Solving basic quadratics through factorisation 9) Applying to questions involving measures 10) End of unit test	Simplifying algebra Expanding and factorising Solving	One written and one retrieval piece on expanding and factorising.



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Ratio and Proportion	<p>To fluently simplify ratios including where the units are different and to simplify ratios in the form 1:n</p> <p>To be able to divide a given quantity into two parts in a given part:part or Part:whole ratio.</p> <p>To understand proportion and use it to solve problems using the unitary method</p> <p>To be able to convert interchangeably between different currencies</p>	<p>Proportion</p> <p>Multiplier</p> <p>Unitary method</p> <p>Units</p>	<ol style="list-style-type: none"> 1) Simplifying ratios with different units and writing in the form 1:n where n is a decimal 2) Ratio problems via bar modelling 3) Ratio problems via bar modelling 4) Ratio problems involving algebra 5) Best buys 6) Currency conversions 7) Unit conversions 8) End of unit test 	<p>Find common factors of pairs of numbers</p> <p>Convert between standard metric units of measurement</p> <p>Convert between units of time</p> <p>Recall multiplication facts for multiplication tables up to 12×12</p> <p>Recall division facts for multiplication tables up to 12×12</p> <p>Solve comparison problems</p>	<p>One written and one retrieval piece on ratio</p>
Compound interest and reverse percentages	<p>To understand the difference between simple and compound interest.</p> <p>To calculate simple interest</p> <p>To be able to calculate compound interest</p> <p>To calculate a reverse percentage</p>	<p>Percent</p> <p>Multiplier</p> <p>Increase, decrease</p> <p>Simple interest</p> <p>Compound interest</p>	<ol style="list-style-type: none"> 1) Simple interest 2) Compound interest 3) Simple and compound interest 4) Rearranging with simple and compound interest 5) Reverse percentages non-calculator 6) Reverse percentages calculator 	<p>To calculate percentages of amounts and percentage increase and decrease</p> <p>To convert interchangeably between decimals and percentages</p> <p>To understand the use of a multiplier</p>	<p>One written and one retrieval piece on percentages.</p>



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Averages from grouped frequency tables	<p>To be able to find the estimated mean from a grouped frequency and understand why it is only an estimate and can be affected by outliers.</p> <p>To understand how to find the median, mode and range from a grouped frequency</p>	Continuous data Discrete data Average Spread Mean Median Mode Range Measure	<ol style="list-style-type: none"> 1) Mean from a grouped frequency table 2) Problems involving mean from grouped frequency 3) Median from a grouped frequency table 4) Mode range and averages problems from grouped frequency – include comparing data. 	Averages from a data set. Averages from ungrouped frequency tables Comparing data.	One written and one retrieval piece on averages.



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Similarity and congruence	<p>To be able to construct triangles (SAS, ASA, SSS)</p> <p>To understand the conditions for Congruency, particularly congruent triangles (SSS, RHS, ASA, SAS)</p> <p>To understand similarity and recognise linear scale factors to find missing lengths</p> <p>To calculate areas and volumes in similar shapes.</p>	<p>Congruent, congruence</p> <p>Similar (shapes), similarity</p> <p>Conjecture</p> <p>Derive</p> <p>Prove, proof</p> <p>Multiplier</p> <p>Scale factor</p>	<p>1) Constructing triangles</p> <p>2) Congruency – discussing why and what satisfies congruency</p> <p>3) Congruent triangles</p> <p>4) Similarity – discussing whats and whys</p> <p>5) Similarity – missing lengths</p> <p>6) Similarity – harder questions and angles rules</p> <p>7) Exploring the effect of similarity on area</p> <p>8) Exploring the effect of similarity on volume</p>	<p>Accurately draw angles</p> <p>To understand scale factors (from previous enlargement topic in Year 7)</p> <p>Know angle facts including angles at a point, on a line and in a triangle</p> <p>Know angle facts involving parallel lines and vertically opposite angles</p> <p>Know the properties of special quadrilaterals</p>	<p>One written and one retrieval piece on similarity.</p>
Probability	<p>To be able to calculate the probabilities of independent or dependent combined events</p> <p>Construct and list outcomes of combined events using a tree diagram and use a tree diagram to solve simple problems involving independent combined events</p> <p>Use a tree diagram to solve complex problems involving independent combined events</p> <p>Use a tree diagram to solve simple problems involving dependent combined events</p> <p>Use a tree diagram to solve complex problems involving dependent combined events</p>	<p>Outcome, equally likely outcomes</p> <p>Independent event</p> <p>Conditional probability</p> <p>Tree diagrams</p> <p>Theoretical probability</p> <p>Experimental probability</p> <p>Random</p> <p>Bias, unbiased, fair</p> <p>Relative frequency</p> <p>Set</p>	<p>1) Probability recap</p> <p>2) Probability rules – AND/OR</p> <p>3) Probability trees basics</p> <p>4) Calculating probabilities from probability trees</p> <p>5) Gaining a sound understanding of probability trees</p> <p>6) Conditional probability and probability trees basic examples</p> <p>7) Conditional probability and probability trees worded</p> <p>8) End of unit assessment</p>	<p>Add fractions and decimals</p> <p>Multiply fractions and decimals</p> <p>Convert between fractions, decimals and percentages</p> <p>Use frequency trees to record outcomes of probability experiments</p>	<p>One written and one retrieval piece on probability.</p>



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Sequences	<p>To be able to fluently find the nth term of ascending and descending linear sequences. To use the nth term to find other terms in the sequence and to identify if a number belongs in a linear sequence.</p> <p>To be able to recognise and use the Fibonacci sequence and generate Fibonacci type sequences including continuing to find the next terms of a Fibonacci sequence</p> <p>To explore growing patterns and other problems involving quadratic sequences</p> <p>To be able to generate terms of a quadratic sequence from a written rule and find the next terms of a quadratic sequence using first and second differences and from its nth term.</p> <p>To be able to find the nth term for a quadratic sequence</p>	<p>Term-to-term rule</p> <p>Position-to-term rule</p> <p>nth term</p> <p>Generate</p> <p>Linear</p> <p>Quadratic</p> <p>Fibonacci</p>	<ol style="list-style-type: none"> 1) Term to term rule and next terms 2) Finding the Nth term 3) Generating from the Nth term 4) Problems with the Nth term 5) Fibonacci including algebraic 6) Picture sequences 7) Basic quadratic sequences 8) Basic quadratic sequences 2 	<p>Generate a linear sequence from its nth term</p> <p>Substitute positive numbers into quadratic expressions</p> <p>Find the nth term for an increasing linear sequence</p> <p>Find the nth term for a decreasing linear sequence</p> <p>Solve two step equations</p>	<p>One written and one retrieval piece on sequences.</p>



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Surface area and volume	<p>To be able to fluently recall area formulae for 2d shapes</p> <p>To be able to calculate the surface area of cuboids, prisms and cylinders</p> <p>To be able to calculate the volume of cylinders and prisms and work with inverse operations and rearranging formulae to calculate missing dimensions.</p> <p>To be able to express surface area and volume algebraically.</p>	<p>Trapezium</p> <p>Parallelogram</p> <p>(Right) prism</p> <p>Circumference</p> <p>Cylinder</p> <p>Cross-section</p> <p>Volume</p> <p>Surface area</p> <p>Units</p> <p>Inverse</p>	<ol style="list-style-type: none"> 1) Area recap – Trapezium, triangle, parallelogram and circle and compound 2) Surface area of prisms including all 2D faces 3) Surface area of prisms 2 4) Surface area of cylinders 5) Problems involving surface area 6) Calculating the volume of a prism including cylinders 7) Calculating missing lengths involving volume 8) Working with the volume of a cylinder – calculating a radius 9) Functional skills – mixing the volume and surface area 10) SA volume and algebra 	<p>Know how to use formulae to find the area of rectangles, parallelograms, triangles and trapezia</p> <p>Know how to find the area of compound shapes</p> <p>Name 3d shapes and properties</p>	<p>One written and one retrieval piece on surface area.</p>



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Time Series Graphs	<p>To be able to plot a scatter diagram of bivariate data</p> <p>Interpret a scatter diagram using understanding of correlation and accurately constructing a line of best fit.</p> <p>To calculate with compound measures.</p> <p>To draw and interpret a distance-time graph</p>	<p>Scatter graph</p> <p>Positive correlation</p> <p>Negative correlation</p> <p>Line of best fit</p> <p>Interpolate</p> <p>Extrapolate</p> <p>Trend</p> <p>Units</p> <p>Pressure</p> <p>Mass</p>	<ol style="list-style-type: none"> 1) Exploring scatter graphs and correlation 2) Plotting and line of best fit 3) Estimating from scatter graphs 4) Working with time e.g. converting mins to hours 5) Speed distance and time 6) SDT graphs drawing graphs 7) Understanding SDT graphs 8) Density mass and volume 9) Pressure mass and area 	<p>Know the meaning of discrete data</p> <p>Interpret and construct frequency tables</p> <p>Construct and interpret pictograms, bar charts, pie charts, tables and vertical line charts</p> <p>Convert between units of time</p> <p>Convert between units of metric measurements</p> <p>Understand how to find the gradient of a line segment</p>	<p>One written and one retrieval piece on time series.</p>



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Scale drawing, bearings and measures	<p>To understand the criteria of writing a bearing and to accurately draw/measure bearings</p> <p>To understand how to calculate distances using a scale and produce a scale drawing</p> <p>To convert interchangeably between metric units of measurement</p> <p>To convert the key units of metric measurement to imperial measurements and vice versa</p>	<p>Bearings</p> <p>Scale diagram</p> <p>Clockwise</p> <p>Metric</p> <p>Centi(metre), Centi (litre)</p> <p>Kilo(metre), kilo (gram)</p> <p>Imperial</p>	<ol style="list-style-type: none"> 1) Understanding bearings and calculating back bearings 2) Measuring and drawing bearings 3) Understanding scale (maps, blueprints and objects) 4) Functional scale drawings activity 5) Imperial measures 6) Metric measures 7) Converting between including miles and km 	<p>1. Resources\Academic texts, maths</p> <p>Accurately measure angles</p> <p>Understand what metric units of measurement are</p> <p>Understand what imperial units of measurement are</p>	<p>One written and one retrieval piece on scale drawings.</p>
Properties of shape	<p>To be able to draw accurate plans and elevations of 3d representations.</p>	<p>Object, Image</p> <p>Plan</p> <p>Elevation</p>	<ol style="list-style-type: none"> 1) Properties of 2D and 3D shapes 2) Plans and elevations 1 3) Plans and elevations 2 	<p>Names of 2D and 3D shapes</p> <p>Understanding of faces, edges vertices,</p> <p>Drawing to scale</p>	<p>One written and one retrieval piece on properties of shape</p>