



Topic	Learning Objectives	Key Vocabulary	Learning Sequence	Linked Learning	Home Learning
Number system	<p>Be able to identify the highest common factor and lowest common multiple</p> <p>Be able to identify prime numbers and understand the concept of prime factorisation</p> <p>Be able to round numbers to an appropriate degree of accuracy</p> <p>Be able to interpret standard form</p>	<p>Factor</p> <p>Multiple</p> <p>Prime factor</p> <p>Venn diagram</p> <p>Significant figure</p> <p>Standard form</p>	<p>Solve problems using highest common factor and lowest common multiple</p> <p>Write a number as a product of its prime factors</p> <p>Use prime factorisation to find the highest common factor and lowest common multiple of two numbers</p> <p>Round numbers to a given number of significant figures</p> <p>Use standard form to write small and large numbers</p>	<p>Know the meaning of a prime number</p> <p>Recall prime numbers up to 50</p> <p>Understand the use of notation for powers</p> <p>Know how to round to the nearest whole number, 10, 100, 1000 and to decimal places</p> <p>Know how to identify the first significant figure in any number</p> <p>Multiply and divide numbers by powers of 10</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>
Calculating	<p>Be able to apply the four operations to integers and simple fractions and mixed numbers – all both positive and negative</p> <p>Be able to use conventional notation for priority of operations, including brackets, powers, roots and reciprocals</p>	<p>Directed number</p> <p>Improper fraction</p> <p>Mixed number</p> <p>Power</p> <p>Indices</p> <p>Root</p>	<p>Add, subtract, multiply and divide integers that are both positive and negative</p> <p>Add, subtract, multiply and divide fractions that are both positive and negative</p> <p>Square and cube positive and negative numbers</p> <p>Use a scientific calculator to calculate with negative numbers</p> <p>Use the order of operations for calculations involving powers and roots</p>	<p>Fluently recall and apply multiplication facts up to 12×12</p> <p>Know the formal written method of long multiplication and division</p> <p>Convert between an improper fraction and a mixed number</p> <p>Know the order of operations for the four operations and brackets</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>



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<p>Visualising and constructing</p>	<p>Be able to interpret plans and elevations of 3D shapes</p> <p>Be able to interpret maps and scale drawings and use bearings</p> <p>Be able to describe and construct similar shapes by enlargement, including on coordinate axes</p>	<p>Plan</p> <p>Elevation</p> <p>Bearing</p> <p>Scale drawing</p> <p>Similar</p> <p>Enlarge</p> <p>Scale factor</p>	<p>Identify plans and elevations of 3D shapes</p> <p>Construct scale diagrams and solve geometrical problems involving bearings</p> <p>Find the centre and scale factor of an enlargement</p> <p>Use the centre and scale factor to carry out an enlargement with a positive integer scale factor</p>	<p>Use a protractor to measure angles to the nearest degree</p> <p>Use a ruler to measure lengths to the nearest millimetre</p> <p>Understand coordinates in all four quadrants</p> <p>Work out a multiplier given two numbers</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>
<p>Understanding risk</p>	<p>Be able to describe and analyse the frequency of outcomes of probability experiments using tables</p> <p>Be able to construct theoretical possibility spaces for single experiments with equally likely outcomes</p>	<p>Outcome</p> <p>Equally likely</p> <p>Mutually exclusive</p> <p>Exhaustive</p> <p>Possibility space</p>	<p>List all the outcomes for an experiment, including the use of tables</p> <p>Work out theoretical probabilities for events with equally likely outcomes</p> <p>Apply the fact that the sum of probabilities for all outcomes is 1</p>	<p>Understand the equivalence between fractions, decimals and percentages</p> <p>Compare fractions, decimals or percentages</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>



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Algebraic proficiency	<p>Be able to simplify algebraic expressions</p> <p>Be able to substitute numerical values into scientific formulae</p> <p>Be able to rearrange formulae to change the subject</p>	<p>Product</p> <p>Variable</p> <p>Term</p> <p>Coefficient</p> <p>Common factor</p> <p>Power</p> <p>Indices</p> <p>Formulae</p> <p>Subject</p>	<p>Know and use the zero index</p> <p>Simplify expressions using the law of indices</p> <p>Simplify expressions involving terms with combinations of variables (e.g. $3a^2b + 4ab^2 + 2a^2 - a^2b$)</p> <p>Substitute positive and negative numbers into formulae</p> <p>Change the subject of a formula when one step or two steps are required</p>	<p>Simplify an expression by collecting like terms</p> <p>Substitute positive numbers into expressions and formulae</p> <p>Calculate with negative numbers</p> <p>Understand inverse operations</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>



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<p>Exploring fractions, decimals and percentages</p>	<p>work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 or 3/8)</p>	<p>Fraction Mixed number Percentage Decimal Proportion Terminating Recurring Simplify, Cancel</p>	<p>Identify if a fraction is terminating or recurring Recall some decimal and fraction equivalents (e.g. tenths, fifths etc.) Write a terminating decimal as a fraction Write a fraction in its lowest terms by cancelling common factors Use a calculator to change any fraction to a decimal</p>	<p>Understand that fractions, decimals and percentages are different ways of representing the same proportion Convert between mixed numbers and top-heavy fractions Write one quantity as a fraction of another</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>
<p>Proportional reasoning</p>	<p>express the division of a quantity into two parts as a ratio; apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing, concentrations) identify and work with fractions in ratio problems understand and use proportion as equality of ratios express a multiplicative relationship between two quantities as a ratio or a fraction use compound units (such as speed, rates of pay, unit pricing) and change freely between compound units in numerical contexts relate ratios to fractions and to linear functions</p>	<p>Ratio Proportion Proportional Multiplier Speed Units Compound unit</p>	<p>Express the division of a quantity into two parts as a ratio Solve problems involving ratio in a real-life context Solve problems involving scaling Find a relevant multiplier in a situation involving proportion Understand the connections between ratios and fractions Understand and use compound units Convert between compound units Solve problems involving speed, rates of pay and unit pricing Relate ratios to fractions and linear functions</p>	<p>Understand and use ratio notation Divide an amount in a given ratio</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>



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<p>Pattern sniffing</p>	<p>generate terms of a sequence from either a term-to-term or a position-to-term rule</p> <p>deduce expressions to calculate the nth term of linear sequences</p>	<p>Sequence</p> <p>Linear</p> <p>Term</p> <p>Difference</p> <p>Term-to-term rule</p> <p>Position-to-term rule</p> <p>Ascending</p> <p>Descending</p>	<p>Generate terms of a sequence from a term-to-term rule</p> <p>Generate terms of a sequence from a position-to-term rule</p> <p>Describe the position-to-term rule of a linear sequence using nth term</p> <p>Use the nth term of a sequence to deduce if a given number is in a sequence</p>	<p>Use a term-to-term rule to generate a sequence</p> <p>Find the term-to-term rule for a sequence</p> <p>Describe a sequence using the term-to-term rule</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>



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Investigating angles	<p>understand and use alternate and corresponding angles on parallel lines</p> <p>derive and use the sum of angles in a triangle (e.g. to deduce and use the angle sum in any polygon, and to derive properties of regular polygons)</p>	<p>Degrees</p> <p>Right angle, acute angle, obtuse angle, reflex angle</p> <p>Vertically opposite</p> <p>Geometry, geometrical</p> <p>Parallel</p> <p>Alternate angles, corresponding angles</p> <p>Interior angle, exterior angle</p> <p>Regular polygon</p>	<p>Solve missing angle problems involving alternate angles</p> <p>Solve missing angle problems involving corresponding angles</p> <p>Use knowledge of alternate and corresponding angles to calculate missing angles in geometrical diagrams</p> <p>Establish the fact that angles in a triangle must total 180°</p> <p>Establish the size of an interior and exterior angle in a regular polygon</p> <p>Solve missing angle problems in polygons</p>	<p>Use angles at a point, angles at a point on a line and vertically opposite angles to calculate missing angles in geometrical diagrams</p> <p>Know that the angles in a triangle total 180°</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>
Calculating fractions, decimals and percentages	<p>interpret fractions and percentages as operators</p> <p>work with percentages greater than 100%</p> <p>solve problems involving percentage change, including original value problems, and simple interest including in financial mathematics</p> <p>calculate exactly with fractions</p>	<p>Proper fraction, improper fraction, mixed number</p> <p>Simplify, cancel, lowest terms</p> <p>Percent, percentage</p> <p>Percentage change</p> <p>Original amount</p> <p>Multiplier</p> <p>(Simple) interest</p> <p>Exact</p>	<p>Identify the multiplier for a percentage increase or decrease when the percentage is greater than 100%</p> <p>Use calculators to increase an amount by a percentage greater than 100% and exact calculation with fractions</p> <p>Solve problems involving percentage change</p> <p>Solve original value problems when working with percentages</p> <p>Solve financial problems including simple interest</p>	<p>Apply the four operations to proper fractions, improper fractions and mixed numbers</p> <p>Use calculators to find a percentage of an amount using multiplicative methods</p> <p>Identify the multiplier for a percentage increase or decrease</p> <p>Use calculators to increase (decrease) an amount by a percentage using multiplicative methods</p> <p>Know that percentage change = actual change \div original amount</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>



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<p>Solving equations and inequalities</p>	<p>solve linear equations with the unknown on both sides of the equation</p> <p>find approximate solutions to linear equations using a graph</p>	<p>Algebraic</p> <p>Unknown</p> <p>Equation</p> <p>Operation</p> <p>Solve</p> <p>Solution</p> <p>Brackets</p> <p>Substitute</p> <p>Graph</p> <p>Point of intersection</p>	<p>Solve linear equations with the unknown on one side when the solution is a negative.</p> <p>Solve linear equations with the unknown on both sides when the solution is a whole number/ fraction.</p> <p>Solve linear equations with the unknown on both sides when the solution is a negative.</p> <p>Solve linear equations with the unknown on both sides when the equation involves brackets</p> <p>Recognise that the point of intersection of two graphs corresponds to the solution of a connected equation</p>	<p>Choose the required inverse operation when solving an equation</p> <p>Solve linear equations by balancing when the solution is a whole number or a fraction</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>



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<p>Calculating space</p>	<p>compare lengths, areas and volumes using ratio notation</p> <p>calculate perimeters of 2D shapes, including circles</p> <p>identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference</p> <p>know the formulae: circumference of a circle = $2\pi r = \pi d$, area of a circle = πr^2</p> <p>calculate areas of circles and composite shapes</p> <p>know and apply formulae to calculate volume of right prisms (including cylinders)</p>	<p>Circle</p> <p>Centre</p> <p>Radius,</p> <p>Diameter</p> <p>Chord</p> <p>Circumference</p> <p>Pi</p> <p>(Right) prism</p> <p>Cross-section</p> <p>Cylinder</p> <p>Polygon</p> <p>Polygonal</p> <p>Solid</p>	<p>Know circle definitions and properties, including: centre, radius, chord, diameter, circumference</p> <p>Calculate the circumference of a circle when radius or diameter is given</p> <p>Calculate the perimeter of composite shapes that include sections of a circle</p> <p>Calculate the area of a circle when radius or diameter</p> <p>Calculate the area of composite shapes that include sections of a circle</p> <p>Calculate the volume of a right prism</p> <p>Calculate the volume of a cylinder</p> <p>Compare lengths, areas and volumes using ratio notation</p>	<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>There will be a written piece of homework each week to reinforce key concepts.</p>



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<p>Algebraic proficiency: visualising</p>	<p>plot graphs of equations that correspond to straight-line graphs in the coordinate plane</p> <p>identify and interpret gradients and intercepts of linear functions graphically</p> <p>recognise, sketch and interpret graphs of linear functions and simple quadratic functions</p> <p>plot and interpret graphs and graphs of non-standard (<i>piece-wise linear</i>) functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance and speed</p>	<p>Plot</p> <p>Equation (of a graph)</p> <p>Function</p> <p>Formula</p> <p>Linear</p> <p>Coordinate plane</p> <p>Gradient</p> <p>x-intercept</p> <p>y-intercept</p> <p>Substitute</p> <p>Quadratic</p> <p>Piece-wise linear</p> <p>Model</p> <p>Kinematic,</p> <p>Speed,</p> <p>Distance</p>	<p>Know that graphs of functions of the form $y = mx + c$, $x \pm y = c$ and $ax \pm by = c$ are linear</p> <p>Plot graphs of functions of the form $y = mx \pm c$</p> <p>Plot graphs of functions of the form $ax \pm by = c$</p> <p>Find the gradient of a straight line on a unit grid</p> <p>Find the y-intercept of a straight line</p> <p>Sketch linear graphs</p> <p>Distinguish between a linear and quadratic graph</p> <p>Plot graphs of quadratic functions of the form $y = x^2 \pm c$</p> <p>Sketch a simple quadratic graph</p> <p>Plot and interpret graphs of piece-wise linear functions in real contexts</p> <p>Plot and interpret distance-time graphs (speed-time graphs) including approximate solutions to kinematic problems</p>	<p>Use coordinates in all four quadrants</p> <p>Write the equation of a line parallel to the x-axis or the y-axis</p> <p>Draw a line parallel to the x-axis or the y-axis given its equation</p> <p>Identify the lines $y = x$ and $y = -x$</p> <p>Draw the lines $y = x$ and $y = -x$</p> <p>Substitute positive and negative numbers into formulae</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>



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<p>Algebraic proficiency</p>	<p>Be able to simplify algebraic expressions</p> <p>Be able to substitute numerical values into scientific formulae</p> <p>Be able to rearrange formulae to change the subject</p>	<p>Product</p> <p>Variable</p> <p>Term</p> <p>Coefficient</p> <p>Common factor</p> <p>Power</p> <p>Indices</p> <p>Formulae</p> <p>Subject</p>	<p>Know and use the zero index</p> <p>Simplify expressions using the law of indices</p> <p>Simplify expressions involving terms with combinations of variables</p> <p>(e.g. $3a^2b + 4ab^2 + 2a^2 - a^2b$)</p> <p>Substitute positive and negative numbers into formulae</p> <p>Change the subject of a formula when one step or two steps are required</p>	<p>Simplify an expression by collecting like terms</p> <p>Substitute positive numbers into expressions and formulae</p> <p>Calculate with negative numbers</p> <p>Understand inverse operations</p>	



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<p>Understanding risk II</p>	<p>apply systematic listing strategies</p> <p>record describe and analyse the frequency of outcomes of probability experiments using frequency trees</p> <p>enumerate sets and combinations of sets systematically, using tables, grids and Venn diagrams</p> <p>construct theoretical possibility spaces for combined experiments with equally likely outcomes and use these to calculate theoretical probabilities</p> <p>apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments</p>	<p>Outcome</p> <p>Event</p> <p>Experiment</p> <p>Combined experiment</p> <p>Frequency tree</p> <p>Set</p> <p>Venn diagram</p> <p>Possibility</p> <p>Space</p> <p>Sample space</p> <p>Theoretical probability</p> <p>Random</p> <p>Bias</p> <p>Fairness</p> <p>Relative frequency</p>	<p>List all elements in a combination of sets using a Venn diagram</p> <p>List outcomes of an event systematically</p> <p>Use a table to list all outcomes of an event</p> <p>Use frequency trees to record outcomes of probability experiments</p> <p>Construct theoretical possibility spaces for combined experiments with equally likely outcomes</p> <p>Calculate probabilities using a possibility space</p> <p>Use theoretical probability and experimental probability to calculate expected outcomes</p>	<p>Convert between fractions, decimals and percentages</p> <p>Understand the use of the 0-1 scale to measure probability</p> <p>Work out theoretical probabilities for events with equally likely outcomes</p> <p>Know how to represent a probability</p> <p>Know that the sum of probabilities for all outcomes is 1</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>



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Presentation of data	<p>interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate graphical representation involving discrete, continuous and grouped data</p> <p>use and interpret scatter graphs of bivariate data</p> <p>recognise correlation</p>	<p>Categorical data, Discrete data, Continuous data, Grouped data</p> <p>Frequency Frequency table</p> <p>Histogram</p> <p>Axis, axes</p> <p>Scatter graph</p> <p>Positive and Negative correlation</p>	<p>Construct and interpret a grouped frequency table for continuous data</p> <p>Construct and interpret histograms for grouped data with equal class intervals</p> <p>Plot a scatter diagram of bivariate data</p> <p>Interpret a scatter diagram using understanding of correlation</p>	<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>There will be a written piece of homework each week to reinforce key concepts.</p>
Measuring data	<p>interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers)</p> <p>apply statistics to describe a population</p>	<p>Average</p> <p>Spread</p> <p>Consistency</p> <p>Mean</p> <p>Median</p> <p>Mode</p> <p>Range</p> <p>Statistic</p> <p>Approximate</p> <p>Round</p> <p>Calculate an estimate</p> <p>Grouped frequency</p> <p>Midpoint</p>	<p>Find the modal class of set of grouped data</p> <p>Find the class containing the median of a set of data</p> <p>Calculate an estimate of the mean from a grouped frequency table</p> <p>Estimate the range from a grouped frequency table</p> <p>Analyse and compare sets of data, appreciating the limitations of different statistics (mean, median, mode, range)</p> <p>Choose appropriate statistics to describe a set of data</p>	<p>Understand the mean, mode and median as measures of typicality (or location)</p> <p>Find the mean, median, mode and range of a set of data</p> <p>Find the mean, median, mode and range from a frequency table</p>	<p>There will be a written piece of homework each week to reinforce key concepts.</p>