

Year 8	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
TOPIC	<u>W1/2 - Measuring data</u> <u>W3 - Visualising and constructing</u> <u>W4 - Investigating properties of shapes</u> <u>W5/6 - Numbers and the number system</u> <u>W7/8 - Calculating</u>	<u>W1/3 - Calculating FDP</u> <u>W3/4 - Algebraic Proficiency</u> <u>W6/7 - Investigating angles</u>	<u>W1/2 - Calculating FDP pt 2</u> <u>W3/4 - Calculating</u> <u>W5/6 - Algebraic proficiency pt 2</u>	<u>W1/2 - Proportional reasoning</u> <u>W3/4 - Solving equations and inequalities</u> <u>W5/6 - Algebraic proficiency: visualising</u>	<u>W1/2 - Algebraic proficiency</u> <u>W3/4 - Calculating space</u> <u>W4 - Exploring FDP</u> <u>W5 - Pattern Sniffing</u>	<u>W1/2 - Visualising and constructing pt 2</u> <u>W3 - Understanding risk</u> <u>W4 - Calculating FDP</u> <u>W5 - Presentation of data</u>
KNOWLEDGE TAUGHT	<p>Measuring data</p> <ul style="list-style-type: none"> 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 <p>Visualising and constructing</p> <ul style="list-style-type: none"> Use ruler and protractor to construct triangles, and other shapes, from written descriptions Use ruler and compasses to construct triangles when all three sides known <p>Investigating properties of shapes</p> <ul style="list-style-type: none"> Know the connection between faces, edges and vertices in 3D shapes Recognise and use nets of 3D shapes Know and solve problems using the properties and definitions of triangles Know and solve problems using the properties and definitions of special types of quadrilaterals (including diagonals) Know and solve problems using the properties of other plane figures <p>Numbers and the number system</p> <ul style="list-style-type: none"> Write a number as a product of its prime factors Use prime factorisations to find the highest common factor of two numbers Use prime factorisations to find the lowest common multiple of two numbers Solve problems using highest common factors or lowest common multiples Round numbers to a given number of significant figures <p>Calculating</p> <ul style="list-style-type: none"> Subtract a number from a smaller number Add a positive number to a negative number Subtract a positive number from a negative number Add a negative number 	<p>Calculating FDP</p> <ul style="list-style-type: none"> Identify the multiplier for a percentage increase or decrease Use calculators to find a percentage of an amount using multiplicative methods Use calculators to increase and 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 <p>Algebraic Proficiency</p> <ul style="list-style-type: none"> Use and interpret algebraic notation, including: $a^2 b$ in place of $a \times a \times b$, coefficients written as fractions rather than as decimals Simplify an expression involving terms with combinations of variables (e.g. $3a^2b + 4ab^2 + 2a^2 - a^2b$) Factorise an algebraic expression by taking out common factors Simplify expressions using the law of indices for multiplication Simplify expressions using the law of indices for division Simplify expressions using the law of indices for powers Know and use the zero index Substitute positive and negative numbers into formulae <p>Investigating angles</p> <ul style="list-style-type: none"> Solve missing angle problems involving alternate angles 	<p>Calculating FDP pt 2</p> <ul style="list-style-type: none"> Identify the multiplier for a percentage increase or decrease when the percentage is greater than 100% Use calculators to increase an amount by a percentage greater than 100% Solve problems involving percentage change <p>Calculating</p> <ul style="list-style-type: none"> Square and cube positive and negative numbers Use a scientific calculator to calculate with negative numbers Use a scientific calculator to calculate with fractions, both positive and negative Understand how to use the order of operations including powers Understand how to use the order of operations including roots <p>Algebraic proficiency pt 2</p> <ul style="list-style-type: none"> Simplify a simple expression by collecting like terms Simplify more complex expressions by collecting like terms Manipulate expressions by multiplying an integer over a bracket (the distributive law) Manipulate expressions by multiplying a single term over a bracket (the distributive law) Use and interpret algebraic notation, including: $a^2 b$ in place of $a \times a \times b$, coefficients written as fractions rather than as decimals Simplify an expression involving terms with combinations of variables (e.g. $3a^2b + 4ab^2 + 2a^2 - a^2b$) 	<p>Proportional reasoning</p> <ul style="list-style-type: none"> Express the division of a quantity into two parts as a ratio Understand the connections between ratios and fractions Find a relevant multiplier in a situation involving proportion Solve ratio problems involving mixing Solve ratio problems involving comparison Solve ratio problems involving concentrations Understand and use compound units Convert between units of speed Solve problems involving speed Solve problems involving rates of pay <p>Solve problems involving unit pricing</p> <p>Solving equations and inequalities</p> <ul style="list-style-type: none"> Solve one-step equations when the solution is a positive integer or fraction Solve two-step equations when the solution is a positive integer or fraction Solve three-step equations when the solution is a positive integer or fraction Solve multi-step equations including the use of brackets when the solution is a positive integer or fraction Solve equations when the solution is an integer or fraction <p>Algebraic proficiency: visualising</p> <ul style="list-style-type: none"> Know that graphs of functions of the form $y = mx + c$, $x \pm y = c$ and $ax \pm by = c$ are linear Plot graphs of functions of the form $y = mx \pm c$ Plot graphs of functions of the form $ax \pm by = c$ 	<p>Algebraic proficiency</p> <ul style="list-style-type: none"> Use and interpret algebraic notation, including: $a^2 b$ in place of $a \times a \times b$, coefficients written as fractions rather than as decimals Simplify an expression involving terms with combinations of variables (e.g. $3a^2b + 4ab^2 + 2a^2 - a^2b$) Factorise an algebraic expression by taking out common factors Simplify expressions using the law of indices for multiplication Simplify expressions using the law of indices for division Simplify expressions using the law of indices for powers Know and use the zero index <p>Calculating space</p> <ul style="list-style-type: none"> Calculate perimeters of 2D shapes Use and apply the formula to calculate the area of triangles Use and apply the formula to calculate the area of trapezia Use and apply the formula to calculate the volume of cuboids Find the surface area of cuboids (including cubes) <p>Exploring FDP</p> <ul style="list-style-type: none"> Identify if a fraction is terminating or recurring Recall some decimal and fraction equivalents (e.g. tenths, fifths, eighths, thirds, quarters, etc.) Write a terminating decimal as a fraction <p>Pattern Sniffing</p> <ul style="list-style-type: none"> Generate terms of a sequence from a position-to-term rule Find the nth term of an ascending linear sequence 	<p>Visualising and constructing pt 2</p> <ul style="list-style-type: none"> Use the centre and scale factor to carry out an enlargement with a positive integer scale factor Find the centre of enlargement Find the scale factor of an enlargement Use scale diagrams, including maps Use the concept of scaling in diagrams Interpret plans and elevations Understand and use bearings Construct scale diagrams involving bearings Solve geometrical problems using bearings <p>Understanding risk</p> <ul style="list-style-type: none"> Know and use the vocabulary of probability Understand the use of the 0-1 scale to measure probability List all the outcomes for an experiment, including the use of tables Work out theoretical probabilities for events with equally likely outcomes Know that the sum of probabilities for all outcomes is 1 Apply the fact that the sum of probabilities for all outcomes is 1 <p>Calculating FDP</p> <ul style="list-style-type: none"> Identify the multiplier for a percentage increase or decrease Use calculators to find a percentage of an amount using multiplicative methods Use calculators to increase and decrease an amount by a percentage using multiplicative methods Compare two quantities using percentages

	<ul style="list-style-type: none"> Subtract a negative number Multiply a positive number by a negative number Multiply a negative number by a negative number Divide a positive number by a negative number Divide a negative number by a negative number 	<ul style="list-style-type: none"> Solve missing angle problems involving corresponding angles 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° Establish the size of an interior angle in a regular polygon Establish the size of an exterior angle in a regular polygon Solve missing angle problems in polygons 	<ul style="list-style-type: none"> Factorise an algebraic expression by taking out common factors 	<ul style="list-style-type: none"> Find the gradient of a straight line on a unit grid Find the y-intercept of a straight line Sketch linear graphs Distinguish between a linear and quadratic graph Plot graphs of quadratic functions of the form $y = x^2 \pm c$ 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) including approximate solutions to kinematic problems 	<ul style="list-style-type: none"> Find the nth term of an descending linear sequence Use the nth term of a sequence to deduce if a given number is in a sequence 	<ul style="list-style-type: none"> Know that percentage change = actual change + original amount Calculate the percentage change in a given situation, including percentage increase / decrease <p>Presentation of data</p> <ul style="list-style-type: none"> Construct and interpret a grouped frequency table for continuous data Construct and interpret histograms for grouped data with equal class intervals Plot a scatter diagram of bivariate data Interpret a scatter diagram using understanding of correlation
<p>SKILLS DEVELOPED (Include any trips and visits.)</p>	<ul style="list-style-type: none"> Apply the four operations with negative numbers Describe, sketch and draw using conventional terms and notations. Use the concepts and vocabulary of common factors and multiples. 	<ul style="list-style-type: none"> Define a percentage as 'a number of parts per hundred'. Interpret percentages and percentage change as fractions or decimals. Interpret fractions as operators Understand and use standard mathematical formulae. Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon. 	<ul style="list-style-type: none"> Factorise an expression by taking out common factors Interpret percentages as operators Recognise powers of 2, 3 and 4 Use and interpret algebraic notation 	<ul style="list-style-type: none"> Find a relevant multiplier when solving problems involving proportion Plot and interpret graphs of linear functions Solve linear equations with unknowns on both sides Apply the formulae for circumference and area of a circle 	<ul style="list-style-type: none"> Convert between terminating decimals and fractions Apply the multiplication, division and power laws of indices Find and use the nth term for a linear sequence 	<ul style="list-style-type: none"> Solve problems involving percentage change, including original value problems Calculate theoretical probabilities for single events
<p>ASSESSMENTS (Minimum two per half term, with focussed marking.)</p>	<ol style="list-style-type: none"> Knowledge check 1 Knowledge check 2 	<ol style="list-style-type: none"> Knowledge check 1 PUMA Autumn 	<ol style="list-style-type: none"> Knowledge check 1 Knowledge check 2 	<ol style="list-style-type: none"> Knowledge check 1 PUMA Spring 	<ol style="list-style-type: none"> Knowledge check 1 Knowledge check 2 	<ol style="list-style-type: none"> Knowledge check 1 PUMA Summer
<p>HOME LEARNING (To be made available via Century Tech; one per week.)</p>	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2
<p>SEQUENCING (What must students already have been taught in order to begin to learn this topic? Identify opportunities to address knowledge gaps)</p>	<p>Measuring data</p> <ul style="list-style-type: none"> Understand the mean, mode and median as measures of typicality (or location) Find the mean, median, mode and range of a set of data Find the mean, median, mode and range from a frequency table <p>Visualising and constructing</p> <ul style="list-style-type: none"> Use a ruler to measure and draw lengths to the nearest millimetre 	<p>Calculating FDP</p> <ul style="list-style-type: none"> 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 	<p>Calculating FDP pt 2</p> <ul style="list-style-type: none"> Apply the four operations to proper fractions, improper fractions and mixed numbers Use calculators to find a percentage of an amount using multiplicative methods Identify the multiplier for a percentage increase or decrease 	<p>Proportional reasoning</p> <ul style="list-style-type: none"> Understand and use ratio notation Divide an amount in a given ratio <p>Solving equations and inequalities</p> <ul style="list-style-type: none"> Know the basic rules of algebraic notation Express missing number problems algebraically 	<p>Algebraic proficiency</p> <ul style="list-style-type: none"> 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 	<p>Visualising and constructing pt 2</p> <ul style="list-style-type: none"> Use a protractor to measure angles to the nearest degree Use a ruler to measure lengths to the nearest millimetre Understand coordinates in all four quadrants Work out a multiplier given two numbers Understand the concept of an enlargement (no scale factor)

	<ul style="list-style-type: none"> Use a protractor to measure and draw angles to the nearest degree <p>Investigating properties of shapes</p> <ul style="list-style-type: none"> Know the names of common 3D shapes Know the meaning of face, edge, vertex Understand the principle of a net Know the names of special triangles Know the names of special quadrilaterals Know the meaning of parallel, perpendicular Know the notation for equal sides, parallel sides, right angles <p>Numbers and the number system</p> <ul style="list-style-type: none"> Know the meaning of a prime number Recall prime numbers up to 50 Understand the use of notation for powers Know how to round to the nearest whole number, 10, 100, 1000 and to decimal places Multiply and divide numbers by powers of 10 Know how to identify the first significant figure in any number Approximate by rounding to the first significant figure in any number <p>Calculating</p> <ul style="list-style-type: none"> Calculate with negative numbers Apply the correct order of operations 	<ul style="list-style-type: none"> 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 <p>Algebraic Proficiency</p> <ul style="list-style-type: none"> 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 <p>Calculate with negative numbers</p> <p>Investigating angles</p> <ul style="list-style-type: none"> 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° 	<ul style="list-style-type: none"> Use calculators to increase (decrease) an amount by a percentage using multiplicative methods Know that percentage change = actual change ÷ original amount <p>Calculating</p> <ul style="list-style-type: none"> Fluently recall and apply multiplication facts up to 12 × 12 Know and use column addition and subtraction Know the formal written method of long multiplication Know the formal written method of short division Apply the four operations with fractions and mixed numbers Convert between an improper fraction and a mixed number Know the order of operations for the four operations and brackets <p>Algebraic proficiency pt 2</p> <ul style="list-style-type: none"> Use symbols (including letters) to represent missing numbers Substitute numbers into worded formulae Substitute numbers into simple algebraic formulae Know the order of operations 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 	<ul style="list-style-type: none"> Solve missing number problems expressed algebraically Choose the required inverse operation when solving an equation Solve linear equations by balancing when the solution is a whole number or a fraction <p>Algebraic proficiency: visualising</p> <ul style="list-style-type: none"> Use coordinates in all four quadrants Write the equation of a line parallel to the x-axis or the y-axis Draw a line parallel to the x-axis or the y-axis given its equation Identify the lines $y = x$ and $y = -x$ Draw the lines $y = x$ and $y = -x$ Substitute positive and negative numbers into formulae 	<p>Calculating space</p> <ul style="list-style-type: none"> Understand the meaning of area, perimeter, volume and capacity Know how to calculate areas of rectangles, parallelograms and triangles using the standard formulae Know that the area of a triangle is given by the formula $\text{area} = \frac{1}{2} \times \text{base} \times \text{height} = \text{base} \times \text{height} \div 2 = \frac{bh}{2}$ Know appropriate metric units for measuring area and volume <p>Exploring FDP</p> <ul style="list-style-type: none"> 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>Pattern Sniffing</p> <ul style="list-style-type: none"> 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 	<p>Understanding risk</p> <ul style="list-style-type: none"> Understand the equivalence between fractions, decimals and percentages Compare fractions, decimals or percentages Simplify a fraction by cancelling common factors <p>Calculating FDP</p> <ul style="list-style-type: none"> 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 <p>Presentation of data</p> <ul style="list-style-type: none"> Know the meaning of discrete data Interpret and construct frequency tables Construct and interpret pictograms, bar charts, pie charts, tables and vertical line charts
<p>SCHEMAS (Where might students learn about elements of this topic in other subjects? Which subjects might this topic feed into beyond your own?)</p>	<p>Links with Science</p> <ul style="list-style-type: none"> - Describing and interpreting data - Multiples and factors - Applying four operations to integers. <p>Links with Geography</p> <ul style="list-style-type: none"> - Averages <p>Links with Art</p> <ul style="list-style-type: none"> - Drawing and sketching lines and angles. - Properties of shape. 	<p>Links with Science</p> <ul style="list-style-type: none"> - Percentages - Substitution <p>Links with Art</p> <ul style="list-style-type: none"> - Investigating angles. 	<p>Links with Science</p> <ul style="list-style-type: none"> - Order of operations - Algebraic notation <p>Links with Business Studies</p> <ul style="list-style-type: none"> - Percentage change - Profit/lost 	<p>Links with Science</p> <ul style="list-style-type: none"> - Solving equations - Graphs <p>Links with food technology</p> <ul style="list-style-type: none"> - Ratio and proportion <p>Links with Business Studies</p> <ul style="list-style-type: none"> - Plotting and using linear graphs 	<p>Links with Science</p> <ul style="list-style-type: none"> - Decimals and fractions <p>Links with Art</p> <ul style="list-style-type: none"> - Pattern and sequences - Area 	<p>Links with Science</p> <ul style="list-style-type: none"> - Presentation of data <p>Links with Art</p> <ul style="list-style-type: none"> - Enlargement and scale factors <p>Links with Geography</p> <ul style="list-style-type: none"> - Scale factors and enlargement <p>Links with Business Studies</p> <ul style="list-style-type: none"> - Probability - Understanding risk

<p>CAREERS LINKS <i>(How might this benefit them in the future?)</i></p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>
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