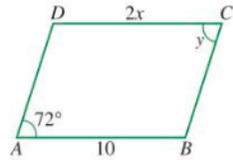
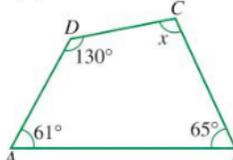
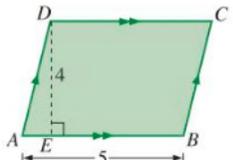
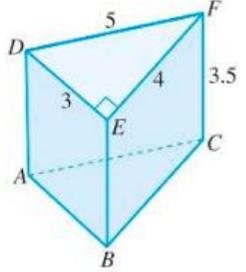
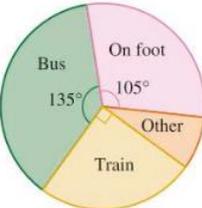


Curriculum Map: Mathematics in Year 8

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Content</p> <p>Declarative knowledge</p> <p>'I Know'</p>	<p><u>Factors and Multiples</u></p> <ul style="list-style-type: none"> * Primes, Prime Factorisation and Index Notation * Highest Common Factor (HCF) * Lowest Common Multiple (LCM) * Prime Factorisation and Roots <p><u>Approximation and Estimation</u></p> <ul style="list-style-type: none"> * Rounding Numbers to a specified amount of Decimal Places * Rounding Numbers to a specified amount of Significant Figures * Estimation 	<p><u>Ratio, Rate and Speed</u></p> <ul style="list-style-type: none"> * Integer ratios * All kinds of ratios * Scale plans and Maps * Rates * Speed <p><u>Working with Percentages</u></p> <ul style="list-style-type: none"> * Simple Interest * Reverse Percentages * Percentage Increase and Decrease * Repeated Percentage Changes 	<p><u>Algebraic Expressions, Formulae and Proof</u></p> <ul style="list-style-type: none"> * Use of letters in Algebra * Evaluation of Algebraic Expressions and Formulae * Algebraic Expressions in the real world * Simplification of Linear Expressions * Factorisation by using Common Factors * Proof <p><u>Equations and Inequalities in One Variable</u></p> <ul style="list-style-type: none"> * Simple Linear Equations in One Variable * Equations Involving Brackets * Simple Fractional Equations * Forming Linear Equations to Solve Problems * Inequality Relationships * Solving Inequalities 	<p><u>Coordinates and Linear Functions</u></p> <ul style="list-style-type: none"> * Cartesian Coordinate System * Idea of a Function * Linear Functions and their Graphs * Gradients of Linear Graphs <p><u>Number Patterns</u></p> <ul style="list-style-type: none"> * Number Patterns and Sequences * General Term of a Sequence 	<p><u>Angles in Quadrilaterals and Polygons</u></p> <ul style="list-style-type: none"> * Quadrilaterals * Polygons <p><u>Perimeter and Area of Parallelograms and Trapezia</u></p> <ul style="list-style-type: none"> * Area of Parallelograms * Area of Trapezia * Perimeter and Area of Composite Plane Figures 	<p><u>Volume and Surface Area of Prisms and Cylinders</u></p> <ul style="list-style-type: none"> * Views and Nets of Three-dimensional (3D) Shapes * Volume and Total Surface Area of Prisms * Volume and Total Surface Area of Cylinders * Volume and Surface Area of Composite Solids <p><u>Statistical Graphs</u></p> <ul style="list-style-type: none"> * Line Graphs * Pie Charts * Use and Misuse of Statistical Graphs * Scatter Graphs

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Skills</p> <p>Procedural Knowledge</p> <p>‘I know how to’</p>	<p><u>Factors and Multiples</u></p> <ul style="list-style-type: none"> Recognise prime numbers Express a composite number as a product of its prime factors Represent the prime factorisation of a number in index notation Find the highest common factor (HCF) of a group of numbers by using prime factorisation Find the lowest common multiple (LCM) of a group of numbers by using prime factorisation Understand the use of prime factorisation to find the square root and cube root of a number <p><u>Approximation and Estimation</u></p> <ul style="list-style-type: none"> Round numbers to the required number of decimal places Round numbers to the required number of significant figures Estimate quantities (numbers and measures) to an appropriate degree of accuracy Estimate the results of computation Be aware of rounding errors in the intermediate steps of calculations 	<p><u>Ratio, Rate and Speed</u></p> <ul style="list-style-type: none"> Use ratio notation Compare quantities by ratio Describe the relationship between ratio and fraction Divide a quantity in a given ratio Solve problems involving ratio Understand and use the scale of a plan or a map Solve problems involving rate in daily life Recognise the relationships between distance, time and speed Recognise the concepts of constant speed and average speed Write speed in different units and convert it from one unit to another Solve problems involving speed <p><u>Working with Percentages</u></p> <ul style="list-style-type: none"> Calculate simple interest Solve problems involving reverse percentage Calculate percentage increase and decrease in quantities Calculate repeated percentage change Calculate compound interest Solve problems involving growth and depreciation 	<p><u>Algebraic Expressions, Formulae and Proof</u></p> <ul style="list-style-type: none"> Use letters to represent numbers or variables Interpret algebraic notations Evaluate algebraic expressions and formulae Express real-world situations in algebraic terms Simplify linear expressions Factorise an algebraic expression by using common factors Prove a statement algebraically <p><u>Equations and Inequalities in One Variable</u></p> <ul style="list-style-type: none"> Understand the concepts of equations and the solution of an equation Solve linear equations in one variable Solve linear equations in one variable involving brackets Solve simple fractional equations Formulate linear equations in one variable to solve problems Understand the concept and properties of linear inequalities Solve simple linear inequalities Solve simple problems involving inequalities 	<p><u>Coordinates and Linear Functions</u></p> <ul style="list-style-type: none"> Construct the Cartesian coordinate system in 2 dimensions and state coordinates of points within it Recognise the idea of functions Plot a graph of a set of ordered pairs as a representation of a relationship between two variables Recognise linear functions in the form of $y = mx + c$ and draw their graphs Find the gradient of a linear graph <p><u>Number Patterns</u></p> <ul style="list-style-type: none"> Recognise number patterns and sequences Find the terms of a sequence using a term-to-term rule Recognise arithmetic and geometric sequences Find terms of a sequence using a position-to-term rule Find the formula for the general (nth) term of a sequence Solve problems involving number patterns and sequences 	<p><u>Angles in Quadrilaterals and Polygons</u></p> <ul style="list-style-type: none"> Classify special quadrilaterals based on their properties Recognise the properties of special quadrilaterals Recognise the properties of polygons, including symmetry properties <p><u>Perimeter and Area of Parallelograms and Trapezia</u></p> <ul style="list-style-type: none"> Calculate the area of a parallelogram Calculate the area of a trapezium Solve problems involving perimeters and areas of composite plane figures 	<p><u>Volume and Surface Area of Prisms and Cylinders</u></p> <ul style="list-style-type: none"> Visualise and draw sketches of three-dimensional shapes from different views Visualise and draw the nets of prisms and cylinders Calculate the volume and surface area of prisms Calculate the volume and surface area of cylinders Convert between cm^2 and m^2, and between cm^3 and m^3 Solve problems involving volume and surface area of composite solids <p><u>Statistical Graphs</u></p> <ul style="list-style-type: none"> Construct, analyse and interpret line graphs Construct, analyse and interpret pie charts Describe the purposes and appropriateness of using different forms of statistical representation, including pictograms and bar charts Explain why a given statistical diagram can lead to misinterpretation of data Construct, analyse and interpret scatter graphs Describe types of correlation for a scatter graph Draw a line of best fit on a scatter graph and use it to estimate data values Find the equation of a given line of best fit Identify and explain outliers

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Strategies Conditional Knowledge 'I know when to'	<u>Factors and Multiples</u> * Apply prime factorisation. * Apply index notation to calculate the highest common factor (HCF), lowest common multiple (LCM) and square and cube roots. <u>Approximation and Estimation</u> * Apply rounding of numbers to decimal places. * Apply rounding of numbers to significant figures. * Apply estimation to a calculation.	<u>Ratio, Rate and Speed</u> * Simplify ratios. * Divide quantities in a given ratio. * Apply knowledge of ratios to scale plans and maps. * Use rate to calculate best value. * Calculate speed as a rate of distance travelled over time taken. <u>Working with Percentages</u> * Calculate simple interest * Calculate reverse percentages. * Calculate percentage increase and decrease. * Calculate repeated percentage changes.	<u>Algebraic Expressions, Formulae and Proof</u> * Use letters to represent variables. * Evaluate algebraic expressions and formulae. * Apply algebraic expressions in the real world. * Simplify linear expressions. * Apply factorisation by using common factors. * Apply a proof. <u>Equations and Inequalities in One Variable</u> * Solve simple linear equations in one variable. * Solve equations Involving brackets. * Solve simple fractional equations. * Form linear equations to solve problems. * Inequality Relationships. * Solve inequalities.	<u>Coordinates and Linear Functions</u> * Apply the Cartesian coordinate system. * Apply the idea of a function. * Represent linear functions as graphs. * Calculate gradients of linear graphs. <u>Number Patterns</u> * Notice number patterns and sequences. * Apply the general term of a sequence.	<u>Angles in Quadrilaterals and Polygons</u> * Classify quadrilaterals in terms of their properties. * Apply the properties of polygons. <u>Perimeter and Area of Parallelograms and Trapezia</u> * Calculate the area of parallelograms. * Calculate the area of trapezia. * Calculate the perimeter and area of composite plane figures.	<u>Volume and Surface Area of Prisms and Cylinders</u> * Visualise views and nets of three-dimensional (3D) shapes. * Calculate volume and total surface area of prisms. * Calculate volume and total surface area of cylinders. * Calculate volume and surface area of composite solids. <u>Statistical Graphs.</u> * Apply my knowledge of line graphs. * Apply my knowledge of pie charts. * Consider the use and misuse of statistical graphs. * Apply my knowledge of scatter graphs.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key Questions	<p><u>Factors and Multiples</u></p> <p>Q1) Express 36 as a product of prime factors using index notation.</p> <p>Q2) Using prime factorisation, find the HCF and LCM of 42 and 105.</p> <p>Q3) Find the positive square root of $5^4 \times 7^2$.</p> <p><u>Approximation and Estimation</u></p> <p>Q1) Round 10.7549 to 2 decimal places.</p> <p>Q2) Evaluate $4.937 + 3.625$, giving your answer to 3 significant figures.</p> <p>Q3) Estimate $6.25^2 \div 4.38$</p>	<p><u>Ratio, Rate and Speed</u></p> <p>Q1) Simplify the ratio 540g: 9kg</p> <p>Q2) In a salt solution, the ratio of the mass of salt to the mass of water is 2:13. If the mass of the solution is 180g, find the mass of salt in the solution.</p> <p>Q3) Express the map scale 1cm : 12m in the form 1 : n.</p> <p>Q4) Roman works 8 hrs a day. His daily wage is £184. Find his hourly wage rate.</p> <p>Q4) Matt runs 1500m in 3 mins 45 s. Find his average speed in m/s.</p> <p><u>Working with Percentages</u></p> <p>Q1) Mrs Smith wants to deposit £2500 in a savings account. How much interest will she get after 1 year if the interest rate per annum is 2.1%?</p> <p>Q2) Patrick's monthly salary has increased from £3600 to £3888. Find the percentage increase in his salary.</p>	<p><u>Algebraic Expressions, Formulae and Proof</u></p> <p>Q1) Find the value of $3x - 1$ when $x = -1$</p> <p>Q2) Expand $4(7b + 5c)$</p> <p>Q3) Factorise $7a + 7b + 7c$</p> <p><u>Equations and Inequalities in One Variable</u></p> <p>Q1) Solve $x - 9 = 5$</p> <p>Q2) Solve the equation $3x + 4 = 2(2x + 7)$</p> <p>Q3) Solve $\frac{y}{2} = 3$</p> <p>Q4) Tim is 5kg heavier than Amy. Let Amy's mass be x kg. Express Tim's mass in terms of x.</p> <p>Q5) Represent the solutions to this inequality on a number line: $x \leq 5$.</p>	<p><u>Coordinates and Linear Functions</u></p> <p>Q1) On a Cartesian plane plot the points A (3,4), B (0,3) and C (-2,5).</p> <p>Q2) For the statement y is seven less than x, express y as a function of x in the form of an equation</p> <p>Q3) Draw the graph of $y = x + 1$</p> <p><u>Number Patterns</u></p> <p>Q1) The first four terms of a sequence are 1,4,7,10, ...</p> <p>Write down the position to term rule and express the nth term of the sequence in terms of n.</p>	<p><u>Angles in Quadrilaterals and Polygons</u></p> <p>Q1) Find the values of x and y in the diagram below, where ABCD is a parallelogram.</p>  <p>Q2) Find the value of x in the diagram below.</p>  <p><u>Perimeter and Area of Parallelograms and Trapezia.</u></p> <p>Q1) Calculate the area. Lengths are given in cm.</p> 	<p><u>Volume and Surface Area of Prisms and Cylinders</u></p> <p>Q1) Draw a net of the prism, then calculate the volume and total surface area of the prism. Units are cm.</p>  <p><u>Statistical Graphs.</u></p> <p>Q1) The pie chart shows how some students travel to school. Find the percentage of students who walk to school.</p> 
Assessment topics		Assessment of Autumn term topics		Assessment of Spring term topics		End of year assessment (topics to date)

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Cross curricular links/ Character Education	<p><u>Factors and Multiples</u></p> <p>In Design Technology, I may have two pieces of material 36cm wide and 24cm wide. If I want to cut the material into strips of equal width, that are as wide as possible, I can calculate the HCF.</p> <p><u>Approximation and Estimation</u></p> <p>Rounding to decimal places and significant figures are used in Science, Economics, Statistics, Finance, Geography and many other areas of life where I am measuring things to a certain level of accuracy.</p>	<p><u>Ratio, Rate and Speed</u></p> <p>In Food Technology I frequently have to scale quantities up and down in recipes and share ingredients in proportion.</p> <p>I can also compare prices by determining the unit price.</p> <p>In Science I can complete calculations involving speed.</p> <p><u>Working with Percentages</u></p> <p>Percentage change, increase and decrease are common terms we encounter in daily life.</p> <p>Percentages are useful when drawing comparisons between samples with different numbers of observations. Applicable when comparing data in many subjects such as Geography, History and Science.</p>	<p><u>Algebraic Expressions, Formulae and Proof</u></p> <p>I can use basic algebraic equations in Physics and Chemistry.</p> <p>Algebraic algorithms are used in Computer Science to draw geometric shapes.</p> <p>Algebra can be used in art and architecture to calculate proportions.</p> <p><u>Equations and Inequalities in One Variable</u></p> <p>Algebraic equations can be used to predict trajectories in Sport and to design the path made by a character in a computer game.</p>	<p><u>Coordinates and Linear Functions</u></p> <p>I can use the Cartesian coordinate system to plot experimental data in Science and in Geography to plot a variety of data including rainfall, temperature and population.</p> <p><u>Number Patterns</u></p> <p>I can use my knowledge of sequences in Music and in Design Technology. For example, with a repeating pattern I can calculate the final number of units that may be in a row or pattern.</p>	<p><u>Angles in Quadrilaterals and Polygons</u></p> <p>I use angles frequently in my daily life. In Design Technology I learn how engineers and architects use angles for designing roads, buildings and sporting facilities. In sport athletes use angles to assess their progress and performance. In Art, artists use their knowledge of angles to sketch portraits and paintings.</p> <p><u>Perimeter and Area of Parallelograms and Trapezia</u></p> <p>I can apply my knowledge of perimeter and area in real world applications such as determining how much material is needed to encircle the outer edge of a shape, for example fencing in a garden, or how much material is needed to completely cover a surface, for example tiles in a kitchen.</p>	<p><u>Volume and Surface Area of Prisms and Cylinders</u></p> <p>Volume is frequently considered in daily life, for example, whether measuring out ingredients for a recipe, filling up a car's fuel tank or adding detergent to the washing machine.</p> <p>Calculating surface area can help when designing the cooling properties of a shape since greater surface area allows more heat to be dissipated. This has relevance in Chemistry, Biology, Design Technology and Computer Science.</p> <p><u>Statistical Graphs</u></p> <p>I can use graphs in many subjects to display key facts clearly and accurately.</p>