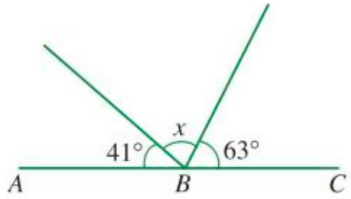
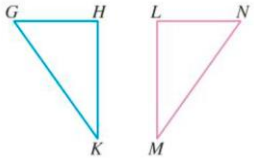
Curriculum Map: Mathematics in Year 7

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Content Declarative knowledge 'I Know'	<u>Positive integers</u> * Place values * Rounding integers * Arithmetic: four operations with natural numbers * Indices, square roots, and cube roots * Order of operations and using a calculator * Factors and multiples <u>Negative integers</u> * Negative numbers and the number line * Arithmetic: four operations with positive and negative integers	<u>Introduction to Algebra</u> * Letters to represent integers * Substituting integers * Writing algebraic expressions and formulae * Like terms and unlike terms * Addition and subtraction of linear expressions * Algebraic expressions with brackets <u>Simple Equations</u> * Equations in one variable * Equations in one variable with brackets * Writing equations to solve problems	<u>Fractions</u> * Quantities as fractions * Equivalent fractions and comparing fractions * The four operations with fractions * Rational numbers and using a calculator with fractional calculations <u>Decimals</u> * Place values, ordering and rounding of decimal numbers * Arithmetic: four operations with decimals * Division of a decimal by a whole number * Mental calculation and conversion between units * Division of a decimal by a decimal * Rational numbers and real numbers	<u>Percentages</u> * Meaning of percentage * Percentage of a quantity * Reducing and increasing a quantity by a percentage <u>Angles, Parallel Lines and Triangles</u> * Points, lines, and planes * Angles * Parallel lines and transversals * Triangles	<u>Transformations, Symmetry and Congruence</u> * Transformations * Symmetry * Congruence <u>Perimeter and area of triangles and circles</u> * Perimeter and area of a triangle * Circumference of a circle * Area of a circle * Perimeter and area problems	<u>Surface Area and Volume of Cuboids including Cubes</u> * Nets of cuboids, including cubes * Surface area of cuboids, including cubes * Volumes of cuboids, including cubes <u>Collecting, organising and displaying data</u> * Collection of data * Organisation of data * Data representation

Skills Procedural Knowledge 'I know how to'	Positive integers • Recognise the place value within an integer. • Round an integer number to the nearest 10, 100 or 1000. • Add, subtract, multiply and divide two positive integers. • Relate addition and subtraction. • Relate multiplication and division. • Understand the meaning of square, cube, square root and cube root of a number. • Understand index notation. • Apply the order of operations in calculations. • Use a calculator to apply operations. • Identify multiples and factors of a number. • Apply the above concepts to solve real life problems. Negative integers • Recognise the use of negative numbers in the real world. • Represent positive and negative integers on a number line. • Identify integers and perform the four operations on them.	Introduction to Algebra • Use letters to represent integers. • Interpret simple algebraic notation. • Substitute integers into simple expressions and formulae. • Write simple expressions and formulae. • Simplify expressions by collecting like terms. • Add and subtract linear expressions. • Expand a single bracket Simple Equations • Understand the concept of equations and balancing. • Solve simple equations in one variable. • Solve simple equations involving brackets. • Write simple equations in one variable to solve problems.	Fractions • Use fraction notation and express one quantity as a fraction of another. • Convert between improper fractions and mixed numbers. • Identify equivalent fractions, simplify fractions and compare fractions. • Find the reciprocal of a number. • Perform the four operations on fractions and on mixed numbers. • Calculate fractions of quantities. • Apply fractions in practical situations. • Identify fractions as rational numbers. • Use a calculator to perform fractional calculations. Decimals • Interpret decimals and write decimals in order of size. • Round decimals to the nearest integer. • Use the four operations with decimals. • Convert between units of measure. • Convert between decimals and fractions.	Percentages • Define percentage as 'number of parts per hundred'. • Interpret a percentage as a fraction or a decimal. • Convert a fraction or a decimal to a percentage. • Recognise percentages greater than 100%. • Compare two quantities using percentages. • Express one quantity as a percentage of another. • Find a percentage of a quantity using multiplication. • Reduce or increase a quantity by a percentage. Angles, Parallel Lines and Triangles • Describe a point, a line, a line segment, a ray, and a plane. • Construct lines, line segments and angles. • Identify different types of angles. • Recognise the properties of vertically opposite angles, angles on a straight line and angles at a point. • Recognise the properties of angles formed by parallel lines and transversals. • Using the above properties, find unknown marked angles in a diagram. • Understand the general properties of sides and angles of a triangle. • Classify triangles based on their sides and angles. • Construct triangles where three sides are given.	Transformations, Symmetry and Congruence • Translate, rotate, and reflect 2D shapes. • Describe transformations in vector form. • Combine transformations. • Recognise and describe reflection symmetry of 2D shapes. • Recognise and describe rotation symmetry of 2D shapes. • Understand the idea of congruence. • Match the sides and angles of two congruent shapes. Perimeter and Area of Triangles and Circles • Find the perimeter and area of a triangle. • Find the circumference and area of a circle. • Find the perimeter and area of a semicircle and a quarter of a circle. • Find a length given the perimeter or area of a shape. • Solve problems involving perimeters and areas of composite plane figures formed by rectangles, squares, triangles and circles.	Surface Area and Volume of Cuboids, including Cubes • Draw nets of cuboids, including cubes. • Calculate the surface area of cuboids, including cubes. • Calculate the volume of cuboids, including cubes. • Solve problems involving volume and surface area of cuboids, including cubes. Collecting, Organising and Displaying Data • Recognise different methods of collecting data. • Identify and write appropriate survey questions. • Organise data. • Create frequency tables. • Construct, analyse and interpret various chart types.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Strategies Conditional Knowledge 'I know when to'	<u>Positive integers</u> * Consider place value in calculations. * Apply the rounding of integers. *Apply the four operations of arithmetic. * Use indices, square roots and cube roots. * Apply the order of operations. * Apply my knowledge of factors and multiples. <u>Negative integers</u> * Apply my knowledge of negative numbers and the number line. *Apply negative number arithmetic and use the four operations.	<u>Introduction to Algebra</u> * Use letters to represent Integers. * Substitute numbers for letters. * Write algebraic expressions and formulae in problem solving. *Apply my knowledge of like terms and unlike terms. * Apply my knowledge of addition and subtraction of linear expressions. * Apply my knowledge of algebraic expressions that include brackets. <u>Simple Equations</u> *Use equations in one variable. * Use equations in one variable with brackets. * Write equations to solve problems.	<u>Fractions</u> * Express quantities as fractions. * Use equivalent fractions * Compare fractions. * To apply my knowledge of the four operations with fractions. * Identify rational numbers * Use a calculator with fractional calculations. <u>Decimals</u> * Consider place value * Order and round decimal numbers. * Apply my knowledge of the four arithmetic operations with decimals. * Apply my knowledge of division of a decimal by a whole number. * Apply mental calculation and when to convert between units. * Apply my knowledge of division of a decimal by a decimal. *Apply my knowledge of rational numbers and real numbers.	<u>Percentages</u> * Consider the meaning of percentage. * Apply percentage of a quantity. * Apply my knowledge of reducing and increasing a quantity by a percentage. <u>Angles, Parallel Lines and Triangles</u> * Consider points, lines and planes. * Consider angles. * Apply my knowledge of parallel lines and transversals. *Apply my knowledge of triangles.	<u>Transformations, Symmetry and Congruence</u> * Apply my knowledge of transformations. * Apply my knowledge of symmetry. * Apply my knowledge of congruence. <u>Perimeter and area of triangles and circles</u> * Calculate the perimeter and area of a triangle. * Calculate the circumference of a circle. * Calculate the area of a circle. * Apply my knowledge to perimeter and area problems.	<u>Surface Area and Volume of Cuboids including Cubes</u> * Interpret nets of cuboids, including cubes. * Apply my knowledge of surface area of cuboids, including cubes. * Apply my knowledge of volumes of cuboids, including cubes. <u>Collecting, organising, and displaying data</u> *Consider collection of data. * Apply organisation of data. * Make use of data representation.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key Questions	<u>Positive integers</u> Q1) $21 \times 3 - 7^2$ Q2) If a rod of length 96cm is cut into equal parts, can the length of each part be 7cm? Explain your answer. <u>Negative integers</u> Q1) Evaluate $(-16) \times (-3)$ Q2) Evaluate $(-3)^3$ Q3) A lift is initially 108m above ground level. It descends 6m per second for 12 seconds. Then it rises 65m in 13 seconds. Calculate (a) the distance it travelled during the descent, (b) the final position above ground level.	<u>Introduction to Algebra</u> Q1) Simplify $p \times 7 \times p \times p$ Q2) When $n = 4$, find the value of the expression $7(1 - 3n)$ <u>Simple Equations</u> Q1) Solve $3 + x = -11$ Q2) Solve $2(x + 4) = 24$ Q3) Aria reads two more books than Ken in a month. They read 16 books altogether. a) Draw a bar model for the situation. b) Write an equation and solve it to find the number of books which Ken reads.	<u>Fractions</u> Q1) Which fraction is smaller: $\frac{5}{6}$ *or* $\frac{7}{8}$? Q2) Calculate $3\frac{1}{2} + 2\frac{2}{3}$. <u>Decimals</u> Q1) Calculate 3.457 + 0.982 – 0.17 Q2) Calculate $79.5 \div 6$	<u>Percentages</u> Q1) What percentage is equivalent to $\frac{3}{5}$? Q2) Calculate 35% of £200. Q3) Increase 310m by 20%. <u>Angles, Parallel Lines and Triangles</u> * Consider points, lines, and planes. * Consider angles. * Apply my knowledge of parallel lines and transversals. *Apply my knowledge of triangles. Q1) Calculate the angle $x°$ 	<u>Transformations, Symmetry and Congruence</u> Q1) Are these shapes congruent?  <u>Perimeter and area of triangles and circles</u> Q1) The diameter of a circular pond is 2.8m. Calculate the circumference and area of the surface of the pond.	<u>Surface Area and Volume of Cuboids, including Cubes</u> Q1) How many ways can you draw the net of a cube? <u>Collecting, organising, and displaying data</u> Q1) Collect your raw data from one of the scenarios. Organize the data and then present your results using an appropriate chart.
Assessment topics	KS2 Baseline assessment	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	<u>Positive integers</u> In all subjects that require numerical computation, I can confidently apply my knowledge of numeracy. In Design Technology I can apply my knowledge of factors to divide material, without waste, into equal lengths. <u>Negative integers</u> I understand that negative numbers can be used to represent debt. In Geography I use negative numbers to represent depth below sea level. In Science I record temperature using negative numbers and I can perform calculations with those negative numbers.	<u>Introduction to Algebra</u> I can use algebra in Computing to write equations which create graphics. <u>Simple Equations</u> Complex algebraic equations can be used to create wire frame models and to apply texture maps and shading in Computing.	<u>Fractions</u> In Design Technology I can work with materials of fractional lengths. <u>Decimals</u> In Geography I can make appropriate use of rounding to compare data.	<u>Percentages</u> In Geography I can use percentage calculations to make comparisons of annual rainfall statistics. Percentage calculations also allow us to compare and subsequently contrast population samples of different sizes. In Science, percentages allow us to compare the saturation levels of different solutions. I understand that in Business and Economics, profit, loss, growth, decay can all be represented using percentages. <u>Angles, Parallel Lines and Triangles</u> In Design Technology I can confidently present scale drawings.	<u>Transformations, Symmetry and Congruence</u> Application of symmetry in Art, Design and Photography <u>Perimeter and area of triangles and circles</u> Application of area of shape in scientific measurements	<u>Surface Area and Volume of Cuboids, including Cubes</u> Calculations based on physical objects in Design Technology <u>Collecting, organising and displaying data</u> Completion and interpretation of population graphs in Geography