Maths: CURRICULUM CONTENT AND PROGRESSION FRAMEWORK

Curriculum Content	The key things we want children to know/be able to do
FOUNDATION	
	Number and Place Value: ● In everyday situations, take or give two or three objects from a group ● Compare two small groups of up to five objects, saying when there are the same number of objects in each group, e.g. You've got two, I've got two. Same! ● Begin to recognise and write numerals 0 to 10 ● Count up to five items, recognising that the last number said represents the total counted so far (cardinal principle) ● Link numerals with amounts up to 5 and maybe beyond ● Explore using a range of their own marks and signs to which they ascribe mathematical meanings ● Solve practical problems using understanding of number ● Begin to recognise that each counting number is one more than the one before ● Have a deep understanding of number to 10, including the composition of each number ● Subitise (recognise quantities without counting) up to 5; ● Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. **Numerical patterns:** ● Verbally count beyond 20, recognising the pattern of the counting system ● Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity ● Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally. **Shape:**

	• Recognise that two objects have the same shape • Recognise common shape names • Show awareness of shape similarities and differences between objects **Pattern:** • Recognise and develop simple patterns, predicting what comes next **Measures:** • Explore differences in size, length, weight and capacity • Begin to understand some talk about immediate past and future • Begin to anticipate times of the day such as mealtimes or home time • In meaningful contexts, find the longer or shorter, heavier or lighter and more/less full of two items • Recall a sequence of events in everyday life and stories
YEAR 1	
Curriculum Content	**The key things we want children to know/be able to do**
	Number and Place Value: • Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • Count, read and write numbers to 100 in numerals. • Count in multiples of twos, fives and tens beginning with any multiple, and count forwards and backwards through the odd numbers. • Given a number, identify one more and one less • Use the language of: equal to, more than, less than (fewer), most, least • Identify and represent numbers using objects and pictorial representations including the number line • Read and write numbers from 1 to 20 in numerals and words • Reason about the location of numbers to 20 within the linear number system, including comparing using < > and = **Addition and Subtraction:**

	● Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers. ● Represent and use number bonds and related subtraction facts within 20 ● Add and subtract one-digit and two-digit numbers to 20, including zero ● Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods) ● Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? - 9 **Multiplication and Division:** ● Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. **Fractions, Decimals and Percentages:** ● Recognise, find and name a half as one of two equal parts of an object, shape or quantity ● Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity **Measurement:** ● Compare, describe and solve practical problems for: - lengths & heights [e.g. long/short, longer/shorter, tall/short, double/half] - mass/weight [e.g. heavy/light, heavier than, lighter than] - capacity & volume [e.g. full/empty, more than, less than, half, half full, quarter] - time [e.g. quicker, slower, earlier, later] ● Sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] ● Measure and begin to record the following: - lengths and heights - mass/weight - capacity and volume - time (hours, minutes, seconds) ● Recognise and know the value of different denominations of coins and notes

	● Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. ● Recognise and use language relating to dates, including days of the week, weeks, months and years **Geometry:** ● Recognise and name common 2D and 3D shapes, including: - 2D shapes [e.g. rectangles (including squares), circles and triangles] - 3D shapes [e.g. cuboids (including cubes), pyramids and spheres] ● Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations. ● Describe position, direction and movement, including half, quarter and three-quarter turns.
YEAR 2	
Curriculum Content	**The key things we want children to know/be able to do**
	Number and Place Value: ● Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward. Compare and order numbers from 0 up to 100; use <, > and = signs ● Identify, represent and estimate numbers using different representations, including the number line. Reason about the location of any two digit number in the linear number system, including identifying the previous and next multiple of 10. ● Read and write numbers to at least 100 in numerals and in words ● Recognise the place value of each digit in a two-digit number (tens, ones) ● Use place value and number facts to solve problems **Addition and Subtraction:** ● Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 ● Add and subtract numbers using concrete objects, pictorial representations, and mentally, including:

	- a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-digit numbers ● Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot ● Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems ● Solve problems with addition and subtraction: - using concrete objects and pictorial representations, including those involving numbers, quantities and measures - applying their increasing knowledge of mental and written methods **Multiplication and Division:** ● Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers ● Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot ● Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs ● Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts **Fractions, Decimals and Percentages:** ● Recognise, find, name and write fractions ⅓, ¼, $^2/_4$ and ¾ of a length, shape, set of objects or quantity ● Write simple fractions e.g. ½ of 6 = 3 and recognise the equivalence of $^2/_4$ and ½ **Measurement:** ● Compare and order lengths, mass, volume/capacity and record the results using >, < and = ● Compare and sequence intervals of time

	• Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • Find different combinations of coins that equal the same amounts of money • Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change. • Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • Know the number of minutes in an hour and the number of hours in a day **Geometry:** • Identify and describe the properties of 2D shapes, including the number of sides and line symmetry in a vertical line • Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces • Identify 2D shapes on the surface of 3D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] • Compare and sort common 2D and 3D shapes and everyday objects • Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise) • Order and arrange combinations of mathematical objects in patterns and sequences **Statistics:** • Interpret and construct simple pictograms, tally charts, block diagrams and simple tables • Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • Ask and answer questions about totalling and comparing categorical data
YEAR 3	
Curriculum Content	**The key things we want children to know/be able to do**

	Number and Place Value: ● Count from 0 in multiples of 4, 8, 50 and 100 ● Find 10 or 100 more or less than a given number ● Compare and order numbers up to 1000 ● Read and write numbers up to 1000 in numerals and in words ● Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) ● Solve number problems and practical problems involving these ideas **Addition and Subtraction:** ● Add and subtract numbers mentally, including: - a three-digit number and ones - a three-digit number and tens - a three-digit number and hundreds ● Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction ● Estimate the answer to a calculation and use inverse operations to check answers ● Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction **Multiplication and Division:** ● Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables ● Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods) ● Estimate and use inverse operations to check answers to a calculation ● Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects **Fractions, Decimals and Percentages:** ● Count up and down in tenths ● Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators

	• Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • Compare and order unit fractions, and fractions with the same denominators • Recognise and show, using diagrams, equivalent fractions with small denominators • Add and subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7) • Solve problems that involve all of the above **Measurement:** • Compare durations of events, for example to calculate the time taken by particular events or tasks • Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time) • Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • Measure the perimeter of simple 2D shapes • Add and subtract amounts of money to give change, using both £ and p in practical contexts • Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24- hour clocks • Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight • Know the number of seconds in a minute and the number of days in each month, year and leap year **Geometry:** • Draw 2D shapes and make 3D shapes using modelling materials; recognise 3D shapes in different orientations and describe them • Recognise angles as a property of shape or a description of a turn

	● Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle ● Identify horizontal and vertical lines and pairs of perpendicular and parallel lines **Statistics:** ● Interpret and present data using bar charts, pictograms and tables ● Solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables
YEAR 4	
Curriculum Content	**The key things we want children to know/be able to do**
	Number and Place Value: ● Count backwards through zero to include negative numbers ● Count in multiples of 6, 7, 9, 25 and 1000 ● Find 1000 more or less than a given number ● Order and compare numbers beyond 1000 ● Identify, represent and estimate numbers using different representations ● Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value ● Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) and compose and decompose 4-digit numbers using standard and non-standard partitioning ● Round any number to the nearest 10, 100 or 1000 ● Solve number and practical problems that involve all of the above and with increasingly large positive numbers **Addition and Subtraction:** ● Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate ● Estimate and use inverse operations to check answers to a calculation

	● Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why **Multiplication and Division:** ● Recall multiplication and division facts for multiplication tables up to 12x12 ● Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers ● Recognise and use factor pairs and commutativity in mental calculations ● Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 ● Multiply two-digit and three-digit numbers by a one-digit number using formal written layout ● Estimate and use inverse operations to check answers to a calculation ● Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects **Fractions, Decimals and Percentages:** ● Count up and down in hundredths ● Recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten ● Compare numbers with the same number of decimal places up to two decimal places ● Round decimals with one decimal place to the nearest whole number ● Recognise and show, using diagrams, families of common equivalent fractions ● Recognise and write decimal equivalents of any number of tenths or hundredths ● Recognise and write decimal equivalents to ¼; ½; ¾ ● Add and subtract fractions with the same denominator ● Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths ● Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths ● solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole ● number

	● Solve simple measure and money problems involving fractions and decimals to two decimal places **Measurement:** ● Estimate, compare and calculate different measures, including money in pounds and pence ● Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres ● Find the area of rectilinear shapes by counting squares ● Read, write and convert time between analogue and digital 12- and 24-hour clocks ● Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days ● Convert between different units of measure (e.g. kilometre to metre; hour to minute) ● Perimeter can be expressed algebraically as 2(a + b) where a and b are the ● dimensions in the same unit. **Geometry:** ● Identify lines of symmetry in 2D shapes presented in different orientations ● Complete a simple symmetric figure with respect to a specific line of symmetry ● Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes ● Identify acute and obtuse angles and compare and order angles up to two right angles by size ● Identify acute and obtuse angles and compare and order angles up to two right angles by size ● Describe positions on a 2D grid as coordinates in the first quadrant ● describe movements between positions as translations of a given unit to the left/right and up/down ● Plot specified points and draw sides to complete a given polygon **Statistics:** ● Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs

	● Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs
YEAR 5	
Curriculum Content	**The key things we want children to know/be able to do**
	Number and Place Value: ● Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero ● Count forwards or backwards in steps of powers of 10 for any given number up to 1000000 ● Read, write, order and compare numbers to at least 1000000 and determine the value of each digit (appears also in Reading and Writing Numbers) ● Read, write, order and compare numbers to at least 1000000 and determine the value of each digit (appears also in Comparing Numbers) ● Read Roman numerals to 1000 (M) and recognise years written in Roman numerals ● Read, write, order and compare numbers to at least 1000000 and determine the value of each digit ● Round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000 ● Solve number problems and practical problems that involve all of the above **Addition and Subtraction:** ● Add and subtract numbers mentally with increasingly large numbers ● Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) ● Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy ● Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why **Multiplication and Division:** ● Multiply and divide numbers mentally drawing upon known facts ● Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers

	• Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • Establish whether a number up to 100 is prime and recall prime numbers up to 19 • Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates **Fractions, Decimals and Percentages:** • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalent (appears also in Equivalence) • Compare and order fractions whose denominators are all multiples of the same number • Read, write, order and compare numbers with up to three decimal places • Round decimals with two decimal places to the nearest whole number and to one decimal place • Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • Read and write decimal numbers as fractions (e.g. 0.71 = $^{71}/_{100}$) • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal

	• Add and subtract fractions with the same denominator and denominators that are multiples of the same number • Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. 2/5 + 4/5 = 6/5 = 1 1/5) • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • Solve problems involving numbers up to three decimal places • Solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those with a denominator of a multiple of 10 or 25 **Measurement:** • Calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes (appears also in Measuring) • Estimate volume (e.g. using $1cm^3$ blocks to build cubes and cuboids) and capacity (e.g. using water) • Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • Calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes • Solve problems involving converting between units of time • Convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints **Geometry:** • Identify 3D shapes, including cubes and other cuboids, from 2D representations • Draw given angles, and measure them in degrees (°)

	● Distinguish between regular and irregular polygons based on reasoning about equal sides and angles ● Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles ● Identify: - angles at a point and one whole turn (total 360°) - angles at a point on a straight line and ½ a turn (total 180°) - other multiples of 90° ● Use the properties of rectangles to deduce related facts and find missing lengths and angles ● Identify, describe and represent the position of a shape following reflection or translation, using the appropriate language, and know that the shape has not changed **Statistics:** ● Complete, read and interpret information in tables, including timetables ● Solve comparison, sum and difference problems using information presented in a line graph
YEAR 6	
Curriculum Content	**The key things we want children to know/be able to do**
	Number and Place Value: ● Use negative numbers in context, and calculate intervals across zero ● Read, write, order and compare numbers up to 10000000 and determine the value of each digit ● Round any whole number to a required degree of accuracy ● Solve number and practical problems that involve all of the above **Addition and Subtraction:** ● Perform mental calculations, including with mixed operations and large numbers ● Use their knowledge of the order of operations to carry out calculations involving the four operations ● Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

	• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why **Multiplication and Division:** • Perform mental calculations, including with mixed operations and large numbers • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of short division where appropriate for the context • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Identify common factors, common multiples and prime numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • Solve problems involving addition, subtraction, multiplication and division **Fractions, Decimals and Percentages:** • Compare and order fractions, including fractions >1 • Identify the value of each digit in numbers given to three decimal places • Solve problems which require answers to be rounded to specified degrees of accuracy • Use common factors to simplify fractions; use common multiples to express fractions in the same denomination • Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. ⅜) • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

	• Multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. 1/4 x 1/2 = 1/8) • Divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6) • Multiply one-digit numbers with up to two decimal places by whole numbers • Identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places • Use written division methods in cases where the answer has up to two decimal places **Ratio and Proportion:** • Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison • Solve problems involving similar shapes where the scale factor is known or can be found • Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples **Algebra:** • Express missing number problems algebraically • Find pairs of numbers that satisfy number sentences involving two unknowns • Enumerate all possibilities of combinations of two variables • Use simple formulae • Generate and describe linear number sequences **Measurement:** • Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3 • Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • Recognise that shapes with the same areas can have different perimeters and vice versa • Calculate the area of parallelograms and triangles

	• Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m), and extending to other units [e.g. mm and km]. • Recognise when it is possible to use formulae for area and volume of shapes • Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places. • Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • Convert between miles and kilometres **Geometry:** • Recognise, describe and build simple 3D shapes, including making nets • Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • Draw 2D shapes using given dimensions and angles • Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. • Describe positions on the full coordinate grid (all four quadrants) • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes **Statistics:** • Interpret and construct pie charts and line graphs and use these to solve problems • Calculate and interpret the mean as an average
YEAR 7	
Curriculum Content	**The key things we want children to know/be able to do**

	Manipulating algebra and equations ● use and interpret algebraic notation, including: ab in place of a × b, 3y in place of y + y + y and 3 × y, a^2 in place of a × a, a^3 in place of a × a × a; a^2b in place of a × a × b in place of a ÷ b, coefficients written as fractions rather than as decimals, brackets ● substitute numerical values into formulae and expressions, including scientific formulae ● understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors ● simplify and manipulate algebraic expressions to maintain equivalence by: ■ ○ collecting like terms ■ ○ multiplying a single term over a bracket ■ ○ taking out common factors ■ ○ expanding products of two or more binomials ■ ○ understand and use standard mathematical formulae; rearrange formulae to change the subject ● model situations or procedures by translating them into algebraic expressions or formulae ● Understand and use standard mathematical formulae; rearrange formulae to change the subject ● use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement) **Averages, charts and graphs** ● describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers) ● construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data

	• describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs. **Arithmetic Ratio and Proportion** • change freely between related standard units [for example time, length, area, volume/capacity, mass] • use ratio notation, including reduction to simplest form • divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio • understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction • relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions • solve problems involving direct and inverse proportion, including graphical andalgebraic representations • use the four operations, including formal written methods, applied to integers, all both positive and negative • recognise and use relationships between operations including inverse operations **Angles** • draw and measure line segments and angles in geometric figures, including interpreting scale drawings • derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line • describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric • use the standard conventions for labelling the sides and angles of triangle ABC • derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies

	• apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles • understand and use the relationship between parallel lines and alternate and corresponding angles • derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons • apply angle facts, properties of quadrilaterals to derive results about angles and sides and use known results to obtain simple proofs • use trigonometric ratios in similar triangles to solve problems involving right-angled triangles • interpret mathematical relationships both algebraically and geometrically. • use scale factors, scale diagrams and maps **Probability** • record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale • understand that the probabilities of all possible outcomes sum to 1 • enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams • generate theoretical sample spaces for single and combined events with equally likely, • mutually exclusive outcomes and use these to calculate theoretical probabilities.
YEAR 8	
Curriculum Content	**The key things we want children to know/be able to do**
	Inequalities • Write inequalities in words and using the inequality symbols.

	• Represent inequalities on a number line • Solve inequalities **Fractions, Decimals and Percentages** • express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1 • solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics • order fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ • use the four operations, including formal written methods, proper and improper fractions, and mixed numbers, all both positive and negative • work interchangeably with terminating decimals and their corresponding fractions • define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages,and work with percentages greater than 100% • interpret fractions and percentages as operators • use standard units of mass, length, time, money and other measures, including with decimal quantities **Area Perimeter and Volume** • derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders) • calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes • apply Pythagoras' Theorem, and use known results to obtain simple proofs • use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D • interpret mathematical relationships both algebraically and geometrically.

	● use compound units such as speed, unit pricing and density to solve problems **Number properties** ● understand and use place value for decimals, measures and integers of any size ● order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ ● use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property ● use the four operations, including formal written methods, decimals, all both positive and negative ● use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals ● use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations ● interpret and compare numbers in standard form $A \times 10^n$ $1 \leq A < 10$, where n is a positive or negative integer or zero ● round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures] ● use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a < x \leq b$ ● use a calculator and other technologies to calculate results accurately and then interpret them appropriately ● appreciate the infinite nature of the sets of integers, real and rational numbers. **Sequences and Graphs** ● Model situations or procedures by using graphs ● Work with coordinates in all four quadrants

	• Recognise, sketch and produce graphs of linear and quadratic functions of one variable • With appropriate scaling, using equations in x and y and the Cartesian plane • Interpret mathematical relationships both algebraically and graphically • Reduce a given linear equation in two variables to the standard form y = mx + c; • Calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically • Use linear and quadratic graphs to estimate values of y for given values of x and vice versa and to find approximate solutions of simultaneous linear equations • Find approximate solutions to contextual problems from given graphs of a variety of functions, including piece-wise linear, exponential and reciprocal graphs • Generate terms of a sequence from either a term-to-term or a position-to-term rule • Recognise arithmetic sequences and find the nth term • Recognise geometric sequences and appreciate other sequences that arise. **Transformations** • know and use the criteria for congruence of triangles • identify properties of, and describe the results of, translations, rotations and reflections applied to given figures • identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids • apply triangle congruence, and similarity and use known results to obtain simple proofs