



Maths (Number) – Programme of Study KEY STAGE 2				
Taught content: Knowledge/Skills	Number and Place Value	Addition and Subtraction	Multiplication and Division	Fractions (including decimals and percentages)
Prior learning	<p>count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward</p> <p>recognise the place value of each digit in a two-digit number (tens, ones)</p> <p>identify, represent and estimate numbers using different representations, including the number line</p> <p>compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs</p> <p>read and write numbers to at least 100 in numerals and in words</p> <p>use place value and number facts to solve problems</p>	<p>solve problems with addition and subtraction:</p> <p>using concrete objects and pictorial representations, including those involving numbers, quantities and measures</p> <p>applying their increasing knowledge of mental and written methods</p> <p>recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</p> <p>add and subtract numbers using concrete objects, pictorial representations, and mentally, including:</p> <p>a two-digit number and ones, a two-digit number and tens, two two-digit numbers, adding three one-digit numbers</p> <p>show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot</p>	<p>recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers</p> <p>calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals ($=$) signs</p> <p>show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</p> <p>solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.</p>	<p>recognise, find, name and write fractions $1/3$, $1/4$, $2/4$, $3/4$ of a length, shape, set of objects or quantity</p> <p>write simple fractions for example, $1/2$ of 6 = 3 and recognise the equivalence of $2/4$ and $1/2$.</p>



		recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems		
Year 3	<p>count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number</p> <p>recognise the place value of each digit in a three-digit number (hundreds, tens, ones)</p> <p>compare and order numbers up to 1000</p> <p>identify, represent and estimate numbers using different representations</p> <p>read and write numbers up to 1000 in numerals and in words</p> <p>solve number problems and practical problems involving these ideas.</p>	<p>Add and subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds</p> <p>Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction</p> <p>Estimate the answer to a calculation and use inverse operations to check answers</p> <p>Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.</p>	<p>recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</p> <p>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</p> <p>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</p>	<p>count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10</p> <p>recognise, find and write fractions of a discrete set of objects: unit fractions and nonunit fractions with small denominators</p> <p>recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators</p> <p>recognise and show, using diagrams, equivalent fractions with small denominators</p> <p>add and subtract fractions with the same denominator within one whole [for example, $5/7 + 1/7 = 6/7$]</p> <p>compare and order unit fractions, and fractions with the same denominators</p> <p>solve problems that involve all of the above.</p>



<p>Year 4</p>	<p>count in multiples of 6, 7, 9, 25 and 1000</p> <p>find 1000 more or less than a given number</p> <p>count backwards through zero to include negative numbers</p> <p>recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)</p> <p>order and compare numbers beyond 1000</p> <p>identify, represent and estimate numbers using different representations</p> <p>round any number to the nearest 10, 100 or 1000</p> <p>solve number and practical problems that involve all of the above and with increasingly large positive numbers</p> <p>read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the</p>	<p>add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate</p> <p>estimate and use inverse operations to check answers to a calculation</p> <p>solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.</p>	<p>recall multiplication and division facts for multiplication tables up to 12×12</p> <p>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</p> <p>recognise and use factor pairs and commutativity in mental calculations</p> <p>multiply two-digit and three-digit numbers by a one-digit number using formal written layout</p> <p>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.</p>	<p>recognise and show, using diagrams, families of common equivalent fractions</p> <p>count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten</p> <p>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</p> <p>add and subtract fractions with the same denominator</p> <p>recognise and write decimal equivalents of any number of tenths or hundredths</p> <p>recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$.</p> <p>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</p>
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	concept of zero and place value.			<p>round decimals with one decimal place to the nearest whole number</p> <p>compare numbers with the same number of decimal places up to two decimal places</p> <p>solve simple measure and money problems involving fractions and decimals to two decimal places.</p>
Year 5	<p>read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</p> <p>count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</p> <p>interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero</p> <p>round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</p> <p>solve number problems and practical problems that involve all of the above</p>	<p>add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)</p> <p>add and subtract numbers mentally with increasingly large numbers</p> <p>use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</p> <p>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</p>	<p>identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers</p> <p>know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers</p> <p>establish whether a number up to 100 is prime and recall prime numbers up to 19</p> <p>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</p> <p>multiply and divide numbers mentally drawing upon known facts</p> <p>divide numbers up to 4 digits by a one-digit number using the formal written method</p>	<p>compare and order fractions whose denominators are all multiples of the same number</p> <p>identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths</p> <p>recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $2/5 + 4/5 = 6/5 = 1 \frac{1}{5}$]</p> <p>add and subtract fractions with the same denominator and denominators that are multiples of the same number</p> <p>multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams</p>



	<p>read Roman numerals to 1000 (M) and recognise years written in Roman numerals.</p>		<p>of short division and interpret remainders appropriately for the context</p> <p>multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</p> <p>recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)</p> <p>solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</p> <p>solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</p> <p>solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</p>	<p>read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$]</p> <p>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</p> <ul style="list-style-type: none"> • round decimals with two decimal places to the nearest whole number and to one decimal place • read, write, order and compare numbers with up to three decimal places • solve problems involving number up to three decimal places • 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 <p>solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.</p>
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<p>Year 6</p>	<p>read, write, order and compare numbers up to 10 000 000 and determine the value of each digit</p> <p>round any whole number to a required degree of accuracy</p> <p>use negative numbers in context, and calculate intervals across zero</p> <p>solve number and practical problems that involve all of the above.</p>	<p>multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</p> <p>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</p> <p>divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context</p> <p>perform mental calculations, including with mixed operations and large numbers</p> <p>identify common factors, common multiples and prime numbers</p> <p>use their knowledge of the order of operations to carry out calculations involving the four operations</p> <p>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p> <p>solve problems involving addition, subtraction, multiplication and division</p> <p>use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</p>	<p>use common factors to simplify fractions;</p> <p>use common multiples to express fractions in the same denomination</p> <p>compare and order fractions, including fractions > 1</p> <p>add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions</p> <p>multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]</p> <p>divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]</p> <p>associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]</p> <p>identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places</p>
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<p>Subsequent learning – working mathematically</p>	<p>consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots</p> <p>select and use appropriate calculation strategies to solve increasingly complex problems</p> <p>extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations</p> <p>develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems</p> <p>begin to model situations mathematically and express the results using a range of formal mathematical representations</p> <p>select appropriate concepts, methods and techniques to apply to unfamiliar and nonroutine problems.</p>		



Maths (Other areas) – Programme of Study KEY STAGE 2						
Taught content: Knowledge/Skills	Measurement	Geometry (Properties of shapes)	Geometry (Position and Direction)	Statistics	Ratio and Proportion	Algebra
Prior learning	<p>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</p> <p>compare and order lengths, mass, volume/capacity and record the results using >, < and =</p> <p>recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value</p>	<p>identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line</p> <p>identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces</p> <p>identify 2-D shapes on the surface of 3-D shapes [for example, a circle on a cylinder and a triangle on a pyramid]</p> <p>compare and sort common 2-D and 3-D shapes and everyday objects</p>	<p>order and arrange combinations of mathematical objects in patterns and sequences</p> <p>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 anticlockwise).</p>	<p>interpret and construct simple pictograms, tally charts, block diagrams and simple tables</p> <p>ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity</p> <p>ask and answer questions about totalling and comparing categorical data.</p>		



	<p>find different combinations of coins that equal the same amounts of money</p> <p>solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change</p> <p>compare and sequence intervals of time</p> <p>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</p> <p>know the number of minutes in an hour and the number of hours in a day</p>					
<p>Year 3</p>	<p>measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)</p> <p>measure the perimeter of simple 2-D shapes</p>	<p>draw 2-D shapes and make 3-D shapes using modelling materials</p> <p>recognise 3-D shapes in different orientations and describe them</p>		<p>interpret and present data using bar charts, pictograms and tables</p> <p>solve one-step and two-step questions [for example, 'How many more?' and 'How</p>		



	<p>add and subtract amounts of money to give change, using both £ and p in practical contexts</p> <p>tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks</p> <p>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</p> <p>know the number of seconds in a minute and the number of days in each month, year and leap year</p> <p>compare durations of events [for example to calculate the time taken by particular</p>	<p>recognise angles as a property of shape or a description of a turn</p> <p>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</p> <p>identify horizontal and vertical lines and pairs of perpendicular and parallel lines</p>		<p>many fewer?'] using information presented in scaled bar charts and pictograms and tables.</p>		
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	events or tasks].					
Year 4	<p>Convert between different units of measure [for example, kilometre to metre; hour to minute]</p> <p>measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres</p> <p>find the area of rectilinear shapes by counting squares</p> <p>estimate, compare and calculate different measures, including money in pounds and Pence</p> <p>read, write and convert time between analogue and digital 12- and 24-hour clocks</p> <p>solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.</p>	<p>compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</p> <p>identify acute and obtuse angles and compare and order angles up to two right angles by size</p> <p>identify lines of symmetry in 2-D shapes presented in different orientations</p> <p>complete a simple symmetric figure with respect to a specific line of symmetry.</p>	<p>describe positions on a 2-D grid as coordinates in the first quadrant</p> <p>describe movements between positions as translations of a given unit to the left/right and up/down</p> <p>plot specified points and draw sides to complete a given polygon.</p>	<p>Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.</p> <p>solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.</p>		



<p>Year 5</p>	<p>convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)</p> <p>understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints</p> <p>measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres</p> <p>calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes</p> <p>estimate volume [for example, using 1 cm³</p>	<p>identify 3-D shapes, including cubes and other cuboids, from 2-D representations</p> <p>know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles</p> <p>draw given angles, and measure them in degrees (o)</p> <p>identify: angles at a point and one whole turn (total 360o) , angles at a point on a straight line and ½ a turn (total 180o) , other multiples of 90o</p> <p>use the properties of rectangles to deduce related facts and find missing lengths and angles</p> <p>distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</p>	<p>identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.</p>	<p>solve comparison, sum and difference problems using information presented in a line graph</p> <p>complete, read and interpret information in tables, including timetables.</p>		
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	<p>blocks to build cuboids (including cubes) and capacity [for example, using water]</p> <p>solve problems involving converting between units of time</p> <p>use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.</p>					
Year 6	<p>solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate</p> <p>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</p>	<p>draw 2-D shapes using given dimensions and angles</p> <p>recognise, describe and build simple 3-D shapes, including making nets</p> <p>compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons</p> <p>illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius</p>	<p>describe positions on the full coordinate grid (all four quadrants)</p> <p>draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</p>	<p>interpret and construct pie charts and line graphs and use these to solve problems</p> <p>calculate and interpret the mean as an average.</p>	<p>solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</p> <p>solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of</p>	<p>use simple formulae</p> <p>generate and describe linear number sequences</p> <p>express missing number problems algebraically</p> <p>find pairs of numbers that satisfy an equation with two unknowns</p>



	<p>convert between miles and kilometres</p> <p>recognise that shapes with the same areas can have different perimeters and vice versa</p> <p>recognise when it is possible to use formulae for area and volume of shapes</p> <p>calculate the area of parallelograms and triangles</p> <p>calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]</p>	<p>recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</p>			<p>percentages for comparison</p> <p>solve problems involving similar shapes where the scale factor is known or can be found</p> <p>solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</p>	<p>enumerate possibilities of combinations of two variables</p>
<p>Subsequent learning – Working mathematically</p>	<p>use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships</p> <p>move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs]</p> <p>develop algebraic and graphical fluency, including understanding linear and simple quadratic functions</p>					



	<p>begin to reason deductively in geometry, number and algebra, including using geometrical constructions</p> <p>use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics.</p>
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Areas not explicitly covered