Maths programme of study – Key stages 1 and 2 National Curriculum

	Year 1 Expectations	Year 2 Expectations	Year 3 Expectations	Year 4 Expectations	Year 5 Expectations	Year 6 Expectations
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 different multiples including ones, twos, fives and tens • Given a number, identify one more and one less • Identify and represent numbers using concrete objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • Read and write numbers 1 to 20 in digits and words	• Count in steps of 2, 3, and 5 from 0, and count in tens from any number, forward or backward • Recognise the value of each digit in a two digit number (tens, ones) • Identify, represent and estimate numbers using different representation, including the number line • Compare and order numbers from 0 up to 100; use <, > and = signs • Read and number facts to solve problems • Read and write numbers to at least 100 in numerals and in words • Use place value and number facts to solve problems	• Count from 0 in multiples of 4, 8, 50 and 100; finding 10 or 100 more than a given number • Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • Compare and order numbers up to 1000 • Identify, represent and estimate numbers using different representations • Read and write numbers to at least 1000 in numerals and in words • Solve number problems and practical problems involving these ideas.	• Count in multiples of 6, 7, 9, 25 and 100 • Find 1000 more or less than a given number • Count backwards through zero to include negative numbers • Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones) • Order and compare numbers beyond 1000 • Identify, represent and estimate numbers using different representations • 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 • Read Roman numerals to 100 (I to C) and understand how, over time, the numeral system changed to include the concept of zero and place value	• Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero • Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • Solve number problems and practical problems that involve all of the above • Read Roman numerals to 1000 (M) and recognise years written in Roman numerals	• Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit • Round any whole number to a required degree of accuracy • Use negative numbers in context, and calculate intervals across zero • Solve number problems and practical problems that involve all of the above.

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Addition and Subtraction	• Read, write and interpret mathematical statements involving addition (+), subtraction (-), and equals (=) signs • Represent and use number bonds and related subtraction facts within 20 • Add and subtract one-digit and two-digit numbers to 20,including zero • Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 =□ - 9.	• Solve simple one-step 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 • 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 missing number problems	• 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 the efficient 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.	• 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.	• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction • Add and subtract numbers mentally with increasingly large numbers • 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	• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
Multiplication and Division	• Solve simple one step problems involving multiplication and division, calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	• Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs	• 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 two-digit numbers times one-digit numbers, using mental and progressing to efficient written methods	• Recall multiplication and division facts for multiplication tables up to 12 x 12 • 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	• 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	• Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the efficient written method of long multiplication • 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

		• Show that multiplications of two numbers can be done in any order (commutative and division of one number by another cannot • Solve one-step problems involving multiplication and division, using materials arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	• Solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which n objects are connected to m objects.	• Recognise and use factor pairs and commutatively in mental calculations • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout • 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 which n objects are connected to m objects.	prime numbers up to 19 • 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 • Multiply and divide numbers mentally drawing upon known facts • 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 • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) • 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	• 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 context • Perform mental calculations, including with mixed operations and large numbers • Identify common factors, common multiples and prime numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations • Using their knowledge of the order of operations to carry out calculations involving the four operations • Solve problems involving addition, subtraction, multiplication and division • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
Fractions	• Recognise, find and name a half	• Recognise, find name and write	• Count up and down in tenths;	• Recognise and show, using	• Compare and order fractions	• Use common factors to simplify

(including decimals and percentages)	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.	fractions 1/3, 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 equivalent of two quarters and one half	recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • Recognise, find and write fractions of a discrete set of objects; unit fractions and non-unit fractions with small denominators • Recognise and use fractions as numbers; unit fractions and non-unit fractions with small 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) • Compare and order unit fractions with the same denominator • Solve problems that involve all of the above	diagrams, families of common equivalent fractions • Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten • Solve problems involving increasingly harder fractions to calculate quantities, including non-unit fractions where the answer is a whole number • Add and subtract fractions with the same denominator. • Recognise and write decimal equivalents of any number of tenths or hundredths • Recognise and write decimal equivalents to ¼; ½; ¾ • 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 • Round decimals with one decimal place to the nearest whole number • Compare numbers with the same number of decimal places up to two decimal places • Solve simple measures and money problems involving fractions and decimals to two decimal places	whose denominators are all multiples of the same number • Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • Recognise mixed numbers and improper fractions and convert from one to the other and write mathematical statements >1 as a mixed number (e.g. 2/5 + 4/5 = 6/5 = 1 1/5) • Add and subtract fractions with the same denominator and denominators that are multiples of the same number • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. • 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 • 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 numbers up to three decimal places • Recognise the per cent symbol (%) and understand that per cent relates to	fractions; use common multiples to express fractions in the same denomination • Compare and order fractions including fractions >1 • 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. ¼ x ½ = 1/8) • Divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6) • Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8) • 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 • Multiply one-digit numbers with up to two decimal places by whole numbers • Use written division methods in cases where the answer has up to two decimal places • Solve problems which require answers to be rounded to specified degrees of accuracy. • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

					'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal • Solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25	
Measurement	• Compare, describe and solve practical problems for: ▪ Lengths and heights (e.g. long/short, longer/shorter, tall/short, double/half) ▪ Mass or weight (e.g. heavy/light, heavier than, lighter than ▪ Capacity/volume (full/empty, more than/less than, quarter ▪ Time (quicker, slower, earlier, later • 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 • Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening • Recognise and use the language relating to dates, including days of the week, weeks, months and years • Tell the time to the hour and half	• 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 • Compare and order lengths, mass, volume/capacity and record the results using <, > and = • Read relevant scales to the nearest numbered unit • Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • Find different combinations of coins that equal the same amounts of money • Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • Compare and sequence intervals of time • Tell and write time to five minutes, including quarter past/to the hour and draw the hands on a clock	• Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • Measure the perimeter of simple 2-D shapes • Add and subtract amounts of money giving change, using both £ and p in practical contexts • Tell and write the time from an analogue clock, including using Roman numerals from 1 to X11, and 12 hour and 24 hour clocks • Estimate and read time to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as am/pm, 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 • Compare durations of events, for example to calculate the time taken by particular events or tasks.	• Convert between different units of measure (e.g. kilometre to metre; hour to minute) • Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • Find the area of rectilinear shapes by counting • Estimate, compare and calculate different measures, including money in pounds and pence • 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 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 • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • 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 • Estimate volume (e.g. using 1 cm³ blocks to build cuboids (including cubes)) and capacity (e.g. using water) • Solve problems involving converting between units of time	• Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • 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 three decimal places • Convert between miles and kilometre • Recognise that shapes with the same areas can have different perimeters and vice versa • Recognise when it is possible to use formulae for area and volume of shapes • Calculate the area of parallelograms and triangles • Recognise when it is necessary to use the formulae for area and volume of shapes • Calculate, estimate and compare volume of cubes and cuboids using standard units, including

	past the hour and draw the hands on a clock face to show these times.	face to show these times • Know the number of minutes in an hour and the number of hours in a day			• Use all four operations to solve problems involving measure (for example, length, mass, volume, money)using decimal notation, including scaling	cubic centimetres (cm³) and cubic metres (m³) and extending to other units (e.g. mm³ and km³).
Geometry – Properties of Shape	• Recognise and name common 2-D and 3-D shapes, including: ▪ 2-D shapes (e.g. rectangles (including squares), circles and triangles) ▪ 3-D shapes (e.g. cuboids (including cubes), pyramids and spheres)	• Identify and describe the properties of 2-D shapes, including the number of sides and symmetry in a vertical line • Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • Identify 2-D shapes on the surface of 3-D shapes, for example a circle on a cylinder and a triangle on a pyramid • Compare and sort common 2-D and 3-D shapes and everyday objects	• Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations; and describe them with increasing accuracy • Recognise angles as a property of shape and associate angles with turning • 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, vertical, perpendicular and parallel lines in relation to other lines.	• Compare and classify geometric shapes, including quadrilaterals and triangles, based n their properties and sizes • Identify acute and obtuse angles and compare and order angles up to two right angles by size • Identify lines of symmetry in 2-D shapes presented in different orientations • Complete a simple symmetric figure with respect to a specific line of symmetry.	• Identify 3-D shapes, including cubes and cuboids, from 2-D representations • Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles • draw given angles, measuring them in degrees (°) • 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 a rectangle to deduce related facts and find missing lengths and angles • distinguish between regular and irregular polygons based on reasoning about equal sides and angles	• draw 2D shapes using given dimensions and angles • recognise , describe and build simple 3-D shapes, including making nets • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
Geometry - Position	• Describe position, directions and movements, including half, quarter and three-quarter turns	• Order and arrange combinations of mathematical objects in patterns		• Describe positions on a 2-D grid as coordinates in the first quadrant	• Identify, describe and represent the position of a shape following a reflection or translation, using the	• Describe positions on the full coordinate grid (all four quadrants)

		• Use mathematical vocabulary to describe position, direction and movement, including distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)		• Describe movement 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.	appropriate language, and know that the shape has not changed.	• Draw and translate simple shapes on the coordinate plane, and reflect them in the axes
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 compare categorical data.	• Interpret and present data using bar charts, pictograms and tables • Solve one-step and two-step questions such as 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables.	• 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.	• Solve comparison, sum and difference problems using information presented in a line graph • Complete, read and interpret information in tables, including timetables	• Interpret and construct pie charts and line graphs and use these to solve problems • Calculate and interpret the mean as an average
Ratio and Proportion						• 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 the calculation of percentages (e.g 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						• Use simple formulae • Generate and describe linear number sequences • Express missing number problems algebraically • Find pairs of numbers that satisfy number sentences involving two unknowns • Enumerate possibilities of combinations of two variables.