Maths Programmes of Study

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number and place value	Count to and across 100, forward and backward, 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 pictoral 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 place value of each digit in a two-digit number (tens, ones) Identify, represent and estimate numbers using different representations including the number line Compare and order numbers from 0 up to 100; use <, > and = signs 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 or less than a given number Recognise the place value of each digit in a three-digit number (hundred, tens, ones) Compare and order numbers up to 1000 Identify, represent and estimate numbers using different representation 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 1000 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 at 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 (9 + 9, 18 – 9), including zero Solve simple one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems.	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 efficient 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 efficient 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

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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 Recognise and use the inverse relationship between multiplication and division in calculations Show that multiplication 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 material, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	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 two-digit numbers times one-digit numbers, using mental and progressing to efficient written methods 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.	Recall multiplication and division facts for multiplication tables up to 12 x 12 Use place value, known and derived facts to multiply and drive 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 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 and harder multiplication problems such as which n objects are connected to m objects	Identify multiples and factors, including finding all factor pairs Solve problems involving multiplication and division where larger numbers are used by decomposing them into their factors 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 Multiply numbers up to 4 digits by a one- or two-digit number using an efficient 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 efficient 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})	Identify common factors, common multiples and prime numbers 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 efficient written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

					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.	
Addition, subtraction, multiplication and division						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 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.

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Fractions	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	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 two quarters and one half.	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 Recognise, find and write fractions of a discrete set of objects: unit factions 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	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, and fractions to divide quantities, including non-unit fractions where the answer is a whole number Identify, name and write equivalent fractions of a given fraction, including tenths and hundredths Add and subtract fractions with the same denominator.	Compare and order fractions whose denominators are all multiples of the same number Recognise mixed numbers and improper fractions and convert from one form to the other Add and subtract fractions with the same denominator and related fractions; write mathematical statements >1 as a mixed number (e.g. 2/5 + 4/5 = 6/5 = 11/5) Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination Compare and order fractions, including fractions >1 Associate a fraction with division to calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8) 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 × 1/2 = 1/8) Divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6)
Decimals and fractions				Recognise and write decimal equivalents of any number of tenths or hundredths Recognise and write decimal equivalents to ¼, ½, and ¾	Read and write decimal numbers as fractions (e.g. 0.71 = 71/100) Recognise and use thousandths and relate them	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

				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 units, 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 measure and money problems involving fractions and decimals to two decimal places.	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 number 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.
Percentages, decimals and fractions					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 hundred, and as a decimal fraction 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.	Solve problems involving the calculation of percentages of whole numbers or measures such as 15% of 360 and the use of percentages for comparison Recall and us equivalences between simple fractions, decimals and percentages, including in different contexts.
Ratio						Solve problems involving the relative sizes of two quantities, including similarity Solve problems involving unequal sharing and grouping
Algebra						Express missing number problems algebraically

						Use simple formulae expressed in words Generate and describe linear number sequences Find pairs of numbers that satisfy number sentences involving two unknowns.
Measures	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, quarter 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	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 and match different combinations of coins to equal the same amounts of money; add and subtract money of the same unit, including giving change Solve simple problems in a practical context involving addition and subtraction of money Compare and sequence intervals of time	Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume (l/ml) Measure the perimeter of simple 2-D 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, hours and o'clock; use vocabulary such as 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 Compare durations of events, for example to calculate the time taken by particular events, for example to	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; metre and centimetre; centimetre and millimetre; kilogram and gram; litre and millilitre) Understand and use basic equivalences between metric and common imperial units and express them in approximate terms 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 Recognise and estimate volume (e.g. using 1 cm^3 blocks to build cubes and cuboids) 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 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 kilometres Recognise that shapes with the same areas can have different perimeters and vice versa 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 centimetre cubed

	after, next, first, today, yesterday, tomorrow, morning, afternoon and evening Recognise and use language relating to dates, including days of the week, weeks, months and years Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	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.	calculate the time taken by particular events or tasks.		Solve problems involving addition and subtraction of units of measure (e.g. length, mass, volume, money) using decimal notation.	(cm^3) and cubic metres (m^3) and extending to other units, such as mm^3 and km^3.
Geometry: Properties of shapes	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 on 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 measure them and draw a given angle, writing its size in degrees (o) Identify: • Multiples of 90o • Angles at a point on a straight line and ½ a turn (total 180o) • Angles at a point and one whole turn (total 360o) • Reflex angles Compare different angles Draw shapes using given dimensions and angles State and use the properties of a rectangle (including squares) to deduce related facts Distinguish between regular and irregular polygons based on reasoning about equal sides 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 Find unknown angles where they meet at a point, are on a straight line, and are vertically opposite. 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.

Geometry: position, direction, motion	Order and arrange combination of objects and shapes in patterns Describe position, directions and movements, including half, quarter and three-quarter turns	Order and arrange combinations of mathematical objects in patterns 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), and movement in a straight line.		Describe positions on a 2-D 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	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	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.

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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 data using bar charts and continuous data using line graphs Solve comparison, sum and different problems using information presented in bar charts, pictograms, tables and simple line graphs.	Solve comparison, sum and difference problems using information presented in line graphs 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.