

Number – number and place value

Year 1

- ✓ 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
- ✓ given a number, identify one more and one less
- ✓ identify and represent numbers using 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 from 1 to 20 in numerals and words.

Year 2

- ✓ count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and 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.

Year 3

- ✓ count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less 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 up to 1000 in numerals and in words
- ✓ solve number problems and practical problems involving these ideas.

Year 4

- ✓ 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 know that over time, the numeral system changed to include the concept of zero and place value.

Year 5

- ✓ 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, including 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.

Year 6

- ✓ 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 and practical problems that involve all of the above.

Number – addition, subtraction, multiplication and division

Year 1

- ✓ 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 $7 = \square - 9$
- ✓ 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.

Year 2

- ✓ 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
- ✓ 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
- ✓ 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 (\times), division (\div) and equals (=) signs
- ✓ show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
- ✓ solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Year 3

- ✓ 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
- ✓ 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
- ✓ 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.

Year 4

- ✓ 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.
- ✓ recall multiplication and division facts for multiplication tables up to 12×12
- ✓ 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
- ✓ 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 to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Year 5

- ✓ 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.
- ✓ 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
- ✓ 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.

Year 6

- ✓ 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 long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- ✓ 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
- ✓ 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
- ✓ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- ✓ solve problems involving addition, subtraction, multiplication and division
- ✓ use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Number – fractions

Year 1

- ✓ 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.

Year 2

- ✓ recognise, find, name and write fractions a third, a quarter, two quarters and three quarters of a length, shape, set of objects or quantity
- ✓ write simple fractions for example, one half of 6 = 3
- ✓ recognise the equivalence of two quarters and a half.

Year 3

- ✓ 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 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
- ✓ compare and order unit fractions, and fractions with the same denominators
- ✓ solve problems that involve all of the above.

Year 4

- ✓ recognise and show, using diagrams, families of common equivalent fractions
- ✓ count up and down in hundredths; recognise that hundredths arise when dividing an object by one 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
- ✓ add and subtract fractions with the same denominator
- ✓ recognise and write decimal equivalents of any number of tenths or hundredths
- ✓ recognise and write decimal
- ✓ 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 measure and money problems involving fractions and decimals to two decimal places.

Year 5

- ✓ compare and order fractions 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 form to the other and write mathematical statements
- ✓ 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 [for example, $0.71 = \frac{71}{100}$]
- ✓ 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 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
- ✓ solve problems which require knowing percentage and decimal equivalents .

Year 6

- ✓ use common factors to simplify 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
- ✓ divide proper fractions by whole numbers
- ✓ associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction
- ✓ 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.

Measurement

Year 1

- ✓ compare, describe and solve practical problems for:
- ✓ lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]
- ✓ mass/weight [for example, heavy/light, heavier than, lighter than]
- ✓ capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]
- ✓ time [for example, 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 [for example, before and 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.

Year 2

- ✓ 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 $=$
- ✓ 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 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.

Year 3

- ✓ 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 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
- ✓ compare durations of events [for example to calculate the time taken by particular events or tasks].

Year 4

- ✓ Convert between different units of measure [for example, 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 squares
- ✓ 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.

Year 5

- ✓ convert between different units of metric measure (for example, 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 [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water]
- ✓ solve problems involving converting between units of time
- ✓ use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

Year 6

- ✓ 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 up to three decimal places
- ✓ convert between miles and kilometres
- ✓ 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
- ✓ 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].

Geometry – properties of shapes/position and direction

Year 1

- ✓ recognise and name common 2-D and 3-D shapes, including:
- ✓ 2-D shapes [for example, rectangles (including squares), circles and triangles]
- ✓ 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]
- ✓ describe position, direction and movement, including whole, half, quarter and three-quarter turns.

Year 2

- ✓ identify and describe the properties of 2-D shapes, including the number of sides and line 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
- ✓ order and arrange combinations of mathematical objects in patterns and sequences
- ✓ 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).

Year 3

- ✓ draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D 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.

Year 4

- ✓ 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
- ✓ 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.

Year 5

- ✓ identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- ✓ know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- ✓ draw given angles, and measure them in degrees (o)
- ✓ identify:
 - angles at a point and one whole turn (total 360o)
 - angles at a point on a straight line and 2
 - 1 a turn (total 180o)
- ✓ other multiples of 90o
- ✓ use the properties of rectangles to deduce related facts and find missing lengths and angles
- ✓ distinguish between regular and irregular polygons based on reasoning about equal sides and angles
- ✓ 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.

Year 6

- ✓ draw 2-D 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
- ✓ 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

Year 2

- ✓ 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

- ✓ interpret and present data using bar charts, pictograms and tables
- ✓ solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.

Year 4

- ✓ 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

- ✓ solve comparison, sum and difference problems using information presented in a line graph
- ✓ complete, read and interpret information in tables, including timetables.

Year 6

- ✓ 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

Year 6

- ✓ 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 [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

Year 6

- ✓ use simple formulae
- ✓ generate and describe linear number sequences
- ✓ express missing number problems algebraically
- ✓ find pairs of numbers that satisfy an equation with two unknowns
- ✓ enumerate possibilities of combinations of two variables.