Mathematics: Planning and Assessment from National Curriculum Year 1

For statements to be completely embedded they should be demonstrated in a range of contexts and subject areas if applicable.

Number & Place Value	Addition & Subtraction	Multiplication & Division	Fractions	Measurement	Geometry: Properties of Shapes
❖ 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.	❖ 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; ☐+ 3 = 10	❖ 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.	❖ 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.	*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.	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].*
					Geometry: Position & Direction
					❖ Describe position, direction and movement, including whole, half, quarter and three-quarter turns.

Mathematics: Planning and Assessment from National Curriculum Year 2

For statements to be completely embedded they should be demonstrated in a range of contexts and subject areas if applicable.

Number & Place Value

- 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.

Addition & Subtraction

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 and 100:

- fluently up to 20;
- related facts 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.

Multiplication & Division

- 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 (×), division (÷) 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.

Fractions

- Recognise, find, name and write fractions $^1/_3$, $^1/_4$, $^2/_4$, and $^3/_4$ of a length, shape, set of objects or quantity.
- Write simple fractions for example, $^1/_2$ of 6 = 3 and recognise the equivalence of $^2/_4$ and $^1/_2$.

Measurement

Choose and use appropriate standard units to estimate and measure to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels:

- length/height in any direction (m/cm);
- mass (kg/g);
- temperature (°C);
- capacity (litres/ml).

- 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 number of hours in a day.

Geometry: Properties of Shapes

- 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.

Geometry: Position & Direction

- 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).

Statistics

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.
- Ask and answer questions about totalling and comparing categorical data.

End of key stage 1: Know number bonds to 20; be precise in using place value; read and spell mathematical vocabulary at a level consistent with their increasing work reading and spelling knowledge at key stage 1.

Mathematics: Planning and Assessment from National Curriculum Year 3

For statements to be completely embedded they should be demonstrated in a range of contexts and subject areas if applicable.

Number & Place Value	Addition & Subtraction	Multiplication & Division	Fractions	Measurement	Geometry: Properties of Shapes
❖ 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.	*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 3x table. ❖ Recall and use multiplication and division facts for the 4x table. ❖ Recall and use multiplication and division facts for the 8x table. ❖ 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.	❖ 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 (numerator of 1) 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 *[for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$].* ❖ Compare and order unit fractions, and fractions with the same denominators. ❖ Solve problems that involve all of the above.	❖ Measure, compare, add and subtract lengths (m/cm/mm); ❖ Measure, compare, add and subtract mass (kg/g); ❖ Measure, compare, add and subtract 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 and 12-hour and 24-hour clocks; ❖ an analogue clock, including using Roman numerals from I to XII. ❖ 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].*	❖ 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. **Statistics** ❖ 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.

Mathematics: Planning and Assessment from National Curriculum Year 4

For statements to be completely embedded they should be demonstrated in a range of contexts and subject areas if applicable.

Number & Place Value

- 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.

Addition & Subtraction

- Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.
- Estimate and use inverse operations to check answers to a calculation.
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Multiplication & Division

- **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.

- 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.

Fractions (including decimals)

- 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 equivalents to $^1/_4$, $^1/_2$, $^3/_4$.
- 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.

Measurement

- 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.

Geometry: Properties of Shapes

- 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.

Geometry: Position & Direction

- 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.

Statistics

- Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.
- Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

End of Year 4: Have memorized multiplication tables up to and including 12 x 12; show precision and fluency in their work; read and spell mathematical vocabulary correctly and confidently.

Mathematics: Planning and Assessment from National Curriculum Year 5

For statements to be completely embedded they should be demonstrated in a range of contexts and subject areas if applicable.

Number & 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, 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.

Addition & Subtraction

- 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 *(example, 12 462 – 2300 = 10 162)*
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Multiplication & Division

- 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.

Fractions (including decimals & %)

- 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 > 1 as a mixed number *[for example, $^2/_5 + {}^4/_5 = {}^6/_5 = 1{}^1/_5$]*.
- 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 *[for example, 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 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 of $^1/_2$, $^1/_4$, $^1/_5$, $^2/_5$, $^4/_5$ and those fractions with a denominator of a multiple of 10 or 25.

Measurement

- 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 (cm^2) and square metres (m^2) .
- Estimate the area of irregular shapes.
- Estimate volume *[for example, using 1 cm^3 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.

Geometry: Properties of Shapes

- 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 (^{0}).

Identify:

- angles at a point and one whole turn (total 3600);
- angles at a point on a straight line and $^1/_2$ a turn (total 1800);
- other multiples of 90.

- 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.

Geometry: Position & Direction

- 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.

Statistics

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

Mathematics: Planning and Assessment from National Curriculum Year 6

For statements to be completely embedded they should be demonstrated in a range of contexts and subject areas if applicable.

Place Value

- 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.

Addition, Subtraction, Multiplication & Division

- Multiply multi-digit numbers up to 4 digits by a two-digit whole number.
- 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 number 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 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.
- 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, subtraction multiplication and division multi-step problems in contexts, deciding which operations and methods to use and why..
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Fractions (including decimals & %)

- 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 *[for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]*.
- Divide proper fractions by whole numbers *[for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]*.
- Associate a fraction with division and calculate decimal fraction equivalents *[for example, 0.375]* for a simple fraction *[for example, $\frac{3}{8}$]*.
- 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.

Ratio & 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 *[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

- 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.

Measurement

- 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 (cm^3) and cubic metres (m^3), and extending to other units *[for example, mm^3 and km^3]*.

Properties of Shapes

- 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.

Position and Direction

- Describe positions on the full coordinate grid (all four quadrants).
- Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

.Statistics

- Interpret pie charts and line graphs and use these to solve problems.
- Construct pie charts and line graphs.
- Calculate and interpret the mean as an average.

End of Year 6: Be fluent in written methods for all 4 operations, including long multiplication and division and in working with fractions, decimals and percentages; read, spell and pronounce mathematical vocabulary correctly.