

Mathematics Subject Content and Key Assessment Criteria

Key Stage 1	
Pupils should be taught:	<ul style="list-style-type: none"> • Number and Place Value • Addition and Subtraction • Multiplication and division • Fractions • Measurement • Properties of shapes • Position and direction • Statistics in Year 2
Key Assessment Criteria	
Year 1	<p>Number and place value</p> <ul style="list-style-type: none"> • Count to 100, forwards and backwards, beginning with 0 or 1, from any number. • Count, read, and write numbers from 1 to 100. • Count in multiples of 2, 5, and 10. • Identify one more and one less from a number. • Identify and represent numbers using objects and pictures (using a number line) and use language of: equal to, more than, less than (fewer), most, least. • Read and write numbers from 1 to 20 in numerals and words. <p>Addition and subtraction</p> <ul style="list-style-type: none"> • Read, write, and interpret statements involving addition, subtraction, and equals signs. • Represent and use number bonds and related subtraction facts within 20. • Add and subtract one and two-digit numbers to 20, including 0. • Solve one-step problems which involve addition and subtraction. <p>Multiplication and division</p> <ul style="list-style-type: none"> • Solve one-step problems using multiplication and division, calculating the answer using concrete objects and pictorial representations. <p>Fractions</p> <ul style="list-style-type: none"> • Recognise, find and name a half as 1 of 2 equal parts. • Recognise, find and name a quarter as 1 of 4 equal parts. <p>Measurement</p> <ul style="list-style-type: none"> • Compare, describe and solve practical problems for lengths and heights, weight, time, capacity and volume. • Measure and begin to record lengths and heights, weight, time, capacity and volume. • Recognise and know the value of different denominations of coins and notes. • Sequence events in chronological order using language.

	<ul style="list-style-type: none"> • 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. <p>Properties of shapes</p> <ul style="list-style-type: none"> • Recognise and name common 2D and 3D shapes. <p>Position and direction</p> <ul style="list-style-type: none"> • Describe position, direction and movement, including whole, half, quarter and three-quarter turns.
<p>Year 2</p>	<p>Number and place value</p> <ul style="list-style-type: none"> • Count in steps of two, three and five from 0, and in 10s from any number, forwards and backwards. • Recognise the place value of each digit in a two-digit number. • Identify, represent and estimate numbers using different depictions, including the number line. • Compare and order numbers from 0 to 100, using $<$, $>$ and $=$ signs. • Read and write numbers 1 to 100 in numerals and words. • Use place value and number facts to solve problems. <p>Addition and subtraction</p> <ul style="list-style-type: none"> • Solve problems with addition and subtraction using concrete objects and pictorial representations. • Apply increasing knowledge of mental and written methods. • Recall and use addition and subtraction facts to 20, 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 1s, a two-digit number and 10s, two two-digit numbers, and adding three one-digit numbers. • Show that the addition of two numbers can be done in any order 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. <p>Multiplication and division</p> <ul style="list-style-type: none"> • Recall and use multiplication and division facts for the 2, 5, and 10 multiplication tables. • Recognise odd and even numbers. • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using \times, \div, and $=$ signs. • Show that multiplication of two numbers can be done in any order, 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.

Fractions

- Recognise, find, name, and write fractions of a length, shape, set of objects or quantity.
- Write simple fractions and recognise their equivalence, e.g. $\frac{1}{2}$ and $\frac{2}{4}$.

Measurement

- Choose and use appropriate standard units to estimate and measure length/height in any direction, mass, temperature, and capacity to the nearest appropriate unit.
- Compare and order lengths, heights, mass, volume/capacity, and record the results using $>$, $<$ and $=$.
- Recognise and use symbols for pounds (£) and pence (p), and 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, e.g. giving change.
- Compare and order 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.

Properties of shapes

- Identify and describe the properties of 2D shapes, including the number of sides, and line symmetry in a vertical line.
- Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces.
- Identify 2D shapes on the surface of 3D shapes.
- Compare and sort common 2D and 3D shapes using everyday objects.

Position and 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, distinguishing between rotation as a turn, and in terms of right angles for quarter, half and three-quarter turns.

Statistics

- Interpret and construct simple pictograms, tally charts, block diagrams and 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 data.

Key Stage 2	
Pupils should be taught:	<ul style="list-style-type: none"> • Number and Place Value • Addition and Subtraction • Multiplication and division • Fractions including decimals Y4 / percentages Y5 • Measurement • Properties of shapes • Position and direction • Statistics • Ration and proportion Y6 • Algebra Y6
Key Assessment Criteria	
Year 3	<p>Number and place value</p> <ul style="list-style-type: none"> • 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 3-digit number (100s, 10s, 1s). • Compare and order numbers up to 1,000. • Identify, represent and estimate numbers using different representations. • Read and write numbers up to 1,000 in numerals and in words. • Solve number problems and practical problems involving these concepts. <p>Addition and subtraction</p> <ul style="list-style-type: none"> • Add and subtract numbers mentally, including a three-digit number and 1s, a three-digit number and 10s, and a three-digit number and 100s. • 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 reverse operations to check answers. • Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. <p>Multiplication and division</p> <ul style="list-style-type: none"> • 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, including for two-digit numbers times one-digit numbers, using mental maths 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. <p>Fractions</p> <ul style="list-style-type: none"> • Distinguish what tenths are. • Count up and down in tenths.

	<ul style="list-style-type: none"> • Distinguish, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. • Distinguish and use fractions as numbers: unit fractions and non-unit fractions with small denominators. • Distinguish and show, using diagrams, equivalent fractions with small denominators. • Add and subtract fractions with the same denominator within one whole. • Compare and order unit fractions, and fractions with the same denominators. • Solve problems that involve all of the above. <p>Measurement</p> <ul style="list-style-type: none"> • Measure, compare, add and subtract lengths, mass, volume/capacity. • Measure the perimeter of simple 2D shapes. • Add and subtract amounts of money to give change. • 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, record, compare and read times, with increasing accuracy to the nearest minute. • Use vocabulary such as o'clock, am/pm, morning, afternoon, noon, and midnight. • Distinguish the number of seconds in a minute and the number of days in each month, year and leap year. • Compare the durations of events. <p>Properties of shapes</p> <ul style="list-style-type: none"> • Draw 2D shapes and make 3D shapes using modelling materials; recognise 3D shapes in different orientations and describe them. • Recognise angles as a property of a shape or a description of a turn. • Identify right angles and distinguish 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. <p>Statistics</p> <ul style="list-style-type: none"> • Show data using bar charts, pictograms and tables. • Solve one and two-step data using bar charts, pictograms and tables.
<p>Year 4</p>	<p>Number and place value</p> <ul style="list-style-type: none"> • Count in multiples of 6, 7, 9, 25 and 1,000. • Find 1,000 more or less than a chosen number. • Count negative numbers from 0. • Recognise place value of each digit of a four-digit number. • Recognise, represent and estimate numbers using different representations. • Round any number to the nearest 10, 100 or 1,000. • Solve number and practical problems that involve all of the above, and with increasingly large numbers. • Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value. <p>Addition and subtraction</p> <ul style="list-style-type: none"> • Add and subtract numbers with up to four digits using formal written methods, and columnar addition and subtraction where necessary.

- Estimate and use inverse operations to check the answers to a calculation.
- Solve addition and subtraction two-step problems in different contexts, deciding which operations to use and why.

Multiplication and division

- Use multiplication and division facts for tables up to 12x12
- Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and one; dividing by one; 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 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 100 and dividing tenths by 10.
- 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.
- Identify and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$
- 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 measurement.
- Measure and calculate the perimeter of a rectilinear figure 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.

Properties of shapes

- Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.

	<ul style="list-style-type: none"> • Recognise acute and obtuse angles, and compare and order angles – up to two right angles – by size. • Recognise lines of symmetry in 2D shapes presented in different orientations. • Complete a simple symmetric figure with respect to a specific line of symmetry. <p>Position and direction</p> <ul style="list-style-type: none"> • Describe positions on a 2D 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. <p>Statistics</p> <ul style="list-style-type: none"> • 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.
<p>Year 5</p>	<p>Number and place value</p> <ul style="list-style-type: none"> • 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 0. • Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000. • Solve number problems and practical problems that involve all of the above. • Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals. <p>Addition and subtraction</p> <ul style="list-style-type: none"> • Add and subtract whole numbers with more than four digits, including using formal written methods. • Add and subtract numbers mentally using 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 context, deciding which operations and methods to use and why. <p>Multiplication and division</p> <ul style="list-style-type: none"> • Recognise 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 non-prime numbers. • Establish whether a number up to 100 is prime and recall prime numbers up to 19. • Multiply numbers up to four 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. • Divide numbers up to four 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 1,000.

- Identify and use square numbers and cube numbers, and the notation for squared (2) and cubed (3).
- Solve problems involving multiplication and division, including using 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 and percentages)

- 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, know how to convert from one form to the other, and write mathematical statements greater than one as a mixed number.
- 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.
- 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 with up to three decimal places.
- Recognise the percent symbol (%) and understand that percent relates to 'number of parts per 100,' writing percentages as a fraction with a denominator of 100, and as a decimal fraction
- Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.

Measurement

- Convert between different units of metric measurement.
- 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, including using standard units, square centimetres (cm^2) and square metres (m^2), and estimate the area of irregular shapes.
- Estimate volume and capacity.
- Solve problems involving converting between units of time.
- Use all four operations to solve problems involving measure using decimal notation, including scaling.

Properties of shapes

- Identify 3D shapes, including cubes and other cuboids, from 2D representations.

	<ul style="list-style-type: none"> • Know that angles are measured in degrees, and estimate and compare acute, obtuse and reflex angles. • Draw given angles, and measure them in degrees ($^{\circ}$). • Identify angles at a point and 360° (one whole turn), angles at a point on a straight line and 180° (half a turn), and 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. <p>Position and direction</p> <ul style="list-style-type: none"> • Identify, describe and represent the position of a shape following a reflection or translation using the appropriate language, and know that the shape has not changed. <p>Statistics</p> <ul style="list-style-type: none"> • Solve comparison, sum and difference problems using information presented in a line graph. • Complete, read and interpret information in tables, including timetables.
<p>Year 6</p>	<p>Number and place value</p> <ul style="list-style-type: none"> • 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 0. • Solve numerical and practical problems that involve all of the above. <p>Addition, subtraction, multiplication and division</p> <ul style="list-style-type: none"> • Multiply multi-digit numbers of up to four digits by a two-digit whole number using the formal written method of long multiplication. • Divide numbers of up to four 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 of up to four 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 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. <p>Fractions (including decimals and percentages)</p> <ul style="list-style-type: none"> • Use common factors to simplify fractions, and use common multiples to express fractions in the same denomination. • Compare and order fractions, including fractions greater than one. • 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 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 1,000 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 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 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 the volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extend to other units.

Properties of shapes

- Draw 2D shapes using given dimensions and angles.
- Recognise, describe and build simple 3D 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.

• Draw and translate simple shapes on the coordinate grid, and reflect them in the axes.

Statistics

• Interpret and construct pie charts and line graphs, and use these to solve problems.

• Calculate and interpret the mean as an average.