

Mathematics Learning Intentions

Year 1

Place Value

- Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. Count, read and write numbers to 100 in numerals.
- Count in 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.

Add and Subtract

- 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 $7 = _ - 9$.

Multiplication

- 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.

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.

Measure

- Compare, describe & solve practical problems for: lengths/heights (long/short/tall, half/double); mass/weight (heavier/lighter); capacity/volume (full/empty, more/less); time (quicker/slower/later).
- Measure and begin to record the following: lengths/heights; mass/weight; capacity/volume; time (hours, minutes, seconds).
- Recognise and know the value of different denominations of coins and notes.
- Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening.
- Recognise and use 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.

Geometry

- Recognise and name common 2-D shapes (e.g. rectangles, circles and triangles) and 3-D shapes (e.g. cuboids (including cubes), pyramids and spheres).
- Describe position, directions and movements, including whole, half, quarter and three-quarter turns.

Year 2

Place Value

- Count in steps of 2, 3, and 5 from 0, and 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, inc. 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.

Add and Subtract

- Solve problems with addition and subtraction: using concrete objects and pictorial representations; applying their increasing knowledge of mental and written methods.
- Recall and use add and subtract facts to 20 fluently, and derive and use related facts up to 100.
- Add and sub nos using concrete objects, pictorial representations, and mentally, including: a 2-digit no and 1s or 10s; two 2-digit numbers; adding three 1-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.

Multiplication

- 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.

Fractions

- Recognise, find, name & write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ of a length, shape, set of objects or quantity.
- Write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.

Measure

- Choose/use appropriate standard units to estimate/measure length/height (m/cm); mass (kg/g); temp ($^{\circ}\text{C}$); cap (litres/ml) to nearest 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.

Geometry

- 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.
- Order & arrange combinations of mathematical objects in patterns & sequences.
- Use math vocab to describe position, direction & movement inc movement in a straight line and distinguishing rotation as a turn & in terms of right angles for $\frac{1}{4}$, $\frac{1}{2}$, & $\frac{3}{4}$ turns (clock/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.

Year 3

Place Value

- 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 nos up to 1000. Read and write nos up to 1000 in numerals and in words.
- Identify, represent and estimate numbers using different representations.
- Solve number problems and practical problems involving these ideas.

Add and Subtract

- Add and subtract numbers mentally, including: a 3-digit no and 1s, 10s, 100s.
- Add and subtract numbers with up to 3 digits, using formal written methods of columnar add and subtract.
- 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 add/sub.

Multiplication/Division

- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.
- Write & calculate math statements for \times & \div using the tables they know, including 2 digit numbers times 1-digit numbers, using mental & formal written methods.
- Solve problems & missing number problems, involving \times & \div , including integer scaling problems & correspondence problems in which n objects are connected to m objects.

Fractions

- Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts & 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 sub fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$).
- Compare and order unit fractions, and fractions with the same denominators.

Measure

- 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/write the time from an analogue clock, inc Roman numerals from I to XII, and 12-hr/24-hr clocks.
- Est. & read time with increasing acc. to nearest min; record/compare time in secs, mins, hrs. Use vocab such as o'clock, a.m/p.m, morn, aft, noon & midnight
- Know the no of seconds in a minute and the number of days in each month, year and leap year.

Geometry

- Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them.
- Recognise that angles are a property of shape or a description of a turn.
- Identify right angles, recognising that 2 right angles make a $\frac{1}{2}$ turn, 3 make $\frac{3}{4}$ of a turn & 4 a complete turn. Identify whether angles are greater 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 such as 'How many more?' and 'How many fewer?' using info presented in scaled bar charts & pictograms & tables.

Year 4

Place Value

- Count in multiples of 6, 7, 9, 25 and 1000.
- Find 1000 more or less than a given number. Round any number to the nearest 10, 100 or 1000.
- Count backwards through zero to include negative numbers.
- Recognise the place value of each digit in a 4-digit number (thousands, hundreds, tens, and ones). Order and compare numbers beyond 1000.
- 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.

Add and Subtract

- 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 12×12 .
- 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 \times and \div , including using the distributive law to multiply 2 digit nos by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Fractions

- 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 a hundred and dividing tenths by ten.
- Add and subtract fractions with the same denominator.
- Recognise and write decimal equivalents of any number of tenths or hundredths; and the decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$ and three quarters.
- 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. Solve simple measure and money problems involving fractions and decimals to 2 decimal places.

Measure

- Convert between different units of measure (e.g. kilometre to metre). Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days).
- 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.

Geometry

- 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.

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.

Year 5

Place Value

- Read, write, order & 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. Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero
- Read Roman numerals to 1000 (M) and recognise years written in Roman numerals

Add and Subtract

- 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
- 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 1- or 2-digit number using a formal written method. Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division
- 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 and cubed

Fractions

- Compare and order fractions whose denominators are all multiples of the same number. Add and subtract fractions with the same denominator and 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
- Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- 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

- Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$ and those with a denominator of a multiple of 10 or 25.

Measure

- Convert between different units of metric measure (e.g. km & m; cm & m; cm & mm; g & kg; l & ml). Use approx. equivalences between metric and imperial units (e.g. inches, pounds & pints).
- Measure & calculate the perimeter of composite rectilinear shapes in cm/m. Calculate the area of squares/rectangles using standard units, square cm/m and estimate the area of irregular shapes
- Estimate volume (e.g. using 1 cm blocks to build cubes/cuboids) and capacity (e.g. using water)
- Solve problems involving converting between units of time. Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling.

Geometry

- 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.
- Identify: angles at a point and one whole turn (total 360°); angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°); other multiples of 90° .
- Use the properties of rectangles to deduce related facts and find missing lengths 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.

Statistics

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

Year 6

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.

Add/Subtract/Multiplication/Division

- Multiply and divide numbers up to 4 digits by a 2-digit whole number using the formal written methods and interpret remainders as whole number remainders, fractions, or by rounding. Use of estimation to check answers to calculations
- 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

Fractions

- Use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- Multiply simple proper fractions and simplify the answer (e.g. $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{8}$). Divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)
- 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
- 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
- Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

R & P

- Solve problems involving the calculation of percentages (e.g. of measures) 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

- 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. Enumerate all possibilities of combinations of two variables.

Measure

- Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. Convert between miles and km.
- Use, read, write & convert between standard units of measure, converting length, mass, volume & time from smaller to larger units, and vice versa, using decimal notation to up to 3 dec places
- 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 possible to use formulae for area and volume of shapes
- Calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units

Geometry

- 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.

P & D

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