

Mathematics Curriculum - Year 5

Autumn 1

- Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.
- Identify, represent and estimate numbers using the number line.
- Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.
- Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal.
- 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.
- Find 1, 10, 100, 1000 and other powers of 10 more or less than a given number than a given number.
- Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.
- Identify the value of each digit to three decimal places.
- Read, write, order and compare numbers with up to three decimal places.
- Find 0.01, 0.1, 1, 10, 100, 1000 and other powers of 10 more or less than a given number than a given number.
- Count forwards and backwards in decimal steps.
- Round decimals with two decimal places to the nearest whole number and to one decimal place.
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- Solve problems involving number up to three decimal places.
- Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (columnar addition and subtraction).
- Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).
- Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.
- Draw given angles and measure them in degrees ($^{\circ}$).
- Distinguish between regular polygons based on reasoning about equal sides and angles.
- Use the properties of rectangles to deduce related facts and find missing lengths and angles.
- Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.
- Solve comparison, sum and difference problems using information presented in a line graph.
- Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places.
- Select a mental strategy appropriate for the numbers involved in the calculation.

Autumn 2

- 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.
- Establish whether a number up to 100 is prime.
- Recognise and use square numbers and the notation for squared (2).
- Use partitioning to double or halve any number, including decimals to two decimal places.
- Multiply and divide numbers mentally drawing upon known facts.
- Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).
- Select a mental strategy appropriate for the numbers involved in the calculation.
- Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.
- 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.
- Solve problems involving division.
- Count on and back in mixed number steps such as $1\frac{1}{2}$.
- Read and write decimal numbers as fractions.
- Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
- Compare and order fractions whose denominators are all multiples of the same number (including on a number line).
- Solve problems involving fractions.
- 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.
- Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes.

- Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks.
- Complete, read and interpret information in tables, including timetables.
- Solve problems involving converting between units of time.

Spring 1

- Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero.
- Calculate difference in temperature, including those that involve a positive and negative temperature.
- Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal.
- Continue to order temperatures including those below 0°C.
- Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.
- Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places.
- Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (columnar addition and subtraction).
- Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
- Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).
- Select a mental strategy appropriate for the numbers involved in the calculation.
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- Use all four operations to solve problems involving measure (for example, length, mass, volume, money) using decimal notation.
- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
- Multiply and divide numbers mentally drawing upon known facts.
- 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.
- Solve problems involving multiplication including using their knowledge of factors and multiples, cubes and squares.
- Solve problems involving multiplication, including scaling by simple fractions and problems involving simple rates.
- Use, read and write standard units of length and mass to a suitable degree of accuracy.
- Estimate (and calculate) capacity.
- Multiply and divide numbers and those involving decimals by 10, 100 and 1000.
- Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre).
- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.
- Describe positions on the first quadrant of a coordinate grid.
- Plot specified points and complete shapes.
- 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.
- 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°).
- Identify angles at a point on a straight line and a turn (total 180°).
- Identify other multiples of 90°.

Spring 2

- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.
- 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.
- Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).
- Select a mental strategy appropriate for the numbers involved in the calculation.
- 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.
- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

- Use the properties of rectangles to deduce related facts and missing lengths and angles.
- Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.
- Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.
- Recognise mixed number and improper fractions and convert from one form to the other.
- Add and subtract fractions with the same denominator and denominators that are multiples of the same number (using diagrams).
- Write mathematical statements > 1 as a mixed number, e.g.

$$\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$$
- 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.
- Understand the difference between liquid volume, including capacity and solid volume.
- Estimate (and calculate) volume (for example, using 1cm³ blocks to build cuboids (including cubes)).
- Use, read and write standard units of length and mass to a suitable degree of accuracy.
- Estimate and calculate capacity.
- Calculate and interpret the mode, median and range.
- Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places.
- Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods.
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Summer 1

- Identify, represent and estimate numbers using the number line.
- Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.
- Identify the value of each digit to three decimal places.
- Read, write, order and compare numbers with up to three decimal places.
- Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.
- Count forwards and backwards in decimal steps.
- Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal.
- Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.
- Round decimals with two decimal places to the nearest whole number and to one decimal place.
- Solve number problems and practical problems that involve all of the above.
- Find 0.01, 0.1, 1, 10, 100, 1000 and other powers of 10 more or less than a given number than a given number.
- Recognise mixed numbers and improper fractions and convert from one form to another.
- Compare and order fractions whose denominators are all multiples of the same number (including on a number line).
- Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
- Add and subtract fractions with the same denominator and denominators that are multiples of the same number (using diagrams).
- Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.
- Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks.
- Complete, read and interpret information in tables, including timetables.
- Solve problems involving converting between units of time.
- Understand and use approximate equivalences between metric and common imperial units such as pints.
- Solve comparison, sum and difference problems using information presented in all types of graph including a line graph.
- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.
- Use the properties of rectangles to deduce related facts and missing lengths and angles.
- Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.
- Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.
- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.
- Describe positions on the first quadrant of a coordinate grid.
- Plot specified points and complete shapes.
- 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.
- Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (columnar addition and subtraction).
- Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places.
- Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).

- Select a mental strategy appropriate for the numbers involved in the calculation.
- Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- 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 scaling by simple fractions and problems involving simple rates.

Summer 2

- 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.
- Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal.
- Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.
- Continue to order temperatures including those below 0°C.
- 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.
- Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (columnar addition and subtraction).
- 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.
- 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.
- Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).
- Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
- Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.
- Round decimals with two decimal places to the nearest whole number and to one decimal place.
- 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 $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.
- Solve problems involving converting between units of time.
- Use all four operations to solve problems involving measure (for example, mass, capacity and volume) using decimal notation, including scaling.
- Understand the difference between liquid volume, including capacity and solid volume.
- Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.
- 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.
- Understand the difference between liquid volume, including capacity and solid volume.
- Estimate volume (for example, using 1 cm³ blocks to build cuboids (including cubes)) and capacity (for example, using water).