



MATHEMATICS



By the end of Year 6 pupils should be able to:

Number, Place Value, Approximation and Estimation

- Read, write, order and compare numbers to at least 10 000 000 and determine the value of each digit
- Round any whole number to a required degree of accuracy
- Use negative number in context, and calculate intervals across zero
- Solve number problems and practical problems that involve all of the above

Addition and Subtraction

- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
- Perform mental calculations, including with mixed operations and large numbers
- Use their knowledge of the order of operation to carry out calculations involving the four operations
- 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.

Multiplication and Division

- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
- Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- Identify common factors, common multiples and prime numbers
- Perform mental calculations, including with mixed operations and large numbers
- Use my knowledge of the order of operations to carry out calculations involving the four operations
- 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.

Fractions

- 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 the same 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, $1/3 \div 2 = 1/6$)
- Associate a fraction with division and calculate decimal fraction equivalents (for example, 0.375) for a simple fraction (for example, $3/8$)
- 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 different contexts.

Measures

- 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).

Geometry: 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.

Geometry: Position and Direction

- Describe positions on the full coordinate grid (all four quadrants)
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Statistics

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

Ratio and Proportion

- 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.