



Mathematics: Year 5

I. NUMBERS AND THE NUMBER SYSTEM

A. WHOLE NUMBERS

- Read and write numbers to at least 1 000 000 in figures and words.
- Recognise and extend number sequences formed by counting on or back from any number in whole number or decimal steps of constant size, extending beyond zero when counting backwards.
- Identify Roman numerals from 1 to 100 (I – C).
- Recognise the place value of each digit in any number to at least 1 000 000, and partition such numbers.
- Round numbers to the nearest 10, 100 or 1000.
- Compare positive and/or negative integers using the <, >, and = signs.
- Order a set of positive and/or negative integers and position them on a number line.

B. FRACTIONS

- Compare fractions with like or unlike denominators, using the signs <, >, and =.
- Order a set of fractions with like or unlike denominators and position them on a number line.
- Identify mixed numbers and improper fractions
- Convert improper fractions to mixed numbers and vice versa.
- Recognise and find equivalent fractions, e.g. $\frac{2}{3} = \frac{8}{12}$.
- Express a smaller number as a fraction of a larger number, e.g. 3 out of 4 as $\frac{3}{4}$.
- Add or subtract fractions with like denominators, converting totals that exceed 1 to a mixed number.
- Find fractions of numbers or quantities, e.g. $\frac{3}{4}$ of 12, $\frac{1}{100}$ of £8.

C. DECIMALS

- Explain what each digit represents in decimals with up to two decimal places, and partition such numbers.
- Compare decimals with up to two decimal places using the signs <, >, and =.
- Order a set of decimals with up to two decimal places and position them on a number line.
- Round a decimal with one decimal place to the nearest whole number, and a decimal with two decimal places to the nearest tenth and whole number.
- Relate fractions to their decimal representations, e.g. $0.45 = \frac{45}{100}$.

D. PERCENTAGES

- Recognise the per cent sign (%) and understand percentages as the number of parts in every 100.
- Express one half, one quarter, three quarters, tenths and hundredths as percentages and decimals:
 - e.g. $\frac{3}{4} = 0.75 = 75\%$, $\frac{4}{10} = 0.4 = 40\%$, $\frac{27}{100} = 0.27 = 27\%$.
- Find simple percentages of numbers or quantities, e.g. 10% of 60, 5% of £20.

II. NUMBER OPERATIONS AND CALCULATIONS

A. ADDITION AND SUBTRACTION

- Use the principles (but not the names) of the commutative and associative laws as they apply to addition.
- Use known number facts and place value mentally to:
 - find the difference between two near multiples of 100 or 1000, e.g. $809 - 496$, $3006 - 1993$;
 - add or subtract a multiple of 100 to or from a three-digit or four-digit number, e.g. $458 + 500$, $1357 - 600$;
 - add or subtract three-digit multiples of 10, e.g. $470 + 240$, $570 - 390$.

- Use efficient written methods to add and subtract whole numbers and decimals with up to two decimal places.

B. MULTIPLICATION AND DIVISION

- Use the principles (but not the names) of the commutative, associative and distributive laws as they apply to multiplication:
 - example of commutative law: $15 \times 33 = 33 \times 15$
 - example of associative law: $15 \times 33 = (5 \times 3) \times 33$ or $15 \times (3 \times 11) = 495$
 - example of distributive law: $34 \times 98 = 34 \times (100 - 2) = (34 \times 100) - (34 \times 2) = 3400 - 68 = 3332$
- Recall quickly multiplication facts up to 10×10 and the corresponding division facts.
- Recall square numbers and square roots, and recognise the notation for square (2) and square root ($\sqrt{\quad}$).
- Identify multiples, common multiples, factors and common factors.
- Know the meanings of prime number, prime factor and composite number.
- Use known number facts and place value to multiply pairs of multiples of 10 or 100, e.g. 50×30 .
- Multiply and divide whole numbers and decimals by 0, 1, 10, 100 or 1000, and understand the effect (including understanding that division by 0 is impossible).
- Use efficient written methods to:
 - multiply a three-digit or four-digit number by a one-digit number, e.g. 2814×7
 - multiply a two-digit or three-digit number by a two-digit number, e.g. 57×42
 - multiply decimals with one or two decimal places by a one-digit number, e.g. 8.3×7 , 15.6×8 , $\text{£}4.23 \times 6$
- Divide a two-digit or three-digit number by a one-digit number, including division with remainders, rounding up or down depending on the context, e.g. $574 \div 9$

C. MIXED OPERATIONS

- Use knowledge of rounding, number operations and inverse relationships to estimate and check calculations.
- Begin to use brackets to solve multi-step calculations.

III. MEASUREMENT

A. LENGTH, MASS, CAPACITY, VOLUME AND TEMPERATURE

- Estimate, measure and record lengths, masses, capacities and temperatures using standard units (km, m, cm, mm, kg, g, l, ml, °C) to a suitable degree of accuracy.
- Convert between different units of measure using decimals to one or two places, e.g. 3.25 litres = 3250 ml, or vice versa.
- Interpret a reading that lies between two unnumbered divisions on a scale.
- Understand basic equivalencies between metric and common imperial units still in everyday use.
- Know abbreviations for common imperial units.
- Recognise volume in practical contexts, for example using 1cm^3 blocks or interlocking cubes.

B. TIME

- Read the time on a 24-hour digital clock and use 24-hour clock notation, e.g. 17:42.
- Read a timetable using 24-hour clock notation.

C. MONEY

- Use all four operations to solve problems involving money.

D. PERIMETER AND AREA

- Measure and calculate the perimeter of regular polygons.
- Calculate the area of rectangles and related compound shapes using standard unit cm^2 or m^2 .
- Use the formula for the area of a rectangle.

IV. GEOMETRY

A. 2-D SHAPES AND 3-D SOLIDS

- Identify, visualise and describe properties of triangles, quadrilaterals, regular polygons and 3-D solids.
- Use knowledge of properties to draw 2-D shapes and make nets of common 3-D solids such as a cube, cuboid, pyramid and triangular prism.
 - E.g. The drawing shows how the 3-D solid would look if opened out and unfolded into a flat shape.

B. POSITION, DIRECTION AND MOVEMENT

- Use coordinates in the first quadrant to read and plot specified points, and to draw sides to complete 2-D shapes.
- Draw the position of a shape after a translation.
- Identify, estimate and order acute and obtuse angles.
- Use a protractor to draw and measure angles.

C. SYMMETRY

- Complete symmetrical patterns with up to two lines of symmetry.
- Draw the reflection of a shape or pattern in a mirror line parallel to one side, where all sides of the shape or pattern are not parallel or perpendicular to the mirror line.

V. DATA

- Collect, process, represent, interpret and discuss data in a tally chart, frequency table, pictogram, bar chart or line graph.
- Read, interpret and represent data:
 - where symbols represent more than one unit, e.g. 2, 5, 10, 20 or 100
 - where scales have intervals of differing step size, e.g. axis labelled in 2s, 5s, 10s, 20s or 100s

VI. PROBLEM SOLVING AND REASONING

- Identify, describe and use numerical and symbolic patterns and relationships.
- Solve mathematical problems and puzzles involving numbers or shapes.
- Propose and investigate a general statement involving numbers or shapes.
- Solve one-step and two-step problems involving whole numbers and decimals, and all four operations, in the context of numbers or measurements, including money and time.