

YEAR 9 FOUNDATION CURRICULUM OUTLINE

TOPIC

1 NUMBER

Key Concepts Use the concepts and vocabulary of prime numbers, highest common factor, lowest common multiple, prime factorisation, including using product notation and unique factorisation theorem.
Round numbers and measures to an appropriate degree of accuracy (e.g., to a specified number of decimal places or significant figures).
Interpret standard form $A \times 10^n$, where $1 \leq A < 10$ and n is an integer.

2 CALCULATING

Key Concepts Apply the four operations, including formal written methods, to integers, decimals and simple fractions (proper and improper), and mixed numbers - all positive and negative.
Use conventional notation for priority of operations, including brackets, powers, roots and reciprocals.

3 CONSTRUCTIONS

Key Concepts Measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings.
Identify, describe and construct similar shapes, including on coordinate axes, by considering enlargement.
Interpret plans and elevations of 3D shapes.
Use scale factors, scale diagrams and maps.

4 PROBABILITY 1

Key Concepts Relate relative expected frequencies to theoretical problems, using appropriate language and the 0-1 probability scale.
Record, describe and analyse the frequency of outcomes of probability experiments using tables.
Construct theoretical probability spaces for single experiments with equally likely outcomes and use these to calculate theoretical probabilities.
Apply the property that the probabilities of an exhaustive set of outcomes sum to one.

5 ALGEBRA 1

Key Concepts Use and interpret algebraic notation, including; a^2b in place of $a \times a \times b$, coefficients written as fractions rather than as decimals.
Understand and use the concepts and vocabulary of factors.
Simplify and manipulate algebraic expressions by taking out common factors and simplifying expressions involving sums, products and powers, including the laws of indices.
Substitute numerical values into scientific formulae.
Rearrange formulae to change the subject.

6 FRACTIONS, DECIMALS AND PERCENTAGES 1

Key Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $\frac{7}{2}$).

7 RATIO AND PROPORTION

Key Concepts Express the division of a quantity into two parts as a ratio; apply ratio to real contexts and problems (such as those involving conversions, comparison, scaling, mixing and concentrations).

Identify and work with fractions in ratio problems.

Understand and use proportion as equality of ratios.

Express a multiplicative relationship between two quantities as a ratio or a fraction.

Use compound units (such as speed, rates of pay, unit pricing).

Change freely between compound units (e.g., speed, rates of pay, prices) in numerical contexts.

Relate ratios to fractions and linear functions.

8 SEQUENCES

Key Generate terms of a sequence from either a term-to-term or a position-to-term rule.
Deduce expressions to calculate the n th term of linear sequences.

9 ANGLES AND POLYGONS

Key Understand and use alternate and corresponding angles on parallel lines.
Derive and use the sum of angles in a triangle (e.g., to deduce and use the angle sum in any polygon, and to derive properties of regular polygons).

10 FRACTIONS, DECIMALS AND PERCENTAGES 2

Key Interpret fractions and percentages as operators.
Work with percentages greater than 100%.
Solve problems involving percentage change, including original value problems, and simple interest including in financial mathematics.
Calculate exactly with fractions.

11 SOLVING EQUATIONS AND INEQUALITIES

Key Solve linear equations with the unknown on both sides of the equation.
Find approximate solutions to linear equations using a graph.

12 AREA AND VOLUME

Key Compare lengths, areas and volumes using ratio notation.
Calculate perimeters of 2D shapes, including circles.
Identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference.
Know the formulae for the circumference and area of a circle.
Calculate areas of circles and composite shapes.

Know and apply formulae to calculate volume of right prisms (including cylinders).

13 ALGEBRA 2

Key

Plot graphs of equations that correspond to straight-line graphs in the coordinate plane.
Identify and interpret gradients and intercepts of linear functions graphically.
Recognise, sketch and interpret graphs of linear functions and simple quadratic functions.
Plot and interpret graphs and graphs of non-standard (piece-wise linear) functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance and speed.

14 PROBABILITY 2

Key

Apply systematic listing strategies.
Record, describe and analyse the frequency of outcomes of probability experiments using frequency trees.
Enumerate sets and combinations of sets systematically, using tables, grids and Venn diagrams.
Construct theoretical possibility spaces for combined experiments with equally likely outcomes and use these to calculate theoretical probabilities.

15 HANDLING DATA

Key

Concepts

Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate graphical representation involving discrete, continuous and grouped data.
Use and interpret scatter graphs of bivariate data.
Recognise correlation.

16 COLLECTING DATA

Key

Concepts

Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate measures of central tendency (mean, median, mode and modal class) and spread (range, including consideration of outliers).
Apply statistics to describe a population.