

1. Number Systems, Standard Form, and Numerical Precision

- Integers, fractions, decimals, percentages, rational numbers, and real numbers
- Irrational numbers, square roots, cube roots, and surds at an introductory level where appropriate
- Powers and exponent laws, including integer exponents and simple rational exponents where appropriate
- Standard form/scientific notation for very large and very small quantities
- Rounding, significant figures, decimal places, and approximation
- Bounds, intervals, and error checking at an age-appropriate level
- Absolute value and number-line reasoning
- Order of operations and efficient calculation strategies
- Estimation and reasonableness in scientific calculations and practical STEM contexts

2. Ratio, Proportion, Rates, and Percentage Applications

- Ratio as part–part, part–whole, and comparison
- Equivalent ratios, simplifying ratios, ratio tables, and sharing in a ratio
- Direct proportion and introductory inverse proportion where appropriate
- Unit rates and compound units such as speed, density, pressure, flow rate, concentration, and cost per unit
- Scale factors, maps, models, plans, and scale drawings
- Percentage of a quantity, percentage change, reverse percentages, and repeated percentage change at an introductory level
- Multi-step percentage applications: discount, tax, mark-up, simple interest, depreciation, efficiency, and error percentage where appropriate
- Proportional reasoning in science, finance, design, data, and practical contexts

3. Algebraic Expressions, Formulae, Equations, and Inequalities

- Algebraic notation, variables, constants, coefficients, terms, and structure
- Writing expressions and equations from verbal and contextual descriptions
- Expanding, factorising, and simplifying expressions, including quadratics at an introductory level
- Algebraic identities and equivalent forms
- Substitution and evaluation of formulae
- Rearranging formulae and changing the subject
- Linear equations and multi-step equations
- Quadratic equations by factorising and other age-appropriate methods where included
- Simultaneous linear equations at an introductory level
- Linear inequalities, compound inequalities, and graphical or number-line representation
- Equations and inequalities from real STEM contexts
- Checking solutions and identifying invalid or extraneous answers where appropriate

4. Functions, Graphs, Sequences, and Mathematical Modelling

- Function concept: input-output, domain, range, and function notation at an appropriate level
- Linear functions: gradient, intercepts, equations, and contextual interpretation
- Quadratic functions: shape, roots, intercepts, vertex, symmetry, and transformations at an introductory level
- Exponential growth and decay at an introductory level where appropriate
- Graph transformations: translations, reflections, stretches, and scale changes at an introductory level
- Tables, graphs, equations, and verbal models
- Comparing representations of relationships
- Arithmetic and geometric sequences
- Explicit and recursive rules at an introductory level
- Rate of change and trend interpretation
- Piecewise and contextual graphs where appropriate
- Modelling real situations with functions and recognising limitations

5. Geometry, Coordinate Geometry, and Mensuration

- Properties of triangles, quadrilaterals, polygons, and circles
- Angle rules involving parallel lines, polygons, and circles at an age-appropriate level
- Congruence and similarity
- Transformations: reflection, translation, rotation, enlargement, and combinations
- Scale factor effects on length, area, and volume
- Coordinate geometry: distance, midpoint, gradient, and equations of straight lines where appropriate
- Perimeter and area of common and composite shapes
- Surface area and volume of prisms, cylinders, pyramids, cones, spheres, and composite solids where appropriate
- Circle measures: circumference, area, arcs, sectors, and introductory circle geometry where appropriate
- Nets and spatial visualisation
- Geometric modelling and optimisation at an introductory level

6. Trigonometry and Measurement in Context

- Pythagorean theorem and distance applications
- Right-triangle trigonometry: sine, cosine, and tangent
- Solving for unknown sides and angles in right triangles
- Angle of elevation and depression
- Bearings and direction at an age-appropriate level
- Trigonometry in practical diagrams, measurement, navigation, and design
- Sine rule, cosine rule, and area of triangles using trigonometry where appropriate
- Choosing suitable methods for triangle problems

7. Data, Statistics, Probability, and Uncertainty

- Data collection, sampling, bias, representativeness, and data quality
- Tables, frequency tables, grouped data, and spreadsheets where appropriate
- Bar charts, histograms, line graphs, scatter plots, cumulative displays, and box plots at an age-appropriate level

- Measures of centre: mean, median, and mode
- Measures of spread: range, interquartile range, and introductory standard deviation where appropriate
- Comparing distributions and interpreting outliers
- Correlation and trend interpretation; correlation vs causation at an introductory level
- Probability of simple and compound events
- Experimental and theoretical probability
- Tree diagrams, tables, and sample spaces where appropriate
- Uncertainty, error, and reliability in data-based conclusions

8. Math Modelling, Problem Solving, and Financial Reasoning

- Multi-step and unfamiliar problem solving
- Modelling with formulae, functions, graphs, diagrams, statistics, and constraints
- Estimation, approximation, bounds, and reasonableness checks
- Optimisation at an introductory level: cost, time, efficiency, materials, space, and performance
- Interpreting limitations of mathematical models
- Financial math: budgeting, unit price, discount, tax, mark-up, profit/loss, simple interest, compound growth at an introductory level, depreciation, and value comparison
- Decision-making using quantitative evidence
- Communicating mathematical reasoning clearly with units, assumptions, and limitations