



## Cambridge Lower Secondary Programme Mathematics Curriculum Framework: Year 8

### Number

#### Properties

- Np1 Understand place value  
Multiply and divide integers and decimals by 0.1 and 0.01
- Np2 Add, subtract, multiply and divide integers  
Multiply and divide integers and decimals (up to two places)  
Know and use the order of operations, including brackets, with more complex calculations
- Np3 Multiply and divide an integer by a fraction
- Np4 Write a number in terms of its prime factors  
Use squares, square roots and cubes of numbers
- Np6 Use index notation for positive integer powers.

#### Problem Solving

- Ns3 Reduce a ratio to its simplest form, including a ratio expressed in different units  
Use the unitary method to solve simple problems involving ratio and direct proportion
- Ns4 Round positive numbers to any given power of 10  
Round decimals to the nearest whole number or to 1 or 2 decimal places
- Ns5 Use an electronic calculator to carry out more sophisticated calculations involving powers and fractions
- Ns6 Recall known number facts, including simple fraction to decimal conversions and vice-versa  
Use known facts to multiply simple fractions together  
Use known facts to multiply simple decimals together  
Recall simple squares, square roots and cubes  
Solve simple problems mentally

#### Data Handling

- Nd1 Know the difference between discrete and continuous data  
Identify and collect data to answer a question, choosing the method of data collection and the degree of accuracy needed  
Construct frequency tables with given equal class intervals for sets of continuous data  
Construct and interpret stem-and-leaf diagrams, pie charts, bar charts, frequency diagrams for discrete and continuous data, simple line graphs for time series and simple scatter graphs  
Compare two distributions using the range and one or more of the mode, median or mean
- Nd2 Calculate statistics, including the range, mean, median and mode and, for grouped data, the modal class.
- Nd3 Know that if the probability of an event occurring is  $p$  then the probability of the event not occurring is  $1-p$   
Find and record all possible mutually exclusive outcomes for a single event  
Understand the difference between mutually exclusive and independent events



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### Algebra

#### Manipulation

- An1 Simplify or transform linear expressions by collecting like terms  
Transform simple formulae  
Evaluate formulae, including quadratic and cubic expressions
- An2 Construct and solve linear equations
- An3 Understand and use inequality signs  
Represent the solution set on a number line

#### Graphs

- Ag1 Construct tables of values and plot graphs of linear functions, where  $y$  is given explicitly in terms of  $x$   
Recognise that equations of the form  $y = mx + c$  correspond to straight-line graphs  
Find the gradient of a straight line graph  
Rearrange linear equations into the form  $y = mx + c$  and know the significance of the numbers  $m$  and  $c$
- Ag2 Recognise when two quantities are directly proportional.  
Draw and interpret the graphs of linear functions arising from practical situations
- Ag5 Recognise and continue number patterns  
Find term-to-term and position-to-term rules

### Space

#### Measure

- Sm1 Use names and abbreviations of units of measurement to measure, estimate, calculate and solve problems in everyday contexts involving mass, length, area, capacity, mass, time and angle  
Use rough metric equivalents of imperial measures to solve problems
- Sm3 Calculate using money, including converting between different currencies  
Solve simple problems involving personal and household finance, including simple interest, discount, profit, loss and tax
- Sm5 Know and use the formula for the volume of a cuboid  
Calculate the volume and surface areas of cuboids and shapes made from cuboids  
Calculate length, surface areas and volumes in right prisms, including cylinders  
Know and use the formulae for the circumference and area of a circle



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### Geometry

- Sg1** Understand and use the vocabulary, notation and labelling conventions for lines, angles and shapes  
Identify parallel and perpendicular lines  
Use and interpret the vocabulary of triangles, quadrilaterals and polygons  
Know that the exterior angles of a polygon add up to  $360^\circ$   
Understand and use the formula for the sum of the interior angles of a regular polygon  
Know the definition of a circle and the names of its parts
- Sg2** Know the sum of angles at a point, on a straight line and in a triangle  
Recognise vertically opposite angles  
Identify alternate angles and corresponding angles  
Know and use angle properties of equilateral, isosceles and right-angled triangles and special quadrilaterals to solve problems  
Know that if two 2-D shapes are congruent, corresponding sides and angles are equal
- Sg3** Use a straight edge and compasses to construct:  
(a) the perpendicular bisector of a line segment  
(b) the bisector of an angle  
(c) the perpendicular from a point to a line  
(d) the perpendicular at a point on a line  
Construct nets of simple 3-D shapes, e.g. cuboid, tetrahedron, square based pyramid, triangular prism  
Use a ruler and compasses to construct a triangle given three sides
- Sg4** Recognise the line symmetry of a 2-D shape  
Recognise and state the order of rotational symmetry of a 2-D shape  
Transform 2-D shapes by simple combinations of rotations, reflections and translations