

Year 9 Mathematics Mastery Programme of Study

Autumn 1 ~ Graphs and proportion

Unit 1 Coordinates (1 week)	<ul style="list-style-type: none"> Plot coordinates in all four quadrants Find the midpoint of a line segment joining two points Find an endpoint of a line segment, given the midpoint and one endpoint Solve problems using coordinate grids 	Y8 U3
Unit 2 Linear graphs (2 weeks)	<ul style="list-style-type: none"> Identify the equations of horizontal and vertical lines Plot coordinates from a rule to generate a straight line Identify key features of a linear graph Make links between the graphical and the algebraic representation Identify parallel lines from algebraic equations 	Y7 U18 Y8 U4
Unit 3 Proportion (2 weeks)	<ul style="list-style-type: none"> Recognise when two quantities are directly or inversely proportional to each other Recognise the graphical representation of a proportional relationship Solve proportion problems Interpret and use conversion graphs and other graphs of proportional relationships 	Y8 U8
Unit 4 Scales and standard form (1)	<ul style="list-style-type: none"> Use standard form to express very large and small numbers Convert between standard form and ordinary numbers Order large and small numbers KS4 content: Use standard form to solve simple problems Use scales to solve distance and area problems in context 	Y7 U4

Autumn 2 ~ Algebra

Unit 5 Linear and non-linear sequences (1 week)	<ul style="list-style-type: none"> Recognise that linear and quadratic expressions can be used to represent sequences of different types Recognise arithmetic and geometric sequences and appreciate other sequences that may arise Solve problems involving linear and non-linear sequences in a variety of contexts 	Y7 U18 Y8 U4
Unit 6 Expanding and factorising (2 weeks)	<ul style="list-style-type: none"> Multiply a term over a single bracket Expand products of two or more binomials Factorise expressions into a single bracket KS4 Content: Factorise quadratic expressions where the coefficient of x^2 is equal to one 	Y7 U18 Y8 U4
Unit 7 Changing the subject of a formula (2 weeks)	<ul style="list-style-type: none"> Write expressions, equations and formulae to represent relationships Use substitution to find the value of one variable given other values Make links between solving linear equations and rearranging formulae Apply "changing the subject" to equations of straight lines Manipulate familiar formulae such as formulae for area and perimeter 	Y7 U18 Y8 U4

Spring 1 ~ 2D geometry

Unit 8 Constructions (1 week)	<ul style="list-style-type: none"> Use the standard ruler and compass constructions for: <ul style="list-style-type: none"> perpendicular bisector of a line segment constructing a perpendicular to a given line from/at a given point bisecting a given angle Understand and use the perpendicular distance from a point to a line as the shortest distance to the line 	Y7 U10 Y7 U11 Y7 U12 Y8 U5
Unit 9 Congruence (1 week)	<ul style="list-style-type: none"> Know the criteria for congruence of triangles Apply properties of plane figures, and the criteria for congruence, using appropriate language 	Y7 U11 Y7 U12 Y8 U5
Unit 10 Pythagoras' theorem (2 weeks)	<ul style="list-style-type: none"> Derive Pythagoras' theorem Use Pythagoras' theorem to find missing sides in right-angled triangles Solve associated problems in other shapes where right-angled triangles exist Deduce whether a triangle is right-angled by considering its sides 	Y8U1

Unit 11 Angles in polygons (1 week)	<ul style="list-style-type: none"> Derive the proof of the sum of the angles in a triangle Find the formula for sum of the angles of any polygon Understand and use the sum of the exterior angles of a polygon Solve problems involving the angles/number of sides in a regular polygon 	Y7 U10 Y7 U11 Y7 U12 Y8 U5
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Spring 2 ~ Equations and inequalities

Unit 12 Linear equations and inequalities (3 weeks)	<ul style="list-style-type: none"> Form and solve linear equations and inequalities in one unknown, including those where the unknown appears on both sides Rearrange and solve linear equations and inequalities given in any form, including those involving fractions and brackets 	Y7 U18 Y8 U4 Y9 U2
Unit 13 Graphical solutions (2 weeks)	<ul style="list-style-type: none"> Use linear and quadratic graphs to estimate values of y for given values of x Use linear graphs to find approximate solutions of simultaneous linear equations KS4 content: Solve simultaneous equations algebraically Find approximate solutions to contextual problems from given graphs of a variety of functions including: <ul style="list-style-type: none"> Piecewise linear (e.g. real-life linear graphs) Exponential Reciprocal 	Y9 U1 Y9 U2

Summer 1 ~ Handling data and probability

Unit 14 Probability (3 weeks)	<ul style="list-style-type: none"> Understand and use the probability scale from 0 to 1 Understand and use the language associated with probability Understand the relationship between relative frequency and theoretical probability Understand that different trials of an experiment may produce different outcomes Systematically list outcomes using a variety of representations Use Venn diagrams and understand the meaning of union and intersection KS4 content: Frequency tree diagrams 	Y7 U4 Y7 U14 Y7 U15 Y7 U16 Y7 U20
Unit 15 Working with data (1 week)	<ul style="list-style-type: none"> Appreciate the difference between discrete and continuous data Understand why the exact mean cannot be found from grouped data Find an estimate of the mean from grouped data and continuous data Describe, interpret and compare distributions, involving appropriate measures of central tendency and spread 	Y8 U13
Unit 16 Scatter graphs (1 week)	<ul style="list-style-type: none"> Plot scatter graphs Describe the type of correlation observed Interpret correlation in context 	Y9 U1 Y9 U2

Summer 2 ~ Geometry

Unit 17 Similarity and enlargement (1 week)	<ul style="list-style-type: none"> Enlarge shapes from a given centre, with and without coordinate grids Understand that the corresponding angles of similar shapes are equal Solve problems involving similar triangles 	Y8 U8 Y9 U9
Unit 18 Transformations (2 weeks)	<ul style="list-style-type: none"> Translate a shape by a given vector Reflect a shape in a line, including on coordinate axes Rotate a shape about a centre, including on coordinate axes Identify the type of transformation carried out by comparing an object and image 	Y8 U3 Y9 U1 Y9 U2
Unit 19 Trigonometry (2 weeks)	<ul style="list-style-type: none"> Develop an understanding of the trigonometric ratios Solve problems using trigonometric ratios in right-angled triangles 	Y9 U10 Y9 U17