

# GCSE Scheme of Work ( Yr 10 & Yr 11)

## FOUNDATION ROUTE

YEAR 4	YEAR 5
GCSE (9-1) Foundation	GCSE (9-1) Foundation
Unit 1 Number	Unit 16 Quadratic equations and graphs
Unit 2 Algebra	Unit 17 Perimeter, area and volume 2
Unit 3 Graphs, tables and charts	Unit 18 Fractions, indices and standard form
Unit 4 Fractions and percentages	Unit 19 Congruence, similarity and vectors
Unit 5 Equations, inequalities and sequences	Unit 20 More algebra
Unit 6 Angles	
Unit 7 Averages and range	
Unit 8 Perimeter, area and volume 1	
Unit 9 Graphs	
Unit 10 Transformations	
Unit 11 Ratio and proportion	
Unit 12 Right-angled triangles	
Unit 13 Probability	
Unit 14 Multiplicative reasoning	
Unit 15 Constructions, loci and bearings	

## HIGHER ROUTE

YEAR 4	YEAR 5
GCSE (9-1) Higher	GCSE (9-1) Higher
Unit 1 Number	Unit 16 Circle theorems
Unit 2 Algebra	Unit 17 More algebra
Unit 3 Interpreting and representing data	Unit 18 Vectors and geometric proof
Unit 4 Fractions, ratio and proportion	Unit 19 Proportion and graphs
Unit 5 Angles and trigonometry	
Unit 6 Graphs	
Unit 7 Area and volume	
Unit 8 Transformation and constructions	
Unit 9 Equations and inequalities	
Unit 10 Probability	
Unit 11 Multiplicative reasoning	
Unit 12 Similarly and congruence	
Unit 13 More trigonometry	
Unit 14 Further statistics	
Unit 15 Equations and graphs	

<b>YEAR 4</b>	<b>Year 10 F</b>	<b>Foundation Student Book</b>		
<b>TERM</b>	<b>UNIT / LESSON</b>	<b>GCSE (9-1) SPEC REFERENCE</b>	<b>STEPS FROM ...</b>	<b>STEPS TO ...</b>
AUTUMN	1 Number	N1 N2 N3 N4 N5 N6 N7 N13 N14 N15	2nd	7th
AUTUMN	2 Algebra	N1 N3 N4 A1 A2 A3 A4	3rd	7th
AUTUMN	3 Graphs, tables and charts	G2 G14 G15 S2 S4 S5	3rd	7th
AUTUMN	4 Fractions and percentages	N1 N2 N3 N4 N8 N10	3rd	7th
AUTUMN	5 Equations, inequalities and sequences	N1 N3 A2 A3 A5 A7	3rd	7th
SPRING	6 Angles	G1 G3 G4 G6 G7 G11	3rd	8th
SPRING	7 Averages and range	S1 S2 S4 S5	2nd	7th
SPRING	8 Perimeter, area and volume 1	N13 N14 R1 G12 G14	4th	8th
SPRING	9 Graphs	N13 A7 A8 A9 A10 A12	2nd	8th
SPRING	10 Transformations	R6 G1 G7 G24	4th	7th
SUMMER	11 Ratio and proportion	N11 N13 R1 R4 R5 R6	4th	8th
SUMMER	12 Right-angled triangles	N7 N15 R12 G6 G11	3rd	8th
SUMMER	13 Probability	N5 P1 P2 P3 P4 P5 P6	3rd	8th
SUMMER	14 Multiplicative reasoning	N13 R1 R7 R9 R10 R11	5th	8th
SUMMER	15 Constructions, loci and bearings	R2 R6 G1 G2 G4 G5 G6	1st	7th

<b>YEAR 4</b>	<b>Year 10 H</b>	<b>Higher Student Book</b>		
<b>TERM</b>	<b>UNIT / LESSON</b>	<b>GCSE (9-1) SPEC REFERENCE</b>	<b>STEPS FROM ...</b>	<b>STEPS TO ...</b>
AUTUMN	1 Number	N2 N3 N4 N5 N6 N7 N8 N9 N14 N15	6th	12th
AUTUMN	2 Algebra	N1 N3 N8 N9 A1 A2	6th	10th
AUTUMN	3 Interpreting and representing data	G14 S1 S2 S3 S4 S5 S6	4th	8th
AUTUMN	4 Fractions, ratio and percentages	N2 N3 N8 N10 N11	6th	10th
AUTUMN	5 Angles and trigonometry	N7 N8 N15 G1 G3 G4	6th	9th
SPRING	6 Graphs	N13 A8 A9 A10 A11	6th	10th
SPRING	7 Area and volume	N8 N13 N14 N15 N16	6th	12th
SPRING	8 Transformations and constructions	R2 R6 G1 G2 G7 G8	6th	10th
SPRING	9 Equations and inequalities	N1 N8 A3 A4 A5 A9	6th	12th
SPRING	10 Probability	N1 P1 P2 P3 P4 P5 P6	5th	12th
SUMMER	11 Multiplicative reasoning	N12 N13 A2 A9 R1 R6	6th	9th
SUMMER	12 Similarity and congruence	R6 R12 G5 G6 G7 G17	6th	12th
SUMMER	13 More trigonometry	N16 A8 A12 A13 G20	9th	12th
SUMMER	14 Further statistics	S1 S3 S4	6th	12th
SUMMER	15 Equations and graphs	N8 A4 A11 A12 A18	6th	12th

<b>YEAR 5</b>	<b>Year 11F</b>		<b>Foundation Student Book</b>		
<b>TERM</b>	<b>UNIT / LESSON</b>	<b>HOURS</b>	<b>GCSE (9-1) SPEC REFERENCE</b>	<b>STEPS FROM ...</b>	<b>STEPS TO ...</b>
<b>AUTUMN</b>	<b>16 Quadratic equations and graphs</b>	11	N4 A1 A3 A4 A6 A8 A11 A12 A14 A18	6th	8th
<b>AUTUMN</b>	<b>17 Perimeter, area and volume 2</b>	12	N8 N14 N15 N16 G9	4th	8th
<b>AUTUMN</b>	<b>18 Fractions, indices and standard form</b>	10	N2 N3 N6 N7 N8 N9	6th	8th
<b>AUTUMN</b>	<b>19 Congruence, similarity and vectors</b>	12	R6 R12 G3 G5 G6 G7	6th	8th
<b>AUTUMN</b>	<b>20 More algebra</b>	12	A2 A3 A5 A6 A12 A14	4th	8th

<b>YEAR 5</b>	<b>Year 11 H Higher Student Book</b>				
<b>TERM</b>	<b>UNIT / LESSON</b>	<b>HOURS</b>	<b>GCSE (9-1) SPEC REFERENCE</b>	<b>STEPS FROM ...</b>	<b>STEPS TO ...</b>
AUTUMN	16 Circle theorems	10	A16 G9 G10	7th	11th
AUTUMN	17 More algebra	13	N8 A4 A5 A6 A7 A18	8th	12th
AUTUMN	18 Vectors and geometric proof	10	G25	9th	12th
AUTUMN	19 Proportion and graphs	13	A7 A12 A13 A14 A15	7th	12th

REFERENCE	STATEMENT FROM EDEXCEL SPECIFICATION FOR GCSE (9-1) MATHEMATICS
Higher tier students will be assessed on all content. Foundation tier students will be assessed on content identified by the standard and underlined type.	
N1	order positive and negative integers, decimals and fractions; use the symbols =, ≠, <, >, ≤, ≥
N2	apply the four operations, including formal written methods, to integers, decimals and simple fractions (proper and improper), and mixed numbers – all both positive and negative; understand and use place value (e.g. when working with very large or very small numbers, and when calculating with decimals)
N3	recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions); use conventional notation for priority of operations, including brackets, powers, roots and reciprocals
N4	use the concepts and vocabulary of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation theorem
N5	apply systematic listing strategies, <b>including use of the product rule for counting (i.e. if there are m ways of doing one task and for each of these, there are n ways of doing another task, then the total number of ways the two tasks can be done is <math>m \times n</math> ways)</b>
N6	use positive integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5; <b>estimate powers and roots of any given positive number</b>
N7	<u>calculate with roots, and with integer and fractional indices</u>
N8	calculate exactly with fractions, <u>surds and multiples of <math>\pi</math></u> ; <b>simplify surd expressions involving squares (e.g. <math>\sqrt{12} = \sqrt{4 \times 3} = \sqrt{4} \times \sqrt{3} = 2\sqrt{3}</math>) and rationalise denominators</b>
N9	calculate with and interpret standard form $A \times 10^n$ , where $1 \leq A < 10$ and n is an integer
N10	work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $\frac{7}{2}$ or 0.375 or $\frac{3}{8}$ ); <b>change recurring decimals into their corresponding fractions and vice versa</b>
N11	identify and work with fractions in ratio problems
N12	interpret fractions and percentages as operators
N13	use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate
N14	estimate answers; check calculations using approximation and estimation, including answers obtained using technology
N15	round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures); <u>use inequality notation to specify simple error intervals due to truncation or rounding</u>
N16	<u>apply and interpret limits of accuracy, including upper and lower bounds</u>

<b>A1</b>	use and interpret algebraic manipulation, including: <ul style="list-style-type: none"> <li>● <math>ab</math> in place of <math>a \times b</math></li> <li>● <math>3y</math> in place of <math>y + y + y</math> and <math>3 \times y</math></li> <li>● <math>a^2</math> in place of <math>a \times a</math>, <math>a^3</math> in place of <math>a \times a \times a</math>, <math>a^2b</math> in place of <math>a \times a \times b</math></li> <li>● <math>a/b</math> in place of <math>a \div b</math></li> <li>● coefficients written as fractions rather than as decimals</li> <li>● brackets</li> </ul>
<b>A2</b>	substitute numerical values into formulae and expressions, including scientific formulae
<b>A3</b>	understand and use the concepts and vocabulary of expressions, equations, formulae, <u>identities</u> , inequalities, terms and
<b>A4</b>	simplify and manipulate algebraic expressions ( <u>including those involving surds and algebraic fractions</u> ) by:
<b>A5</b>	<del>and collecting like terms</del> and selecting like terms; rearrange formulae to change the subject
<b>A6</b>	know the difference between an equation and an identity; <u>argue mathematically to show algebraic expressions are</u>
<b>A7</b>	where appropriate, interpret simple expressions as functions with inputs and outputs; ; <b>interpret the reverse process as the</b>
<b>A8</b>	work with coordinates in all four quadrants
<b>A9</b>	plot graphs of equations that correspond to straight-line graphs in the coordinate plane; <u>use the form <math>y = mx + c</math> to identify</u>
<b>A10</b>	identify and interpret gradients and intercepts of linear functions graphically and algebraically
<b>A11</b>	identify and interpret roots, intercepts, turning points of quadratic functions graphically; deduce roots algebraically <b>and</b>
<b>A12</b>	recognise, sketch and interpret graphs of linear functions, quadratic functions, <u>simple cubic functions, the reciprocal</u>
<b>A13</b>	<b>sketch translations and reflections of a given function</b>
<b>A14</b>	plot and interpret graphs ( <u>including reciprocal graphs and exponential graphs</u> ) and graphs of non-standard functions in real
<b>A15</b>	<b>calculate or estimate gradients of graphs and areas under graphs (including quadratic and other non-linear graphs), and</b>
<b>A16</b>	<b>recognise and use the equation of a circle with centre at the origin; find the equation of a tangent to a circle at a given</b>
<b>A17</b>	solve linear equations in one unknown algebraically ( <u>including those with the unknown on both sides of the equation</u> ); find
<b>A18</b>	<b>square and by using the quadratic formula</b> ; <u>find approximate solutions using a graph</u>
<b>A19</b>	solve two simultaneous equations in two variables ( <u>linear/linear or linear/quadratic</u> ) algebraically; <u>find approximate</u>
<b>A20</b>	<b>find approximate solutions to equations numerically using iteration</b>
<b>A21</b>	<u>translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or two simultaneous</u>
<b>A22</b>	<u>number line, using set notation and on a graph</u>
<b>A23</b>	generate terms of a sequence from either a term-to-term or a position-to-term rule
<b>A24</b>	recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, <u>Fibonacci type</u>
<b>A25</b>	deduce expressions to calculate the $n$ th term of linear <b>and quadratic</b> sequences

<b>R1</b>	change freely between related standard units (e.g. time, length, area, volume/capacity, mass) and compound units (e.g.
<b>R2</b>	use scale factors, scale diagrams and maps
<b>R3</b>	express one quantity as a fraction of another, where the fraction is less than 1 or greater than 1
<b>R4</b>	use ratio notation, including reduction to simplest form
<b>R5</b>	divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two
<b>R6</b>	express a multiplicative relationship between two quantities as a ratio or a fraction
<b>R7</b>	understand and use proportion as equality of ratios
<b>R8</b>	relate ratios to fractions and to linear functions
<b>R9</b>	define percentage as 'number of parts per hundred'; interpret percentages and percentage changes as a fraction or a
<b>R10</b>	solve problems involving direct and inverse proportion, including graphical and algebraic representations
<b>R11</b>	use compound units such as speed, rates of pay, unit pricing, <u>density and pressure</u>
<b>R12</b>	compare lengths, areas and volumes using ratio notation; <u>make links to similarity (including trigonometric ratios) and scale</u>
<b>R13</b>	<u>understand that X is inversely proportional to Y is equivalent to X is proportional to 1/Y; <b>construct and interpret equations</b></u>
<b>R14</b>	<u>interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and</u>
<b>R15</b>	<b>interpret the gradient at a point on a curve as the instantaneous rate of change; apply the concepts of average and</b>
<b>R16</b>	<u>set up, solve and interpret the answers in growth and decay problems, including compound interest <b>and work with general</b></u>
<b>G1</b>	use conventional terms and notation: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles,
<b>G2</b>	<u>use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to</u>
<b>G3</b>	apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles; 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)
<b>G4</b>	derive and apply the properties and definitions of special types of quadrilaterals, including square, rectangle, parallelogram,
<b>G5</b>	<u>use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS)</u>
<b>G6</b>	<u>apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about</u>
<b>G7</b>	identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation,
<b>G8</b>	<b>describe the changes and invariance achieved by combinations of rotations, reflections and translations</b>
<b>G9</b>	identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, <u>tangent, arc,</u>
<b>G10</b>	<b>apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and use them to prove</b>
<b>G11</b>	solve geometrical problems on coordinate axes

G12	identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and
G13	<u>construct and interpret plans and elevations of 3D shapes</u>
G14	use standard units of measure and related concepts (length, area, volume/capacity, mass, time, money, etc.)
G15	measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings
G16	know and apply formulae to calculate: area of triangles, parallelograms, trapezia; volume of cuboids and other right prisms
G17	know the formulae: circumference of a circle = $2\pi r = \pi d$ , area of a circle = $\pi r^2$ ; calculate: perimeters of 2D shapes, including
G18	<u>calculate arc lengths, angles and areas of sectors of circles</u>
G19	<u>apply the concepts of congruence and similarity, including the relationships between lengths, areas and volumes in similar</u>
G20	know the formulae for: Pythagoras' theorem $a^2 + b^2 = c^2$ , and the trigonometric ratios, $\sin \theta = \text{opposite/hypotenuse}$ , $\cos \theta =$
G21	<u>know the exact values of <math>\sin \theta</math> and <math>\cos \theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ</math> and <math>90^\circ</math>; know the exact value of <math>\tan \theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ</math></u>
G22	<b>know and apply the sine rule <math>a/\sin A = b/\sin B = c/\sin C</math>, and cosine rule <math>a^2 = b^2 + c^2 - 2bc \cos A</math>, to find unknown lengths</b>
G23	<b>know and apply Area = <math>1/2 ab \sin C</math> to calculate the area, sides or angles of any triangle</b>
G24	describe translations as 2D vectors
G25	<u>apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column</u>
P1	record, describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees
P2	apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future
P3	relate relative expected frequencies to theoretical probability, using appropriate language and the 0-1 probability scale
P4	apply the property that the probabilities of an exhaustive set of outcomes sum to one; apply the property that the
P5	<u>understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size</u>
P6	enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams <u>and tree diagrams</u>
P7	construct theoretical possibility spaces for single and combined experiments with equally likely outcomes and use these to
P8	<u>calculate the probability of independent and dependent combined events, including using tree diagrams and other</u>
P9	<b>calculate and interpret conditional probabilities through representation using expected frequencies with two-way tables,</b>
S1	<u>infer properties of populations or distributions from a sample, while knowing the limitations of sampling</u>
S2	interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for
S3	<b>construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal</b>
S4	interpret, analyse and compare the distributions of data sets from univariate empirical distributions through:
S5	<b>• apply appropriate graphical representation involving discrete, continuous and grouped data,</b>
S6	use and interpret scatter graphs of bivariate data; recognise correlation <u>and know that it does not indicate causation; draw</u>