LEARNING PLAN AND TOPIC CHECKLIST

GCSE Mathematics

Foundation Tier | Year 11 | 2026/27

A shared Foundation learning plan for AQA, Pearson Edexcel and Cambridge OCR GCSE Mathematics (9-1). It covers the six national topic domains and includes Foundation content that is sometimes overlooked, such as quadratic factorisation, simultaneous linear equations and right-angle trigonometry.

The plan we follow

86 specification-reference entries organise what students should learn and practise. References N, A, R, G, P and S follow the common DfE/AQA/Edexcel structure; OCR arranges the same national content under its own topic numbers.

Qualification scope

Board	GCSE code	Foundation assessment
AQA	8300	Three 90-minute papers; Paper 1 non-calculator; Papers 2-3 calculator.
Pearson Edexcel	1MA1	Three 90-minute papers; Paper 1 non-calculator; Papers 2-3 calculator.
Cambridge OCR	J560	Three 90-minute papers; Papers 1 and 3 calculator; Paper 2 non-calculator.

Foundation tier assesses grades 1-5. This document is for GCSE, not A-level or International GCSE. Higher-only content is identified at the boundary where it is easy to confuse with Foundation content.

Coverage

Number • Algebra • Ratio, proportion and rates of change • Geometry and measures • Probability • Statistics

How we use this learning plan

This is the full topic coverage map for a Year 11 GCSE revision programme. Weekly lessons prioritise diagnosed gaps, school deadlines and exam practice. Topics are revisited rather than treated as complete after one explanation.

Record the correct student route first

Record	What staff need
Student and group	Full name, tutor, group slot, starting assessment and individual support needs.
Qualification	Exam board, exact specification code and Foundation tier entry.
Evidence of progress	Topic ID, date taught, independent practice, assessment evidence, misconception and next action.

A suggested 60-minute lesson

Minutes	Learning activity
0-5	Retrieval questions and a short check of prior learning.
5-20	Teach or revisit one focused objective with a worked example.
20-40	Guided practice with active checks and corrections.
40-55	Independent exam-style application, matched to board and tier.
55-60	Exit question, feedback and clear homework or revision action.

Track competence, not just attendance

Use the blank tracking box beside each objective: N = not yet taught; T = taught; P = practising; S = secure independently. Record evidence in the group learning record. Revisit an S judgement if later retrieval shows a gap.

Suggested review cycle: baseline assessment; focused teaching blocks; a short mixed assessment after each block; correction and re-teaching; then timed papers with a question-level gap review. The exact order and pace are set for the group.

At the end of each week, send attendance, actual teaching time, content covered and private individual concerns to Asad Patel or Aman. They issue the parent update and arrange resources through the community or private channels.

Number

FOUNDATION TIER | N reference checklist

Develop accurate calculation, estimation and unit handling with and without a calculator. Arithmetic skills recur in every other domain.

Ref	Teaching focus and required coverage	Track
N1	**Number lines and ordering** Compare positive and negative whole numbers, fractions and decimals; use equality and inequality symbols correctly.	☐
N2	**Arithmetic and place value** Use written and mental methods for all four operations with signed integers, decimals, proper/improper fractions and mixed numbers; solve money and household-finance problems.	☐
N3	**Operations and reciprocals** Apply the order of operations, brackets, powers and roots; use inverse operations, cancellation and reciprocals to check and simplify calculations.	☐
N4	**Factors, multiples and primes** Recognise primes; list factors and multiples; find HCF and LCM; use prime-factor decomposition, product notation and prime-power notation.	☐
N5	**Systematic listing** Organise possibilities in ordered lists, tables and diagrams so that cases are neither omitted nor counted twice.	☐
N6	**Powers and roots** Use squares, cubes, square/cube roots and other positive integer powers; recognise powers of 2, 3, 4 and 5.	☐
N7	**Integer index calculations** Apply index laws with integer powers, including zero and negative indices where required; calculate with roots. Fractional-index algebra is outside this Foundation plan.	☐
N8	**Exact calculations** Retain exact fractions and multiples of pi; distinguish exact answers from rounded decimal answers. Surd simplification and rationalising denominators are Higher-only extensions.	☐
N9	**Standard form** Read, write, compare and calculate with standard form using positive or negative integer powers of ten; interpret calculator displays.	☐
N10	**Fractions and terminating decimals** Convert between fractions and terminating decimals; simplify fractions and recognise equivalent forms. Algebraic conversion of recurring decimals is Higher-only.	☐
N11	**Fractions within ratios** Connect part-to-part ratios with part-to-whole fractions, including finding the fraction represented by one part of a mixture.	☐

Ref	Teaching focus and required coverage	Track
N12	**Fractions and percentages as operators** Find a fraction or percentage of an amount, use multipliers, and recover an original amount from a stated fraction or percentage.	☐
N13	**Units and measures** Use metric and other stated units for length, mass, capacity, time and money; interpret decimal measures and compound units.	☐
N14	**Estimation and checking** Round inputs to estimate calculations; judge the size and reasonableness of an answer and check calculator results in context.	☐
N15	**Rounding and error intervals** Round to decimal places, significant figures or a stated unit; write simple error intervals for rounded or truncated values using inequalities.	☐
N16	**Limits of accuracy** Interpret the possible range of an individual measured or rounded quantity. Calculating upper/lower bounds of multi-step expressions belongs to Higher-tier work.	☐

Algebra

FOUNDATION TIER | A reference checklist

Include Foundation overlap topics as well as basic algebra. The listed quadratic and simultaneous-equation work is part of this plan; do not replace it with Higher-only techniques.

Ref	Teaching focus and required coverage	Track
A1	**Algebraic notation** Read coefficients, terms, powers, products, fractional coefficients and brackets; write expressions using conventional notation.	☐
A2	**Substitution** Substitute positive, negative, decimal and fractional values into expressions and familiar or supplied formulae, including scientific formulae.	☐
A3	**Algebra vocabulary** Distinguish expressions, equations, formulae, identities and inequalities; identify terms, coefficients and factors.	☐
A4	**Manipulating expressions** Collect like terms; multiply and divide terms; use integer index laws; expand one bracket and two binomials; factor out common factors; factorise x^2 + bx + c and differences of two squares.	☐
A5	**Formulae and changing the subject** Use standard formulae and rearrange them to make a different variable the subject, selecting operations and checking by substitution.	☐
A6	**Equivalence and arguments** Recognise equations and identities; demonstrate that expressions are equivalent and use algebra to explain a pattern or support a simple argument.	☐
A7	**Inputs and outputs** Interpret simple expressions as functions; use function machines and input/output tables. Formal composite and inverse functions are outside this plan.	☐
A8	**Coordinates** Read and plot coordinates in all four quadrants; use coordinates in algebraic and geometrical problems.	☐
A9	**Straight-line equations** Plot straight lines; use y = mx + c; recognise parallel lines; find a line through two points or through a point with a given gradient.	☐
A10	**Gradient and intercept** Find and interpret the gradient and intercept of a straight line from a graph or equation; connect gradient with rate of change.	☐
A11	**Quadratic features** Read roots, intercepts and turning points from quadratic graphs; obtain roots algebraically when a quadratic can be factorised.	☐

Ref	Teaching focus and required coverage	Track
A12	**Recognising graphs** Recognise, sketch and interpret linear, quadratic, simple cubic and reciprocal graphs; note that y = 1/x is undefined at x = 0.	☐
A14	**Graphs in context** Plot and interpret conversion, distance-time and other real-life graphs, including reciprocal or unfamiliar functions; use graphs to estimate solutions.	☐
A17	**Linear equations** Solve one-variable linear equations, including unknowns on both sides and brackets; use graphs for approximate solutions and check solutions.	☐
A18	**Quadratic equations** Solve suitable quadratics by factorisation and by reading approximate roots from graphs. Completing the square and the quadratic formula are Higher-only.	☐
A19	**Simultaneous equations** Solve two linear equations in two variables by elimination or substitution; find approximate intersections graphically and interpret them in context.	☐
A21	**Forming and solving equations** Translate worded situations into expressions, formulae, a single equation or a pair of linear equations; solve and interpret answers with appropriate units.	☐
A22	**Linear inequalities** Solve inequalities in one variable and show solution sets on number lines, using open/closed endpoints and integer solutions where requested.	☐
A23	**Sequence rules** Generate sequences from term-to-term and position-to-term rules, including numerical, diagrammatic and fractional patterns.	☐
A24	**Recognising sequences** Recognise triangular, square and cube numbers, arithmetic sequences, Fibonacci-type patterns, simple quadratic patterns and positive-ratio geometric progressions.	☐
A25	**Linear nth terms** Find and use the nth term of a linear sequence; decide whether a number appears in the sequence. Deriving a quadratic nth term is Higher-only.	☐

Ratio, proportion and rates of change

FOUNDATION TIER | R reference checklist

Ref	Teaching focus and required coverage	Track
R1	**Converting units** Convert length, area, volume, capacity, mass and time units, and convert compound units in numerical or algebraic contexts.	☐
R2	**Scale factors and maps** Use scale drawings, scale factors and map scales; move between a diagram measurement and the corresponding real distance.	☐
R3	**One amount as a fraction of another** Express and compare quantities as fractions, including fractions greater than one, using consistent units.	☐
R4	**Ratio notation** Write, simplify and compare ratios; express ratios in a requested form and connect equivalent ratios.	☐
R5	**Sharing and ratio problems** Share totals in part-to-part or part-to-whole ratios; solve mixing, recipes, concentration, conversion and best-value problems.	☐
R6	**Multiplicative relationships** Express a multiplicative comparison as a ratio or fraction and identify the multiplier connecting two quantities.	☐
R7	**Proportion** Treat proportional quantities as equivalent ratios; use unitary methods, scaling and proportional reasoning.	☐
R8	**Linking representations** Connect ratio, fractions and linear relationships; interpret proportional statements in tables, graphs and simple equations.	☐
R9	**Percentages and financial maths** Convert percentages to fractions/decimals; compare quantities; calculate percentage change, original values, discounts, profit/loss, tax and simple interest, including percentages above 100.	☐
R10	**Direct and inverse proportion** Solve proportional problems with numbers, tables, graphs and suitable algebraic representations; distinguish increasing together from inverse relationships.	☐
R11	**Compound measures** Calculate with speed, density, pressure, pay rates and unit prices; rearrange relationships, convert units and compare rates.	☐
R12	**Ratio in geometry** Compare lengths, areas and volumes numerically using ratios; link length scale factors and similar shapes. General area/volume scale-factor laws are Higher-tier extensions.	☐

Ref	Teaching focus and required coverage	Track
R13	**Interpreting proportional equations** Recognise that inverse proportion links one quantity to the reciprocal of another; interpret equations showing direct or inverse proportion.	☐
R14	**Gradients and proportional graphs** Interpret the gradient of a straight line as a rate and recognise direct- and inverse-proportion graphs.	☐
R16	**Growth and decay** Set up and solve repeated percentage-change problems, including compound interest, depreciation and population change; interpret the result in context.	☐

Geometry and measures

FOUNDATION TIER | G reference checklist

Teach drawing, measurement and explanations alongside calculations. Right-angle trigonometry and the stated exact values are included; sine rule, cosine rule and formal circle theorems are Higher-only.

Ref	Teaching focus and required coverage	Track
G1	**Geometrical language and symmetry** Use correct names and notation for points, lines, planes, angles and polygons; label diagrams; recognise line and rotational symmetry.	☐
G2	**Constructions and loci** Use ruler and compasses to construct perpendiculars, perpendicular bisectors and angle bisectors; construct triangles and solve loci problems, including intersecting conditions.	☐
G3	**Angle reasoning** Use angles at a point, on a line and vertically opposite; corresponding, alternate and co-interior angles; triangle and polygon angle sums; interior/exterior angles of regular polygons.	☐
G4	**Properties of shapes** Use the defining properties of triangles and quadrilaterals, including squares, rectangles, parallelograms, trapezia, kites and rhombi; justify deductions.	☐
G5	**Triangle congruence** Recognise and use SSS, SAS, ASA and RHS to establish triangle congruence and deduce matching sides or angles.	☐
G6	**Geometrical arguments** Combine angle facts, shape properties, congruence, similarity and Pythagoras to explain results and construct simple geometrical arguments.	☐
G7	**Transformations** Describe and perform reflection, rotation, translation and enlargement, including fractional positive scale factors, on coordinate grids; distinguish congruence from similarity.	☐
G9	**Circle vocabulary** Recognise and use centre, radius, diameter, circumference, chord, tangent, arc, sector and segment. Formal circle-theorem proofs are Higher-only.	☐
G11	**Coordinate geometry** Solve geometrical questions on axes, including finding missing vertices, lengths, areas and properties of shapes from coordinates.	☐
G12	**Three-dimensional solids** Recognise faces, curved surfaces, edges and vertices of prisms, cylinders, pyramids, cones, spheres, cubes and cuboids; interpret nets.	☐
G13	**Plans and elevations** Draw and interpret plans, front/side elevations and representations of three-dimensional objects.	☐

Ref	Teaching focus and required coverage	Track
G14	**Units for measurement** Choose and use suitable units for length, area, volume, capacity, mass, time and money; distinguish squared and cubed units.	☐
G15	**Measuring, scale and bearings** Measure lengths and angles; interpret maps and scale drawings; use three-figure bearings and appropriate construction accuracy.	☐
G16	**Area and prism volume** Calculate areas of triangles, parallelograms and trapezia; calculate cuboid and prism volumes, including cylinders; work backwards to find missing dimensions.	☐
G17	**Perimeter, circles and solids** Calculate perimeter, circle circumference/area, composite area, and surface area/volume of spheres, pyramids, cones and composite solids using relevant supplied formulae.	☐
G18	**Arcs and sectors** Find arc lengths, sector angles and sector areas as fractions of a circle; combine them in perimeter or area problems.	☐
G19	**Similar lengths** Use corresponding sides and length scale factors in similar figures; connect congruence with scale factor one.	☐
G20	**Pythagoras and right-angle trigonometry** Use Pythagoras and sine/cosine/tangent to find missing lengths and angles in two-dimensional right-angled triangles; combine steps in worded problems.	☐
G21	**Exact trigonometric values** Use exact sine/cosine values for 0, 30, 45, 60 and 90 degrees, and tangent values for 0, 30, 45 and 60 degrees.	☐
G24	**Translation vectors** Read and write two-dimensional column vectors describing translations; distinguish horizontal and vertical components.	☐
G25	**Vector calculations** Add/subtract vectors and multiply by a scalar using diagrams and column notation. Geometric vector proofs are Higher-only.	☐

Probability

FOUNDATION TIER | P reference checklist

Ref	Teaching focus and required coverage	Track
P1	**Recording outcomes** Record and interpret experimental outcomes using tally/frequency tables, frequency trees and suitable diagrams.	☐
P2	**Fairness and expected outcomes** Use equally likely outcomes and fair experiments to calculate probabilities and expected frequencies over repeated trials.	☐
P3	**Probability and relative frequency** Use the 0-to-1 probability scale and probability language; compare experimental relative frequencies with theoretical probabilities.	☐
P4	**Exhaustive and exclusive outcomes** Use probabilities summing to one to find missing probabilities; distinguish mutually exclusive events and complementary outcomes.	☐
P5	**Samples and long-run behaviour** Explain why larger unbiased samples tend to give relative frequencies closer to theoretical probabilities, without guaranteeing an exact match.	☐
P6	**Listing combined outcomes** Organise sets and combinations with lists, grids, two-way tables, Venn diagrams and tree diagrams; use standard set notation where required.	☐
P7	**Sample spaces** Construct possibility spaces for one or more experiments with equally likely outcomes and use them to calculate probabilities.	☐
P8	**Combined events** Calculate independent and dependent event probabilities, including with/without replacement; use trees and know when to add or multiply. Formal conditional-probability calculations are Higher-only.	☐

Statistics

FOUNDATION TIER | S reference checklist

Ref	Teaching focus and required coverage	Track
S1	**Sampling and populations** Distinguish samples from populations; recognise bias, sample limitations and appropriate ways to collect representative data.	☐
S2	**Data and representations** Distinguish primary/secondary, discrete/continuous and categorical data; construct and interpret tables, pictograms, bar/vertical-line charts, pie charts and time-series graphs.	☐
S4	**Averages, spread and comparison** Find mean, median, mode, modal class and range; estimate a mean from grouped data; compare distributions and consider outliers. Box plots, quartiles and IQR are Higher-only.	☐
S5	**Describing populations** Select appropriate averages, spread and diagrams to describe a population; interpret results in context and recognise misleading presentation.	☐
S6	**Scatter graphs** Plot and interpret scatter graphs; describe strength/direction of correlation; draw a best-fit line; interpolate/extrapolate cautiously and distinguish correlation from causation.	☐

Assessment and teaching priorities

Approximate Foundation content balance	Share
Number	25%
Algebra	20%
Ratio, proportion and rates of change	25%
Geometry and measures	15%
Probability and statistics together	15%

These are overall content emphases, not a guarantee about an individual paper. Any content domain may appear on any paper.

What successful practice should show

- Fluent standard techniques, including accurate arithmetic, rearrangement, unit conversion and calculator use.
- Written reasoning with mathematical vocabulary, justified deductions and explanations of why a method works.
- Multi-step problem solving: selecting information, connecting topics, checking assumptions and interpreting the answer.
- Both calculator and non-calculator practice, with correct rounding at the end, sensible units and visible working.

Route boundaries to keep clear

Do not add Higher-only work to the compulsory Foundation checklist: algebraic fractions; fractional-index techniques; surd manipulation/rationalisation; completing the square/quadratic formula; non-linear simultaneous equations; quadratic nth terms; formal functions; circle theorems; sine/cosine rules; geometric vector proofs; histograms, cumulative frequency, box plots and conditional probability.

Board alignment

AQA and Edexcel use the N/A/R/G/P/S reference families shown in the tables. OCR groups content into 12 areas: integer operations; fractions/decimals/percentages; indices; approximation; ratio/proportion; algebra; graphs; basic geometry; congruence/similarity; mensuration; probability; statistics. Select OCR Foundation statements when preparing OCR tasks.

Formulae and examination materials

Use the current board guidance for the student examination series. Practise selecting, rearranging and applying formulae even when a formula sheet is available; do not rely on a historical list of what must be memorised.

Official sources and specification checks

Research checked on 27 October 2026. Links open the awarding organisation or Department for Education source. The plans paraphrase and organise content for Hikmah teaching; they are not exam-board publications or endorsements.

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01 DfE Mathematics

GCSE mathematics subject content and assessment objectives

02 AQA Maths

Mathematics 8300 - specification, version 1.1, September 2026

03 Edexcel Maths

Mathematics 1MA1 - specification, issue 2

04 OCR Maths

Mathematics J560 - specification, version 2.1, August 2026

Before setting each assignment

Confirm the school entry code, tier and current specification. Select only relevant checklist rows and the correct paper/practical requirements. Recheck board updates before the examination series; provided formula or equation sheets do not remove the need to interpret and use equations.