GCSE Mathematics Skills Map – What Comes First?

Click a skill to see what pupils need first, or a strand name for that strand's page.

H Higher only H+ Both tiers, extended at Higher

Number →

- **N1** Ordering Numbers
- **N2** The Four Operations
- **N3** Order of Operations and Inverses
- **N4** Factors, Multiples and Primes
- **N5** Systematic Listing H+
- **N6** Powers and Roots H+
- **N7** Calculating with Roots and Indices H+
- **N8** Exact Calculations H+
- **N9** Standard Form
- **N10** Fractions and Decimals H+
- **N11** Fractions in Ratio Problems
- **N12** Fractions and Percentages as Operators
- **N13** Units and Compound Measures
- **N14** Estimation
- **N15** Rounding and Error Intervals
- **N16** Limits of Accuracy H+

Probability →

- **P1** Frequency Tables and Trees
- **P2** Expected Outcomes
- **P3** The Probability Scale
- **P4** Probabilities Sum to One
- **P5** Sample Size and Probability
- **P6** Venn Diagrams and Tree Diagrams
- **P7** Possibility Spaces
- **P8** Combined Events
- **P9** Conditional Probability H

Algebra →

- **A1** Algebraic Notation
- **A2** Substitution
- **A3** Algebraic Vocabulary
- **A4** Simplifying and Factorising H+
- **A5** Formulae and Rearranging
- **A6** Identities and Algebraic Argument H+
- **A7** Functions H+
- **A8** Coordinates
- **A9** Straight-line Graphs H+
- **A10** Gradients and Intercepts
- **A11** Roots and Turning Points H+
- **A12** Recognising and Sketching Graphs H+
- **A13** Transforming Graphs H
- **A14** Graphs in Real Contexts H+
- **A15** Gradients and Areas Under Graphs H
- **A16** Equation of a Circle H
- **A17** Linear Equations
- **A18** Quadratic Equations H+
- **A19** Simultaneous Equations H+
- **A20** Iteration H
- **A21** Forming and Solving Equations
- **A22** Inequalities H+
- **A23** Generating Sequences
- **A24** Special Sequences H+
- **A25** nth Term H+

Ratio, proportion & rates of change →

- **R1** Converting Units
- **R2** Scale Factors, Diagrams and Maps
- **R3** One Quantity as a Fraction of Another
- **R4** Ratio Notation
- **R5** Dividing in a Ratio
- **R6** Ratio as a Fraction
- **R7** Proportion as Equal Ratios
- **R8** Ratios, Fractions and Linear Functions
- **R9** Percentages
- **R10** Direct and Inverse Proportion
- **R11** Compound Units
- **R12** Comparing Lengths, Areas and Volumes
- **R13** Proportion Equations H+
- **R14** Gradient as a Rate of Change
- **R15** Instantaneous Rate of Change H
- **R16** Growth and Decay H+

Statistics →

- **S1** Sampling
- **S2** Tables, Charts and Diagrams
- **S3** Histograms and Cumulative Frequency H
- **S4** Averages, Spread and Comparing Data H+
- **S5** Describing a Population
- **S6** Scatter Graphs and Correlation

Geometry & measures →

- **G1** Geometric Notation
- **G2** Constructions and Loci
- **G3** Angle Facts and Polygons
- **G4** Properties of 2D Shapes
- **G5** Congruence Criteria
- **G6** Geometric Reasoning
- **G7** Transformations H+
- **G8** Combining Transformations H
- **G9** Parts of a Circle
- **G10** Circle Theorems H
- **G11** Geometry on Coordinate Axes
- **G12** Properties of 3D Shapes
- **G13** Plans and Elevations
- **G14** Units of Measure
- **G15** Measuring, Scale Drawings and Bearings
- **G16** Area and Volume
- **G17** Circles, Composite Shapes and Solids
- **G18** Arcs and Sectors
- **G19** Congruence and Similarity H+
- **G20** Pythagoras and Trigonometry H+
- **G21** Exact Trig Values
- **G22** Sine and Cosine Rules H
- **G23** Area = ½ab sin C H
- **G24** Translations as Vectors
- **G25** Vector Arithmetic H+

Number

16 skills. Click a skill to see what pupils need first.

H Higher only H+ Both tiers, extended at Higher

- **N1** Ordering Numbers
- **N2** The Four Operations
- **N3** Order of Operations and Inverses
- **N4** Factors, Multiples and Primes
- **N5** Systematic Listing H+
- **N6** Powers and Roots H+
- **N7** Calculating with Roots and Indices H+
- **N8** Exact Calculations H+
- **N9** Standard Form
- **N10** Fractions and Decimals H+
- **N11** Fractions in Ratio Problems
- **N12** Fractions and Percentages as Operators
- **N13** Units and Compound Measures
- **N14** Estimation
- **N15** Rounding and Error Intervals
- **N16** Limits of Accuracy H+

⌂ All skills

Algebra →

Algebra

25 skills. Click a skill to see what pupils need first.

H Higher only H+ Both tiers, extended at Higher

- **A1** Algebraic Notation
- **A2** Substitution
- **A3** Algebraic Vocabulary
- **A4** Simplifying and Factorising H+
- **A5** Formulae and Rearranging
- **A6** Identities and Algebraic Argument H+
- **A7** Functions H+
- **A8** Coordinates
- **A9** Straight-line Graphs H+
- **A10** Gradients and Intercepts
- **A11** Roots and Turning Points H+
- **A12** Recognising and Sketching Graphs H+
- **A13** Transforming Graphs H
- **A14** Graphs in Real Contexts H+
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- **A16** Equation of a Circle H
- **A17** Linear Equations
- **A18** Quadratic Equations H+
- **A19** Simultaneous Equations H+
- **A20** Iteration H
- **A21** Forming and Solving Equations
- **A22** Inequalities H+
- **A23** Generating Sequences
- **A24** Special Sequences H+
- **A25** nth Term H+

⌂ All skills

← Number

Ratio →

Ratio, proportion & rates of change

16 skills. Click a skill to see what pupils need first.

H Higher only H+ Both tiers, extended at Higher

- **R1** Converting Units
- **R2** Scale Factors, Diagrams and Maps
- **R3** One Quantity as a Fraction of Another
- **R4** Ratio Notation
- **R5** Dividing in a Ratio
- **R6** Ratio as a Fraction
- **R7** Proportion as Equal Ratios
- **R8** Ratios, Fractions and Linear Functions
- **R9** Percentages
- **R10** Direct and Inverse Proportion
- **R11** Compound Units
- **R12** Comparing Lengths, Areas and Volumes
- **R13** Proportion Equations H+
- **R14** Gradient as a Rate of Change
- **R15** Instantaneous Rate of Change H
- **R16** Growth and Decay H+

Geometry & measures

25 skills. Click a skill to see what pupils need first.

H Higher only H+ Both tiers, extended at Higher

- **G1** Geometric Notation
- **G2** Constructions and Loci
- **G3** Angle Facts and Polygons
- **G4** Properties of 2D Shapes
- **G5** Congruence Criteria
- **G6** Geometric Reasoning
- **G7** Transformations H+
- **G8** Combining Transformations H
- **G9** Parts of a Circle
- **G10** Circle Theorems H
- **G11** Geometry on Coordinate Axes
- **G12** Properties of 3D Shapes
- **G13** Plans and Elevations
- **G14** Units of Measure
- **G15** Measuring, Scale Drawings and Bearings
- **G16** Area and Volume
- **G17** Circles, Composite Shapes and Solids
- **G18** Arcs and Sectors
- **G19** Congruence and Similarity H+
- **G20** Pythagoras and Trigonometry H+
- **G21** Exact Trig Values
- **G22** Sine and Cosine Rules H
- **G23** Area = ½ab sin C H
- **G24** Translations as Vectors
- **G25** Vector Arithmetic H+

⌂ All skills

← Ratio

Probability →

Probability

9 skills. Click a skill to see what pupils need first.

H Higher only

H+ Both tiers, extended at Higher

- **P1** Frequency Tables and Trees
- **P2** Expected Outcomes
- **P3** The Probability Scale
- **P4** Probabilities Sum to One
- **P5** Sample Size and Probability
- **P6** Venn Diagrams and Tree Diagrams
- **P7** Possibility Spaces
- **P8** Combined Events
- **P9** Conditional Probability H

Statistics

6 skills. Click a skill to see what pupils need first.

H Higher only

H+ Both tiers, extended at Higher

- **S1** Sampling
- **S2** Tables, Charts and Diagrams
- **S3** Histograms and Cumulative Frequency H
- **S4** Averages, Spread and Comparing Data H+
- **S5** Describing a Population
- **S6** Scatter Graphs and Correlation

⌂ All skills

← Probability

N1 Ordering Numbers

Foundation & Higher

Order positive and negative integers, decimals and fractions; use the symbols =, ≠, <, >, ≤ and ≥.

To be successful, pupils need

A starting point. This skill builds on Key Stage 3 work rather than another GCSE skill.

N1
Ordering Numbers

This skill leads on to

- **N2** The Four Operations
- **N15** Rounding and Error Intervals
- **A8** Coordinates
- **A22** Inequalities H+

N2 The Four Operations

Foundation & Higher

Apply the four operations, including formal written methods, to integers, decimals, fractions and mixed numbers, positive and negative; use place value with very large and very small numbers.

To be successful, pupils need

N1 Ordering Numbers
Foundation & Higher

N2
The Four Operations

This skill leads on to

- **N3** Order of Operations and Inverses
- **N4** Factors, Multiples and Primes
- **N5** Systematic Listing H+
- **N6** Powers and Roots H+
- **N8** Exact Calculations H+
- **N9** Standard Form
- **N10** Fractions and Decimals H+
- **N12** Fractions and Percentages as Operators
- **N13** Units and Compound Measures
- **N15** Rounding and Error Intervals
- **A2** Substitution
- **A4** Simplifying and Factorising H+
- **A23** Generating Sequences
- **R3** One Quantity as a Fraction of Another
- **R5** Dividing in a Ratio
- **P4** Probabilities Sum to One
- **P8** Combined Events
- **S4** Averages, Spread and Comparing Data H+

N3 Order of Operations and Inverses

Foundation & Higher

Use relationships between operations, including inverse operations and cancellation; use priority of operations with brackets, powers, roots and reciprocals.

To be successful, pupils need

N2 The Four Operations
Foundation & Higher

N3
Order of Operations and Inverses

This skill leads on to

- **N6** Powers and Roots H+
- **N7** Calculating with Roots and Indices H+
- **N14** Estimation
- **A1** Algebraic Notation
- **A2** Substitution
- **A17** Linear Equations

N4 Factors, Multiples and Primes

Foundation & Higher

Use primes, factors, multiples, HCF, LCM and prime factorisation, including product notation and the unique factorisation theorem.

To be successful, pupils need

N2 The Four Operations
Foundation & Higher

N4
Factors, Multiples and Primes

This skill leads on to

N10 Fractions and Decimals H+

A4 Simplifying and Factorising H+

R4 Ratio Notation

N5 Systematic Listing

H+ Both tiers, extended at Higher

Both tiers: Apply systematic listing strategies.

To be successful, pupils need

N2 The Four Operations
Foundation & Higher

N5
Systematic Listing

This skill leads on to

P6 Venn Diagrams and Tree Diagrams

Extra for Higher only
Use the product rule for counting: m ways then n ways gives m × n ways. H+

N6 Powers and Roots

H+ Both tiers, extended at Higher

Both tiers: Use positive integer powers and their real roots (square, cube and higher); recognise powers of 2, 3, 4 and 5.

To be successful, pupils need

- **N2** The Four Operations
  Foundation & Higher
- **N3** Order of Operations and Inverses
  Foundation & Higher

N6
Powers and Roots

This skill leads on to

- **N7** Calculating with Roots and Indices H+
- **N8** Exact Calculations H+
- **N9** Standard Form
- **A12** Recognising and Sketching Graphs H+
- **A24** Special Sequences H+
- **G20** Pythagoras and Trigonometry H+
- **G21** Exact Trig Values

Extra for Higher only
Estimate powers and roots of any given positive number. H+

N7 Calculating with Roots and Indices

H+ Both tiers, extended at Higher

Both tiers: Calculate with roots and with integer indices.

To be successful, pupils need

N6 Powers and Roots
Both tiers, extended at Higher H+

N3 Order of Operations and Inverses
Foundation & Higher

N7
Calculating with Roots and Indices

This skill leads on to

N9 Standard Form

R16 Growth and Decay H+

Extra for Higher only
Calculate with fractional indices. H+

N8 Exact Calculations

H+ Both tiers, extended at Higher

Both tiers: Calculate exactly with fractions and multiples of π.

To be successful, pupils need

N2 The Four Operations
Foundation & Higher

N6 Powers and Roots
Both tiers, extended at Higher H+

G17 Circles, Composite Shapes and Solids
Foundation & Higher

N8
Exact Calculations

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

Extra for Higher only
Calculate exactly with surds; simplify surds (e.g. √12 = 2√3) and rationalise denominators. H+

N9 Standard Form

Foundation & Higher

Calculate with and interpret standard form $A \times 10^n$, where $1 \leq A < 10$ and n is an integer.

To be successful, pupils need

N6 Powers and Roots
Both tiers, extended at Higher H+

N7 Calculating with Roots and Indices
Both tiers, extended at Higher H+

N2 The Four Operations
Foundation & Higher

N9
Standard Form

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

N10 Fractions and Decimals

H+ Both tiers, extended at Higher



Both tiers: Work interchangeably with terminating decimals and their corresponding fractions.

To be successful, pupils need

N2 The Four Operations
Foundation & Higher

N4 Factors, Multiples and Primes
Foundation & Higher

N10
Fractions and Decimals

This skill leads on to

N12 Fractions and Percentages as Operators

R3 One Quantity as a Fraction of Another

R9 Percentages

P3 The Probability Scale

Extra for Higher only
Change recurring decimals into fractions and vice versa. H+

N11 Fractions in Ratio Problems

Foundation & Higher

Identify and work with fractions in ratio problems.

To be successful, pupils need

N12 Fractions and Percentages as Operators
Foundation & Higher

R4 Ratio Notation
Foundation & Higher

N11
Fractions in Ratio Problems

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

N12 Fractions and Percentages as Operators

Foundation & Higher

Interpret fractions and percentages as operators.

To be successful, pupils need

N2 The Four Operations
Foundation & Higher

N10 Fractions and Decimals
Both tiers, extended at Higher
H+

N12
Fractions and Percentages as Operators

This skill leads on to

N11 Fractions in Ratio Problems

R9 Percentages

G18 Arcs and Sectors

P1 Frequency Tables and Trees

P2 Expected Outcomes

S2 Tables, Charts and Diagrams

N13 Units and Compound Measures

Foundation & Higher

Use standard units of mass, length, time, money and other measures, including compound measures, with decimal quantities.

To be successful, pupils need

N2 The Four Operations
Foundation & Higher

G14 Units of Measure
Foundation & Higher

N13
Units and Compound Measures

This skill leads on to

R1 Converting Units

R2 Scale Factors, Diagrams and Maps

R11 Compound Units

N14 Estimation

Foundation & Higher



Estimate answers; check calculations, including answers from technology, using approximation and estimation.

To be successful, pupils need

N15 Rounding and Error Intervals
Foundation & Higher

N3 Order of Operations and Inverses
Foundation & Higher

N14
Estimation

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

N15 Rounding and Error Intervals

Foundation & Higher

Round to a given number of decimal places or significant figures; use inequality notation for error intervals from truncation or rounding.

To be successful, pupils need

- **N2** The Four Operations — **Foundation & Higher**
- **N1** Ordering Numbers — **Foundation & Higher**

N15
Rounding and Error Intervals

This skill leads on to

- **N14** Estimation
- **N16** Limits of Accuracy — H+
- **A20** Iteration — H

N16 Limits of Accuracy

H+ Both tiers, extended at Higher



Both tiers: Apply and interpret limits of accuracy.

To be successful, pupils need

N15 Rounding and Error Intervals
Foundation & Higher

A2 Substitution
Foundation & Higher

N16
Limits of Accuracy

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

Extra for Higher only
Work with upper and lower bounds. H+

A1 Algebraic Notation

Foundation & Higher

Use and interpret algebraic notation: ab, 3y, a^2, a^3, a^2b, a/b, fractional coefficients and brackets.

To be successful, pupils need

N3 Order of Operations and Inverses
Foundation & Higher

A1
Algebraic Notation

This skill leads on to

A2 Substitution

A3 Algebraic Vocabulary

A4 Simplifying and Factorising H+

A17 Linear Equations

A2 Substitution

Foundation & Higher

Substitute numerical values into formulae and expressions, including scientific formulae.

To be successful, pupils need

- **A1** Algebraic Notation — **Foundation & Higher**
- **N2** The Four Operations — **Foundation & Higher**
- **N3** Order of Operations and Inverses — **Foundation & Higher**

A2 Substitution

This skill leads on to

- **N16** Limits of Accuracy (H+)
- **A12** Recognising and Sketching Graphs (H+)
- **A5** Formulae and Rearranging
- **A20** Iteration (H)
- **A7** Functions (H+)
- **A23** Generating Sequences
- **A9** Straight-line Graphs (H+)
- **G16** Area and Volume
- **A11** Roots and Turning Points (H+)

A3 Algebraic Vocabulary

Foundation & Higher

Understand and use expressions, equations, formulae, identities, inequalities, terms and factors.

To be successful, pupils need

A1 Algebraic Notation
Foundation & Higher

A3
Algebraic Vocabulary

This skill leads on to

A6 Identities and Algebraic Argument H+

A21 Forming and Solving Equations

A4 Simplifying and Factorising

H+ Both tiers, extended at Higher



Both tiers: Collect like terms, expand single brackets, take out common factors, expand two binomials, factorise $x^2 + bx + c$ (including difference of two squares) and use the laws of indices.

To be successful, pupils need

- **A1** Algebraic Notation — **Foundation & Higher**
- **N4** Factors, Multiples and Primes — **Foundation & Higher**
- **N2** The Four Operations — **Foundation & Higher**

A4
Simplifying and Factorising

This skill leads on to

- **A6** Identities and Algebraic Argument — H+
- **A17** Linear Equations
- **A18** Quadratic Equations — H+
- **G25** Vector Arithmetic — H+
- **Extra for Higher only** — H+
  Expand three or more binomials, factorise $ax^2 + bx + c$ and simplify algebraic fractions.

A5 Formulae and Rearranging

Foundation & Higher

Understand and use standard formulae; rearrange formulae to change the subject.

To be successful, pupils need

- **A2** Substitution — **Foundation & Higher**
- **A17** Linear Equations — **Foundation & Higher**

A5
Formulae and Rearranging

This skill leads on to

- **A7** Functions — H+
- **A10** Gradients and Intercepts
- **A20** Iteration — H
- **R13** Proportion Equations — H+
- **G17** Circles, Composite Shapes and Solids
- **G20** Pythagoras and Trigonometry — H+
- **G22** Sine and Cosine Rules — H

A6 Identities and Algebraic Argument

H+ Both tiers, extended at Higher



Both tiers: Know the difference between an equation and an identity; show expressions are equivalent and use algebra to construct arguments.

To be successful, pupils need

A3 Algebraic Vocabulary
Foundation & Higher

A4 Simplifying and Factorising
Both tiers, extended at Higher H+

A6
Identities and Algebraic Argument

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

Extra for Higher only
Construct formal algebraic proofs. H+

A7 Functions

H+ Both tiers, extended at Higher



Both tiers: Interpret simple expressions as functions with inputs and outputs.

To be successful, pupils need

A2 Substitution
Foundation & Higher

A5 Formulae and Rearranging
Foundation & Higher

A7
Functions

This skill leads on to

A13 Transforming Graphs — H

Extra for Higher only
Inverse and composite functions, using formal function notation. — H+

A8 Coordinates

Foundation & Higher

Work with coordinates in all four quadrants.

To be successful, pupils need

N1 Ordering Numbers
Foundation & Higher

A8
Coordinates

This skill leads on to

- **A9** Straight-line Graphs H+
- **A11** Roots and Turning Points H+
- **G7** Transformations H+
- **G11** Geometry on Coordinate Axes
- **G24** Translations as Vectors
- **S6** Scatter Graphs and Correlation

A9 Straight-line Graphs

H+ Both tiers, extended at Higher



Both tiers: Plot straight-line graphs; use y = mx + c to identify parallel lines; find the equation of a line through two points or one point with a given gradient.

To be successful, pupils need

- **A8** Coordinates — **Foundation & Higher**
- **A2** Substitution — **Foundation & Higher**
- **A17** Linear Equations — **Foundation & Higher**

A9 Straight-line Graphs

This skill leads on to

- **A10** Gradients and Intercepts
- **A19** Simultaneous Equations (H+)
- **A12** Recognising and Sketching Graphs (H+)
- **R8** Ratios, Fractions and Linear Functions
- **A14** Graphs in Real Contexts (H+)
- **G11** Geometry on Coordinate Axes
- **A16** Equation of a Circle (H)
- **S6** Scatter Graphs and Correlation

Extra for Higher only (H+)
Use y = mx + c to identify perpendicular lines.

A10 Gradients and Intercepts

Foundation & Higher

Identify and interpret gradients and intercepts of linear functions graphically and algebraically.

To be successful, pupils need

A9 Straight-line Graphs H+
Both tiers, extended at Higher

A5 Formulae and Rearranging
Foundation & Higher

A10
Gradients and Intercepts

This skill leads on to

A15 Gradients and Areas Under Graphs H

R14 Gradient as a Rate of Change

⌂ All skills | Algebra | Ratio

← A9 | A11 →

A11 Roots and Turning Points

H+ Both tiers, extended at Higher



Both tiers: Identify and interpret roots, intercepts and turning points of quadratics graphically; deduce roots algebraically.

To be successful, pupils need

A8 Coordinates
Foundation & Higher

A18 Quadratic Equations H+
Both tiers, extended at Higher

A2 Substitution
Foundation & Higher

A11
Roots and Turning Points

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

Extra for Higher only H+
Find turning points by completing the square.

A12 Recognising and Sketching Graphs

H+ Both tiers, extended at Higher

Both tiers: Recognise, sketch and interpret linear, quadratic, simple cubic and reciprocal (y = 1/x) graphs.

To be successful, pupils need

- **A9** Straight-line Graphs — **Both tiers, extended at Higher** (H+)
- **A2** Substitution — **Foundation & Higher**
- **N6** Powers and Roots — **Both tiers, extended at Higher** (H+)

A12
Recognising and Sketching Graphs

This skill leads on to

- **A13** Transforming Graphs (H)
- **A14** Graphs in Real Contexts (H+)
- **Extra for Higher only** (H+)
  Exponential graphs $y = k^x$ and trigonometric graphs of sin x, cos x and tan x for any angle.

A13 Transforming Graphs

H Higher only

Sketch translations and reflections of a given function.

To be successful, pupils need

- **A12** Recognising and Sketching Graphs — **Both tiers, extended at Higher** (H+)
- **G7** Transformations — **Both tiers, extended at Higher** (H+)
- **A7** Functions — **Both tiers, extended at Higher** (H+)

A13
Transforming Graphs

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

A14 Graphs in Real Contexts

H+ Both tiers, extended at Higher



Both tiers: Plot and interpret graphs, including reciprocal and non-standard graphs, in real contexts such as distance, speed and acceleration.

To be successful, pupils need

- **A9** Straight-line Graphs — **Both tiers, extended at Higher** (H+)
- **A12** Recognising and Sketching Graphs — **Both tiers, extended at Higher** (H+)
- **R11** Compound Units — **Foundation & Higher**

A14
Graphs in Real Contexts

This skill leads on to

- **A15** Gradients and Areas Under Graphs (H)
- **Extra for Higher only** — Include exponential graphs. (H+)

A15 Gradients and Areas Under Graphs

H Higher only

Calculate or estimate gradients of graphs and areas under graphs, including non-linear graphs; interpret them for distance–time, velocity–time and financial graphs.

To be successful, pupils need

- **A10** Gradients and Intercepts
  Foundation & Higher
- **A14** Graphs in Real Contexts H+
  Both tiers, extended at Higher
- **G16** Area and Volume
  Foundation & Higher

A15
Gradients and Areas Under Graphs

This skill leads on to

- **R15** Instantaneous Rate of Change H

⌂ All skills | Algebra | Ratio | Geometry

← A14 | A16 →

A16 Equation of a Circle

H Higher only

Recognise and use the equation of a circle with centre at the origin; find the equation of a tangent at a given point.

To be successful, pupils need

- **G20** Pythagoras and Trigonometry — **Both tiers, extended at Higher** (H+)
- **A9** Straight-line Graphs — **Both tiers, extended at Higher** (H+)
- **G9** Parts of a Circle — **Foundation & Higher**

A16
Equation of a Circle

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

A17 Linear Equations

Foundation & Higher

Solve linear equations in one unknown, including unknowns on both sides; find approximate solutions from a graph.

To be successful, pupils need

- **A1** Algebraic Notation — **Foundation & Higher**
- **N3** Order of Operations and Inverses — **Foundation & Higher**
- **A4** Simplifying and Factorising — H+ — **Both tiers, extended at Higher**

A17
Linear Equations

This skill leads on to

- **A5** Formulae and Rearranging
- **A21** Forming and Solving Equations
- **A9** Straight-line Graphs — H+
- **A22** Inequalities — H+
- **A18** Quadratic Equations — H+
- **A25** nth Term — H+
- **A19** Simultaneous Equations — H+
- **R10** Direct and Inverse Proportion

A18 Quadratic Equations

H+ Both tiers, extended at Higher

Both tiers: Solve quadratic equations by factorising; find approximate solutions from a graph.

To be successful, pupils need

A4 Simplifying and Factorising H+
Both tiers, extended at Higher

A17 Linear Equations
Foundation & Higher

A18
Quadratic Equations

This skill leads on to

A11 Roots and Turning Points H+

Extra for Higher only
Solve by completing the square and the quadratic formula, including equations that need rearranging. H+

A19 Simultaneous Equations

H+ Both tiers, extended at Higher

Both tiers: Solve two linear simultaneous equations algebraically; find approximate solutions from a graph.

To be successful, pupils need

A17 Linear Equations
Foundation & Higher

A9 Straight-line Graphs
Both tiers, extended at Higher H+

A19
Simultaneous Equations

This skill leads on to

A21 Forming and Solving Equations

Extra for Higher only
Solve one linear and one quadratic equation simultaneously. H+

A20 Iteration

H Higher only

Find approximate solutions to equations numerically using iteration.

To be successful, pupils need

- **A2** Substitution — **Foundation & Higher**
- **A5** Formulae and Rearranging — **Foundation & Higher**
- **N15** Rounding and Error Intervals — **Foundation & Higher**

A20
Iteration

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

A21 Forming and Solving Equations

Foundation & Higher

Translate situations into expressions or formulae; derive one equation or two simultaneous equations, solve and interpret the solution.

To be successful, pupils need

- **A17** Linear Equations
  Foundation & Higher
- **A19** Simultaneous Equations H+
  Both tiers, extended at Higher
- **A3** Algebraic Vocabulary
  Foundation & Higher

A21
Forming and Solving Equations

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

A22 Inequalities

H+ Both tiers, extended at Higher

Both tiers: Solve linear inequalities in one variable; represent the solution set on a number line.

To be successful, pupils need

N1 Ordering Numbers
Foundation & Higher

A17 Linear Equations
Foundation & Higher

A22
Inequalities

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

Extra for Higher only
Linear inequalities in two variables and quadratic inequalities; use set notation and graphs. H+

A23 Generating Sequences

Foundation & Higher

Generate terms of a sequence from a term-to-term or position-to-term rule.

To be successful, pupils need

A2 Substitution
Foundation & Higher

N2 The Four Operations
Foundation & Higher

A23
Generating Sequences

This skill leads on to

A24 Special Sequences H+

A25 nth Term H+

A24 Special Sequences

H+ Both tiers, extended at Higher



Both tiers: Recognise triangular, square and cube numbers, arithmetic, Fibonacci-type, quadratic and simple geometric sequences.

To be successful, pupils need

A23 Generating Sequences
Foundation & Higher

N6 Powers and Roots
Both tiers, extended at Higher H+

A24
Special Sequences

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

Extra for Higher only
Geometric sequences with a surd common ratio, and other sequences. H+

A25 nth Term

H+ Both tiers, extended at Higher



Both tiers: Deduce expressions for the nth term of linear sequences.

To be successful, pupils need

A23 Generating Sequences
Foundation & Higher

A17 Linear Equations
Foundation & Higher

A25
nth Term

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

Extra for Higher only
Find the nth term of quadratic sequences. H+

R1 Converting Units

Foundation & Higher

Change between standard units (time, length, area, volume, mass) and compound units (speed, pay rates, prices, density, pressure).

To be successful, pupils need

- **N13** Units and Compound Measures
  Foundation & Higher
- **G14** Units of Measure
  Foundation & Higher

R1
Converting Units

This skill leads on to

- **R11** Compound Units

R2 Scale Factors, Diagrams and Maps

Foundation & Higher

Use scale factors, scale diagrams and maps.

To be successful, pupils need

R4 Ratio Notation
Foundation & Higher

N13 Units and Compound Measures
Foundation & Higher

R2
Scale Factors, Diagrams and Maps

This skill leads on to

R12 Comparing Lengths, Areas and Volumes

G15 Measuring, Scale Drawings and Bearings

R3 One Quantity as a Fraction of Another

Foundation & Higher

Express one quantity as a fraction of another, where the fraction is less than or greater than 1.

To be successful, pupils need

N2 The Four Operations
Foundation & Higher

N10 Fractions and Decimals
Both tiers, extended at Higher
H+

R3
One Quantity as a Fraction of Another

This skill leads on to

R6 Ratio as a Fraction

R9 Percentages

R4 Ratio Notation

Foundation & Higher

Use ratio notation, including reducing a ratio to its simplest form.

To be successful, pupils need

N4 Factors, Multiples and Primes
Foundation & Higher

R4
Ratio Notation

This skill leads on to

N11 Fractions in Ratio Problems

R2 Scale Factors, Diagrams and Maps

R5 Dividing in a Ratio

R6 Ratio as a Fraction

R12 Comparing Lengths, Areas and Volumes

R5 Dividing in a Ratio

Foundation & Higher

Divide a quantity in a part:part or part:whole ratio; apply ratio to conversion, comparison, scaling, mixing and concentration problems.

To be successful, pupils need

R4 Ratio Notation
Foundation & Higher

N2 The Four Operations
Foundation & Higher

R5
Dividing in a Ratio

This skill leads on to

R7 Proportion as Equal Ratios

R6 Ratio as a Fraction

Foundation & Higher

Express a multiplicative relationship between two quantities as a ratio or a fraction.

To be successful, pupils need

R4 Ratio Notation
Foundation & Higher

R3 One Quantity as a Fraction of Another
Foundation & Higher

R6
Ratio as a Fraction

This skill leads on to

R7 Proportion as Equal Ratios

R8 Ratios, Fractions and Linear Functions

R7 Proportion as Equal Ratios

Foundation & Higher

Understand and use proportion as equality of ratios.

To be successful, pupils need

R5 Dividing in a Ratio
Foundation & Higher

R6 Ratio as a Fraction
Foundation & Higher

R7
Proportion as Equal Ratios

This skill leads on to

R10 Direct and Inverse Proportion

R8 Ratios, Fractions and Linear Functions

Foundation & Higher

Relate ratios to fractions and to linear functions.

To be successful, pupils need

R6 Ratio as a Fraction
Foundation & Higher

A9 Straight-line Graphs H+
Both tiers, extended at Higher

R8
Ratios, Fractions and Linear Functions

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

R9 Percentages

Foundation & Higher

Use percentages as parts per hundred and multiplicatively; percentage change, original value problems, percentages over 100% and simple interest.

To be successful, pupils need

N12 Fractions and Percentages as Operators
Foundation & Higher

R3 One Quantity as a Fraction of Another
Foundation & Higher

N10 Fractions and Decimals H+
Both tiers, extended at Higher

R9
Percentages

This skill leads on to

R16 Growth and Decay H+

R10 Direct and Inverse Proportion

Foundation & Higher

Solve direct and inverse proportion problems, including graphical and algebraic representations.

To be successful, pupils need

R7 Proportion as Equal Ratios
Foundation & Higher

A17 Linear Equations
Foundation & Higher

R10
Direct and Inverse Proportion

This skill leads on to

R13 Proportion Equations H+

R14 Gradient as a Rate of Change

⌂ All skills | Algebra | Ratio

← R9 | R11 →

R11 Compound Units

Foundation & Higher

Use compound units such as speed, rates of pay, unit pricing, density and pressure.

To be successful, pupils need

N13 Units and Compound Measures
Foundation & Higher

R1 Converting Units
Foundation & Higher

R11
Compound Units

This skill leads on to

A14 Graphs in Real Contexts H+

R14 Gradient as a Rate of Change

R12 Comparing Lengths, Areas and Volumes

Foundation & Higher

Compare lengths, areas and volumes using ratio notation; link to similarity, trigonometric ratios and scale factors.

To be successful, pupils need

- **R4** Ratio Notation — **Foundation & Higher**
- **R2** Scale Factors, Diagrams and Maps — **Foundation & Higher**
- **G16** Area and Volume — **Foundation & Higher**

R12
Comparing Lengths, Areas and Volumes

This skill leads on to

- **G19** Congruence and Similarity — H+

⌂ All skills | Ratio | Geometry

← R11 | R13 →

R13 Proportion Equations

H+ Both tiers, extended at Higher



Both tiers: Understand that X ∝ 1/Y means X is inversely proportional to Y; interpret equations describing direct and inverse proportion.

To be successful, pupils need

R10 Direct and Inverse Proportion
Foundation & Higher

A5 Formulae and Rearranging
Foundation & Higher

R13
Proportion Equations

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

Extra for Higher only
Construct equations that describe direct and inverse proportion. H+

R14 Gradient as a Rate of Change

Foundation & Higher

Interpret the gradient of a straight-line graph as a rate of change; recognise graphs of direct and inverse proportion.

To be successful, pupils need

- **A10** Gradients and Intercepts — **Foundation & Higher**
- **R10** Direct and Inverse Proportion — **Foundation & Higher**
- **R11** Compound Units — **Foundation & Higher**

R14
Gradient as a Rate of Change

This skill leads on to

- **R15** Instantaneous Rate of Change — H

⌂ All skills | Algebra | Ratio

← R13 | R15 →

R15 Instantaneous Rate of Change

H Higher only



Interpret the gradient at a point on a curve as the instantaneous rate of change; use chords and tangents for average and instantaneous rates.

To be successful, pupils need

R14 Gradient as a Rate of Change
Foundation & Higher

A15 Gradients and Areas Under Graphs
Higher only H

R15
Instantaneous Rate of Change

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

R16 Growth and Decay

H+ Both tiers, extended at Higher



Both tiers: Set up, solve and interpret growth and decay problems, including compound interest.

To be successful, pupils need

R9 Percentages
Foundation & Higher

N7 Calculating with Roots and Indices H+
Both tiers, extended at Higher

R16
Growth and Decay

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

Extra for Higher only H+
Work with general iterative processes.

G1 Geometric Notation

Foundation & Higher

Use conventional terms and notation for points, lines, angles, polygons and symmetry; label triangles; draw diagrams from written descriptions.

To be successful, pupils need

A starting point. This skill builds on Key Stage 3 work rather than another GCSE skill.

G1
Geometric Notation

This skill leads on to

- **G2** Constructions and Loci
- **G3** Angle Facts and Polygons
- **G4** Properties of 2D Shapes
- **G7** Transformations H+
- **G9** Parts of a Circle
- **G12** Properties of 3D Shapes

G2 Constructions and Loci

Foundation & Higher

Use ruler and compass constructions (perpendicular bisector, perpendicular from or at a point, angle bisector) to construct figures and solve loci problems.

To be successful, pupils need

G1 Geometric Notation
Foundation & Higher

G15 Measuring, Scale Drawings and Bearings
Foundation & Higher

G2
Constructions and Loci

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

G3 Angle Facts and Polygons

Foundation & Higher

Use angles at a point, on a straight line, vertically opposite and on parallel lines; derive the angle sum of a triangle and any polygon.

To be successful, pupils need

G1 Geometric Notation
Foundation & Higher

G3
Angle Facts and Polygons

This skill leads on to

G4 Properties of 2D Shapes

G5 Congruence Criteria

G6 Geometric Reasoning

G10 Circle Theorems H

G15 Measuring, Scale Drawings and Bearings

S2 Tables, Charts and Diagrams

G4 Properties of 2D Shapes

Foundation & Higher

Derive and apply properties of special quadrilaterals, triangles and other plane figures.

To be successful, pupils need

- **G1** Geometric Notation — **Foundation & Higher**
- **G3** Angle Facts and Polygons — **Foundation & Higher**

G4
Properties of 2D Shapes

This skill leads on to

- **G5** Congruence Criteria
- **G6** Geometric Reasoning
- **G11** Geometry on Coordinate Axes
- **G20** Pythagoras and Trigonometry — H+

G5 Congruence Criteria

Foundation & Higher

Use the congruence criteria for triangles: SSS, SAS, ASA and RHS.

To be successful, pupils need

G4 Properties of 2D Shapes
Foundation & Higher

G3 Angle Facts and Polygons
Foundation & Higher

G5
Congruence Criteria

This skill leads on to

G6 Geometric Reasoning

G19 Congruence and Similarity H+

G6 Geometric Reasoning

Foundation & Higher

Use angle facts, congruence, similarity and quadrilateral properties to derive results, including Pythagoras' theorem, and write simple proofs.

To be successful, pupils need

- **G3** Angle Facts and Polygons — **Foundation & Higher**
- **G5** Congruence Criteria — **Foundation & Higher**
- **G4** Properties of 2D Shapes — **Foundation & Higher**

G6
Geometric Reasoning

This skill leads on to

- **G10** Circle Theorems — H

⌂ All skills | Geometry

← G5 | G7 →

G7 Transformations

H+ Both tiers, extended at Higher

Both tiers: Identify, describe and construct congruent and similar shapes using rotation, reflection, translation and enlargement, including fractional scale factors.

To be successful, pupils need

A8 Coordinates
Foundation & Higher

G1 Geometric Notation
Foundation & Higher

G7
Transformations

This skill leads on to

A13 Transforming Graphs — H

G8 Combining Transformations — H

G19 Congruence and Similarity — H+

G24 Translations as Vectors

Extra for Higher only — H+
Enlargement with negative scale factors.

G8 Combining Transformations

H Higher only

Describe the changes and invariance from combinations of rotations, reflections and translations.

To be successful, pupils need

G7 Transformations
Both tiers, extended at Higher H+

G8
Combining Transformations

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

G9 Parts of a Circle

Foundation & Higher

Identify and apply circle definitions: centre, radius, chord, diameter, circumference, tangent, arc, sector and segment.

To be successful, pupils need

G1 Geometric Notation
Foundation & Higher

G9
Parts of a Circle

This skill leads on to

A16 Equation of a Circle — H

G10 Circle Theorems — H

G17 Circles, Composite Shapes and Solids

G10 Circle Theorems

H Higher only

Apply and prove the standard circle theorems about angles, radii, tangents and chords, and use them to prove related results.

To be successful, pupils need

- **G9** Parts of a Circle — **Foundation & Higher**
- **G3** Angle Facts and Polygons — **Foundation & Higher**
- **G6** Geometric Reasoning — **Foundation & Higher**

G10
Circle Theorems

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

G11 Geometry on Coordinate Axes

Foundation & Higher

Solve geometrical problems on coordinate axes.

To be successful, pupils need

A8 Coordinates
Foundation & Higher

A9 Straight-line Graphs H+
Both tiers, extended at Higher

G4 Properties of 2D Shapes
Foundation & Higher

G11
Geometry on Coordinate Axes

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

G12 Properties of 3D Shapes

Foundation & Higher

Identify faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres.

To be successful, pupils need

G1 Geometric Notation
Foundation & Higher

G12
Properties of 3D Shapes

This skill leads on to

G13 Plans and Elevations

G13 Plans and Elevations

Foundation & Higher

Construct and interpret plans and elevations of 3D shapes.

To be successful, pupils need

G12 Properties of 3D Shapes
Foundation & Higher

G13
Plans and Elevations

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

G14 Units of Measure

Foundation & Higher

Use standard units of length, area, volume, capacity, mass, time and money.

To be successful, pupils need

A starting point. This skill builds on Key Stage 3 work rather than another GCSE skill.

G14
Units of Measure

This skill leads on to

- **N13** Units and Compound Measures
- **R1** Converting Units
- **G15** Measuring, Scale Drawings and Bearings
- **G16** Area and Volume

G15 Measuring, Scale Drawings and Bearings

Foundation & Higher

Measure lines and angles; interpret maps and scale drawings; use bearings.

To be successful, pupils need

- **G14** Units of Measure — **Foundation & Higher**
- **R2** Scale Factors, Diagrams and Maps — **Foundation & Higher**
- **G3** Angle Facts and Polygons — **Foundation & Higher**

G15
Measuring, Scale Drawings and Bearings

This skill leads on to

- **G2** Constructions and Loci

⌂ All skills | Ratio | Geometry

← G14 | G16 →

G16 Area and Volume

Foundation & Higher

Know and apply formulae for the area of triangles, parallelograms and trapezia and the volume of cuboids and right prisms, including cylinders.

To be successful, pupils need

- **G14** Units of Measure — **Foundation & Higher**
- **A2** Substitution — **Foundation & Higher**

G16
Area and Volume

This skill leads on to

- **A15** Gradients and Areas Under Graphs — H
- **R12** Comparing Lengths, Areas and Volumes
- **G17** Circles, Composite Shapes and Solids
- **G23** Area = ½ab sin C — H
- **S3** Histograms and Cumulative Frequency — H

G17 Circles, Composite Shapes and Solids

Foundation & Higher

Know circumference and area of a circle; find perimeters and areas of composite shapes and the surface area and volume of spheres, pyramids, cones and composite solids.

To be successful, pupils need

- **G16** Area and Volume — **Foundation & Higher**
- **G9** Parts of a Circle — **Foundation & Higher**
- **A5** Formulae and Rearranging — **Foundation & Higher**

G17
Circles, Composite Shapes and Solids

This skill leads on to

- **N8** Exact Calculations — H+
- **G18** Arcs and Sectors

G18 Arcs and Sectors

Foundation & Higher

Calculate arc lengths, angles and areas of sectors.

To be successful, pupils need

G17 Circles, Composite Shapes and Solids
Foundation & Higher

N12 Fractions and Percentages as Operators
Foundation & Higher

G18
Arcs and Sectors

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

G19 Congruence and Similarity

H+ Both tiers, extended at Higher



Both tiers: Apply congruence and similarity, including the relationship between lengths in similar figures.

To be successful, pupils need

G7 Transformations
Both tiers, extended at Higher H+

R12 Comparing Lengths, Areas and Volumes
Foundation & Higher

G5 Congruence Criteria
Foundation & Higher

G19
Congruence and Similarity

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

Extra for Higher only H+
Relationships between areas and volumes in similar figures.

⌂ All skills | Ratio | Geometry

← G18 | G20 →

G20 Pythagoras and Trigonometry

H+ Both tiers, extended at Higher

Both tiers: Use Pythagoras' theorem and sin, cos and tan to find lengths and angles in right-angled triangles in 2D.

To be successful, pupils need

G4 Properties of 2D Shapes
Foundation & Higher

A5 Formulae and Rearranging
Foundation & Higher

N6 Powers and Roots
Both tiers, extended at Higher H+

G20
Pythagoras and Trigonometry

This skill leads on to

A16 Equation of a Circle H

G21 Exact Trig Values

G22 Sine and Cosine Rules H

G23 Area = ½ab sin C H

Extra for Higher only
Apply them in general triangles and in 3D figures where possible. H+

G21 Exact Trig Values

Foundation & Higher

Know exact values of sin and cos for 0°, 30°, 45°, 60° and 90°, and of tan for 0°, 30°, 45° and 60°.

To be successful, pupils need

G20 Pythagoras and Trigonometry
Both tiers, extended at Higher H+

N6 Powers and Roots
Both tiers, extended at Higher H+

G21
Exact Trig Values

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

G22 Sine and Cosine Rules

H Higher only

Know and apply the sine rule and cosine rule to find unknown lengths and angles.

To be successful, pupils need

G20 Pythagoras and Trigonometry H+
Both tiers, extended at Higher

A5 Formulae and Rearranging
Foundation & Higher

G22
Sine and Cosine Rules

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

G23 Area = ½ab sin C

H Higher only

Use Area = ½ab sin C to find the area, sides or angles of any triangle.

To be successful, pupils need

G16 Area and Volume
Foundation & Higher

G20 Pythagoras and Trigonometry H+
Both tiers, extended at Higher

G23
Area = ½ab sin C

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

G24 Translations as Vectors

Foundation & Higher

Describe translations as 2D vectors.

To be successful, pupils need

- **G7** Transformations — **Both tiers, extended at Higher** (H+)
- **A8** Coordinates — **Foundation & Higher**

G24
Translations as Vectors

This skill leads on to

- **G25** Vector Arithmetic (H+)

G25 Vector Arithmetic

H+ Both tiers, extended at Higher



Both tiers: Add and subtract vectors, multiply by a scalar, and use diagram and column representations.

To be successful, pupils need

G24 Translations as Vectors
Foundation & Higher

A4 Simplifying and Factorising
Both tiers, extended at Higher H+

G25
Vector Arithmetic

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

Extra for Higher only
Use vectors to construct geometric arguments and proofs. H+

P1 Frequency Tables and Trees

Foundation & Higher

Record, describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees.

To be successful, pupils need

N12 Fractions and Percentages as Operators
Foundation & Higher

S2 Tables, Charts and Diagrams
Foundation & Higher

P1
Frequency Tables and Trees

This skill leads on to

P3 The Probability Scale

P5 Sample Size and Probability

P2 Expected Outcomes

Foundation & Higher

Use randomness, fairness and equally likely events to calculate expected outcomes of future experiments.

To be successful, pupils need

P3 The Probability Scale
Foundation & Higher

N12 Fractions and Percentages as Operators
Foundation & Higher

P2
Expected Outcomes

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

P3 The Probability Scale

Foundation & Higher

Relate relative expected frequencies to theoretical probability, using the 0–1 scale and appropriate language.

To be successful, pupils need

P1 Frequency Tables and Trees
Foundation & Higher

N10 Fractions and Decimals
Both tiers, extended at Higher
H+

P3
The Probability Scale

This skill leads on to

P2 Expected Outcomes

P4 Probabilities Sum to One

P5 Sample Size and Probability

P7 Possibility Spaces

P4 Probabilities Sum to One

Foundation & Higher

Use the fact that the probabilities of an exhaustive set of (mutually exclusive) outcomes sum to one.

To be successful, pupils need

P3 The Probability Scale
Foundation & Higher

N2 The Four Operations
Foundation & Higher

P4
Probabilities Sum to One

This skill leads on to

P6 Venn Diagrams and Tree Diagrams

P8 Combined Events

P5 Sample Size and Probability

Foundation & Higher

Understand that unbiased samples tend towards theoretical probability as sample size increases.

To be successful, pupils need

P3 The Probability Scale
Foundation & Higher

P1 Frequency Tables and Trees
Foundation & Higher

P5
Sample Size and Probability

This skill leads on to

S1 Sampling

P6 Venn Diagrams and Tree Diagrams

Foundation & Higher

Enumerate sets and combinations of sets systematically using tables, grids, Venn diagrams and tree diagrams.

To be successful, pupils need

N5 Systematic Listing (H+)
Both tiers, extended at Higher

P4 Probabilities Sum to One
Foundation & Higher

P6
Venn Diagrams and Tree Diagrams

This skill leads on to

P7 Possibility Spaces

P9 Conditional Probability (H)

P7 Possibility Spaces

Foundation & Higher

Construct possibility spaces for single and combined experiments with equally likely outcomes and use them to calculate probabilities.

To be successful, pupils need

- **P6** Venn Diagrams and Tree Diagrams
  Foundation & Higher
- **P3** The Probability Scale
  Foundation & Higher

P7
Possibility Spaces

This skill leads on to

- **P8** Combined Events

P8 Combined Events

Foundation & Higher

Calculate probabilities of independent and dependent combined events using tree diagrams and other representations; know the assumptions.

To be successful, pupils need

- **P7** Possibility Spaces — **Foundation & Higher**
- **N2** The Four Operations — **Foundation & Higher**
- **P4** Probabilities Sum to One — **Foundation & Higher**

P8
Combined Events

This skill leads on to

- **P9** Conditional Probability — H

P9 Conditional Probability

H Higher only

Calculate and interpret conditional probabilities using two-way tables, tree diagrams and Venn diagrams.

To be successful, pupils need

P8 Combined Events
Foundation & Higher

P6 Venn Diagrams and Tree Diagrams
Foundation & Higher

P9
Conditional Probability

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

S1 Sampling

Foundation & Higher

Infer properties of populations or distributions from a sample, knowing the limitations of sampling.

To be successful, pupils need

S2 Tables, Charts and Diagrams
Foundation & Higher

P5 Sample Size and Probability
Foundation & Higher

S1
Sampling

This skill leads on to

S5 Describing a Population

S2 Tables, Charts and Diagrams

Foundation & Higher

Construct and interpret frequency tables, bar charts, pie charts, pictograms, vertical line charts and time-series line graphs; know when each is appropriate.

To be successful, pupils need

- **N12** Fractions and Percentages as Operators — **Foundation & Higher**
- **G3** Angle Facts and Polygons — **Foundation & Higher**

S2
Tables, Charts and Diagrams

This skill leads on to

- **P1** Frequency Tables and Trees
- **S1** Sampling
- **S3** Histograms and Cumulative Frequency — H
- **S4** Averages, Spread and Comparing Data — H+
- **S6** Scatter Graphs and Correlation

S3 Histograms and Cumulative Frequency

H Higher only

Construct and interpret histograms with equal and unequal class intervals and cumulative frequency graphs.

To be successful, pupils need

S2 Tables, Charts and Diagrams
Foundation & Higher

S4 Averages, Spread and Comparing Data H+
Both tiers, extended at Higher

G16 Area and Volume
Foundation & Higher

S3
Histograms and Cumulative Frequency

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

S4 Averages, Spread and Comparing Data

H+ Both tiers, extended at Higher



Both tiers: Compare distributions using graphs for discrete, continuous and grouped data, averages (mean, median, mode, modal class) and range, including outliers.

To be successful, pupils need

S2 Tables, Charts and Diagrams
Foundation & Higher

N2 The Four Operations
Foundation & Higher

S4
Averages, Spread and Comparing Data

This skill leads on to

S3 Histograms and Cumulative Frequency — H

S5 Describing a Population

Extra for Higher only — H+
Box plots, quartiles and interquartile range.

S5 Describing a Population

Foundation & Higher



Apply statistics to describe a population.

To be successful, pupils need

S1 Sampling
Foundation & Higher

S4 Averages, Spread and Comparing Data
Both tiers, extended at Higher
H+

S5
Describing a Population

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.

S6 Scatter Graphs and Correlation

Foundation & Higher

Use scatter graphs; recognise correlation but not causation; draw lines of best fit; interpolate and extrapolate, knowing the dangers.

To be successful, pupils need

A8 Coordinates
Foundation & Higher

S2 Tables, Charts and Diagrams
Foundation & Higher

A9 Straight-line Graphs
Both tiers, extended at Higher H+

S6
Scatter Graphs and Correlation

This skill leads on to

No other GCSE skill builds directly on this one. It is an end point at this level.