

GCSE Maths (9 - 1) Higher Tier Curriculum

GCSE (9-1) Foundation
Unit 1 Number
Unit 2 Algebra
Unit 3 Graphs, tables and charts
Unit 4 Fractions and percentages
Unit 5 Equations, inequalities and sequences
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
Unit 16 Quadratic equations and graphs
Unit 17 Perimeter, area and volume 2
Unit 18 Fractions, indices and standard form
Unit 19 Congruence, similarity and vectors
Unit 20 More algebra

Year 9 Foundation Tier Curriculum

Chapter 1 Topics - Number

Use priority of operations with positive and negative numbers

Simplify calculations by cancelling.

Use inverse operations

Round to a given number of decimal places

Round to a given number of significant figures

Write decimal numbers of millions

Multiply and divide decimal numbers

Estimate answers to calculations

Use one calculation to find the answer to another (place value/estimation)

Use index notation for powers of 10

Use index notation in calculations

Use the laws of indices

Find factors and multiples of numbers

Find common factors and common multiples of two numbers

Recognise 2-digit prime numbers

Write a number as the product of its prime factors

Find the HCF and LCM of two numbers by listing

Use prime factor decomposition and Venn diagrams to find the HCF and LCM

Chapter 2 Topics – Algebra

Use correct algebraic notation

Write and simplify expressions

Multiply and divide expressions

Use the index laws

Substitute numbers into expressions

Substitute numbers into a simple formula

Substitute numbers into expressions with brackets and powers

Recognise the difference between a formula and an expression

Expand brackets

Simplify expressions with brackets

Recognise factors of algebraic terms

Factorise algebraic expressions

Use the identity symbol and the not equals symbol

Write expressions and simple formula to solve problems

Chapter 3 Topics – Graphs, Tables and Charts

Designing frequency tables and data collection sheets

Use data from tables

Design and use two-way table

Draw and interpret comparative and composite bar charts

Interpret and compare data shown in bar charts, line graphs and histograms

Plot and interpret time series graphs

Use trends to predict what might happen in the future

Construct and interpret stem and leaf and back-to-back stem and leaf diagrams

Draw and interpret pie charts

Plot and interpret scatter graphs

Determine whether there is a relationship between sets of data

Draw a line of best fit on a scatter graph

Use the line of best fit to predict values

Chapter 4 Topics – Fractions and Percentages

Compare fractions (including ordering)

Cancelling fractions down

Equivalent fractions

Find a fraction of a quantity or measurement

Write one number as a fraction of another

Adding and Subtracting Fractions

Multiplying fractions

Dividing fractions

Working with mixed numbers & improper fractions (includes adding, subtracting, multiplying and dividing)

Fraction Problem Solving

Convert between fractions, decimals and percentages

Write one number as a percentage of another

Find percentages of a quantity

Calculate percentage increase/decrease

Calculate simple interest and VAT

Percentages problem solving

Chapter 5 Topics – Equations, Inequalities and Sequences

Understand and use inverse operations

Know the difference between an expression, equation, formula and identity

Rearrange simple linear equations

Solve simple linear equations

Solve two-step equations

Solve linear equations with brackets

Solve equations with unknowns on both sides

Use correct notation to show inclusive and exclusive inequalities

Solve simple linear inequalities

Solve two-sided equations (inequalities)

Write down whole numbers which satisfy an inequality

Represent inequalities on a number line

Change the subject of a formula

Recognise and extend sequences

Use the n th term to generate terms of a sequence

Find the n th term of an arithmetic sequence

Chapter 6 Topics – Angles

Solve geometric problems using side and angle properties of quadrilaterals

Solve angle problems in triangles

Understand angle proofs about triangles

Identify congruent shapes

Find missing angles using corresponding, alternate and co-interior angles

Calculate the interior and exterior angles of regular polygons

Calculate the interior and exterior angles of irregular polygons

Solve angle problems using equations

Solve geometric problems showing reasoning

Chapter 7 Topics – Averages and Range

Recognise the advantages and disadvantages of each type of average

Find the mode, median and range from a stem and leaf

Calculate the mean from a list and a frequency table

Estimate the mean of grouped data

Estimate the range from a grouped frequency table

Find the modal class

Find the median from a frequency table

Compare sets of data using the mean and range

Identify outliers

Understand the need for sampling

Understand how to avoid bias

Chapter 8 Topics – Perimeter, Area and Volume 1

Calculate the perimeter and area of rectangles, parallelograms, triangles & trapeziums

Calculate a missing length, given the area.

Find the height of a trapezium given its area.

Calculate the perimeter and area of shapes made from triangles and rectangles.

Convert between area measures.

Calculate areas in hectares and convert between ha and m^2 .

Calculate the surface area of a cuboid.

Calculate the surface area of a prism.

Calculate the volume of a cuboid and prism

Solve problems involving surface area and volume.

Convert between measures of volume.

Chapter 9 Topics – Graphs

Understand what m and c represent in $y = mx + c$

Identify and interpret the gradient from an equation

Find the midpoint of a line segment

Plot the gradient of a line

Recognise, name and plot the graphs of $y = x$ and $y = -x$

Find the equations of straight-line graphs

Sketch graphs given the values of m and c

Generate and plot coordinates from a rule

Plot straight line graphs from tables of values

Understand that parallel lines have the same gradient

Recognise, name and plot straight line graphs parallel to the axes

Draw and interpret graphs from real data

Draw distance-time graphs

Use distance-time graphs to solve problems

Interpret rate of change on graphs

Draw and interpret a range of graphs

Understand when predictions are reliable

Year 10 Foundation Tier Curriculum

Chapter 10 Topics – Transformations

Translate a shape on a coordinate grid

Use a column vector to describe a translation

Draw a reflection of a shape in a mirror line

Draw reflections on a coordinate grid

Describe reflections on a coordinate grid

Rotate a shape on a coordinate grid

Describe a rotation

Enlarge a shape by a scale factor

Enlarge a shape using a centre of enlargement

Identify the scale of an enlargement

Find the centre of enlargement

Describe an enlargement

Transform shapes using more than one transformation

Describe combined transformations of shapes on a grid

Chapter 11 Topics – Ratio and Proportion

Use ratio notation

Write a ratio in its simplest form

Write a ratio in the form 1:n or n:1

Divide a quantity into 2 parts in a given ratio

Divide a quantity into 3 parts in a given ratio

Solve simple problems using ratios

Use ratios to convert between units

Write and use ratios for shapes and their enlargement

Use ratios involving decimals

Recognise different types of proportion

Recognise and use direct proportion on a graph

Solve word problems involving direct and inverse proportion

Chapter 12 Topics – Right-Angled Triangles

Understand Pythagoras' Theorem

Calculate the length of the hypotenuse in a right-angled triangle

Calculate the length of a shorter side in a right-angled triangle

Solve problems using Pythagoras' Theorem

Calculate the length of a line segment AB

Use SOHCAHTOA to find lengths in a right-angled triangle

Use SOHCAHTOA to find angles in a right-angled triangle

Solve problems using SOHCAHTOA

Solve problems using an angle of elevation or depression

Know exact values of the sine, cosine and tangent of key angles

Chapter 13 Topics – Probability

Calculate simple probabilities from equally likely events

Use two-way tables to record the outcomes from two events

Understand mutually exclusive and exhaustive outcomes

Understand independent and dependent events

Work out the probabilities from sample space diagrams

Find and interpret probabilities based on experimental data

Make predictions from experimental data

Use Venn diagrams to work out probabilities

Understand the language of sets and Venn diagrams

Use frequency trees and tree diagrams

Work out probabilities using tree diagrams

Solve probability involving dependent events

Estimate the probabilities from experimental data

Compare experimental data with given probabilities

Chapter 14 Topics – Multiplicative Reasoning

Calculate percentage profit or loss

Find the original amount given the final amount after a percentage increase or decrease

Find an amount after repeated percentage changes

Solve growth and decay problems

Solve problems involving compound measures

Convert between metric speed measures

Calculate average speed, distance and time

Use formulae to calculate speed and acceleration (SUVAT)

Calculate mass, density and volume

Use ratio and proportion in measures and conversions

Chapter 15 Topics – Constructions, Loci and Bearings

Recognise 3D shapes and their properties

Describe 3D shapes using the correct mathematical words

Understand the 2D shapes that make up 3D objects

Identify and sketch planes of symmetry of 3D shapes

Understand and draw plans and elevations of 3D shapes

Sketch 3D shapes based on their plans and elevations

Make accurate drawings of triangles using a ruler, protractor and compasses

Identify SSS, ASA, SAS and RHS triangles as unique from a given description

Identify congruent triangles

Draw diagrams to scale

Correctly interpret scales in real-life contexts

Use scales on maps and diagrams to work out lengths and distances

Draw lengths and distances correctly given scale drawings

Accurately draw angles and 2D shapes using a ruler, protractor and compasses

Construct a polygon inside a circle

Recognise nets and make accurate drawings of nets of common 3D objects

Bisect angles and lines using rules and compasses

Chapter 16 Topics – Quadratic Equations and Graphs

Multiply double brackets

Recognise quadratic expressions

Square single brackets

Recognise a quadratic function

Use quadratic graphs to solve problems

Solve quadratic equations $ax^2 + bx + c = 0$ using a graph

Solve quadratic equations $ax^2 + bx + c = k$ using a graph

Factorise quadratic expressions

Solve quadratic functions algebraically

Year 11 Foundation Tier Curriculum

Chapter 17 Topics – Perimeter, Area and Volume 2

Calculate the circumference of a circle

Solve problems involving the circumference of a circle

Calculate the circumference and radius of a circle when given the area

Work out percentage error intervals

Work out the area of a circle

Work out areas of semicircles and quarter circles

Work out the radius or diameter of a circle

Give answers in terms of π

Solve problems involving sectors of circles

Solve problems involving areas and perimeters of 2D shapes

Work out the volume and surface area of cylinders

Work out the volume of a pyramid

Work out the volume of a cone

Work out the volume of a sphere

Work out the surface area of a pyramid

Work out the surface area of a cone

Work out the volume of a sphere

Chapter 18 Topics – Fractions, Indices and Standard Form

Multiply and divide mixed numbers and fractions

To know and use the laws of indices

Write large & small numbers in standard form

Convert numbers from standard form into ordinary numbers

Multiply & divide numbers in standard form

To add and subtract numbers in standard form

Chapter 19 Topics – Congruence, Similarity and Vectors

Understand similarity

Use similarity to solve angle problems

Find the scale factor of an enlargement

Use similarity to solve problems

Understand the similarity of regular polygons

Calculate perimeters of similar shapes

Recognise congruent shapes

Use congruence to work out unknown angles

Use congruence to work out unknown sides

Add and subtract vectors

Find the resultant of two vectors

Find multiples of a vector

Chapter 20 Topics – More Algebra

Draw and interpret graphs of cubic functions

Draw and interpret the graph of $y = 1/x$

Draw and interpret non-linear graphs to solve problems

Solve simultaneous equations by drawing a graph

Write and solve simultaneous equations

Changing the subject of a formula

Identify expressions, equations, formulae and identities

Prove results using algebra