

# MATHEMATICS

## KS3 Curriculum

### What does this course involve at Key Stage 3?

Maths at Key Stage 3 involves the development of the Units listed below. The aim of this course is to ensure students become fluent in the fundamentals of Mathematics and to ensure students can reason Mathematically and solve problems by applying their Mathematical skills. This is achieved through the use of rich tasks that require students to deepen their knowledge of specific topics.

### What do you need to be successful in this course?

To be successful students need to develop their understanding and knowledge of the Mathematical and Numerical concepts outlined. To achieve this students need to be open to and accepting of new and sometimes unfamiliar concepts.

**Investigating Number Systems** - place value, rounding numbers to an appropriate degree of accuracy including decimal places and significant figures, ordering positive and negative integers, decimals and fractions

**Pattern Sniffing** - terms of a sequence, common sequences, prime numbers, HCF, LCM, square and cube numbers

**Solving Calculation Problems** - apply four operations to integers, decimals and fractions, BIDMAS, inequality symbols, estimation, substitution, algebra concepts and vocabulary, use and interpret algebraic notation

**Exploring Shape** - parts of 3D shapes, use of conventional terms and notations to label shapes, finding missing angles

**Generalising Arithmetic** - apply four operations to integers, decimals and fractions, BIDMAS, inverse operations, use and interpret algebraic notation, simplify and manipulate algebraic expressions, algebra concepts and vocabulary

**Reasoning with Measures** - perimeter of 2D shapes, know and apply formula to find circumference of a circle and area of triangles, parallelograms, trapezia and circles, know and apply formulae to calculate volume of cuboids

**Discovering Equivalence** - interpret percentages as a fraction, a decimal or a multiplier, express one quantity as a percentage of another, comparing quantities using percentages, increase and decrease by a percentage, order integers, decimals and fractions

**Investigating Statistics** - interpret and construct frequency tables, bar charts, pie charts, pictograms and vertical line charts, calculate and interpret median, mode, mean and range

**Solving Number Problems** - solving linear equations with one unknown, use of inequality signs

**Reasoning with Fractions** - express one quantity as a fraction of another, probability scale, recording and analysing results of a probability experiment, expected frequencies, constructing and analysing sample spaces

**Shape Properties 2** - draw diagrams from written description, measuring line segments and angles, explain key vocabulary and label sides and angles using conventional notation, label and define parts of a circle

**Exploring Change** - plot and describe coordinates, find the midpoint of two coordinates, identify coordinates of parallel and perpendicular lines

**Proportional Reasoning** - Change between standard units of measurement, express one quantity as a fraction of another, simplifying ratio, ratio of an amount, finding a fraction of an amount

**Investigating Number Systems** - converting between standard form and ordinary numbers, rounding numbers to an appropriate degree of accuracy including decimal places and significant figures

**Pattern Sniffing** - terms of a sequence, nth term, prime numbers, HCF, LCM, prime factorisation

**Solving Calculation Problems** - apply four operations to integers, decimals, fractions and numbers in standard form, BIDMAS, substitution, rearranging formula, simplifying algebraic expressions

**Exploring Shape** - knowledge of alternate and corresponding angles, find all angles in polygons, deduce number of vertices of a polygon

**Generalising Arithmetic** - apply four operations to integers, decimals and fractions, BIDMAS, apply four operations to algebraic terms, expand and factorise single brackets, laws of indices

**Reasoning with Measures** - perimeter of 2D shapes including circles and sectors of circle, area of a circles and composite shapes, know and apply formulae to calculate volume of prisms including cylinder

**Discovering Equivalence** - work with percentages greater than 100, solve problems involving percentage change, reverse percentages and interest, converting fully between FDP

**Investigating Statistics** - construct scatter graph, stem and leaf diagram and frequency polygon, interpret correlation, calculate and compare averages and spreads

**Solving Number Problems** - solving equations with unknowns on both sides, writing and solving equations, solving equations graphically given the graphs

**Reasoning with Fractions** - calculate with fractions, problems involving probabilities sum to one, venn diagrams, sample spaces

**Shape Properties 2** - measure line segments and angles including maps, scales and bearings, construct angle bisector and perpendicular bisector of a line, loci, plans and elevations

**Exploring Change** - plot straight line graphs, identify and interpret gradients and intercepts graphically and algebraically, recognise, sketch and interpret graphs of linear and quadratic functions

**Proportional Reasoning** - best buys, ratio (including real contexts), proportion, enlargements (positive scale factor), use scale factors, diagrams and maps, work with fractions in ratio problems

## KS4 Curriculum

### Qualification name:

Edexcel GCSE (9-1) Mathematics

### Course detail/overview of content:

GCSE Mathematics will follow on from the mathematical skills developed in Key Stage 3. It will allow students to study the 5 areas of Mathematics: Number; Algebra; Statistics and Probability; Geometry and Measures and finally Ratio, Proportion and Rates of Change. Students will be presented with real life problems, helping them to develop their ability to analyse and communicate mathematically.

### Nature of assessment

At the end of the course students will have three exams, equally weighted towards the final grade.

Written papers are either at foundation or higher tier:

Foundation tier is targeted at grade 1-5

Higher tier is targeted at grade 5-9

In both tiers Paper 1 is non-calculator

