Mathematics Course Content
GCSE Foundation

Topic 1	Calculations 1

- Order positive and negative integers and decimals
- Round to a given number of decimal places
- Round to a given number of significant figures
- Add and subtract positive and negative integers and decimals
- Multiply and divide positive and negative integers and decimals
- Use BIDMAS

Topic 2	Expressions

- Simplify expressions by collecting like terms
- Use formulae
- Know the laws of indices
- Multiply out a bracket
- Factorise an expression using brackets
- Simplify algebraic fractions

Topic 3	Angles and Polygons

- Use angle facts at a point and with parallel lines (vertically opposite/alternate/corresponding)
- Know the sum of angles in a triangle and a quadrilateral
- Identify congruent shapes
- Identify Similar shapes and use similarity to find lengths and areas
- Know the sum of external angles for any polygon
- Find the internal and external angles in any polygon

Topic 4	Handling Data 1

- Construct 2 way tables
- Construct frequency tables
- Construct pictograms and bar charts
- Construct and interpret pie charts
- Calculate mean, median and mode
- Calculate range

Topic 5	Fractions, Decimals and Percentages

- Find fractions and percentages of amounts
- Convert decimals to fractions
- Add and subtract fractions
- Multiply and divide fractions
- Convert fractions to decimals to percentages

Topic 6	Formulae and Functions

- Rearrange formulae to change the subject
- Use and understand the terms expression, equation, formula, identify, inequality, term and factor
- Expand two brackets to form a quadratic expression
- Factorise a quadratic expression to brackets
- Understand the meaning of difference of two squares

Topic 7	Working in 2D

- Measure angles accurately
- Know standard units of length and area
- Use bearings
- Use scale drawings
- Calculate the areas of triangles, parallelograms, trapeziums
- Transform and describe the transformation of shapes
  Reflections, Rotations, Translations, Enlargements

Topic 8	Probability

- Find relative frequencies (use experimental data to estimate probability)
- Calculate probabilities
- Recognise mutually exclusive events and exhaustive events
  Know all mutually exclusive exhaustive events add up to 1.

Topic 9	Measures and Accuracy

- Use approximation to estimate calculations
- Convert between standard units of measurement for length, mass, volume, capacity, time and area
- Understand upper and lower bounds

Topic 10	Equations and Inequalities

- Solve linear equations
- Solve quadratic equations using factorisation
- Solve a pair of linear simultaneous equations
- Solve a pair of simultaneous equations using a graph
- Solve inequalities

Topic 11	Circles and Constructions

- Find the area and circumference of circles
- Construct triangles using compasses
- Find perpendicular bisectors of lines
- Bisect angles
- Construct and solve problems involving loci using compasses

Topic 12	Ratio and Proportion

- Use fractions and percentages to describe proportion
- Write a ratio in its simplest form
- Divide a quantity in a given ratio
- Use scale factors
- Solve problems involving percentage change

Topic 13	Factors, Powers and Roots

- Understand factors, multiples and primes
- Write a number as a product of its prime factors
- Find the HCF and LCM of a pair of integers
- Calculate positive powers and find roots

Topic 14	Graphs 1

- Find coordinates in all 4 quadrants
- Plot straight line graphs
- Find the gradient and y-intercept of a line and relate these to the equation y=mx+c
- Identify parallel and lines by their equations
- Use two points to find the equation of a line
- Plot and interpret graphs involving distance, speed and acceleration
- Interpret the gradient of a line as a rate of change

Topic 15	Working in 3D

- Identify the number of faces, edges and vertices of 3D shapes
- Draw and interpret plans and elevations of 3D shapes
- Calculate the volume of cuboids, prisms and cylinders
- Calculate the surface area of cuboids, prisms and cylinders
- Calculate the surface area and volume of spheres, pyramids and cones

Topic 16	Handling Data 2

- Plot scatter graphs and recognise correlation
- Draw lines of best fit
- Use graphs to represent time series data

Topic 17	Calculations 2

- Perform calculations involving indices
- Perform exact calculations involving π
- Work with numbers in standard form

Topic 18	Graphs 2

- Draw graphs to identify roots, intercepts and turning points of quadratic functions
- Solve quadratics using graphs
- Recognise linear, quadratic, cubic and reciprocal functions
- Plot and interpret real life graphs

Topic 19	Pythagoras and Trigonometry

- Use Pythagoras' theorem to find the missing side of a right angled triangle
- Use trigonometry to find the missing lengths and angles in right angled triangles
- Find the exact values of sin x and cos x for key angles 0º, 30º, 45º, 60º, 90º
- Use vectors
- Add, subtract and find multiples of vectors

Topic 20	Probability of combined events

- Use Venn diagrams to represent sets
- Use possibility space to represent outcomes to two events and calculate probabilities
- Use a tree diagram to show outcomes of two or more events and calculate probabilities

Topic 21	Sequences

- Generate a sequence using a term to term rule
- Generate a sequence using a position to term rule
- Recognise a linear sequence and find a formula for the nth term
- Recognise special sequences

Topic 22	Proportionality

- Solve direct proportion problems
- Solve inverse proportion problems
- Recognise graphs of direct and inverse proportion
- Compare lengths, areas and volumes of similar shapes