

### **KS3 - Assessment without Levels**

As a department we believe all students can succeed in maths, because of this all students study the same scheme of learning. Teachers differentiate accordingly so that every student can access and excel within this framework. Currently students will follow our Key Stage 3 scheme of learning up until Christmas of Year 9. Below are the main objectives taught in each topic. As a rough guide we aim to cover 1 unit per half term – although timings are dependent on students learning.

Please note the support groups follow a different schedule as we cover the course over the whole of Year 7 to Year 9. This will mean the objectives will follow a different time scale depending on the needs of the students.

#### **Year 7**

Unit 1: Number (Place value, addition, subtraction, multiplication and division)

- Round numbers to an appropriate degree of accuracy using decimal places or significant figures
- Use formal written methods for addition, subtraction, multiplication & division of integers and decimals
- Use formal written methods for addition, subtraction, multiplication & division of integers and decimals
- Calculate and solve problems involving perimeter and area
- Order positive and negative integers using inequalities

Unit 2: Number 2 (Fractions 1, negative numbers)

- Find the fraction of an amount and express one quantity as a fraction of another
- Identify equivalent fractions, including simplifying fractions and converting between mixed numbers & improper fractions
- Convert between and order fractions and decimals
- Add and subtract fractions
- Use the four operations with negative numbers

Unit 3: Statistics 1 and Algebra 1

- Generate terms of a sequence and find the  $n^{\text{th}}$  term
- Manipulate algebraic expression, including collecting like terms
- Substitute into formulae and expressions
- Solve linear equations
- Collect, organise and interpret data

Unit 4: Geometry: Lines and Angles

- Describe, sketch and draw using conventional notation including using properties of shapes
- Use a protractor to measure and draw angles
- Apply properties of angles at a point, on a straight line and vertically opposite angles
- Understand and use alternate and corresponding angles on parallel lines
- Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon (including regular polygons)

Unit 5: Fractions 2 & Percentages

- Multiply and divide proper and improper fractions and mixed numbers
- Find a fraction of an amount and find the whole amount, given a fraction of the amount.
- Find a fractional increase and decrease and solve problems involving percentage change
- Interpret percentages as a fraction or decimals
- Express one quantity as a percentage of another

## Unit 6: Algebra 2

- Substitute numerical values into formulae and expressions, including scientific formula
- Simplify and manipulate algebraic expressions to maintain equivalence - involving brackets
- Simplify and manipulate algebraic expressions to maintain equivalence – involving sums and products
- Solve inequalities and linear equations with one unknown
- Solve inequalities and linear equations with one unknown

## Year 8

### Unit 1: Geometry: Circles and Area

- Convert between  $\text{cm}^2$  and  $\text{m}^2$
- Derive and apply formulae to calculate and solve problems involving area of circles
- Derive and apply formulae to calculate and solve problems involving composite shapes and trapeziums
- Calculate and solve problems involving perimeter of 2D shapes including circles
- Calculate and solve problems involving perimeter and area using algebra

### Unit 2: Ratio and Proportion

- To use compound units such as speed, unit pricing and density to solve problems
- To use ratio notation, including reduction to the simplest form and to divide a quantity into a given ratio
- To understand that a multiplicative relationship between two quantities can be expressed as a ratio or fraction
- To solve problems involving direct and inverse proportion
- To draw and interpret pie charts

### Unit 3: Statistics and Geometry

- Construct and analyse stem and leaf diagrams, including back to back
- For non-grouped data given in the form of a table, find the mean, median, mode and range
- Calculate surface area of shapes
- Calculate volume of shapes. Know that  $1 \text{ litre} = 1000\text{cm}^3$
- Construct and interpret plans and elevations of 3-D shapes

### Unit 4: Algebra 3

- Recognise and sketch linear and quadratic graphs with one variable
- Rearrange formulae to change the subject, including when the subject appears more than once
- Calculate and interpret gradients and intercepts of graphs
- Find approximate solutions to contextual problems from a given graphs, including piecewise linear graphs
- Recognise and generate geometric sequences

## Unit 5: Geometry (Transformations, angles and constructions)

- Identify properties and describe transformations
- Draw and measure angles
- Use scale factors, scale diagrams and maps
- Understand and use congruence and similarity
- Derive and use the standard ruler compass constructions

## Unit 6: Statistics 3 and Probability

- Use and interpret scatter graphs of bivariate data and recognise correlation. Draw and analyse frequency polygons
- For continuous data given in the form of a table find an estimate of the mean, modal class interval and class interval that contains the median.
- Find the probability of events and recognise that mutually exclusive events sum to 1
- Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams
- Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities

## Year 9

### Unit 1: Number (Standard form and surds)

- Interpret and compare numbers in standard form  $A \times 10^n$ ,  $1 \leq A < 10$ , where  $n$  is a positive or negative integer or zero.
- Add and subtract two numbers in standard form
- Understand what a surd is and simplify basic surds
- Evaluate simple fractional indices
- Evaluate simple negative indices

### Unit 2: Geometry: Pythagoras and Trigonometry

- Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras' Theorem, and use known results to obtain simple proofs
- Use Pythagoras' Theorem to solve problems involving right-angled triangles
- Use trigonometric ratios triangles to find missing lengths of triangles
- Use trigonometric ratios triangles to find missing angles of triangles
- Know the exact values of  $\sin \vartheta$  and  $\cos \vartheta$  for  $\vartheta = 0^\circ, 30^\circ, 45^\circ, 60^\circ$  and  $90^\circ$ ; know the exact value of  $\tan \vartheta$  for  $\vartheta = 0^\circ, 30^\circ, 45^\circ$  and  $60^\circ$

