Mathematics Year 9 Curriculum: We aim to educate our students so that they have the skills, mathematical knowledge and confidence to take their place in our ever changing, technologically driven world. We want them to enjoy their mathematical education and we try to instil in them a love of the subject and an appreciation of how important it is in day to day life. Every lesson incorporates an element of stretch and challenge at every level and we encourage our students to aim high. Ultimately we want our students to leave us with the excellent qualifications that will allow them to fulfil their dreams, whatever they may be.

There are 5 main areas of Mathematics that will be covered in Year 9: **Number: –**indices, roots, standard form, limits of accuracy, surds **Handling Data**: – representation and analysis of data, **Algebra:** equations, identities, simultaneous equations, direct and inverse proportion, quadratics and graphs**. Shape and space –** trigonometry, arc length and sector area **Problem solving/using and applying Mathematics.**

Autumn Term:

1. Powers and Roots
2. Quadratics
3. Inequalities, equations and formulae
4. Collecting and Analysing data

Key Objectives Autumn Term - To be able to:

- calculate with roots, and with integer indices, use negative integers, calculate with fractional indices, calculate with standard form $A \times 10^n$, where $1 \leq A < 10$ and n is an integer, understand the difference between rational and irrational numbers and calculate with surds, be able to rationalise the denominator.
- Generate sequences using quadratic expressions, find an expression for the nth term in a quadratic sequence. Multiply out a pair of brackets, square a linear expression, use quadratic identities, factorise a quadratic into 2 brackets and solve a quadratic by factorising.
- Solve linear equations and represent the solution on a number line, multiply both sides of an inequality by a negative number, use the index laws with zero and negative powers. To be able to explain the difference between equations, formulae and functions, construct and solve complex equations, change the subject of a formula, change algebraic fractions to equivalent fractions, solve problems with fractions in formulae.
- Identify sources of primary and secondary data, choose a suitable sample size, understand how to reduce bias in sampling and questionnaires, identify a random sample, draw and interpret a stem and leaf diagram, construct and interpret frequency polygons, use frequency polygons to compare data, estimate the mean and range from a grouped frequency table, draw conclusions from graphs and charts, interpret and draw box plots, draw and interpret cumulative frequency diagrams, construct and interpret histograms.

Spring Term:

1. Multiplicative Reasoning
2. Non Linear Graphs
3. Accuracy and Measure

Key Objectives Spring Term - To be able to:

- Recognise data sets that are in proportion, set up equations that show direct proportion, set up equations that show inverse proportion, use algebra to solve problems involving proportion, workout the length of the arc of a sector, work out the area of a sector, solve problems involving arcs and sectors.
- Understand and draw quadratic graphs, solve problems involving quadratic graphs, understand and draw graphs of cubic and reciprocal functions
- Solve problems involving rates of change, convert units with compound measures, calculate density and pressure, understand the effects of rounding on calculations.

Summer Term:

1. Graphical Solutions
2. Trigonometry
3. Mathematical Reasoning

Key Objectives Summer Term - To be able to:

- Solve a pair of simultaneous equations, find the equation of the line between two points, solve more complex simultaneous equations algebraically and by drawing a graph, solve inequalities involving straight lines and quadratic graphs.
- Be able to use trigonometry to find missing sides and angles in right angled triangles, plot and sketch the trigonometric graphs, use the trigonometric ratios with any angles from 0 to 360 degrees.
- Understand and be able to use a mathematical proof, present a logical argument using algebra

Key Performance Standards:

- Calculate with roots, integer and fractional indices and surds
- Be able to generate quadratic sequences and find the nth term of a quadratic sequence
- Be able to solve a quadratic, algebraically and graphically
- Be able to solve complex equations, including ones involving fractions
- Collect and analyse data using a variety of graphical and numerical data analysis techniques
- Be able to use direct and inverse proportion
- Be able to calculate arc length and sector areas
- Be able to solve problems involving compound measure and bounds
- Be able to solve linear simultaneous equations and simultaneous equations where one is linear and one is quadratic
- Be able to use trigonometry in right angled triangles and appreciate that this can extend to larger angles
- Be able to construct and use mathematical proof.