**A Level Mathematics/Further Mathematics/Core Maths**

**Overview**

A Level Mathematics is a well-regarded A Level thoroughly embedded in every aspect of the world. The beauty of this subject is that it provides you with a set of thinking skills that is not easy to get from any other subjects. By learning the subject you will develop a thorough and profound understanding of Mathematical concepts and its application to real-life problems. Mathematics in general and A Level Maths in particular is highly desirable in most career paths and highly recommended if you are hoping to pursue a university course in areas such as Mathematics, Physics, Engineering, Psychology, Economics, Finance, Biology, Medicine, Dentistry and Veterinary.

Like many courses on offer, A Level Mathematics is a 2-year course with all public exams at the end of second year (Year 13). The three key areas for exploration in A Level Mathematics are Pure Maths, Mechanics and Statistics

In Pure Maths, the focus is on extending the techniques and knowledge gained at GCSE. You will develop algebraic and manipulative skills, trigonometry, exponential functions and vector geometry as well as establishing an understanding of calculus and logarithms.

Mechanics and Statistics are two predominant areas of applied maths – maths with a practical use. In Mechanics, you will gain an understanding of how mathematics is applied in the physical world, including understanding the motion of bodies under the action of forces. Statistics, on the other hand, focuses on presentation and analysis of data; probability and probability distributions.

For strong mathematicians who want to develop a deeper understanding of mathematical concepts at A Level they can study Further Mathematics (FM) as a separate qualification. In FM you will also encounter new topics such as matrices and complex numbers.

The new AS and A Levels in Mathematics and Further Mathematics were first introduced in schools for first teaching in September 2017. The Mathematics Course team is adopting a new approach (with our current Year 11) to support you through the transition. The plan is to provide you with adequate tools to successfully complete the course. Below is a list of key topics you need to know prior to starting your A-Level Maths course.

**Types of Numbers; Fractions; Laws of Indices; Fractional Indices;** **Multiplication**; **Numbers to the power of 0;** **Negative Indices;** **Simplifying**; **Factorising**; **Algebraic; Fractions**; **Changing the subject of a formula**; **Quadratic Equations;**

**Completing the square**; **Quadratic *Formula****;* **Note: The Difference of two squares;**

**Linear Simultaneous Equations**; **Finding the Gradient**; **Y-intercept - Horizontal and Vertical lines**; **Y = mx + c**; **Finding the distance between two points**; **Circle Properties**

**& Proportion.**

In the coming days you will be provided with electronic copies of this ‘**summer bridging’** work. Be mindful that time and effort matter. By doing the tasks you will demonstrate independence and gain the skills & knowledge needed to succeed in this course.

**Core Mathematics**

**Overview**

Maths is a broad and diverse subject, with many applications.  The Core Maths course is intended to sit between GCSE and A level Maths in difficulty and is designed to show how maths can be useful when you leave school and live and work in society.  This course is for you if you would like to continue to develop your understanding of how maths is applied in the real world. The main areas we will study are Analysis of Data, Maths for Personal Finance, Estimation and Critical Analysis.

In Analysis of Data you will develop and demonstrate confidence and competence in the understanding and application of statistical techniques, interpreting data and drawing conclusions in the solution of problems. Data handling is one of the most common and practical uses of mathematics and we will consolidate and extend your GCSE knowledge.

In Maths for Personal Finance you will learn how Income Tax and National Insurance is calculated and how to solve problems involving loans, savings and investments. We will also examine dealing with foreign currencies and budgeting your personal finances.

Estimation looks at creating mathematical models which can be used to solve problems by representing a situation mathematically, making assumptions and simplifying.  Mathematical models are used to estimate a wide variety of real life problems like the spread of infectious diseases or the consequences of human action on the environment.  You will also learn to analyse and criticise the reasoning of others, helping you make sense of conflicting arguments.

 In the coming days you will be provided with electronic copies of this ‘**summer bridging’** work. If you put in the effort right from the start, you will acquire the skills & knowledge needed to succeed in this course.