Level 3 Mathematical Studies (Core Maths)

Welcome to core maths. We follow the AQA specification (1350). The course is a one year course and is equivalent to an AS level, to be studied alongside three A-levels. Entry requirements are six GCSEs at Grade 4 or above including at least Grade 4 for English Language and Maths.

Why choose core maths?

Core maths has been designed to maintain and develop real-life mathematical skills. The course will include a financial mathematics element and can help with other A-level subjects, in particular with science, geography, business studies, economics and psychology. Core maths involves solving meaningful problems to increase your confidence in using mathematics. This will enable you to be better equipped for the mathematical demands of your other courses, higher education and employment.

What is covered in core maths?

Mathematics is, inherently, a sequential subject. There is a progression of material through all levels at which the subject is studied. It is assumed that students will already have confidence and competence in the content presented within the GCSE mathematics criteria.

The core maths specification aims to build on the knowledge, understanding and skills established in GCSE mathematics, in particular the topics listed below:

- knowledge and use of the formula $y=mx+c$. It is also expected that students will be able to find the gradient of a straight line connecting two different points.
- knowledge and use of the formulae for the circumference and the area of circle.
- knowledge and use of the formulae for the perimeter of 2-D shapes, their areas and for calculating fractional areas of circles and composite shapes.
- knowledge and use of the mathematical content of analysis of data and maths for personal finance elements.
- the ability to calculate surface areas of spheres, cones, pyramids and composite solids.
- the ability to apply Pythagoras' theorem applied to 2-D and 3-D figures.

Spreadsheets and ICT will be used throughout the course. Students are expected to have prior knowledge of the following spreadsheet formulas:

- =A1+A2+A3 to sum values in cells
- =2*B3 to multiply a value in a given cell
- =SUM(A1:A10) to sum values in a range of cells

As well as building on prior knowledge the core maths specification covers lots of new mathematical areas including:

Maths for Personal finance

- interest rates including annual equivalent rate (AER)
- repayments and the cost of credit including annual percentage rate (APR)
- taxation including income tax, national insurance, value added tax (VAT)
- solution to financial problems including the effect of inflation, retail price index (RPI) and consumer price index (CPI), currency exchange and commissions, and budgeting

Estimation

- using assumptions and simplifications
- Fermi estimation

Critical analysis of given data and models

- criticising the arguments of others
- summarising and report writing

Critical Path Analysis

- representing projects on activity networks
- using algorithms to identify critical activities
- using Gantt charts

Expectation

- applying ideas of randomness, fairness and equally likely events to calculate expected outcomes
- understanding Venn diagrams and set notation
- calculating probabilities of combined events

Cost benefit analysis

- living with uncertainty
- control measures
- understanding that actions taken to reduce risk have their own costs
- risk analysis

At the end of the year you will sit two papers, both an hour and a half and both are calculator allowed.

How can I be successful in core maths?

- **be actively involved** in managing the learning process and your study time
- **take responsibility** for studying, recognising what you do and don't know and ask for help with what you don't know
- **attend every lesson**. If you miss a lesson you will be expected to catch up with the work missed before the next lesson, if possible.
- **be an active participant in the classroom**. Lots of core maths lessons will involve discussion so to gain the most from the lesson you will need to participate.
- **ask questions in class!** There are usually other students wanting to know the answers to the same questions you have.
- **ask questions outside the class**. Your teacher will be pleased to see that you are interested and you will be actively helping yourself.
- **take responsibility for keeping up with the homework**. Core maths homework may be different to the type of maths homework you are used to as it may involve research.

Please be aware that if you are eligible for a post 16 bursary then the cost of relevant books and resources may be covered depending on family circumstances – please ask in the sixth form office for further details.