COMPUTER SCIENCE
'THE BEST WAY TO PREDICT THE FUTURE IS TO CREATE IT'

WHAT IS THE COURSE ABOUT?

• Understand and apply the fundamental principles and concepts of Computer Science, including abstraction, decomposition, logic, algorithms, and data representation.

• Analyse problems in computational terms through practical experience of solving such problems, including designing, writing, and debugging programs.

• Think creatively, innovatively, analytically, logically, and critically.

• Understand the components that make up digital systems, and how they communicate with one another and with other systems.

• Understand the impacts of digital technology to the individual and to wider society.

• Apply mathematical skills relevant to Computer Science.

SUBJECT CONTENT

There are three components:
Component 1 – Exploring Enterprises
Component 2 – Planning for and Pitching an Enterprise Activity
Component 3 – Promotion and Finance for Enterprise

The main focus through these components is on the knowledge, understanding and skills required to research, plan, pitch and review an enterprise idea that includes:

• Development of key skills that prove aptitude in planning an enterprise activity, including market Research, planning, carrying out financial transactions, communication and problem solving.

• Knowledge that underpins effective use of skills, such as the features and characteristics of enterprises and entrepreneurs, and the internal and external factors that can affect the performance of an enterprise.

• Attitudes and ways of working that are considered most important for enterprise, including monitoring and reflecting on performance of an enterprise idea and own use of skills.

HOW WILL I BE ASSESSED?

The Computer Systems topic is assessed via a 1 hour and 30 minute written examination (Paper 1) that will be held in the summer examination window of year 11. Paper 1 is worth 50% of the overall GCSE mark.

The Computational thinking, algorithms and programming topic is also assessed via a 1 hour and 30 minute written examination (Paper 2) that will also be held in the summer examination window of year 11.

Paper 2 is again worth 50% of the overall GCSE mark.

The Programming Project is assessed via a non-exam assessment and is compulsory to pass the course. Students undertake the Programming Project during their year 11 studies for a period of 20 hours. The 20 hours can be split amongst lesson time but it is conducted in exam conditions.
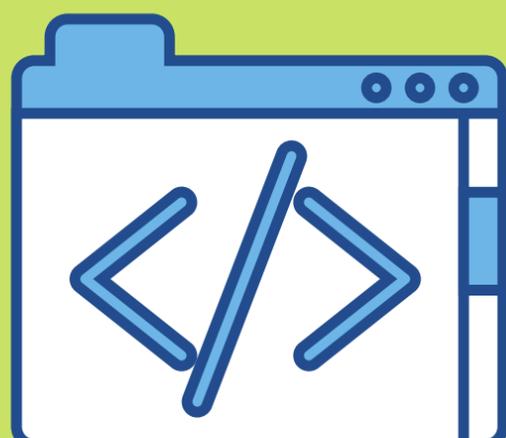
WHAT SKILLS ARE REQURIED?

Students will have undertaken a year 9 computer science program of study in which they will have studied GCSE content that included:

- Systems architecture and the use of a CPU within a computer system
- The role of memory within a computer system
- How storage devices work within a modern-day computer system
- The different types of software
- System Flowcharts and Pseudocode
- How to program using Python programming.

Whilst not experts in Computer Science, students will be able to fully grasp the information they have previously encountered. Students will ideally be competent programmers in Python but a willingness to try is more important.

A desire to succeed and overcome a variety of problems is the most vital attribute of a computer scientist.

STUDYING COMPUTER SCIENCE MAY LEAD TO:

Every student should have the opportunity to learn computer science. It helps nurture problem-solving skills, logic and creativity. By starting early, students will have a foundation for success in any 21st-century career path.

Our world has become exponentially reliant on technology. It is vital that children learn how to become creators, not just consumers of digital technology. Coding is no longer a marginal skill for 'geeks'. From making games, to fighting cybercrime, to designing a jet propulsion engine- computing is essential knowledge.
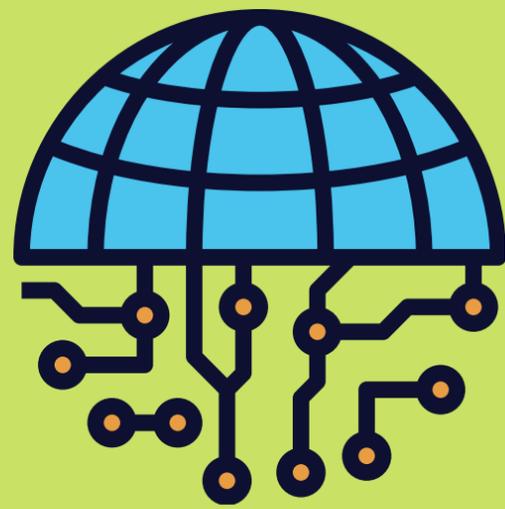
Possible careers include:

- Software engineer
- Games developer/tester
- Web designer/developer
- Technical consultant

ADDITIONAL INFORMATION

Students will be encouraged to work at home, and in particular program using the programming language 'Python'.

Students will use their academy laptops, the onsite computer suite and programable equipment to further their studies.
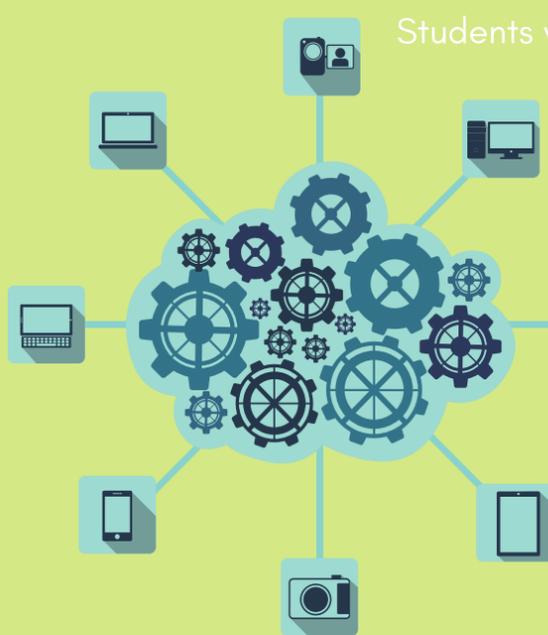
Students will be provided with access to online resources such as Teach ICT, Code Academy, Hour of Code, digital and physical revision materials and extend and reach careers-based tasks for those that aspire to work in the IT industry.

Fieldwork is not required though a future careers-based trip may occur during the course itself.