

Computer Science KS3 and KS4

What are the aims of the course?

- To develop knowledge and understanding of the fundamental principles and concepts of Computer Science.
- To use computational thinking skills to analyse and solve problems.
- To gain practical experience of designing, writing, and testing computer programs.
- To understand how computers can be used to represent, store, collect and search data.
- To understand the impact of Computer Science on the world we live in.



What is the content of the course?

- **Fundamentals of algorithms:** Before you can begin to write computer programmes, you need to learn how to write algorithms – the steps required to solve a problem. This is an essential skill required to think like a Computer Scientist.
- **Programming:** In this part of the course you will learn a modern, powerful programming Language (Python). You will have hands-on, practical experience of writing usable computer software.
- **Fundamentals of data representation:** Every word, picture, sound and video stored in a computer system needs to be represented using binary data. In this section of the course you will learn how we achieve this.
- **Computer Systems:** As we solve problems using computers, we can draw upon and bring together a diverse range of hardware and software. We call these combinations 'Computer Systems'.
- **Fundamentals of computer networks:** One of the most useful aspects of modern computing is the ability to network, either locally or over the internet. You will learn the principles of how we achieve this in this section of the GCSE.
- **Cyber Security:** The internet is a large and potentially scary place. The Cyber Security unit will equip you with an understanding of how to create and maintain secure networked computer systems.
- **Relational Databases:** The modern world generates vast amounts of information. A common way to structure and search this data is to use Relational Databases.
- **Ethical, legal and environmental issues:** Did you know that there are laws around the use of computers that are enforceable through the courts, and can even result in prison sentences? In this unit you will learn about those, and also ethical and environmental implications of computers.

What will be assessed during the course?

Paper 1 – Computational thinking and programming skills: Assesses sections 1 and 2 from the above. A mix of multiple choice, short and longer answer questions assessing programming, practical problem-solving and computational thinking skills. Two hour exam at the end of Year 11, worth 50% of grade.

Paper 2 – Computing Concepts: Assesses sections three to eight from the above. A mix of multiple choice, short and longer answer, extended response questions assessing SQL programming skills and theoretical knowledge. One hour forty five minutes exam at the end of Year 11, worth 50% of grade.

What equipment will be required?

Access to a computer at home with web connectivity, Office suite and Python installed.