

# GCSE Computer Science

**Examination Board:** OCR

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## Why study Computer Science?

### Computer Science will encourage learners to:

- 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.

### Computer Science qualification will enable learners to develop:

- Valuable thinking and programming skills that are extremely attractive in the modern workplace.
- A deep understanding of computational thinking and how to apply it through a chosen programming language.

## Possible next steps (including careers)

With the everchanging digital world, new industries and careers are being created every day. Computer Science GCSE offers a wide progression into a range of further qualifications pathways including A' or AS Level Computer Science; Cambridge Technicals in IT or similar Level 2/Level 3 apprenticeships linked to digital technologies.

Potential future careers could include Artificial Intelligence, Ethical Hacking, Computer Systems Engineering, Business and Management, Human Computer Interaction, Software Engineering, IT Project Management, Microsoft IT, Telecommunications, VMware, Network Technicians and many more!

## Aptitudes needed

It is essential for students to be motivated to learn new programming language skills and a willingness to develop these outside the classroom. During the GCSE pathway, students will be using Python as our programming IDE, building upon the techniques and functions covered Year 9 to support coursework and exam linked theory.

It is also recommended that students have strong numeracy skills to support independent, logic-based problems solving (GCSE prediction of a 5 or above) but also be able to demonstrate resilience when faced with challenge.

## Topic Structure

Component 1 & 2 will be delivered holistically across Years 10 & 11, a break down of the topics are shown below. The Programming Project (03/04) will be covered during Year 11.

### Component 1: Computer systems

- Systems Architecture
- Memory
- Storage
- Wired and wireless networks
- Network topologies, protocols and layers
- System security
- System software
- Ethical, legal, cultural & environmental concerns

### Component 2: Computational thinking, algorithms and programming

- Algorithms
- Programming techniques
- Producing robust programs
- Computational logic
- Translators and facilities of languages
- Data representation

**Assessment Structure****Computer systems Paper 1 (01)**

Written paper (80 marks)

1 hour and 30 minutes

Written paper (no calculators allowed)

50% of total GCSE

**Computational thinking,****algorithms and programming Paper 2 (02)**

Written paper (80 marks) (no calculators allowed)

1 hour and 30 minutes

50% of total

**Programming project (03/04)**

Students will be provided with the opportunity to undertake a programming task during their course of study which allows them to develop their skills to design, write, test and refine programs using a high-level programming language. Students will be assessed on these skills during the written examinations, in particular component 02.

20 hours of lesson time is required.

0% of total GCSE