

# Computer Science A Level



Exam Board: OCR

## Why A Level Computer Science?

A Level Computer Science helps students understand the core academic principles of computer science. Classroom learning is transferred into creating real-world systems through the creation of an independent programming project. Our A Level will develop the student's technical understanding and their ability to analyse and solve problems using computational thinking

## Thinking and Life Skills you will develop:

- Computer science is not just about learning how computers work and how to program them; it's about learning how to think logically which is a skill that many successful professionals possess.
- All students will leave the course being competent in reading and writing Algorithms. These are a logical set of instructions that enable a computer to work.
- In the future workplace everybody will be required to use a computer, whether they go into a career as a computer scientist or not.
- A student with a computer science A level will not only be proficient in using a computer but also know how it works and how to program it to make it work more efficiently.

## University degrees that require or often prefer

### Computing include:

Students who have studied computer science at A Level have gone onto complete apprenticeships at well-known companies. It is a strong subject to include for any student wishing to study mathematics, computer science or physics at university.

## Possible careers:

Former students of Computer Science are now working in the games industry, in research and in the city as quantitative analysts. Opportunities after university for computer scientists and computer programmers are as great as is the penetration of computing technology into modern 21st century society.

## What will you study?

During the A Level you will study 3 components covering different topics, with an examination in components 1 and 2 at the end of year 13. It will be expected that most project work and other units are completed outside of lesson.

### Component 01: Computer systems (40%)

Students are introduced to the internal workings of the (CPU), data exchange, software development, data types and legal and ethical issues. The resulting knowledge and understanding will underpin their work in component 03. It covers:

- the characteristics of contemporary processors, input, output and storage devices
- types of software and the different methodologies used to develop software
- data exchange between different systems
- data types, data structures and algorithms
- legal, moral, cultural and ethical issues

### Component 02: Computational thinking, algorithms and programming (40%)

This builds on component 01 to include computational thinking and problem-solving. It covers:

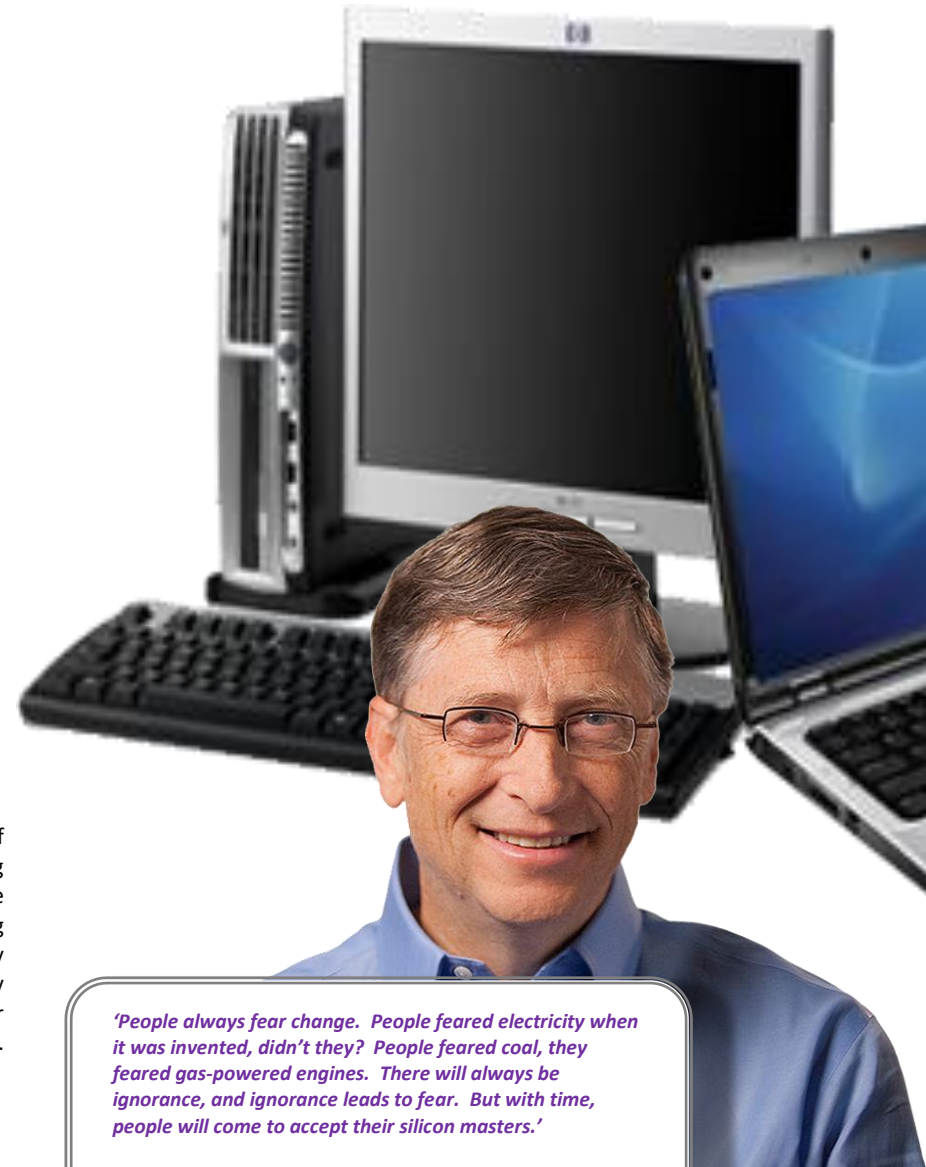
- what is meant by computational thinking (thinking abstractly, thinking ahead, thinking procedurally etc.)
- problem solving and programming – how computers and programs can be used to solve problems
- algorithms and how they can be used to describe and solve problems.

### Component 03: Programming project (20%)

Students are expected to apply the principles of computational thinking to a practical coding programming project. They will analyse, design, develop, test, evaluate and document a program written in a suitable programming language. The project is designed to be independently chosen by the student and provides them with the flexibility to investigate projects within the diverse field of computer science. We support a wide and diverse range of languages.

## Entry requirements:

Minimum grade 6 in Computer Science/Computing if studied at GCSE. We would also expect a grade 6 in GCSE Mathematics and any other science related subject.



*'People always fear change. People feared electricity when it was invented, didn't they? People feared coal, they feared gas-powered engines. There will always be ignorance, and ignorance leads to fear. But with time, people will come to accept their silicon masters.'*

Bill Gates CEO Microsoft