

Workington Academy Sixth Form

Computer Science



Why you should study Computer Science:

Computer Science is the study of computers and the theory behind their working. From the hardware to the software, students will learn how a computer functions and how to design their own programs to utilise the power of computers. It is both analytical and creative, and the best computer scientists can combine the two.

Computer Science is a modern, fast-moving subject which will allow students to understand and control the technology that will the future will be built with. You will be learning the fundamentals of computer hardware and programming in order to prepare effectively for technology that doesn't yet exist. Computer Science pairs well when taken with subjects such as maths, the sciences or business studies.

Examination Board: OCR

Course Content

Component 01 – Computer Systems

This component will introduce learners to the internal workings of the Central Processing Unit (CPU), the exchange of data and will also look at software development, data types and legal and ethical issues. Learners will study the following topics:

- The characteristics of contemporary processors, input, output and storage devices.
- Software and software development
- Exchanging data
- Data types, data structures and algorithms
- Legal, moral, cultural and ethical issues

Component 02 – Algorithms and programming

This component will incorporate and build on the knowledge and understanding gained in the Computer Systems component (01). In addition, learners should:

- understand what is meant by computational thinking
- understand the benefits of applying computational thinking to solving a wide variety of problems
- understand the principles of solving problems using computational methods
- be able to use algorithms to describe problems
- be able to analyse a problem by identifying its component parts

Component 03 – Programming project

Learners will be expected to analyse, design, develop, test, evaluate and document a program written in a suitable programming language. The underlying approach to the project is to apply the principles of computational thinking to a practical coding problem. Learners are expected to apply appropriate principles from an agile development approach to the project development.

Assessment:

For the A Level qualification you will sit two exams in addition to a non-exam assessment:

- Computer Systems (2h 30m) – 40%
- Algorithms and Programming (2h 30m) – 40%
- Programming Project – 20%

The Programming Project is a task of your own choosing, and you will analyse, design, develop and evaluate a solution from start to finish over an extended period of time. This could take the form of a game, simulator, desktop software or mobile app. The project can be tailored to your specific interests to help you on a chosen career path.

Skills Developed, Progression and Possible Future Careers

The aims of this qualification are to enable learners to develop:

- An understanding and ability to apply the fundamental principles and concepts of
- computer science, including: abstraction, decomposition, logic, algorithms and data
- representation
- The ability to analyse problems in computational terms through practical
- experience of solving such problems, including writing programs to do so
- The capacity to think creatively, innovatively, analytically, logically and
- critically
- The capacity to see relationships between different aspects of computer science
- Mathematical skills

Computer Science can lead to a variety of careers, including the following job roles (with average salary*):

- Computer Programmer (£42,500)
- Software Developer (£40,000)
- Game Developer (£45,000)
- Website Developer (£30,000)
- Mobile App Developer (£45,000)
- Cyber-Security Analyst (£38,000)
- Computer Hardware Engineer (£33,000)
- Computer System Architect (£60,000)
- Database Administrator (£40,000)

* salary information taken from [glassdoor.co.uk](https://www.glassdoor.co.uk)

Entry Criteria

Grade 6+ in Mathematics

Grade 6+ in Computer Science