



Computer Science at MSJ Sixth Form

Computer Science studies the design and operation of computer hardware and software. There is no avoiding computer-driven technologies and their potential applications to revolutionise our future.

Computer Science:

- Puts computational thinking as an academic discipline at its core, enabling you to develop your creative problem-solving skills and translate your algorithms into real programmed solutions
- Applies the principles learned about real-world hardware and software systems in a creative, exciting and engaging manner
- Embeds the mathematics of computing – Boolean algebra/logic and the elements of algorithm construction (sequence, iteration, selection, variables)

**TO PURSUE THE A LEVEL COURSE SUCCESSFULLY, PUPILS IDEALLY
NEED A MINIMUM OF:**

GCSE Maths (Grade 6) / GCSE English Language (Grade 5)

GCSE Computer Science (if studied) (Grade 6)

WHAT DOES THE COURSE INVOLVE?

The course involves studying the principles of how and why hardware and software enable computer systems to operate the way they do in a variety of situations. The course also promotes your ability to decompose a problem into smaller, more solvable components, and develops your skills creatively in computational thinking to derive algorithms to solve those problems. A logical approach and use of algebra will be required. You will learn to use programming languages practically to implement those algorithms.

IS IT THE RIGHT COURSE FOR ME?

What skills will I need?

You do not have to have studied Computing or Computer Science previously. You will be applying your GCSE Maths skills to creative problem solving involving Boolean logic, algebra and program design. You will study how computers work and interact with the world around you.

The Computer Science A Level complements other Science, Mathematics and Design and Technology A Levels, but they are not essential.

WHAT ARE THE POSSIBLE CAREER PATHWAYS?

A Level Computer Science supports pathways to Computer Science, Software Engineering and other computing-based courses in Higher Education or employment. In addition, many Science and Mathematics courses in Higher Education have a computer science / programming element, so the A Level in Computer Science can form an effective underpinning element.

TEXTBOOK

We use electronic and online resources to supplement the text book, OCR AS and A Level Computer Science by Heathcote and Heathcote (ISBN 9781910523056).

HEAD OF SUBJECT

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EXAM BOARD

OCR

HOW IS IT ASSESSED?

The AS has two components, externally assessed (weighted at 50% each):	Computing Principles: 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. Algorithms and Programming: Elements of computational thinking; programming and problem solving; pattern recognition, abstraction and decomposition; algorithm design and efficiency; standard algorithms.
The A Level consists of three components, two externally marked question papers (weighted at 40% each) and a programming project (worth 20%):	Computer Systems (AS Computing Principles plus extension topics). Algorithms and Programming (AS topics plus extension topics). Programming Project: This is specific to the A Level and is internally marked and moderated. Pupils analyse a complex problem they have identified, design a solution, program and test that solution and give a thorough evaluation