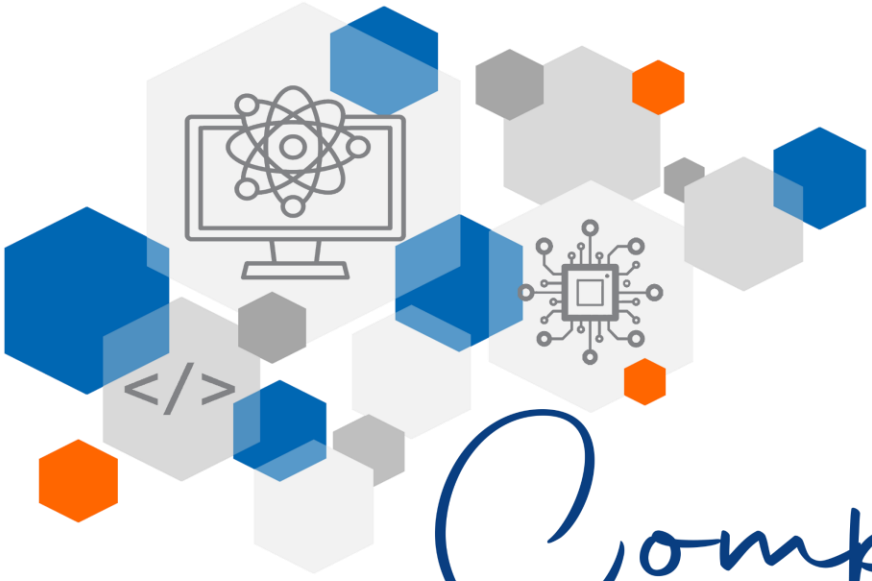
Ashby School
Empowered to Learn

Curriculum Information

Key Stage 4



Computer Science

"Empowering innovative thinkers to shape the digital world with logic and creativity."

For yourself & for others

LIFE
Inspiration Innovation Integrity

Curriculum Intent

The GCSE Computer Science course is designed to ignite curiosity and passion for technology while building a solid foundation in computational thinking, problem-solving, and programming. Students will explore the inner workings of computers, networks, and software, learning how technology shapes the modern world. The course emphasizes practical, hands-on programming experience in Python and developing transferable skills such as logical reasoning and creativity.

Through topics like cybersecurity, algorithms, and data representation, students gain insight into real-world applications of computer science. This course prepares learners for further study and careers in technology, equipping them with critical skills to innovate and adapt in a rapidly evolving digital age. If you enjoy solving problems, creating solutions, and learning how the technology you use every day works, this course is perfect for you.

Key Stage 4 Computer Science

Curriculum Aim:

We aim for students to:

- **Foster Computational Thinking:** Develop problem-solving, logical reasoning, and algorithmic thinking skills to analyse and tackle complex challenges.
- **Build Technical Knowledge:** Provide a deep understanding of how computers and networks operate, covering hardware, software, data representation, and cybersecurity.
- **Enhance Programming Skills:** Equip students with practical coding skills, focusing on designing, writing, and debugging programs in Python.
- **Promote Creativity and Innovation:** Encourage students to apply computational concepts creatively to design and develop technological solutions.
- **Prepare for the Future:** Lay a strong foundation for further education and careers in technology, emphasizing skills that are transferable to various industries.
- **Understand Ethical Impacts:** Explore the societal, environmental, and ethical implications of technology, fostering informed and responsible digital citizenship.
- **Engage with Real-World Applications:** Provide opportunities to relate theoretical knowledge to real-world scenarios, demonstrating the relevance of computer science in everyday life.

Assessments:

Two exams at the end of year 11

- **Paper 1** (50%) - Computer Systems
- **Paper 2** (50%) - Computational thinking, algorithms and programming

Course Content:

Paper 1 Content:

1.1 - Systems architecture
1.2 - Memory and storage
1.3 - Computer networks, connections and protocols
1.4 - Network security
1.5 - Systems software
1.6 - Ethical, legal, cultural and environmental impacts of digital technology

Paper 2 Content:

2.1 - Algorithms
2.2 - Programming fundamentals
2.3 - Producing robust programs
2.4 - Boolean logic
2.5 - Programming languages and Integrated Development Environments

Practical programming skills taught throughout year 10 and 11

Key Stage 4 Computer Science

Exam board: OCR

Link to specification:
https://www.ocr.org.uk/Images/558027-specification-gcse-computer-science-j277.pdf