

## ICT KS4 - Cambridge OCR Level 1 / 2 GCSE (9-1) in Computer Science

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**email:**

### **Curriculum Intent:**

Studying Computer Science at Forge Valley School, challenges pupils to think creatively, innovatively and logically. Pupils will build on their prior knowledge and digital literacy, to understand and apply the fundamental principles and concepts of computer science. They will develop confidence to analyse problems in computational terms through practical experience of solving such problems. They will understand the components that make up digital systems and how they communicate with one another and other systems. They will explore the impacts of digital technology and develop their ability to discuss these using contextual evidence. Their mathematical skills will be strengthened, and they will develop their ability to reflect and adapt. Finally, we feel it is important to make links between classroom learning and careers, directing them to where this could take them in the future, including different pathways for progression.

### **Core Knowledge**

Topics:

#### **Unit 1: Computer Systems**

- 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

#### **Unit 2: Computational thinking, algorithms and programming**

- 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 - pupils will be given the opportunity to undertake programming tasks to a specification/to solve a problem(s) during the course of study.

### **Procedural Knowledge**

Pupils will:

- Apply mathematical skills e.g. converting in both directions between binary and decimal.
- Apply the fundamental principles and concepts of Computer Science, including abstraction, decomposition, logic, algorithms, and data representation e.g. takes a real-world problem and model it by using abstraction and breaking the problem down using decomposition.
- Be able to systematically approach problem solving and algorithm creation representing those algorithms using pseudocode and flowcharts e.g. Designing a flowchart for a program.
- Writing, correcting, testing and interpreting the function of algorithms that solve problems using input/output, variables,

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| <p><b>Homework:</b></p> <p>Homework is set once per week when students have 2 lessons on their timetable and twice when there are 3 lessons. Homework will require pupils to apply the knowledge they have developed in class to show that they have mastered that topic or skill. As pupils progress into Year 11, they may need to dedicate more time on home learning when preparing for examinations. Staff will support the revision process by setting tasks and modelling revision techniques. A revision guide and flashcards are available to purchase to support independent study.</p> <p><b>Assessment:</b></p> <p><b>Formative assessment</b> will be used to regularly monitor student progress and check for understanding. This will include retrieval practice, low-stakes quizzes, end of topic tests, past paper questions and in class questioning.</p> <p><b>Summative assessments:</b></p> <p>For each of the assessments detailed below, pupils will be provided with revision materials including topic lists for each specific assessment.</p> <p><b>Y10 Autumn</b> - this will take place in the classroom. The 45 mins paper will contain questions from topics that have been covered in this early part of the course from Unit 1, consisting of multiple choice, short response and extended answer questions.</p> <p><b>Y10 Summer</b> - this will take place in the exam hall. The 1 hour 30 mins paper will contain questions from topics that have been covered prior to the examination date. This will include topics from Unit 1, consisting of multiple choice, short response and extended answer questions.</p> <p><b>Y11 Autumn</b> - this will take place in the exam hall. The 1 hour 30 mins paper will contain questions from topics that have been covered prior to the examination date. This will include topics from Unit 1 and 2, consisting of multiple choice, short response and extended answer questions.</p> <p><b>Y11 Spring</b> - this will take place in the exam hall. They will sit a mock for both Unit 1 and Unit 2. Each paper will be 1 hour 30 mins, consisting of multiple choice, short</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

response and extended answer questions. Section B of Paper 2 requires pupils to write or refine algorithms using programming language.

**Final Assessment:**

The course is assessed in the summer of Year 11 by 2 written papers that are externally set and marked by the examination board. They are each 1 hour 30 mins in length and a maximum of 80 marks per paper. Each paper carries a 50% weighting towards the final qualification grade.

**Links to Personal Development:**

Through the study of ethical issues, legal issues, cultural issues, environmental issues and privacy issues, there is significant links to Personal Development. Pupils will learn about Data Protection and Computer Misuse, as well as Copyright, Patents and Software licences, all of which are important to know about and are likely to be relevant when developing into responsible adults.

Pupils will learn about careers and progression routes relating to Computer Science, including roles and responsibilities and engaging with universities and employers where possible.

Pupils will develop a range of skills that will be important for personal and professional development including problem-solving, resilience and decision making.

**How is my knowledge further developed in Key Stage 5?**

Pupils can continue to study Computer Science at A-Level, although this is currently not a course offered at Forge Valley Sixth Form, it is offered at a range of sixth forms and colleges. Alternatively, BTEC National Level 3 AAQ in Computing or Information Technology is an option in sixth form or college, where they would explore some of the topics covered in Computer Science in more depth, explore new topics and build on the knowledge and skills that this course has provided. The colleges also offer T-Levels which provide a very focused approach in areas such as Digital Data Analytics and Digital Software Development and Digital Support and Security. They could source an apprenticeship in fields such as AI Engineer, Business IT Support Engineer, Data Analyst or Cyber Operations, and many more.