

GCSE Computer Science

Algorithms

- Understand the fundamentals of algorithms.
- Understand the terms decomposition and abstraction relating to computing.
- Understand how flowcharts and pseudocode are used to create algorithms.
- Understand that computer systems take inputs, process these and provide outputs (I/P/O).
- Understand how to make algorithms efficient.
- Understand how different search algorithms work.
- Create linear, binary and search algorithms to find and sort data.

Programming

- Understand the different data types that are used in programming.
- Understand that programming uses sequence, selection and iteration.
- Create and use definite and indefinite iteration.
- Understand how to create and use selection.
- Create and use nested selection using Select Case and IF Then statements.
- Understand how to use arithmetic operators in programming.
- Understand how to use Boolean operators in programming.
- Understand the AND, OR and NOT Boolean operators and how they are represented.
- Understand how to handle files in programming.
- Understand how to create and use sub routines.
- Understand how to create and use functions.
- Use parameters in sub routines and function.

Data representation

- Understand how computers store data using binary.
- Understand how to convert between different number systems.
- Understand how the ASCII system is used for character encoding.
- Understand how computers store images and sounds.
- Understand how computers use compression to save resources, including Huffman coding and binary trees.

Network Security and Ethics

- Computer systems.
- Computer networks.
- Cyber security.
- Ethical and legal aspects of using computers.

Non-Exam Element

- Introduction: create a project that uses all of the elements of the non-exam assessment of the course.
- Rehearsal: complete a programming challenge that conforms to the non-exam assessment.
- Assessment: complete the 20 hour non-exam assessment in controlled conditions.

**Advice to students
for independent
study**

- Programming at home is a requirement as this will reinforce the teaching in lessons. Programming challenges are set and these are used to help students to hone their programming skills.
- Use revision guides, notes and online resources to spend at least one hour per week learning the key knowledge and concepts of the course.