

AQA GCSE COMPUTER SCIENCE

Year 10 – Autumn Term

This term students will cover the following topics from the specification:

- **Fundamentals of Algorithms**
 - Understand and explain the terms Algorithm, Abstraction and Decomposition
 - Be able to read and write algorithms as pseudo code and flowcharts
 - Follow algorithms to complete trace tables and identify the purpose of an algorithm
 - Understand, explain and compare two different search algorithms (linear and binary)
 - Understand, explain and compare two different sorting algorithms (bubble and merge)
- **Programming**
 - Understand and use key concepts of variable assignment, selection and iteration
 - Understand and use different data types (integer, real/float, string, character, Boolean)
 - Understand and use different operators (arithmetic, relational and Boolean)
 - Understand and use different data structures (1D lists, 2D lists, records)
 - Understand and use different string handling operations
 - Understand and use subroutines and structured programming
 - Understand and use robust and secure programming (validation, user authentication)
 - Be able to test code using different types of test data and recognise different types of error
- **Fundamentals of Data Representation**
 - Understand and convert between different number bases (binary, decimal, hexadecimal)
 - Be able to compare and convert amounts in different units (KiloBytes, MegaBytes, etc.)
 - Be able to carry out binary arithmetic (addition, multiplication and division)
 - Understand how computers store characters and compare different coding systems
 - Understand how computers store images and sounds and be able to calculate file sizes
 - Understand file compression and be able to use Run Length Encoding and Huffman Coding

Recommended online resources:

- **Google Classroom**, where teaching and learning resources will be posted that will follow the planned scheme of learning, should lessons not be possible actually in school
- **BBC Bitesize**, select GCSE, then Computer Science, then AQA
- **Seneca Learning**, requires sign up (free for students), search for GCSE Computer Science AQA
- **YouTube**, search for 'craigndave gcse computer science aqa' or 'William Grey computer science'