

# 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'