

Computing Science:

Year 9:

Module 1:

Computing Fundamentals & Binary Logic (4 hrs):

The focus is on getting pupils to understand the fundamentals of computer data. Pupils will gain an understanding of computing fundamentals, binary, binary addition and logic gates and equations.

Flowol (4 hrs):

Creation of flow charts to solve a programmable task. To understand key programming elements:

- Sequences of instructions.
- Branching using decisions.
- Loops (infinite, or based on a condition or count)
- Subroutines

Module 2:

Python Fundamentals – Stage 1 (8 hrs):

The focus is on getting pupils to understand the process of developing programs written in Python, the importance of writing correct syntax, being able to formulate algorithms for simple programs and debugging their programs. Pupils will cover the key building blocks such as variables, arithmetic, selection, while loops and searching.

Module 3:

Cyber Security (4 hrs): Pupils will learn about the different aspects of cyber security threats and security issues, and methods to detect and prevent these threats. Areas covered include:

- cyber-attack, damage or unauthorised access
- different forms of cyber-attack such as phishing, pharming and shoulder surfing
- ways of recognising a phishing attack
- security measures such as password systems and biometric methods
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Python “The Next Steps” – Stage 2 (4 hrs):

This is a continuation from ‘Python Fundamentals’ in Module 2.

Pupils will be able to formulate algorithms for relatively complex programs that capture and valid data input. Their solutions will be tested and debugged to ensure they are fully functional. These lessons will build upon the fundamentals previously taught and cover loops, lists, procedures and functions.

Module 4:

Software Development Project (5 hrs):

The focus of this project is to bring together the key skills learnt across the year so that they can develop a solution to a real world problem. Pupils will be given a number of scenarios to choose from. Once chosen, pupils will investigate, design, implement and test a solution. This helps students prepare for the practical element of Computing Science at GCSE.

Year 10 and 11 – AQA GCSE Computer Science (8520)

Unit 1: Computational thinking and problem solving

This is the process of thinking through a complex problem, taking the time to understand what the problem is and then develop potential solutions for evaluation. These are then presented in a way that a computer, a human, or both, can understand. This unit is assessed through an external exam. The exam paper has a mixture of short and long answer questions. Weighting = 50%

Unit 2: Theoretical content:

Here you will understand the fundamentals of data representation and computer networks. You will learn about the computer systems that you will create and use and also delve in to the world of cyber security and ethical, legal and environmental impacts of digital technology. This unit is assessed through an external exam. The paper has a mixture of short and long answer questions. Weighting = 50%

Unit 3: Aspects of software development (non-exam assessment)

This component is the non-exam assessment where candidates will be challenged by a range of exciting and engaging tasks to apply the knowledge and skills they have learned. Pupils will design, program and test a software solution for a given problem. Weighting = Compulsory.