

St Cuthbert Mayne School Curriculum Map



Year 11

Department: COMPUTING

Key Stage 4 Curriculum Summary

Exam Board: OCR

Course title: J277 Computer Science

This GCSE consists of two papers, one focusing on computer systems and one with a focus on programming, computational thinking, and algorithms. Both papers have identical weighting and mark allocations. Computer Science will encourage students to understand and apply the fundamental principles and concepts of Computer Science, including abstraction, decomposition, logic, algorithms, and data representation.

They will analyse problems in computational terms through practical experience of solving such problems, including designing, writing and debugging programs.

Autumn Term

Topic/Unit	Threats and preventions to computer systems and networks	Operating Systems and utility Software	Ethical, legal, cultural and environmental impact	Searching and Sorting Algorithms
Knowledge (Content covered)	Forms of attack - Malware - Social engineering, e.g. phishing, people as the 'weak point' - Brute-force attacks - Denial of service attacks - Data interception and theft - The concept of SQL injection Common prevention methods: - Penetration Testing - Anti-malware software - Firewalls - User access levels - Passwords - Encryption - Physical Security	The purpose and functionality of operating systems: - User interface - Memory management and multitasking - Peripheral management and drivers - User management - File management The purpose and functionality of utility software Utility system software: - Encryption software - Defragmentation - Data Compression	Impacts of digital technology on wider society including: - Ethical issues - Legal issues - Cultural issues - Environmental issues - Privacy issues Legislation relevant to Computer Science: - The Data Protection Act 2018 - Computer Misuse Act 1990 - Copyright Designs and Patents Act 1988 - Software licences (i.e. open source and proprietary)	Standard searching algorithms: - Binary search - Linear search Standard sorting algorithms: - Bubble sort - Merge sort - Insertion sort
Skills	Computer Science Problem solving			Programing Skills
Assessment	Lesson Review Quizzes (AFL) and Final Topic Assessment (Summative)			
Gatsby 4 (Linking curriculum learning to careers)	Data scientist. Software tester. Web developer. Systems analyst. Business analyst. Product manager. Network architect. Software engineer. Teacher			

Spring Term

Topic/Unit	2.3 Robust Programs	2.5 Programming languages and Integrated Development Environments	Preparation for the examinations
Knowledge (Content covered)	Defensive design considerations: - Anticipating misuse - Authentication Input validation Maintainability: - Use of sub programs - Naming conventions - Indentation - Commenting The purpose of testing Types of testing: - Iterative - Final/terminal Identify syntax and logic errors Selecting and using suitable test data: - Normal - Boundary - Invalid - Erroneous Refining algorithms	Characteristics and purpose of different levels of programming language: - High-level languages - Low-level languages The purpose of translators The characteristics of a compiler and an interpreter The integrated development environment Common tools and facilities available in an integrated development environment (IDE): - Editors - Error diagnostics - Run-time environment - Translators	Revision and preparation for the Summer examinations.
Skills	Computer Science Problem solving		
Assessment	Lesson Review Quizzes (AfL) and Final Topic Assessment (Summative)		Past exam practice and programming
Gatsby 4 (Linking curriculum learning to careers)	Data scientist. Software tester. Web developer. Systems analyst. Business analyst. Product manager. Network architect. Software engineer. Teacher.		

