Computer Science Subject Intent

The Computer Science department at Dixons Broadgreen Academy empowered students to become, enthusiastic, skilled, innovative and considerate users of technology, with a deep-rooted ethical and moral compass.

Five Year Plan

Year 7			
	Cycle 1	Cycle 2	Cycle 3
Content	TEAMs Hardware /Software Internet & Hardware	Computer systems	CPU Fetch-execute cycle
Skills	Hardware /Software Operating systems Networks WAN/LAN/Internet Routers/Switches / packets	Networks The Internet CPU Parts Processors and Cores Control Unit IAS ALU	Inputs/Processes/Outputs FDE Cycle Clockspeed/Cores/Cache Decoding Compilers/Interpreters/Assembler IDE's Data vs Information
Progression	Due to KS2 students rarely having acquired knowledge to the expected level and of being mixed exposure/experience we begin with the basics	How a computer transfers/processes data/information	Now pupils know the hardware and technology systems. We learn how the internal system works.
Link to GCSE	J277 Paper 1 Computer systems 1.1 Hardware and Software 1.3 Computer networks, connections and protocol	J277 Paper 1 Computer systems 1.2 Memory and storage, 1.3 Computer networks, connections and protocols	J277 Paper 1 Computer systems 1.1 Systems architecture,
Year 8			
	Cycle 1	Cycle 2	Cycle 3
Content	Data and data representation	Computational Thinking Algorithms, Flowcharts and Pseudocode	Searching and sorting and programming
Skills	Binary Conversion Calculations Images -Depth and resolution Sound -Analogue to digital (HEX ASCII – extension only)	Abstraction Decomposition Pseudocode format Flowchart symbols More than one way to solve a problem	Linear searches Binary searches Sorts
Progression	From Year 7 We learn the language that computers use to communicate and how to convert data/information	Introduction of new skills, preparing to be programmers. How we breakdown ideas, ready for the programmers	Organising and selecting information Developing programming skills Scratch/Python. Scratch progression from KS2
Link to GCSE	J277 Paper 2 Computational thinking / Algorithms / programming 1.2 Memory and storage	J277 Paper 2 Computational thinking / Algorithms / programming 2.1 Algorithms	J277 Paper 2 Computational thinking / Algorithms / programming 2.1 Searching and sorting 2.2 Programming fundamentals - Python
Year 9			
	Cycle 1	Cycle 2	Cycle 3

Content	Origins of Computing	**CPU – Performance and Characteristics**	2.2.1 Programming fundamentals
Skills	Introduction to Python Cipher/Encryption Logic gates And Or Not Truth tables Boolean logic and programming HTML	**Primary storage (Memory)** **Secondary storage** **Units** **Data storage** **Compression** **Boolean logic** **Types of network** Wired and wireless networks, protocols and layers Threats to computer systems and networks	Coding Inputs/Outputs Variable Strings/characters Float Integers Iteration – Condition and Count If-Else
Progression	Computer systems 7.1 CPU and data 7.2 Binary from 7.3	7.1 Computer systems 7.3 Data and data representation 9.1 Boolean logic and programming	7.1 computer systems 8.2 Algorithms, Flowcharts and Pseudocode
Link to GCSE / A-Level	J277 Paper 1 Computer systems 2.4 Boolean logic 2.2 Programming fundamentals - Python	Link to A Level Computer Science BTEC Ext Cert Unit 1	J277 Paper 2 Computational Thinking, Algorithms and Programming
Year 10			
	Cycle 1	Cycle 2	Cycle 3
Content	**2.4.1 Boolean Logic** **1.2.3 Units** 1.2.4 Data storage 1.2.4 Data storage numbers 1.2.4 Data storage – Characters 1.2.4 Data Storage Images 1.2.4 Data storage – Sound **2.1.2 Designing, creating and refining algorithms** **2.2.2 Data Types**	1.2.5 Compression 1.1.1 Architecture of the CPU 1.1.2 CPU Performance **1.1.3 Embedded systems** **1.2.1 Primary storage (Memory)** **1.2.2 Secondary storage** 2.2.1 Programming Fundamentals 2.2.3 Additional programming techniques Practical Programming Skills	1.3.1 Networks and topologies 1.3.2 Wired and wireless networks, protocols and layers Practical Programming Skills Revision 1.4.1 Threats to computer systems and networks (Recap from Yr 9) 1.4.2 Identifying and preventing vulnerabilities 1.5.1 Operating systems 1.5.2 Utility software
Skills			
Progression	Key concepts introduced in Year 9 are systematically revisited throughout Year 10, allowing students to strengthen their understanding of Boolean logic, data representation, data storage and algorithm design, while embedding knowledge through increasingly challenging applications and problem-solving tasks.	Data storage introduced in Yr 9 and built on to secure knowledge.	New topics are explored as a part of the GCSE content
Link to A-Level	Provides the foundational understanding of data representation, Boolean logic, algorithms and data types that is developed at A Level into deeper study of computer architecture, programming, computational thinking and the mathematical principles underpinning computer systems.	Topics provide the essential foundations for A Level study of processor operation, system performance, software development, advanced programming techniques and the interaction between hardware and software within modern computer systems.	This Builds students' understanding of networks, cybersecurity, operating systems and software management, providing the foundation for A Level study of communication technologies, network architecture, cyber security, systems software and the wider role of computing systems in modern society.
Year 11 – Transition to KS5			
	Cycle 1	Cycle 2	Cycle 3
Content	1.6.1 Ethical, legal, cultural and	**Revision of paper 1 and paper**	

	environmental impact 2.3.1 Defensive design 2.3.2 Testing 2.5.1 Languages 2.5.2 The Integrated Development Environment (IDE) 2.1.3 Searching and sorting algorithms Searching and Sorting Practical Programming skills	**two concepts and external exams**	
Skills	understand the impact of technology on society Design reliable and secure solutions Test and improve programs Use programming tools effectively Apply searching and sorting algorithms Develop practical programming skills to solve problems		
Progression	Building on content introduced in Year 9 and reinforced through Years 10 and 11, Year 11 Cycle 1 focuses on deepening understanding of software development, testing, programming tools and algorithmic thinking. The curriculum is structured to complete content delivery by December, allowing extended time for revision and intervention. This model is currently being trialled and evaluated		
Link to A-Level	Develops students' understanding of the societal impacts of computing, software development, testing, programming environments and searching and sorting algorithms, providing the foundation for A Level study of algorithm design and analysis, software engineering, programming paradigms, development methodologies and the ethical implications of computing in real-world contexts		