

# Curriculum Overview - GCSE Computer Science 9-1 (OCR)

## Year 10

Students will build on their work undertaken in Computer Science lessons at Year 7, 8 and 9. They will develop an understanding of the fundamental theories within computer science and develop their programming knowledge using the Visual Basic programming language.

	1.2: Data Storage	2.4: Boolean Logic	1.2: Data Storage	1.1: System Architecture	1.2: Secondary Storage	1.3: Networks and topologies
Knowledge	How computers store data, both numerical and textual. Interpret Binary and Hexadecimal data and convert between them Addition of binary values	Use of logic to make decisions. Interpret logic diagrams and scenarios Logic diagrams	How computer systems store complex information such as sound and images . Techniques used to compress data and reduce storage requirements	Components associated with the processor and the mechanisms used by the processor to carry out complex instructions <ul style="list-style-type: none"> <li>Registers</li> <li>CPU</li> <li>Memory</li> <li>Buses</li> </ul>	Forms of secondary storage <ul style="list-style-type: none"> <li>Optical</li> <li>Magnet</li> <li>Solid State</li> </ul>	Hardware and techniques used to network computers. Topologies <ul style="list-style-type: none"> <li>Bus</li> <li>Star</li> <li>Ring</li> <li>Mesh</li> </ul>
Skills Overview	<ul style="list-style-type: none"> <li>Calculation of Binary Values</li> <li>Calculation of HEX Values</li> <li>Understanding of Binary Shift</li> <li>The use of ASCII text</li> </ul>	<ul style="list-style-type: none"> <li>Understand Boolean logic</li> <li>Apply Boolean logic</li> <li>Interpret Boolean logic diagram</li> </ul>	<ul style="list-style-type: none"> <li>Able to calculate file sizes of image and text files</li> <li>Produce images based on binary data</li> <li>Understand how images and sound are encoded</li> </ul>	<ul style="list-style-type: none"> <li>Understand the components that make up a computer system</li> <li>To explain how a processor will interpret instructions</li> </ul>	<ul style="list-style-type: none"> <li>How do computer systems store data</li> <li>The key methods used to store data</li> </ul>	<ul style="list-style-type: none"> <li>Understand the HW used to create computer networks</li> <li>The benefits and disadvantages associated with different networking topologies</li> </ul>
	2.1: Computational Thinking (3 Weeks)	2.1: Algorithms (6 Weeks)	2.2: Programming Fundamentals (19 Weeks)		Practical programming skills (12 Weeks)	
Knowledge	Learners will look at how problems can be broken down into small tasks and begin to develop skills in programming	Five basic algorithms for searching and sorting data. <ul style="list-style-type: none"> <li>Linear Search</li> <li>Binary Search</li> <li>Insertion Sort</li> <li>Bubble sort</li> <li>Merge sort</li> </ul> Use of Pseudocode and flowcharts to represent algorithms	Key constructs in programming <ul style="list-style-type: none"> <li>Sequence</li> <li>Iteration</li> <li>Selection</li> </ul> Use of variables <ul style="list-style-type: none"> <li>String</li> <li>Float</li> <li>Integer</li> <li>Casting</li> </ul>		Use of programming fundamentals to construct complex programs	
Skills Overview	<ul style="list-style-type: none"> <li>Understand the concepts of Abstraction, Decomposition</li> </ul>	<ul style="list-style-type: none"> <li>Be able to demonstrate each of the five algorithms</li> </ul>	<ul style="list-style-type: none"> <li>Understand how to programmatically implement the key constructs</li> <li>Be able to identify the constructs in Pseudocode</li> </ul>		<ul style="list-style-type: none"> <li>Be able to construct programs based on scenarios</li> <li>To develop suitable code</li> </ul>	

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## Year 11

During the year students will build upon the understanding that they have gained from Year 10. They will apply their programming skills to a series of tasks and develop further their understanding of how computers work in a networked environment. They will investigate areas of software and the legal and ethical implications of computer use.

	1.3: Wired and Wireless Networks & 1.4: Threats to computer systems	1.5: Software	1.6: Ethical, legal and cultural impact	2.1: Algorithms	Revision + Exams
Knowledge	Learners will develop an understanding of the different techniques used to create networks. They will look at the threats associated with computer networks and how these threats can be prevented	Operating systems and System software including Defragmentation, Virus Checkers and Firewalls.	Ethical, Environmental and social issues relating to the use of Technology	Five basic algorithms for searching and sorting data. <ul style="list-style-type: none"> <li>• Linear Search</li> <li>• Binary Search</li> <li>• Insertion Sort</li> <li>• Bubble sort</li> <li>• Merge sort</li> </ul> Use of Pseudocode and flowcharts to represent algorithms	
Skills Overview	<ul style="list-style-type: none"> <li>• Understanding of the use and operation of systems</li> <li>• Identify the parts of the protocol stack</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding of the use of software</li> <li>• Be able to identify different software</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss issues relating to the use of technology and effects on environment and society</li> </ul>		
Knowledge	2.3: Defensive Design and Testing	2.5: Languages and Development Environments			Revision + Exams
	Robust programming methods. Implement testing plans and using trace tables.	Types of programming languages and the scenarios in which they are used. Interpreters Compilers IDE Techniques used to develop programming solutions			
Skills Overview	<ul style="list-style-type: none"> <li>• Create test plans and use when programming</li> <li>• Use trace tables</li> </ul>	<ul style="list-style-type: none"> <li>• Understand the differences in programming languages</li> <li>• Be able to determine when and where to use</li> <li>• Identify the features of programming languages</li> </ul>		<ul style="list-style-type: none"> <li>• Be able to demonstrate each of the five algorithms</li> </ul>	