

GCSE CURRICULUM and ASSESSMENT OVERVIEW

SUBJECT: GCSE Computer Science

Responsibility: Oliver Johnston

	Term1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 9	Computer Systems	Hardware and Software	Networks	Data Representation	Learning to Program in Python	Databases
Literacy/numeracy	Keywords, Exam style questions, command words,	Keywords, Exam style questions, command words,	Keywords, Exam style questions, command words,	Base 2, Base 10, Base 16, number conversions, adding binary	Iteration, Sequencing, numerical operators, Loops	Keywords, Exam style questions, command words,
Assessments	End of topic test	End of topic test	End of topic test	End of topic test	Practical assessment	Written and Practical assessment
Year 10	<p><b>Systems Architecture</b> The purpose of the CPU Von Neumann architecture Components of the CPU CPU and fetch, execute cycle Factors affecting performance of CPU Embedded systems</p> <p><b>Computational Logic</b> why data is represented in computer systems in binary form simple logic diagrams using the operations AND, OR and NOT truth tables combining Boolean operators using AND, OR and NOT to two levels applying logical operators in appropriate truth tables to solve problems applying computing-related mathematics: +, -, /, *, Exponentiation (^)m, MOD, DIV</p>	<p><b>Memory</b> Difference between ROM and RAM Purpose of ROM in a system Purpose of RAM in a system The need for virtual memory Flash memory <b>Storage</b> The need for secondary storage Data capacity and calculation of data capacity requirements common types of storage Suitable storage devices and storage media for a given application, and the advantages and disadvantages of these, using characteristics: capacity, speed, portability, durability, reliability, cost.</p>	<p><b>Wired and wireless networks</b> Types of networks (LAN/WAN) Factors affecting the performance of networks Different roles of computers in a client-server and peer-to-peer network Hardware needed to connect to a LAN (WAP, routers/switches, NIC, transmission media) The internet (DNS, hosting, the cloud) The concept of virtual networks <b>Network topologies, protocols and layers</b> star and mesh network topologies Wifi Ethernet The uses of IP addressing, MAC addressing, and protocols the concept of layers packet switching.</p>	<p><b>System Security</b> Forms of attacks Threats posed to networks Identifying and preventing vulnerabilities <b>System software</b> Purpose and functionality of systems software Operating systems Utility system software</p>	<p><b>Ethical, legal, cultural and environmental concerns</b> How stakeholders are impacted by technologies Environmental impact of computer science Cultural implications of computer science Open source vs proprietary software Legislation relevant to computer science <b>Algorithms</b> Computational thinking Searching algorithms Sorting algorithms How to produce algorithms Interpreting, creating and amending algorithms</p>	<p><b>Programming Techniques</b> the use of variables, constants, operators, inputs, outputs and assignments the use of the three basic programming constructs used to control the flow of a program the use of basic string manipulation the use of basic file handling operations the use of records to store data the use of SQL to search for data the use of arrays (or equivalent) when solving problems, including both one and two dimensional arrays how to use sub programs (functions and procedures) to produce structured code the use of data types the common arithmetic operators the common Boolean operators.</p>
Literacy/numeracy	Keywords, Exam style questions, command words, Boolean operators, Logic Gates,	Keywords, Exam style questions, command words, capacity conversions,	Keywords, Exam style questions, command words,	Keywords, Exam style questions, command words,	Keywords, Exam style questions, command words, flow charts, algorithmic thinking	Boolean operators, data structures, file handling, data types, arrays
Assessment						
Year 11	NEA Task	NEA Task	Translators and facilities of languages characteristics and purpose of different levels of	Data Representation Units: bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte, petabyte	Revision for exams	

			<p>programming language, including low level languages the purpose of translators the characteristics of an assembler, a compiler and an interpreter common tools and facilities available in an integrated development environment (IDE): editors, error diagnostics, run-time environment, translators.</p>	<p>how data needs to be converted into a binary format to be processed by a computer. Numbers: how to convert positive denary whole numbers (0–255) into 8 bit binary numbers and vice versa how to add two 8 bit binary integers and explain overflow errors which may occur binary shifts how to convert positive denary whole numbers (0–255) into 2 digit hexadecimal numbers and vice versa how to convert from binary to hexadecimal equivalents and vice versa check digits. Characters: the use of binary codes to represent characters the term ‘character-set’ the relationship between the number of bits per character in a character set and the number of characters which can be represented (for example ASCII, extended ASCII and Unicode). Images: how an image is represented as a series of pixels represented in binary metadata included in the file the effect of colour depth and resolution on the size of an image file. Sound: how sound can be sampled and stored in digital form how sampling intervals and other factors affect the size of a sound file and the quality of its playback: sample size, bit rate, sampling frequency. Compression: need for compression types of compression: lossy, lossless.</p>		
Literacy/numeracy			Keywords, Exam style questions, command words,	Keywords, Exam style questions, command words, See above for literacy and numeracy		

Assessment	NEA task no longer assessed but needs to be completed	NEA task no longer assessed but needs to be completed				
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