

Subject – GCSE Computer Science

Topic – Component 1 and 2

Name:

My target grade:

S = I have Summarised O = I have Organised (RAG or 😊😊😊) R = I have Recalled T = I have Tested Myself

| Key Idea | | R A G | S | O | R | T |
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| 1.1 Systems Architecture | I can describe: The purpose of the CPU Von Neumann architecture Common CPU components and their function The function of the CPU as fetch and execute instructions stored in memory How common characteristics of CPUs affect their performance Embedded systems | | | | | |
| 1.2 Memory | I can explain: The difference between RAM and ROM The purpose of ROM in a computer system The purpose of RAM in a computer system The need for virtual memory Flash memory | | | | | |
| 1.3 Storage | I can describe: The need for secondary storage Data capacity and calculation of data capacity requirements I can compare: Common types of storage: Suitable storage devices and storage media for a given application, and the advantages and disadvantages of these. | | | | | |
| 1.4 Wired and Wireless Networks | I can describe: Types of networks Factors that affect the performance of networks The different roles of computers in a client-server and a peer-to-peer network The hardware needed to connect stand-alone computers into a Local Area Network The internet as a worldwide collection of computer networks The concept of virtual networks. | | | | | |
| 1.5 Networks topologies, protocols and layers | I can describe and compare: Star and mesh network topologies Wifi Ethernet The uses of IP addressing, MAC addressing, and protocols including: The concept of layers into a Local Area Network Packet switching | | | | | |
| 1.6 Systems security | I can identify: Forms of attack Threats posed to networks: | | | | | |

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| | I can explain how to: Identify and prevent vulnerabilities: | | | | | |
| 1.7 Systems software | I can describe: The purpose and functionality of systems software Operating systems Utility system software | | | | | |
| 1.8 Ethical, legal, cultural and environmental concerns | I can investigate and discuss Computer Science technologies while considering: How key stakeholders are affected by technologies Environmental impact of Computer Science Cultural implications of Computer Science Open source vs proprietary software Legislation relevant to Computer Science: | | | | | |
| 2.1 Algorithms | I can explain the following terms of Computational thinking: abstraction decomposition I can describe and execute: Standard searching algorithms: binary search linear search Standard sorting algorithms: bubble sort merge sort insertion sort I can produce algorithms using: pseudocode using flow diagrams I can Interpret, correct or complete algorithms. | | | | | |
| 2.2 Programming techniques | I can explain: The use of variables, constants, operators, inputs, outputs and assignments I can use the three basic programming constructs used to control the flow of a program: sequence selection iteration (count and condition controlled loops) I can use: basic string manipulation basic file handling operations: open read write close Records to store data SQL to search for data I can use arrays (lists) when solving problems, including both one and two dimensional Arrays I can use sub programs (functions and procedures) to produce structured code | | | | | |

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| | <p>I can explain the use of data types: integer real boolean character and string casting</p> <p>I can use the common arithmetic operators</p> <p>I can use the common Boolean operators.</p> | | | | | |
| <p>2.3 Producing robust programs</p> | <p>I can create defensive designs: input sanitisation/validation planning for contingencies anticipating misuse authentication maintainability: comments indentation</p> <p>I can explain the purpose of testing</p> <p>I can compare the types of testing: iterative final/terminal</p> <p>I can identify syntax and logic errors</p> | | | | | |
| <p>2.4 Computational logic</p> | <p>I can explain why data is represented in computer systems in binary form</p> <p>I can create simple logic diagrams using the operations AND, OR and NOT</p> <p>I can complete truth tables</p> <p>I can combine Boolean operators using AND, OR and NOT to two levels</p> <p>I can apply logical operators in appropriate truth tables to solve problems</p> <p>I can use computing-related mathematics: Add + Subtract - Divide / Multiply (times) * Exponentiation (^) MOD DIV</p> | | | | | |
| <p>2.5 Translators and facilitators of languages</p> | <p>I can explain the characteristics and purpose of different levels of programming language, including low level languages, the purpose of translators, the characteristics of an assembler, a compiler and an interpreter</p> <p>I can explain the common tools and facilities available in an integrated development environment (IDE): editors error diagnostics run-time environment translators.</p> | | | | | |

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| <p>2.6 Data representation</p> | <p>I can calculate Units: bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte, petabyte I can describe why data needs to be converted into a binary format to be processed by a computer"</p> <p>I know: 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</p> <p>How to convert from binary to hexadecimal equivalents and vice versa Check digits.</p> <p>I can explain: The use of binary codes to represent characters</p> <p>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).</p> <p>Images I can explain: 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.</p> <p>Sound I can describe: 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:</p> <p>Sample size Bit rate Sampling frequency.</p> <p>Compression I can explain: The need for compression Types of compression: lossy lossless</p> | | | | | |
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