

Year 10 – Big Picture (GCSE Computing 2023)

Y10 Autumn 01 Weeks 1 – 7 (7 weeks)	Y10 Autumn 02 Weeks 8 – 15 (8 weeks)
<p>Component 1 – Computer Systems</p> <p>1.1 – Systems architecture</p> <p>1.1.1 Architecture of the CPU - Purpose of CPU & fetch-execute cycle</p> <p>1.1.1 Architecture of the CPU - Common CPU components and their functions: ALU CU cache registers</p> <p>1.1.1 Architecture of the CPU - Von Neumann Architecture, MAR, MDR, Program Counter and Accumulator</p> <p>1.1.2 CPU performance - How common characteristics of CPUs affect their performance: clock speed, cache size and number of cores</p> <p>1.1.3 Embedded Systems - The purpose and characteristics of embedded systems</p> <p>1.2 Memory and Storage</p> <p>1.2.1 Primary Memory (storage) – The need for primary storage</p> <p>1.2.1 Primary Memory – The difference of RAM and ROM</p> <p>1.2.1 Primary Memory – The purpose of ROM and RAM.</p> <p>1.2.1 Primary Memory – The virtual memory</p> <p>1.2.2 Secondary Storage – The need for secondary storage</p> <p>1.2.2 Secondary Storage - Common types of storage: optical, magnetic and solid state</p> <p>1.2.2 Secondary Storage - advantages and disadvantages of different storage media relating to these characteristics: capacity, speed, portability, durability, reliability, cost.</p>	<p>1.2.3 Units of data storage - Data representation</p> <p>Units</p> <p>Bit</p> <p>Byte</p> <p>KB to TB</p> <p>1.2.4 Data storage - How to convert positive denary whole numbers and vice versa & Why Binary</p> <p style="text-align: center;">Binary representation of ASCII in the exam will use 8 bits</p> <p>Binary Addition & Shifts</p> <p>Hexadecimal & Check Digits</p> <p>Character sets</p> <p>Images</p> <p>Sound</p> <p>Data Calculations</p> <p>1.2.5 Compression - The need for compression</p> <p>1.2.5 Compression - Types of compression: Lossy and lossless.</p>
<p>Assessment Objectives</p> <p>This is the knowledge, application and skills assessed by the Big Test:</p> <p>Mini Test on 1.1.1 -1.2.2 Paper 1</p>	<p>Assessment Objectives</p> <p>This is the knowledge, application and skills assessed by the Big Test:</p> <p style="background-color: yellow;">BIG TEST WK 8: 1.1-1.2</p> <p>Mini Test on 1.2.3 – 1.2.5 Paper 1</p>

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Y10 Spring 01 Weeks ...-... (6 weeks)	Y10 Spring 02 Weeks ...- ... (5 weeks)
<p>Computer networks, connections and protocols</p> <p>1.1 Networks and Topologies - the LAN and WAN</p> <p>1.3.1 Factors that affect the performance of networks</p> <p>1.3.1 Different roles of computers in a client-server and a peer-to-peer network.</p> <p>1.3.1 Hardware needed to connect stand-alone computers into a LAN, includes: wireless access points, routers, switches, NIC and Transmedia media.</p> <p>1.3.1 Internet as a worldwide collection of computer networks: DNS, Hosting, the cloud and web server and clients</p> <p>1.3.1 Star and Mesh network technologies</p> <p>1.3.2 Wired and wireless networks, protocols and layers.</p> <p>1.3.2 Modes of connections: wired ethernet, wireless wi-fi and Bluetooth ; Encryption</p> <p>1.3.2 IP Addressing and MAC addressing; (IPv4 and IPv6)</p> <p>1.3.2 Network Standards</p> <p>1.3.2 Common protocols including: TCP/IP, HTTP. HTTPS, FTP, POP, IMAP, SMTP.</p> <p>1.3.2 Concept of layers; How and Benefits</p>	<p>1.4 Network security</p> <p>1.4.1 Threats to computer systems and networks – forms of attacks: malware, social engineering, brute-force attacks, denial of service attacks, data interception and theft, SQL injection.</p> <p>1.4.2 Identifying and preventing vulnerabilities – common prevention methods: penetration testing, anti-malware software, firewalls, user access levels and passwords, encryption and physical security.</p> <p>1.5 Systems Software</p> <p>1.5.1 Operating systems – purpose and functionality of operating systems: user interface, memory, peripheral, user and file management.</p> <p>1.5.2 Utility Software – purpose and functionality of utility software: encryption software, defragmentation and data operations</p>
<p>Assessment Objectives</p> <p>This is the knowledge, application and skills assessed by the Big Test:</p> <p>Mini Test 1.3.</p>	<p>Assessment Objectives</p> <p>This is the knowledge, application and skills assessed by the Big Test:</p> <p>Mini Test 1.4 Big Test 2: 1.1-1.5</p>

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Y10 Summer 01 Weeks ... – ... (5 weeks)	Y10 Summer 02 Weeks ... – ... (7 weeks)
<p>Content 2 – Computational thinking, algorithms and programming</p> <p>1.6 Ethical, legal, cultural and environmental impacts of digital technology</p> <p>1.61 Impacts of digital technology on wider society including:</p> <p>Ethical & legal issues</p> <p>Cultural, Environmental and privacy issues</p> <p>Legislations relevant to Computer Science:</p> <p>The Data Protection Act 2018, Computer Misuse Act 1990, Copyright Designs and Patents Act 1988</p> <p>Software licences (i.e. open source and proprietary software)</p> <p>2.1.1 Algorithms – Computational Thinking: Abstraction, Decomposition & Algorithmic thinking</p> <p>2.1.1 Searching and sorting algorithm: Searching algorithms: Binary and linear search</p> <p>2.1.2 Designing, creating and refining algorithms - Identify the inputs, processes, and outputs for a problem, structure diagrams.</p> <p>2.1.2 Algorithms – create, interpret, correct or complete and refine algorithms using: Pseudocode, flowcharts and high/low -level language</p> <p>2.1.4: Create, interpret, correct, complete, and refine algorithms using: o pseudocode o flowcharts o reference language / high level programming language, trace tables</p>	<p>2.2 Programming Fundamentals</p> <p>2.2.1 Programming fundamentals – The use of variables, constants, operators, inputs, outputs and assignments.</p> <p>2.2.1 The use of the three basic programming constructs: sequence, selection and iteration.</p> <p>2.2.1 The common arithmetic operators, comparison and Boolean operators AND, OR and NOT.</p> <p>2.2.2 Data types – include: integer, real, casting, character and string.</p> <p>2.2.3 Additional programming techniques</p> <p>2.2.3 The use of basic string manipulation</p> <p>2.2.3 The use of basic file handling operation: open, read, write and close.</p> <p>To Be Covered Sept 2025</p> <p>2.3 Producing Robust Programs</p> <p>2.3.1 Defensive Design Considerations, anticipating misuse and authentication.</p> <p>2.3.1 Defensive Design - Input validation and maintainability include: use of sub programs, naming conventions, indentation and commenting.</p> <p>2.3.2 Testing - the purpose of testing: final, iterative & terminal</p> <p>2.3.2 Testing – identifying syntax and logic error</p> <p>2.3.2 Selecting and using suitable test data: Normal, boundary and invalid and erroneous.</p> <p>2.4 Boolean Logic</p> <p>2.4.1 Simple logic diagrams using AND, OR and NOT</p> <p>2.4.1 Truth tables and combining Boolean operators using AND, OR and NOT.</p> <p>2.4.1 Applying logical operators in the truth to solve problems</p> <ul style="list-style-type: none"> • Understanding of how to create, complete or edit logic diagrams and truth tables for given scenarios • Knowledge of the truth tables for each logic gate <p>2.5 Programming languages and Integrated Development Environments</p> <p>2.5.1 Languages – characteristics and purpose of different level of programming language: High-level & low-level languages.</p> <p>2.5.1 The purpose of translators and characteristics of a compiler and an interpreter.</p>



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	<p>2.5.2 The Integrated Development Environment (IDE) - common tools and facilities available in an IDE: editors, error diagnostics</p> <p>2.5.1 Languages – characteristics and purpose of different level of programming language: High-level & low-level languages.</p> <p>2.5.1 The purpose of translators and characteristics of a compiler and an interpreter.</p> <p>2.5.2 The Integrated Development Environment (IDE) - common tools and facilities available in an IDE: editors, error diagnostics, run-time environment and translators., run-time environment and translators.</p>
<p>Assessment Objectives This is the knowledge, application and skills assessed by the Big Test:</p> <p>Mini Test: 1.6 Mini Test 2.1</p>	<p>Assessment Objectives This is the knowledge, application and skills assessed by the Big Test:</p> <p>Dates to be decided</p> <p>Big Test: Mock Exam Paper 1 and Paper 2 (2.1-2.3)</p>
Big Test	