

	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
10	<p>Boolean Logic Basic Gates, truth tables, interpret complex logic circuits, create, modify and interpret complex circuits and truth tables,</p> <p>Units of storage, conversion to binary, binary and denary conversions, hexadecimal conversion, binary addition, overflow errors and binary shift</p> <p>Character sets, images, image calculation, colour depth, metadata</p> <p>Algorithms data types, variables, commands, arithmetic operators, string handling</p>	<p>Sound, sound file in binary, amplitude and calculating file size,</p> <p>python- selection, logical operators, random number generator, string handling, iteration (for and while), write programs using sequence, selection and iteration, functions and procedures, local and global scope variables, writing programs using functions and procedures.</p>	<p>Architecture of the CPU and purpose, FE Cycle, Registers of the Von Neumann Architecture.</p> <p>Python Count Controlled programs, condition controlled programs,</p> <p>Register and Units of the CPU, cache, clock speed and cores,</p> <p>Python 1 and 2 dimensional arrays, embedded systems,</p> <p>Primary memory, purpose, virtual memory</p>	<p>Primary storage and virtual memory</p> <p>Writing and tracing algorithms using flowcharts</p> <p>The need for secondary storage, memory – magnetic, optical and solid state, storage characteristics – capacity, speed and portability</p> <p>Python – validation, user inputs, full programs with validation</p>	<p>Networks and topologies, Internet, IP addresses, DNS, Network interface cards, MAC addressing packet switching, LANs and Hardware, standards, Star and Mesh topologies, Client server networks, peer to peer networks</p> <p>Hosting, the cloud, web servers and clients</p>	<p>Transmission media advantages and disadvantages, factors that affect network performance</p> <p>Bluetooth, Wi-Fi, Ethernet, use of addressing in these technologies, dynamic and static addressing, use of encryption in networking, hardware standards in wired and wireless networks, use of protocols – SMTP, POP, IMAP, FTP, HTTP, HTTPS, and TCP, concept of layers</p> <p>Python – use of file handling, summer project tellium</p>
	<p>Skill development Draw and interpret logic diagrams and truth tables, convert binary, denary and hexadecimal, binary addition, programming</p>	<p>Skill development Algorithms, random number programs, utilise Boolean operators, iteration, strings, sub routines in programming</p>	<p>Skill development Understand the use of the fetch execute cycle, count controlled loops, arrays and lists while programming</p>	<p>Skill development Write and trace algorithms using flowcharts, validate user inputs in programming,</p>	<p>Skill development Understand the range of networks and topologies.</p>	<p>Skill development Accessing the exam style questions, how to revise and prepare for mock exams</p>
	<p>Assessment Boolean Logic, Character sets, odd or even programming</p>	<p>Assessment Data Representation, username programming, writing a calculator program</p>	<p>Assessment Systems architecture, arrays,</p>	<p>Assessment Virtual memory, secondary storage, memory and storage</p>	<p>Assessment DNS, LAN hardware, Network hardware,</p>	<p>Assessment Networking, End of Year mock, protocols,</p>
11	<p>Threats to CS and Networks, DDOS, DOS, Data interception, SQL injection, vulnerabilities and prevention (passwords, encryption and physical security), defensive design (anticipating misuse and authentication.</p> <p>Operating systems (user interfaces, memory management and multi-tasking), peripheral management, user and file management, utility software, encryption software, defragmentation and data compression</p>	<p>Ethical issues, legal issues and cultural issues, environmental issues, privacy issues. Legislation data protection, computer misuse act, copyright, open source vs proprietary.</p> <p>Testing – purpose, iterative and final, identifying syntax and logic errors, types of testing (normal, boundary and invalid / erroneous), refining algorithms</p> <p>Languages – high and low level languages, characters of, purpose of translators, characteristics of compilers and interpreter, IDEs (Editors, error diagnostics)</p>	<p>IDEs – Run time environment and translators</p> <p>Searching and sorting, bubble sort (performing and programming), merge sort (pseudocode) linear search, binary search</p>	<p>Revision:</p> <p>Systems architecture, embedded systems, memory, storage, binary, denary, hexadecimal conversions, binary shifts, images and sound, networks, topologies and hardware, transmission media and standards, protocols and layers, threats and prevention, operating systems and utility software, ethics and legislation, algorithms and computational thinking, functions and procedures.</p>	<p>Revision:</p> <p>Programming – file and string handling, robust programming, logic gates and truth tables, high- and low-level languages, IDEs</p>	
	<p>Skill development Implement validation on user inputs while programming, practice exam questions</p>	<p>Skill development Practice exam questions, focus on the explain element</p>	<p>Skill development Manually complete bubble sorts and trace tables, complete linear and binary search, use of algorithms.</p>	<p>Skill development Practice exam questions, programming skills, preparation for GCSE papers</p>	<p>Skill development Practice exam questions, programming skills, preparation for GCSE papers</p>	<p>Skill development</p>

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	Assessment Threats to CS and networks, systems security, operating systems, system software	Assessment Ethics, testing, languages,	Assessment Languages, merge sort, searing and sorting,	Assessment Practice exam papers / questions	Assessment Practice exam papers / questions	Assessment
Y12	Unit 2 – Problem Solving: Computational thinking, logic problems, construct hierarchy charts when designing programs, algorithms, interpret algorithms using pseudocode, hand trace algorithms, abstraction, create programs in C# Unit 3 Data Representation: Number types, bases, convert between binary, denary and hexadecimal, character codes, binary fractions (mantissa and exponent, fixed- and floating-point binary, relative errors, rounding, normalisation and overflow, bitmapped images, calculating storage requirements, error detections, compression, algorithms	Unit 12 – Object Orientated programming: Basic concepts of OOP, understand association, compositions, aggregation, polymorphism and overriding, be aware of OOP design principles, draw and interpret class diagrams, creating OOP programs Unit 4 – Hardware and Software: Hardware, software, applications, operating systems and utility software, resource management, processor scheduling, low and high level programming languages, assembly languages, source object and byte code, logic gates, Boolean expression, draw logic circuits Boolean algebra, Boolean expressions	Unit 12 – Object Orientated programming: Creating OOP programs Unit 7 Data Structures: Queues, abstract data types, lists, stacks and dynamic and remove how to use tables and dictionaries, graphics and their uses Unit 4 – Hardware and Software: Boolean algebra Unit 5 – Computer Organisation and Architecture: internal computer hardware, processors, memory, differing architecture, stored program concept, the FE Cycle, instruction sets, interrupts and assembly language	Unit 7 – Data Structures: Queues, stacks, and hashing algorithms, trees, vectors and vector notation, Unit 8 – Algorithms: Recursion, big O notation, exponential and logarithmic functions, complexity of algorithms, searching and sorting algorithms, Unit 5 – Computer Organisation and Architecture: Assembly language, inputs and outputs, secondary storage,	Unit 8 – Algorithms: Searching and sorting, graph traversal, Dijkstra’s shortest path algorithm, limits of computational algorithm complexity Unit 11 – Database and Software Development: Data modelling, composite primary and foreign keys, relational databases, normalisation, SQL data retrieval.	NEA Launch Gathering ideas, researching into the problem and current system, compare systems and research key algorithms, setting SMART objectives and software choices, modelling the problem, design solutions
	Skill development Computational thinking, constructing diagrams, producing and interpreting algorithms, using pseudocode, number conversions, and character sets.	Skill development Draw and interpret diagrams, use of Boolean expression and assembly language. using and interpreting assembly language, logic gates, Boolean expression, drawing logic circuits	Skill development Create OOP programs, using stacks and lists , simplify and interpret Boolean algebra and expressions,	Skill development Queues, stacks, and hashing algorithms, trees, vectors and vector notation, using recursion	Skill development Searching and sorting, graph traversal, Dijkstra’s shortest path algorithm, data modelling, relational databases, using SQL,	Skill development NEA skills, year 12 mock exam technique and revision
	Assessment Problem solving, algorithm and merge sort, number types and conversions.	Assessment Text compression, object orientated programming, UML diagrams, programming language, logic gates and Boolean expression.	Assessment Chess, Battleships or Connect 4, stacks and their behaviours, logic gates and Boolean expression, computer organisation and architecture	Assessment Hash tables, data structures, recursive trace table, computer organisation and architecture	Assessment Tracing bubble sort algorithm, DFS and BFS, computer organisation and architecture, storage, databases,	Assessment Year 12 Mock, Project proposal, and analysis of NEA,

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Y13	<p>NEA: Creation of flow charts, pseudocode, implementation, test plans, evaluation, completion and handing of NEA project</p>	<p>Unit 9 – Regular Languages / Prelim Mealy machines, sets, notation and compact representation of a set, cartesian products, subsets, string manipulation, FSM relationships, the Turing Machine, performing simple computations and fixed programs, universal Turing machines, debugging, representing languages, draw syntax diagrams to represent BNF expressions, reverse polish notation, infix form to RPN, creating UML diagrams</p> <p>Unit 11 - Database and Software Development: Use SQL to retrieve data, define a database table, client server database systems, concurrent access, end users, aspects of software development, prototyping, data modelling, evaluating a computer system, problem solving</p> <p>Unit 6: communication and networks: Serial and parallel transmission, synchronous and asynchronous transmission, topologies, client server and peer to peer networking</p>	<p>Prelim: What does each line do? Where are the errors not trapped? Adding basic functionality, adding more complex functionality, creation of board,</p> <p>Unit 6 - Communications and Networks: Wi-Fi and how to secure Wi-Fi connections, CSMA/CA, TRS/CTS, SSIDs, consequences of using technology, legislations, social and cultural issues.</p> <p>Unit 10 - The Internet URL, Domain name and IP address, functions of DNS, internet registries, packet switching and routers, main components of a pack, routing</p>	<p>Unit 12 – Object Orientated programming Big data, domain and co-domain, first class objects, functional application, partial function application, composition of functions, map filter, reduce or folder, higher order functions, list processing, solving problems</p> <p>Unit 10 - The Internet Firewalls, encryption, digital signature certificates, monitoring threats, TCP / IP stack, MAC addressing, ports, SSH, Web addresses, DHCP, NAT, Port Forwarding, client server model web socket protocol, CRUD, JOSON and XML, thin and thick clients</p>	Prelim material and revision	
	<p>Skill development NEA completion</p>	<p>Skill development Databases, interpreting the prelim material</p>	<p>Skill development Programming skill, exam style questions, prelim skills</p>	<p>Skill development Programming skill, exam style questions, prelim skills</p>	<p>Skill development Programming skill, exam style questions, prelim skills</p>	<p>Skill development</p>
	<p>Assessment NEA Completion</p>	<p>Assessment SQL, Turing Machine, database and software development, BNF,</p>	<p>Assessment Paper 1 and paper 2, communications and networks, programming prelim</p>	<p>Assessment Big data, mac addressing, internet, practice exam questions</p>	<p>Assessment Exam preparations</p>	<p>Assessment</p>

