

Year 10 Long Term Plan CS

“Computers are incredibly fast, accurate, and stupid: humans are incredibly slow, inaccurate and brilliant; together they are powerful beyond imagination.” Albert Einstein

Year 10 Intent/End Point: By the end of Year 10 learners will have developed a solid understanding of programming, important algorithms and the fundamentals for how a computer works and represents different digital items. They will also have a solid understanding of how to approach a problem and the stages they should work through to design a solution. A good Computer Science student in Year 10 will have developed problem solving skills and resilience to try and try again when they are faced with tough challenges. They will have a solid understanding of algorithm design and will know examples of common, yet efficient search and sorting algorithms.

	HT1	HT2	HT3	HT4	HT5	HT6	
Unit Title	Re-introduction to Python.	Unit 5 Algorithms	Unit 7 Logic and Languages	Unit 8 Data Representation	Unit 6 Programming	Practical Programming	
Principles that underpin your curriculum	Knowledge	<ol style="list-style-type: none"> Input/output String manipulation Functions Selection Iteration Lists File Handling 	<ol style="list-style-type: none"> Computational Thinking Searching algorithms Sorting algorithms Flow diagrams Pseudocode Trace tables 	<ol style="list-style-type: none"> Logic diagrams Truth tables Defensive design Errors and testing Translators 	<ol style="list-style-type: none"> Units Numbers Characters Images Sound Compression 	<ol style="list-style-type: none"> Programming concepts Sequence and selection Iteration Arrays Sub routines File Handling 	
	Key Terms	<ol style="list-style-type: none"> data types (int, string, Boolean, float/real), Variable, Errors (syntax, runtime, logic), Debug, concatenation, slicing Function/procedure, Parameter Selection (If, elif, else), For/while/repeat until, condition, count controlled. Array, 2d arrays, list Open, write, read, close 	<ol style="list-style-type: none"> abstraction, decomposition, algorithm, binary search, linear search bubble sort, merge sort, insertion sort pseudocode flow diagram trace table, output 	<ol style="list-style-type: none"> Binary, logic gate, NOT, AND, OR, truth table, logic circuit, logic statement, validation, sanitisation, authentication, maintenance, testing syntax error compiler, interpreter, assembler, source code, object code, machine code 	<ol style="list-style-type: none"> Bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte, denary, overflow, hexadecimal, character set, ASCII, Unicode, metadata, pixel, colour depth, resolution, sound sampling, playback lossy, lossless, compression 	<ol style="list-style-type: none"> data type, integer, real, float, Boolean, character, string, variable, constant, concatenation, assignment, selection, comparison operators iteration, arithmetic operators, Boolean operators, data structure, array, record Subroutine, procedure, function, parameter File, open, write, read, close 	<ol style="list-style-type: none"> criteria, analyse, abstraction, decomposition. Pseudocode, flow diagram, ocr reference language data types, Variable, errors debug, concatenation, selection, for/while/repeat until, array, 2d arrays, function/procedure, parameter success criteria, review, brief
	Mid Stake Testing (Purposeful practice)	Small problem solving tasks.	Small assessment sheets.	Small assessment sheets.	Small assessment sheets.	Small assessment sheets.	Small assessment sheets.
	High Stake Testing		Assessment 1		Assessment 2		Assessment 3
	Skills Development	Students will have a solid understanding of programming and will have learnt the development process that can be followed when presented with a problem to solve. They will also have covered common, important algorithms and should be able to apply these to perform tasks and solve problems from memory. They will also have a good fundamental knowledge of how computers represent digital items with the use of binary and should be able to use and understand different number systems such as hexadecimal and denary.					



Year 11 Long Term Plan CS

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Year 11 Intent/End Point: The intention of Year 11 is to cover the remaining content and to allow time to revisit and revise previous learning from Year 10. Students will complete many practise exam questions so that they are prepared for the exam as best as possible. A good computer science student will have a solid understanding of the fundamentals in Computer Science for topics such as system architecture and networking and will be a competent problem solver who can show resilience and determination when faced with a tough challenge.

	HT1	HT2	HT3	HT4	HT5	HT6	
Unit Title	Unit 1 System Architecture	Unit 2 Wired and Wireless Networks	Unit 3 System Software and Security	Unit 4 Ethical, legal, cultural and environmental implications	Revision		
Principles that underpin your curriculum	Knowledge	8. The CPU 9. Function and characteristic of the CPU 10. Memory 11. Storage	1. The internet 2. Local area networks 3. Wireless networking 4. Client server/ peer to peer 5. Protocol and layers	1. Network threats 2. Identifying and preventing vulnerabilities 3. Operating system software 4. Utility software	1. Ethical and cultural issues 2. Computers in the modern world 3. Legislation and privacy	All content covered, starting with units covered in year 10.	
	Key Terms	1. CPU, fetch, decode, execute, program counter (PC), memory address register (MAR), memory data register (MDR), Control Unit, Arithmetic-Logic Unit (ALU), accumulator, instructions, embedded, 2. memory, clock speed, cache, core, RAM, ROM, 3. virtual memory, flash memory, input devices, output devices, 4. secondary storage, optical, magnetic, solid state, pits, lands, capacity, speed, portability, durability, reliability.	1. LAN, WAN, topology, star, mesh 2. hub, switch, router 3. wireless access point, NIC, MAC address, packet, protocol, layer, encryption, hosting, Cloud, Ethernet, frequency, channels, WAP 4. Internet, broadband, www, peer-to-peer, client-server 5. http, https, FTP, POP, IMAP, SMTP, TCP, IP addressing, domain name, DNS server	1. malware, phishing, brute force attack, denial of service attack, data interception, SQL injection, network policy, 2. penetration testing, network forensics, firewall, user access level 3. operating system, user interface, memory management, multi-tasking, peripheral management, interrupt, 4. defragmentation, data compression, symmetric encryption, asymmetric encryption, private key, public key, cypher text, plaintext, full back up, incremental back up;	1. Ethical issues, legal issues, cultural issues, environmental issues, 2. privacy issues, 3. data protection act 2018, computer misuse act 1990, copyright and patents act 1988, software licences, open source, proprietary.		
	Mid Stake Testing (purposeful practice)	Mini topic assessments	Mini topic assessments	Mini topic assessments	Mini topic assessments	Exam questions	Exam questions.
	High Stake Testing		Practice Exam 1		Practice Exam 2	Final exams	
Skills Development	Students will develop an in depth knowledge of the theory elements from the course, they will learn all about the internal parts of a computer and how they work as well as the ins and outs of different types of networks (LAN and WAN). They will sit two exams for the course in the summer term so throughout the whole year we will be completing exam questions and building up a bank of resources that they can use for revision.						