

Week	Date	Topic	Topic detail	Revised Y/N?
Half term	25/02/2019	Unit 1	1. Hardware CPU <u>Von Neumann Architecture</u> Clock, Registers, ALU, Cache, Buses, Fetch-Decode-Execute, cores, CISC and RISC,	
			Input and output devices Know of existence of common input and output devices. Understand usage of devices for specific disabilities or use in certain conditions e.g. noise	
			Storage <u>Primary</u> RAM, ROM, Flash, Cache <u>Secondary</u> Magnetic, Optical, Solid state Durability, Capacity, Portability, Speed of access, Cost Storage units – bits, nibbles, bytes, Kbytes up to Yottabytes	
			Other hardware and Embedded systems GPU, sound card, motherboard, devices in the home	
Week 1	04/03/2019		2. Logical operations Logic Operators (Gates) AND OR NOT XOR, Truth Tables Boolean and Boolean Algebra Write Boolean expressions for each type of logic gate, remember how to use the Boolean laws to simplify a Boolean expression.	
Week 2	11/03/2019	3. Communication Networks <u>Network hardware</u> PAN, LAN, WAN, MAN, Switches, Hubs, Routers, Gateways, Bridge, VPN, NIC <u>Topologies</u> Peer to Peer, Ring, Bus, Star, Mesh, WiFi <u>Protocols and procedures</u> Ethernet, Bluetooth, WiFi (801.11), HTTP, HTTPS, POP3, SMTP, IMAP, Packet Switching, TCP/IP 5 layer model, routing, MAC addresses <u>Internet</u> DNS, IP Addresses		
Week 1	18/03/2019	U	Representation of Numbers	

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		4. Organisation and Structure of Data	Use and convert between binary (up to 16 bits), hex, denary. Bit shifting left or right and explain the effect. Binary addition and overflow	
			Representation of Graphics, Sound and Characters <u>Graphics</u> Raster, Vector, Bitmap, pixels, metadata <u>Sound</u> sample rate, sample frequency, metadata <u>Characters</u> ASCII Code, Unicode – adv and disadv <u>Data types</u> Integer, real, string, character, date/time, boolean <u>Data structures</u> One dimensional, two dimensional arrays <u>Validation</u> Range check, type check, format check, presence check, lookup table, check digit. <u>Verification</u> Double keying, proof reading	
Week 2	25/03/2019	5. System Software	Operating System <u>Managing resources</u> Peripherals, spooling, backing store, file compression, defragmentation, manages RAM, security <u>Interfaces</u> WIMP, GUI, CLI, purpose of an interface, customising a GUI <u>Utility Software</u> Virus scanning, firewalls, defrag, compression, system monitoring, task management, disk scanning and repair, system backup	
Week 1	01/04/2019		6. Programming and Software	Programming Characteristics of High level and Low level languages
		Software tools <ul style="list-style-type: none"> <u>IDEs</u> Editor, compiler, interpreter, linker, loader, debugger, trace, break point, variable watch, memory inspector, error diagnost 		
		Program Construction Purpose and use of compilers, interpreters and assemblers <ul style="list-style-type: none"> Stages of compiling Lexical analysis, symbol table construction, syntax analysis, semantic analysis, code generation, code optimisation Programming errors Syntax, runtime/execution, logical, linking, rounding, truncation 		
Week 2	08/04/2019		Data Security	

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		7. Security, Data Management	<ul style="list-style-type: none"> • Awareness of dangers Hacking, viruses, technical breakdown, interception of data, physical theft, data theft from discarded devices • User access levels, encryption (XOR), password strength/integrity 	
			Data Management	
			<ul style="list-style-type: none"> • Backups – Grandfather, father, son process • Archives 	
			Compression	
			<ul style="list-style-type: none"> • Lossy and lossless compression • Calculate compression ratios 	
			Network security	
			<ul style="list-style-type: none"> • Antivirus, firewall, two factor authentication, access levels, passwords • Hacking, viruses, technical breakdown, interception of data • Acceptable Use policies • Disaster recover policies 	
			Cybersecurity	
			<ul style="list-style-type: none"> • Malware, viruses, worm, key loggers, • Protection provided by – firewalls, antivirus, patching out-dated software, security tools, personnel • SQL injection, DoS attack, password based attack, IP address spoofing • User behaviour – social engineering, phishing • Identifying vulnerabilities – Foot printing, penetration testing • The role of internet cookies 	
Week 1	15/04/2019	8. Ethical, Legal, Environmental	Ethical	
			<ul style="list-style-type: none"> • Digital divide, working conditions, environmental issues, privacy of data, black/white/grey hat hacking • Benefits of acceptable use polices and codes of conduct 	
			Legislation	

Week	Date		Topic	Topic detail	Revised Y/N?
				<ul style="list-style-type: none"> • Data Protection Act • Computer Misuse Act • Copyright Act • Regulation of Investigatory Powers Act • Freedom of Information Act <hr/> <p>Environmental issues</p> <ul style="list-style-type: none"> • Impacts on society Technotrash/Ewaste, increased energy use in homes, global assembly lines, mining of rare earth elements, energy consumption by server farms. 	

Week	Date	Topic	Topic detail	Revised Y/N?
Week 2	22/04/2019	Algorithms and Assembly language	Algorithms and Programming constructs <ul style="list-style-type: none"> Identify and explain Sequences, selection, iteration (loops), counts, rogue values, constants. Follow and make changes to algorithms Dry run and state outputs of an algorithm Identify and explain the use of local and global variables Describe the scope and lifetime of variables in programs Explain the importance of self-documenting identifiers and annotation with algorithms and programs Explain and use routines for string handling – string passing, concatenation, string comparison, substitution, trimming, measuring length. Mathematical operations Identify and explain the use of logical operators – AND, OR, NOT, XOR Sorting – merge sort, bubble sort Explain and use linear and binary search algorithms 	
			Object Orientated Programs (Greenfoot) Identify and explain constructs in object orientated programs:- <ul style="list-style-type: none"> Superclass, class, object, property, method, comment 	
Week 1	29/04/2019	HTML, Java, Assembly language	See separate revision guidance sheets for a breakdown of the programming codes and procedures you are expected to remember.	

Unit 2