

Year 10		Curriculum Checkpoints: What do students know and what can they do?				
Computer Science		Developing	Securing	Mastering	Excelling	
AF1	1.1 Systems Architecture	1.1.1 Architecture of the CPU	Briefly explain what happens in each stage of the fetch-execute cycle.	What actions occur at each stage of the fetch-execute cycle.	The purpose of each register and what it stores (data or address).	The role/purpose of each component and what it manages, stores, or controls during the fetch-execute cycle.
		1.1.2 CPU performance	List the common characteristic to affect CPU performance.	Understanding of each common characteristic to affect CPU performance.	Explain effects of changing any of the common characteristics on CPU performance, either individually or in combination.	Explain and justify effects of changing all common characteristics on CPU performance, both individually and in combination.
		1.1.3 Embedded systems	List some examples of embedded systems.	Understanding of what embedded systems are.	Explain what embedded systems are and identify most of the characteristics of an embedded system.	Explain with real world examples what embedded systems are and identify all characteristics of an embedded system.
AF2	R094 NEA Visual Identity and Digital Graphics	1.2.1 Primary storage (Memory)	Understanding of why computers have primary storage.	Explain the differences between RAM and ROM.	Explain in detail the different characteristics of RAM and ROM.	Why virtual memory may be needed in a system and how data is transferred between it and RAM.
		1.2.2 Secondary storage	Understanding of why computers have secondary storage. List the three different storage technologies.	Explain differences between each type of storage technology/device. List some of the secondary storage characteristics.	Be able to compare advantages and disadvantages for each storage technology and device. Explain most of the secondary storage characteristics	Be able to apply their knowledge of secondary storage technology and devices in context within scenarios
		1.2.3 Units	Order the different units of storage when given them in a list. Knows all data must be in binary for a computer to understand.	List most of the data storage units however these are not always in the correct order.	Can list in order all of the data storage units. Explain why data needs to be in binary format for a computer to understand.	Can list in order all of the data storage units. Calculate required storage capacity for a given set of files, e.g. image, sound, text files.
		1.2.4 Data storage	Knowledge of the three different number systems, binary, denary and hexadecimal. Convert a binary number into denary.	Convert binary numbers to both denary and hexadecimal. Attempts to convert denary and hexadecimal numbers to binary.	Convert any number between 0 and 255 between binary, denary and hexadecimal accurately every time.	Understand the effect of a binary shift (both left or right) on a number and carry out a binary shift (both left and right).
		1.2.5 Compression	Knowledge of the two different types of compression.	Explain the characteristics of the two compression methods.	Explain the advantages and disadvantages of the two compression methods.	Explain the effects on the file for each type of compression and be able to select the appropriate type of compression for a scenario.
AF3	R094 NEA Visual Identity and Digital Graphics	1.3.1 Networks and topologies	Explain the characteristics of LANs and WANs including common examples of each. Identify the differences between a star and mesh topology.	The tasks performed by each piece of hardware. Explain the different advantages and disadvantages of star and mesh topologies.	Understanding of different factors that can affect the performance of a network. Explain the different advantages and disadvantages of cloud storage.	Explain the role of the Domain Name Server, URLs and IP addresses to send and display webpages and files over the internet. Apply understanding of networks to a given scenario.
		1.3.2 Wired and wireless networks, protocols and layers	Explain what an IP and MAC address are. List some of the different protocols used to communicate.	Explain what a protocol is and list most of the protocols. Explain what encryption is and why it is needed.	Explain the differences between an IP address and a MAC address and how they are used by different network hardware. Compare benefits and drawbacks of wired versus wireless connection.	Apply understanding of the different protocols to a given scenario. Explain how layers are used in protocols and the benefits of using layers.

AF4	1.4 Network Security	1.4.1 Threats to computer systems and networks	List some of the threats to network security, e.g. viruses, phishing, etc.	Explain a number of the threats to network security and how they work.	Identify and explain how all the different network security threats work and what their purpose is.	Apply understanding of network security threats and their purposes to different scenarios.
		1.4.2 Identifying and preventing vulnerabilities	List some of the common prevention methods and explain how they work.	Match appropriate prevention methods with network security threats, e.g. strong passwords for brute force attacks.	Explain each prevention method and how they remove vulnerabilities and link them to the appropriate network security threats.	Explain and justify the appropriate prevention method for a given scenario and network threat.
AF5	1.5 System Software	1.5.1 Operating systems	Know what the operating system is and list the functions of one.	Explain the purpose of an operating system and most of the functions.	Explain the purpose of an operating system and each of the functions of one.	Explain why each function of an operating system is important to the running of the system.
		1.5.2 Utility software	Understand computers often come with utility software, and how this performs housekeeping tasks.	Describe the three main utility software; encryption, defragmentation and data compression.	Explain the purpose and why we use encryption, defragmentation and data compression software.	Justify why the different utility software are needed to protect and maintain a computer system.
AF6	1.6 Ethical, Legal, Cultural and Environmental Impacts of Digital Technology	Impacts of digital technology on wider society	Understand the terms ethical, cultural, environmental and privacy issues.	Apply the different issues to a technological problem.	Knowledge of a variety of examples of digital technology and how this impacts on society.	Evaluate and justify the impact of digital technology on wider society.
		Legislation relevant to Computer Science	Identify which Computer Science legislation applies to a given scenario.	Explain the need to license software and the purpose of a software licence. Explain the difference between open and proprietary software.	Explain the purpose of each piece of legislation and the specific actions it allows or prohibits.	Recommend a type of licence for a given scenario including benefits and drawbacks.