HGS Curriculum Map Key Stage 4

Year Group: 10 Computer Science GCSE - Spring

Time period	Spring 1 6 weeks	Spring 2 6 weeks
Topics/ sub-topics	Systems Software and Security	Ethical, Legal, Cultural and Environmental Issues
Purpose	This is a theoretical unit, with two main themes. The first looks at network threats, ways of identifying them and preventing vulnerabilities. The second topic covers operating systems and utility software.	The unit investigates different computer technologies and applications and the ethical, environmental and legal considerations surrounding them.
Crucial Learning	**Students will be able to:** • list some of the threats posed to networks, including malware and phishing • explain briefly what is meant by phishing and how to keep data safe from phishing attacks • list precautions which can be taken to keep data safe from hackers including anti-malware software, firewalls, user access levels, passwords and encryption • list the functions of an operating system: user interface, memory management, multi-tasking, peripheral management, user and file management • explain briefly what is meant by memory management and multi-tasking • describe briefly the purpose of encryption, defragmentation and data compression software • describe different types of user interface **Most students will be able to:** • describe briefly threats posed to networks including brute force attacks, denial of service attacks, data interception and theft, poor network policy • describe ways of identifying and preventing network vulnerabilities, including the use of passwords, encryption, penetration testing, network forensics and network policies • explain what is meant by a social engineering attack and give examples • explain what is meant by a Denial of Service attack and brute force attack	**At the end of this Unit all students should be able to:** • List some ethical, legal, cultural or environmental issues in relation to a given scenario • List some privacy issues in relation to a given scenario • Choose from a given list, which Act is relevant to a particular scenario • List one attribute and advantage of open source software and proprietary software **Most students will be able to:** • Describe some ethical, legal, cultural and/or environmental issues in relation to a given scenario • Describe some privacy issues in relation to a given scenario • Describe the differences between open source and proprietary software and give advantages of each **Some students will be able to:** • List the clauses of the Data Protection Act and Computer Misuse Act and give examples of situations in which they are relevant • Evaluate the impact of and issues related to the use of computers in society

	• describe the basic functions of an operating system: user interface, memory management, multi-tasking, peripheral management, user and file management • describe utility system software: encryption software, defragmentation, data compression • describe methods of backup (full and incremental) **Some students will be able to:** • explain the concept of SQL injection • explain the need for the following functions of an operating system: memory management, peripheral management, multi-tasking and user management • Explain briefly why increasing the length of an encryption key increases the strength of encryption	
Sequence	**Prior Knowledge** • At KS3 pupils are taught about the hardware and software components that make up computer systems, and how they communicate with one another and with other systems.	**Prior Knowledge** • In Y7 pupils complete a module called 'Cybersecurity'. It introduces the students to a range of ways to use technology safely and securely. Including discussions about privacy and protecting their online identity.
	Future Learning A-Level Computer Science (AQA): - 4.6.1 Hardware and software - 4.9.3.2 Internet security	**Future Learning** A-Level Computer Science (AQA): - 4.8 Consequences of uses of computing
Skills Acquired	**Computational Thinking Skills:** • Decomposition - breaking down complex problem or system into smaller, more manageable parts • Pattern recognition - looking for similarities among and within problems • Abstraction - focusing on the important information only, ignoring irrelevant detail • Algorithms - developing a step-by-step solution to the problem, or the rules to follow to solve the problem	**Computational Thinking Skills:** • Decomposition - breaking down complex problem or system into smaller, more manageable parts • Pattern recognition - looking for similarities among and within problems • Abstraction - focusing on the important information only, ignoring irrelevant detail • Algorithms - developing a step-by-step solution to the problem, or the rules to follow to solve the problem

Assessment:	Assessment	Assessment
Formative & summative	**Verbal Feedback**: Regular use of peer, self and teacher feedback **Written Feedback:** Individual feedback of home learning assessments in the Showbie 'Marking and Feedback' folder. Students have dedicated improvement and reflection time at the start of each lesson. **Learning Grids:** - 1.6 System Security - 1.7 System Software **Topic Tests:** - 1.5 System Security - 1.6 System Software **SIMS:** - SPR 1 OGCU	**Verbal Feedback**: Regular use of peer, self and teacher feedback **Written Feedback:** Individual feedback of home learning assessments in the Showbie 'Marking and Feedback' folder. Students have dedicated improvement and reflection time at the start of each lesson. **Learning Grids:** - 1.8 Ethical, Legal, Cultural and Environmental Concerns **Topic Tests:** - 1.7 Ethical, Legal, Cultural and Environmental Concerns **SIMS:** - SPR 2 OGCU