Curriculum map – Computer Science

YEAR 11	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC(s)	**Security** • What is hacking? • Threats to a network and preventions • Network Forensics • Physical Security **Algorithms** • Merge Sort • Insertion Sort • Binary Search • Linear Search **Programming** • File Handling CSV • Programming Project Zork (Log in system Defensive Design, robust programming, validation) **Programming Worksheets (Solidifying Theory)** • Variables • Data Types • Selection	**Software** • Types of software • MUMPUF • Memory Management & Hardware management • Unser interfaces • Peripheral management, File management and User Management • Utility Software **Programming** • Case Statements • SQL • Programming Project Zork (Procedures and Functions) **Programming Worksheets** • Arithmetic operators • While Loops • For Loop	**Levels of Language** • Levels of Language • Translators and Compilers **Algorithms** • Structure Diagrams • Trace Tables **Programming** • Programming Project Zork **Programming Worksheets** • Arrays • Sub Programs • File handling	**Revision** **Exam Skills** • **Computer Systems** • **Main memory, storage and units** • **Networks** • **Security** • **Software** • **Ethics**	Revision Exam Skills • **Algorithms** • **Programming** • **Robust Programs** • **Logic** • **Levels of Language**	GCSEs

What students will know	**Security** • Threats posed to devices/systems • Knowledge and principles of each form of attack, including how the attack is used and the purpose of the attack. • Malware • Social engineering • Brute force • Denial of service • Data interception and theft • The concept of SQL injection. • Identifying vulnerabilities • Understanding how to limit threats, methods to remove vulnerabilities and how to limit the attack • Penetration testing • Anti-Malware • Firewalls • User access levels • Passwords • Encryption • Physical security **Algorithms** Understand the main steps of each algorithm Understand the pre-requisites of an algorithm • Merge Sort • Insertion Sort • Binary Search • Linear Search **Programming** • File Handling CSV • Programming Project Zork (Log in system Defensive Design, robust programming, validation) **Programming Worksheets (Solidifying Theory)** • The use of variables, constants, inputs and outputs and assignments. • Global vs local variables (sub-programs) • Data Types and casting • The use of selection to control the flow of a program. • Comparison operations • Boolean operators use in selection	**Software** • The function and purpose of what an operating systems does • The features of an interface • Memory management and its use in multitasking. • Data is transfer between devices and the processors • User management functions – allocation of accounts, access rights, security. • File management, naming, allocating to folders, moving files, saving. • The purpose of utility software to create housekeeping tasks • Utility software, encryption, defragmentation, compression. **Programming** • The use of selection (Case statements to control the flow of a program) • The use of records to store data • The use of SQL to search for data **Programming Worksheets (Solidifying theory)** • The use of Arithmetic operators including MOD and DIV • The user of iteration to control the flow of a program (While Loops and For Loops)	**Levels of Language** • Characteristics and differences high and low level languages • The need for translators • The benefits and drawbacks of a complier and an interpreters. **Programming Worksheets** • The use of arrays including 2D arrays • They use of Sub Programs (procedures and Functions) • The use of File handling Students will also revisit random number generation.	Solidifying previously taught content. How to use command words to unlock exam questions.	Solidifying previously taught content. How to use command words to unlock exam questions.	•

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What students will be able to do	**Algorithms** • Apply the searching and sorting algorithms to a set of data. • Identify the algorithms if given the code for it. **Programming** • CSV Files • Use basic file handling operations • Open • Read • Write • Close Design and refine algorithms which incorporate elements of robust programs, defensive design, input validation and authentication.	**Programming** • Create case statements and convert a case statement to if statements and visa-versa. **SQL:** • Create SQL statements to query a data base. Using SELECT, FROM, WHERE Design and refine algorithms which incorporate elements of robust programs, defensive design, input validation, authentication, case statements and SQL databases (beyond the scope of the GCSE)	**2.1 Algorithms** • Produce a Structure Diagram • Produce and complete Trace Tables **Programming** Students should be applying previously taught programming skills to the new program ZORK. Design and refine algorithms applying ALL programming skills from across the course.	Solidifying previously taught content. Apply knowledge to exam questions.	Solidifying previously taught content. Apply knowledge to exam questions.	