

Curriculum Overview

Computer Science

KS3

	Year 7	Year 8	Year 9
Half term 1	<p>Digital Literacy Overview: Understanding how to use technology safely and effectively. Areas of Interest:</p> <ul style="list-style-type: none"> Using email and online platforms responsibly File management and cloud storage Understanding digital footprints <p>Skills Learned: Basic ICT skills, safe online practices.</p>	<p>Hardware Overview: Understanding physical components of a computer. Areas of Interest:</p> <ul style="list-style-type: none"> Input/output devices CPU, memory, storage Peripheral devices <p>Skills Learned: Identifying hardware and its purpose.</p>	<p>Computer Security Overview: Protecting systems and data from threats. Areas of Interest:</p> <ul style="list-style-type: none"> Malware and phishing Encryption and passwords Cybersecurity best practices <p>Skills Learned: Identifying risks and securing devices.</p>
Half term 2	<p>E-Safety and Digital Images Overview: Staying safe online and learning how images are created and edited. Areas of Interest:</p> <ul style="list-style-type: none"> Cyberbullying and privacy settings Copyright and image rights Basic image editing tools <p>Skills Learned: Safe social</p>	<p>Micro-bits Overview: Programming small devices for real-world tasks. Areas of Interest:</p> <ul style="list-style-type: none"> Sensors and LEDs Block and Python coding for Micro-bit Physical computing projects <p>Skills Learned: Writing code for hardware interaction.</p>	<p>Networking Overview: How computers connect and share data. Areas of Interest:</p> <ul style="list-style-type: none"> LAN, WAN, PAN and the internet IP addresses and protocols Network hardware (routers, switches)

	media use, image manipulation basics.		Skills Learned: Understanding network diagrams and data flow.
Half term 3	<p>Data Representation Overview: How computers store and process data. Areas of Interest:</p> <ul style="list-style-type: none"> • Binary numbers • ASCII and text representation • Images and sound in digital form <p>Skills Learned: Converting between binary and decimal, understanding pixels and file sizes.</p>	<p>Graphics Overview: Creating and editing digital graphics. Areas of Interest:</p> <ul style="list-style-type: none"> • Bitmap vs vector graphics • Layers and effects • File formats and compression <p>Skills Learned: Designing posters and digital art.</p>	<p>Python Programming – IDE Overview: Using an Integrated Development Environment for coding. Areas of Interest:</p> <ul style="list-style-type: none"> • Writing and debugging code • Using libraries • Testing and error handling <p>Skills Learned: Building more complex Python programs.</p>
Half term 4	<p>Computational Thinking / Scratch Overview: Problem-solving using logical steps and block-based coding. Areas of Interest:</p> <ul style="list-style-type: none"> • Decomposition and abstraction • Algorithms and flowcharts • Scratch programming (loops, variables) <p>Skills Learned: Creating interactive animations and games.</p>	<p>Code Programming – Python & Algorithms Overview: Developing coding skills and understanding algorithms. Areas of Interest:</p> <ul style="list-style-type: none"> • Flowcharts and pseudocode • Loops, conditions, and functions • Problem-solving with Python <p>Skills Learned: Writing structured programs.</p>	<p>Hardware, Software, Operating Systems Overview: How computer systems work together. Areas of Interest:</p> <ul style="list-style-type: none"> • Types of software (application vs system) • Role of operating systems • Hardware-software interaction <p>Skills Learned: Explaining system architecture.</p>
Half term 5	<p>Logic Overview: Using logical reasoning in computing. Areas of Interest:</p> <ul style="list-style-type: none"> • Boolean logic (AND, OR, NOT) 	<p>Technology Overview: Exploring emerging technologies and their impact. Areas of Interest:</p> <ul style="list-style-type: none"> • AI and robotics 	<p>Game Development Overview: Designing and coding interactive games. Areas of Interest:</p> <ul style="list-style-type: none"> • Game loops and logic

	<ul style="list-style-type: none"> • Truth tables • Decision-making in programs <p>Skills Learned: Applying logic to coding and problem-solving.</p>	<ul style="list-style-type: none"> • Cloud computing • Ethical issues in tech <p>Skills Learned: Critical thinking about technology use.</p>	<ul style="list-style-type: none"> • Graphics and sound integration • Testing and debugging <p>Skills Learned: Creating playable games - GameMaker</p>
Half term 6	<p>Python Programming</p> <p>Overview: Introduction to text-based coding.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • Variables and data types • Input/output • Simple calculations and loops <p>Skills Learned: Writing Python scripts. Algorithms, Problem solving</p>	<p>Web Development</p> <p>Overview: Building and designing websites.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • HTML and CSS basics • Layout and navigation • Accessibility and usability <p>Skills Learned: Creating simple web pages.</p>	<p>Artificial Intelligence (AI)</p> <p>Overview: Understanding AI and its applications.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • Machine learning basics • AI in everyday life • Ethical considerations <p>Skills Learned: Exploring AI tools and concepts</p>

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KS4

	Year 10	Year 11
Half term 1	<p>Systems Architecture + Data types Overview: How computer systems are structured and operate. Areas of Interest:</p> <ul style="list-style-type: none"> • CPU components (ALU, Control Unit, Registers) • Von Neumann architecture • Fetch-Decode-Execute cycle • Program data types <p>Skills Learned: Explaining how instructions are processed and how hardware interacts.</p>	<p>System Software Overview: Software that manages hardware and provides a platform for applications. Areas of Interest:</p> <ul style="list-style-type: none"> • Operating systems (functions and types) • Utility software (encryption, compression, backup) <p>Skills Learned: Explaining OS roles and utilities.</p>
Half term 2	<p>Memory & Storage + Programming Overview: How data is stored and accessed in a computer. Areas of Interest:</p> <ul style="list-style-type: none"> • RAM vs ROM • Secondary storage (HDD, SSD, optical) • Cloud storage and virtual memory • Sequence / Selection / Iteration <p>Skills Learned: Comparing storage types and their uses.</p>	<p>Programming challenges Overview: Writing and debugging code to solve problems. Areas of Interest:</p> <ul style="list-style-type: none"> • Python programming (loops, functions, arrays) • Structured programming principles • Debugging and testing <p>Skills Learned: Developing efficient, error-free programs.</p>
Half term 3	<p>Data Representation + Programming Overview: How computers represent numbers, text, images, and sound. Areas of Interest:</p> <ul style="list-style-type: none"> • Binary and hexadecimal • ASCII and Unicode • Images (pixels, color depth) and sound (sample rate) 	<p>Ethics & Code Defensibility Overview: Ethical issues and writing secure, maintainable code. Areas of Interest:</p> <ul style="list-style-type: none"> • Privacy and data ethics • Bias in algorithms • Defensive programming (validation, error handling) <p>Skills Learned: Writing robust code and considering ethical implications.</p>

	<ul style="list-style-type: none"> • Arrays <p>Skills Learned: Converting between number systems and calculating file sizes.</p>	
<p>Half term 4</p>	<p>Networking + Programming</p> <p>Overview: How computers communicate and share resources.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • LAN vs WAN • Network hardware (routers, switches) • Protocols (TCP/IP, HTTP, FTP) • Program testing <p>Skills Learned: Understanding network diagrams and data transmission.</p>	<p>Software Development</p> <p>Overview: The process of creating software solutions.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • Development lifecycle (analysis, design, implementation, testing) • Agile vs waterfall methods <p>Skills Learned: Planning and managing projects effectively.</p>
<p>Half term 5</p>	<p>Security</p> <p>Overview: Protecting systems and data from threats.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • Malware types (virus, trojan, ransomware) • Encryption and authentication • Social engineering and phishing <p>Skills Learned: Identifying risks and applying security measures.</p>	<p>Exam Revision & Projects</p> <p>Overview: Consolidating knowledge and applying skills in practical tasks.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • Past paper practice • Extended programming projects • Reviewing key theory topics <p>Skills Learned: Time management, problem-solving, and exam technique.</p>
<p>Half term 6</p>	<p>Legislation</p> <p>Overview: Laws and regulations affecting computer use.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • Data Protection Act • Computer Misuse Act • Copyright and intellectual property 	

Skills Learned: Understanding legal responsibilities in computing.

Curriculum Overview

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KS5

	Year 12	Year 13
Half term 1	<p>CPU, Input, Output, Storage Overview: Understanding how hardware components interact to process and store data. Areas of Interest:</p> <ul style="list-style-type: none"> • CPU architecture (fetch-decode-execute cycle, registers) • Input/output devices • Primary and secondary storage <p>Skills Learned: Explaining hardware roles and performance factors.</p>	<p>Searching + NEA Overview: Algorithms for finding data efficiently. Areas of Interest:</p> <ul style="list-style-type: none"> • Linear search • Binary search <p>Skills Learned: Implementing and comparing search algorithms.</p>
Half term 2	<p>Software & Software Development + Projects Overview: Types of software and how applications are developed. Areas of Interest:</p> <ul style="list-style-type: none"> • System vs application software 	<p>Sorting + NEA Overview: Algorithms for ordering data. Areas of Interest:</p> <ul style="list-style-type: none"> • Bubble sort, insertion sort, merge sort, quick sort

	<ul style="list-style-type: none"> • Development methodologies (Agile, waterfall) • Testing and debugging • Group project • Individual project <p>Skills Learned: Understanding software lifecycle and writing maintainable code.</p> <p>Group project - Skills Learned: Working in teams, managing deadlines, using Git or similar tools.</p> <p>Individual - Skills Learned: Applying full development lifecycle independently.</p>	<p>Skills Learned: Understanding time complexity and efficiency.</p>
<p>Half term 3</p>	<p>Databases</p> <p>Overview: How data is stored, managed, and queried.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • Relational databases and SQL • Normalisation • Data integrity and security <p>Skills Learned: Writing SQL queries and designing efficient database structures.</p>	<p>Boolean / Flip-Flops, Half and Full Adder, Karnaugh Maps</p> <p>Overview: Logic circuits and simplification techniques.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • Boolean algebra • Logic gates and flip-flops • Karnaugh maps for simplification <p>Skills Learned: Designing and simplifying logic circuits.</p>
<p>Half term 4</p>	<p>Web Technologies</p> <p>Overview: Building and managing web-based applications.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • HTML, CSS, JavaScript basics • Client-server model • Web security principles <p>Skills Learned: Creating functional web pages and understanding web architecture.</p>	<p>Networking</p> <p>Overview: Advanced concepts in computer networks.</p> <p>Areas of Interest:</p> <ul style="list-style-type: none"> • Protocols and layers (OSI, TCP/IP) • Network security • IP addressing and subnetting <p>Skills Learned: Designing and troubleshooting networks.</p>

<p>Half term 5</p>	<p>Data Representation Overview: How computers represent different types of data. Areas of Interest:</p> <ul style="list-style-type: none"> • Binary, hexadecimal • Floating point, character sets • Images and sound representation <p>Skills Learned: Converting between formats and calculating storage requirements.</p>	<p>Exam Revision Overview: Consolidating knowledge and practicing exam techniques. Areas of Interest:</p> <ul style="list-style-type: none"> • Past papers and mark schemes • Key theory topics • Time management strategies <p>Skills Learned: Applying knowledge under exam conditions.</p>
<p>Half term 6</p>	<p>Legal, Moral, Ethical Overview: Issues surrounding computing in society. Areas of Interest:</p> <ul style="list-style-type: none"> • Data protection and privacy • Intellectual property • Ethical use of AI and automation <p>Skills Learned: Evaluating the impact of technology on society.</p>	This cell is intentionally left blank with a dark blue background