Subject Curriculum Plan – KS3

Subject	Computer Science	Year Group	7
Subject Intent	The Key Stage 3 Computer Science curriculum aims to develop digitally literate, computational thinkers who can safely, effectively, and creatively navigate the modern digital world. Students build foundational knowledge of online safety, digital literacy, and fundamental computer science concepts including binary representation, hardware architecture, network topologies, and algorithmic thinking. Through practical control systems and block-based logic, students learn to decompose problems, design structured algorithms, and understand how technology shapes society. By the end of KS3, students possess the technical fluency, analytical mindset, and programming confidence required to succeed in GCSE Computer Science and thrive as safe, responsible digital citizens.		

TERM	TOPIC	CORE LEARNING	KEY CONCEPTS
Autumn (Term 1)	**E-Safety**	Introduction to personal online safety, cyberbullying awareness, identifying malware types (viruses, spyware, ransomware), and understanding social engineering tactics like phishing. Students learn strategies to protect personal data and maintain safe digital habits.	E-Safety, Cyberbullying, Malware, Social Engineering, Phishing, Online Footprint, Security.
SEQUENCING	*Establishes essential digital safety, security awareness, and responsible technology habits required before engaging in broader digital creation and computer systems.*		

TERM	TOPIC	CORE LEARNING	KEY CONCEPTS
Winter (Term 2)	**Binary & Spreadsheets**	Understanding how computers represent data using the binary number system (0s and 1s) and converting between binary and denary. Introduction to ASCII character encoding. Practical spreadsheet modeling using cells, basic formulas (SUM, AVERAGE), and advanced functions (IF statements, lookup functions).	Binary, Denary, ASCII, Data Representation, Spreadsheet Cells, Formulas, Functions, Data Modeling.
SEQUENCING	*Transitions students from user safety to foundational data representation and computational modeling using spreadsheet tools.*		

Subject Curriculum Plan – KS3

TERM	TOPIC	CORE LEARNING	KEY CONCEPTS
Spring (Term 3)	**Computer Hardware & Networks**	Exploration of computer hardware components: data storage devices, input/output devices, and internal CPU components. Understanding computer network types (LAN, WAN), network protocols, and topologies (Star, Bus, Ring).	Hardware, Storage Devices, Input/Output, CPU, RAM/ROM, Networks, Protocols, Topologies.
SEQUENCING	*Connects data representation concepts to physical hardware architecture and interconnected network infrastructure.*		

TERM	TOPIC	CORE LEARNING	KEY CONCEPTS
Summer (Term 4)	**Control Systems – Flowcharts**	Designing and testing automated control systems using flowcharts in Flowol 4. Modeling real-world physical systems including Zebra Crossings, Traffic Lights, Lighthouses, Pelican Crossings, and Robotic control.	Algorithms, Flowcharts, Control Systems, Inputs/Outputs, Decision Symbols, Feedback Loops, Flowol 4.
SEQUENCING	*Applies logic and hardware principles to visual algorithmic design, preparing students for block and text-based programming in Year 8.*		

Subject Curriculum Plan – KS3

Subject	Computer Science	Year Group	8
Subject Intent	The Key Stage 3 Computer Science curriculum aims to develop digitally literate, computational thinkers who can safely, effectively, and creatively navigate the modern digital world. Students build foundational knowledge of online safety, digital literacy, and fundamental computer science concepts including binary representation, hardware architecture, network topologies, and algorithmic thinking. Through practical control systems and block-based logic, students learn to decompose problems, design structured algorithms, and understand how technology shapes society. By the end of KS3, students possess the technical fluency, analytical mindset, and programming confidence required to succeed in GCSE Computer Science and thrive as safe, responsible digital citizens.		

TERM	TOPIC	CORE LEARNING	KEY CONCEPTS
Autumn (Term 1)	**Block-Based Programming with NextBlock (Blockly)**	Building foundational programming concepts using NextBlock. Core topics include sequence, variables and interactive user inputs, conditional selection (If/Else), automated iteration (counted and conditional loops), and synthesizing skills in a capstone mini-project (Guess the Number / Quiz).	Algorithms, Sequence, Variables, Inputs/Outputs, Selection (If/Else), Iteration (Loops), Debugging, DRY Principle.
SEQUENCING	*Builds upon Year 7 flowchart logic by introducing formal block-based programming structures, variables, and algorithmic flow.*		

TERM	TOPIC	CORE LEARNING	KEY CONCEPTS
Winter (Term 2)	**Programming the micro:bit**	Applying programming logic to physical computing using the BBC micro:bit. Students program text displays, custom image patterns, animations, input button event handlers, and motion-responsive outcomes using the built-in accelerometer.	Physical Computing, Event-Driven Programming, Display Control, Event Handlers, Sensors, Accelerometer.
SEQUENCING	*Translates screen-based programming into physical computing, reinforcing software concepts through hardware feedback and sensors.*		

Subject Curriculum Plan – KS3

TERM	TOPIC	CORE LEARNING	KEY CONCEPTS
Spring (Term 3)	**Programming in Python**	Transition from visual block coding to text-based programming in Python. Covers Python syntax, variable declaration, dynamic user inputs, conditional statements (if/elif/else), condition-controlled loops (while), and count-controlled loops (for).	Text-Based Syntax, Variables, Data Types, Selection, Iteration (while/for loops), Computational Logic.
SEQUENCING	*Evolves visual block structures into industry-standard text-based code, deepening algorithmic control structures.*		

TERM	TOPIC	CORE LEARNING	KEY CONCEPTS
Summer (Term 4)	**Number Systems, Logic Gates & Tech Legislation**	Advanced data representation including Binary and Hexadecimal conversions, alongside fundamental Logic Gates (AND, OR, NOT). Analysis of computer legislation: Data Protection Act, Computer Misuse Act, Copyright Designs & Patents Act, and Online Safety Act, plus legal, ethical, and environmental impacts.	Hexadecimal, Logic Gates, Truth Tables, Data Protection Act, Computer Misuse Act, Copyright Act, Online Safety Act, Ethics, Environmental Impact.
SEQUENCING	*Extends Year 7 binary knowledge into advanced math/logic gates while evaluating the legal and societal impacts of computing.*		

Subject Curriculum Plan – KS3

Subject	Computer Science	Year Group	9
Subject Intent	The Key Stage 3 Computer Science curriculum aims to develop digitally literate, computational thinkers who can safely, effectively, and creatively navigate the modern digital world. Students build foundational knowledge of online safety, digital literacy, and fundamental computer science concepts including binary representation, hardware architecture, network topologies, and algorithmic thinking. Through practical control systems and block-based logic, students learn to decompose problems, design structured algorithms, and understand how technology shapes society. By the end of KS3, students possess the technical fluency, analytical mindset, and programming confidence required to succeed in GCSE Computer Science and thrive as safe, responsible digital citizens.		

TERM	TOPIC	CORE LEARNING	KEY CONCEPTS
Autumn (Term 1)	**Advanced Programming in Python**	Deepening text-based Python programming skills. Topics include Python Basics, Selection using complex IF/ELIF/ELSE statements, Condition-Controlled Loops (WHILE), Count-Controlled Loops (FOR), Data Structures using Lists (array handling), and modular program design using Subroutines (functions/procedures). Synthesis through a practical Fruit Machine programming project.	Python Syntax, Selection, Condition Control (while), Count Control (for), Lists / Arrays, Subroutines, Functions, Fruit Machine Project.
SEQUENCING	*Advances Year 8 Python foundations by introducing complex data structures (Lists) and modular architecture (Subroutines) through a real-world software project.*		

TERM	TOPIC	CORE LEARNING	KEY CONCEPTS
Spring (Term 2)	**Fundamentals of Algorithms**	Study of computational thinking principles: Abstraction, Decomposition, and Algorithmic Thinking. Designing and interpreting Flowcharts and Pseudocode. Performing algorithmic execution traces using Trace Tables. Analysis and practical implementation of Searching Algorithms (Linear vs. Binary Search) and Sorting Algorithms (Bubble Sort and Merge Sort).	Computational Thinking, Abstraction, Decomposition, Flowcharts, Pseudocode, Trace Tables, Linear Search, Binary Search, Bubble Sort, Merge Sort.
SEQUENCING	*Formalizes theoretical algorithmic design and problem-solving techniques, bridging Key Stage 3 logic with GCSE-level Computer Science theory.*		

Subject Curriculum Plan – KS3

TERM	TOPIC	CORE LEARNING	KEY CONCEPTS
Summer (Term 3)	**Advanced Data Representations**	In-depth investigation of numerical and textual computer representation. Mastery of Number Systems (Binary & Decimal conversions), Hexadecimal Number Systems, Binary Arithmetic (8-bit binary addition, overflow errors, and logical Left/Right Bit Shifts), and Character Encoding sets (ASCII vs. Unicode).	Binary, Decimal, Hexadecimal, Binary Addition, Bit Shifts (Left/Right), ASCII, Unicode, Character Sets, Data Representation.
SEQUENCING	*Consolidates mathematical data representation concepts learned across Year 7 and 8, completing the KS3 curriculum and providing seamless transition into GCSE Computer Science.*		