Curriculum Knowledge Map

Computing

Year 7	Rotation		
	Digital Literacy	**Computer Systems**	**Computational Thinking**
	Component 1 teaches learners how to use the school network appropriately, emphasizing the importance of appropriate usage and online safety. It also focuses on Microsoft 365 and its applications in the subject and school.	Component 2 provides a concise tour of computing systems, covering computers, programs, physical components, binary building blocks, and data representation. It aims to present an overview of how computing systems operate while simplifying technical details to engage learners effectively.	Component 3 aims to enhance learners' confidence and understanding of fundamental programming constructs. While no prior programming experience is assumed, learners can progressively build their knowledge throughout the units. The main concepts covered include sequencing, variables, selection, and count-controlled iteration.
Declarative *What should they know?*	**Microsoft 365 applications:** ● PowerPoint is a presentation software that allows users to create slideshows with text, images, and videos. ● Word is a word processing software that allows users to create documents, letters, and reports. ● Excel is a spreadsheet software that allows users to store and organise data in tables. ● Class Notebook is a cloud-based collaboration tool that allows students and teachers to share and work on documents, assignments, and class notes. ● Teams is a communication and collaboration platform that allows users to chat, video call, and share files. **Appropriate IT use and Computer Misuse Act:** ● Appropriate IT use refers to the use of technology in a responsible and ethical manner. ● Use of Keyboard shortcuts for productivity. ● The Computer Misuse Act is a law that prohibits unauthorized access to computer systems and networks, as well as the unauthorized modification or destruction of data. **E-Safety and Cyber-crime:** ● E-safety refers to the safe use of electronic devices and the internet. ● Cyber-crime is a crime that is committed using electronic devices and the internet. **How to use the basic features of Microsoft 365 applications.** ● The importance of using strong passwords and keeping them safe. ● The different types of cyber-crime and how to protect yourself from them. ● The rules and regulations surrounding appropriate IT use.	**Computer Systems (Input, Process, Output):** ● A computer system is made up of hardware (physical components) and software (instructions). ● The three main functions of a computer system are input (entering data), processing (manipulating data), and output (displaying or transferring data from a computer system). **Hardware Components:** ● The central processing unit (CPU) is the "brain" responsible for carrying out instructions from software. ● Memory is where data is stored temporarily while the computer is running. ● Storage devices are where data is stored permanently. ● Peripheral devices are devices that connect to the computer system and allow users to interact with it. **RAM & ROM (Primary):** ● Random access memory (RAM) is a type of memory that allows data to be accessed quickly. It is used to store data that is currently being used by the computer. ● Read-only memory (ROM) is a type of memory that can only be read from. It is used to store data that is permanently stored in the computer, such as the computer's operating system. **Secondary Storage:** ● Secondary storage is a type of storage that is used to store data permanently. **Peripheral Devices:** ● Some common types of peripheral devices include keyboards, mice, printers, scanners, and monitors. ● Peripheral devices allow users to interact with the computer system and to output data. **Binary & Logic:**	**Computational Thinking** ● Understanding the concept of computational thinking as a problem-solving approach. ● Knowledge of the key components of computational thinking: decomposition, pattern recognition, abstraction, and algorithmic thinking. ● Familiarity with decomposition, which involves breaking down a complex problem into smaller, manageable parts. ● Recognition of patterns in data or problems and the ability to identify regularities or similarities. ● Understanding abstraction and the ability to generalize and simplify complex ideas or systems. ● Knowledge of algorithmic thinking, which involves designing step-by-step instructions to solve a problem or perform a task. **Programming** ● Understanding the concept of sequencing and the order of execution of program statements. ● Knowledge of variables and their purpose in storing and manipulating data. ● Familiarity with different data types and their characteristics, such as integers, strings, and booleans. ● Recognition of selection structures and the ability to write conditional statements using if-else statements. ● Understanding the concept of count-controlled iteration and its implementation using loops. ● Knowledge of basic input and output operations in programming.

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		• Binary is a number system that uses only two digits: 0 and 1. • Base 10 is the number system that we use in everyday life. It uses ten digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. • Computers store and process data in binary form. • Logic gates are electronic circuits that perform basic logical operations, such as AND, OR, and NOT. **Image Representation:** • Images can be represented in computers in a variety of ways, such as bitmaps. • Bitmaps are images that are made up of a grid of pixels. Each pixel is assigned a colour value.	
Procedural *What should they be able to do?*	**Microsoft 365 applications:** • How to create a new presentation in PowerPoint • How to insert a picture into a Word document. • How to create a new spreadsheet in Excel. • How to use Microsoft 365 Ribbon including Home, Insert, Draw, Layout & Design. • How to access Class Notebook pages & Sections • How to collaborate with others on Microsoft 365 applications. **Appropriate IT use and Computer Misuse Act:** • Use the School network safely and respectfully. • Act responsible & respectfully both online and in the Computing Lab • How to report cyberbullying to a trusted adult. • How to protect your personal information online. • How to identify and avoid phishing scams. **E-Safety and Cyber-crime:** • How to create a strong password and keep it safe. • How to report cyber-crime to the authorities. • How to stay safe while gaming online. • How to use social media responsibly.	**Computer Systems (IPO)** • How to use peripheral devices to input/output data. • How to connect peripheral devices to a computer • How to manipulate data and solve problems **Hardware Components** • Identify hardware components within physical computer systems. **Primary & Secondary Storage** • Use computer systems in a way that does not significantly impact performance. • Identify storage size of data and files in personal drives. **Binary & Logic & Data Representation** • Convert decimal numbers to binary numbers and vice versa. • Represent data in binary form, such as images. • Use logic gates to create simple logic circuits. • Display images in the form of bitmaps	**Computational Thinking** • Applying decomposition to break down a complex problem into smaller subproblems. • Using pattern recognition to identify similarities or patterns in data or problem-solving situations. • Applying abstraction to simplify complex problems or systems by focusing on essential details. • Using algorithmic thinking to design clear, step-by-step instructions or algorithms to solve problems. • Practicing iterative problem-solving, refining and improving solutions through multiple iterations. • Collaborating and communicating effectively when applying computational thinking to solve problems. **Programming** • Applying sequencing to write a program with a step-by-step sequence of instructions. • Implementing variables to store and manipulate data within a program. • Constructing conditional statements to make decisions in a program based on certain conditions. • Using loops to repeat a set of instructions a specific number of times. • Writing programs that involve user input and produce meaningful output. • Debugging programs by identifying and fixing errors in code.
Disciplinary Literacy *(Tier 3 Vocab)*	• Interactivity • Collaboration • Cloud-based • Ribbon (Microsoft 365) • Cyberbullying	• Computer • Input, Process, Output • Hardware • Software • Instructions	• Algorithms • Decomposition • Abstraction • Instructions • Input

Curriculum Knowledge Map

- Phishing - Firewall - Malware - Virus - Privacy - Security - Cybercrime - Computer Misuse - Acceptable Use - Identity theft - Cyberbullying	- Central Processing Unit (CPU) - Primary Memory - Random Access Memory (RAM) - Read Only Memory (ROM) - Secondary Storage - Capacity - Speed - Reliability - Volatile / Non-Volatile - Peripheral Devices - Bit / Nibble / Byte - AND / OR / NOT - Bitmap - Pixel - Resolution	- Process - Output - Sequence - Variable - Data - Condition - Sequence - Selection - Iteration - Comparison - Operators - Count-controlled - Condition-controlled
Assessment Opportunities	1. Cyberbullying Presentation – Rubric 2. Collaborating Online Respectfully - End Point - MSF	1. Home Learning – "Under the Hood" / "It's only logical". 2. Computer Systems – Progress Test	1. Programming Project Rubric 2. Computational Thinking & Scratch – Summative End Point.
National Curriculum Links	- Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability. - Understand a range of ways to use technology safely, respectfully, responsibly, and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns	- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation. - can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems. - understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming. - understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems. - understand how instructions are stored and executed within a computer system.	- Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures (e.g. lists, tables, or arrays); design and develop modular programs that use procedures or functions. - Understand several key algorithms that reflect computational thinking; use logical reasoning to compare the utility of alternative algorithms for the same problem. - Understand simple Boolean logic (e.g. and, or, and not) - Create, reuse, revise, and repurpose digital artefacts for a given audience, with attention to trustworthiness, design, and usability.