CURRICULUM MAP (Long term plan)

SUBJECT : Computing **YEAR GROUP: 8**

	Cycle 1 **Autumn**	**Cycle 2** **Spring**	**Cycle 3** **Summer**
Substantive knowledge – Essential knowledge & conceptual understanding of the National Curriculum	**Computing Systems** Computer systems Data and information Information technology Programming **Mobile App development** Algorithms Programming Using media Computer systems Design and Development Networks	**Introduction to Python** Algorithms Programming **Developing for the web** Information Technology Creating Media Design and Development Communication & Networks Algorithms Programming	**Representations** Data and Information Computer Systems **Vector Graphics** Creating Media Design and Development Effective use of tools Information technology
Disciplinary knowledge - what skills are practised?	**Computing systems** Recall that a general- purpose computing system is a device for executing programs Recall that a program is a sequence of instructions that specify operations that are to be performed on data Explain the difference between a general- purpose computing system and a purpose-built device	**Introduction to Python** Describe what algorithms and programs are and how they differ Locate and correct common syntax errors Recall that a program written in a programming language needs to be translated in order to be executed by a machine Write simple Python programs that display messages, assign values to variables, and receive keyboard input	**Representations** List examples of representations Recall that representations are used to store, communicate, and process information Provide examples of how different representations are appropriate for different tasks Recall that characters can be represented as sequences of symbols and list examples of character coding schemes

	Describe the function of the hardware components used in computing systems Describe how the hardware components used in computing systems work together in order to execute programs Recall that all computing systems, regardless of form, have a similar structure ('architecture') Analyse how the hardware components used in computing systems work together in order to execute programs Define what an operating system is, and recall its role in controlling program execution Describe the NOT, AND, and OR logical operators, and how they are used to form logical expressions Use logic gates to construct logic circuits, and associate these with logical operators and expressions Describe how hardware is built out of increasingly complex logic circuits	Describe the semantics of assignment statements Receive input from the keyboard and convert it to a numerical value Use simple arithmetic expressions in assignment statements to calculate values Generate and use random integers Use binary selection (if, else statements) to control the flow of program execution Use relational operators to form logical expressions Describe how iteration (while statements) controls the flow of program execution Use multi-branch selection (if, elif, else statements) to control the flow of program execution Use iteration (while loops) to control the flow of program executionUse variables as counters in iterative programs Combine iteration and selection to control the flow of program execution Use Boolean variables as flags	Measure the length of a representation as the number of symbols that it contains Provide examples of how symbols are carried on physical media Explain what binary digits (bits) are, in terms of familiar symbols such as digits or letters Measure the size or length of a sequence of bits as the number of binary digits that it contains Describe how natural numbers are represented as sequences of binary digits Convert a decimal number to binary and vice versa Convert between different units and multiples of representation size Provide examples of the different ways that binary digits are physically represented in digital devices **Vector Graphics** Sketch and Edit different vector drawings Develop vector graphics skills to produce designs Understand the role of paths in vector graphics Construct a vector graphic design using the skills developed

	Recall that, since hardware is built out of logic circuits, data and instructions alike need to be represented using binary digits **Mobile App development** Establish user needs when completing a creative project Apply decomposition to break down a large problem into more manageable steps Use a block based programming language to create a sequence Recognise that events can control the flow of a program Implement and customise GUI elements to meet the needs of the user Use variables in an event driven programming environment Pass the value of a variable into an object Use user input in an event driven programming environment. Identify and fix common coding errors in a block- based environment. Use a block based programming language to include selection.	**Developing for the web** Use HTML to structure static web pages Modify HTML tags using inline styling to improve the appearance of web pages Display images within a web page Apply HTML tags to construct a web page structure from a provided design Describe what CSS is Use CSS to style static web pages Assess the benefits of using CSS to style pages instead of in-line formatting Describe what a search engine is Explain how search engines 'crawl' through the World Wide Web and how they select and rank results Analyse how search engines select and rank results when searches are made Use search technologies effectively Discuss the impact of search technologies and the issues that arise by the way they function and the way they are used	Compare vector graphic images to real photography

	Use variables in an event driven programming environment Pass the value of a variable into an object Use user input in an event driven programming environment. Identify and fix common coding errors in a block- based environment. Use a block based programming language to include selection.	Create hyperlinks to allow users to navigate between multiple web pages Implement navigation to complete a functioning website	
Key questions (What is the learning about?)	How instructions are stored and executed within a computer system? How is binary used to store various data types? How can computers collect data from various input devices, including sensors and application software? What is the difference between hardware and application software, and their roles within a computer system? Can I understand that digital computers use binary to represent all data? How can I create and reuse digital artefacts and multiple	What are the benefits to websites in terms of communication in using 1 universal scripting language? What are the benefits of using CSS to a website? How can I develop online-based platforms for a specific purpose? How can I use sequence, selection and iteration to develop a program to solve a problem? What is the difference between, and appropriately I can use if and if, then and else statements? Can I use variable and relational operators within a loop to govern termination? Can I use loops and a sequence of selection statements in programs,	What is binary? How does it work in circuitry? Why do computers use binary? How do I Convert between binary and decimal (vice versa)? What are the different ways binary digits are physically represented in digital devices? What is a vector drawing? How can you use paths to create a stronger vector drawing?

	applications across a range of devices? Can I identify when a problem needs to be broken down? Can I apply decomposition to break down a larger problem into more manageable steps? Can I establish user needs when completing a creative project?	including an IF, THEN and ELSE statement?	
Assessment Verbal feedback used in place of live marking approach.	Computer systems - End of unit online test. Mobile App development - End of unit online test and practical assessment.	End of unit online tests. Practical assessment of creating a website.	End of unit online tests. Practical assessment of creating a vector graphic design.
Literacy (L),**Numeracy** (N), **Oracy** (O) **opportunities**	Combining hardware and software terminologies. Problem solving and algorithmic thinking.	Writing and presenting information suitable for audience and purpose. Problem solving and algorithmic thinking.	Looking at symbols used in place of language. Problem solving.
Cross Curricular Opportunities	History - learning the history of computer systems and chronology of events.		Music and History - learning the history of communication. Learning about rhythm through the use of Morse Code. Art - learning about drawing and vector designs.
SMSC / Character/Careers /Cultural Capital (personal development)	Confidence, Initiative, Aspiration. Resilience, Problem Solving.	Confidence. Resilience. Initiative. Video Game responsibility. Online safety.	Initiative, Aspiration, Resilience and Problem Solving.
Equality and Diversity	Names and characters used in presentations represent people with disabilities and different ethnicities.	Names and characters used in presentations represent people with disabilities and different ethnicities.	Names and characters used in presentations represent people with disabilities and different ethnicities.
Super Curriculum (personal development)	Use of AppLab website Coding club	Use of Python App Coding club	Using Inkscape to develop vector designs. Coding club