



Curriculum Map

Subject: Computer Science

Year group: 8

	Autumn 1	Autumn 2	Autumn 2/ Spring 1	Spring 2	Spring 2 /Summer 1	Summer 2
Content	<i>Python unit 1</i>	<i>Cyber security</i>	<i>Spreadsheet modelling</i>	<i>Layers of a computer system</i>	<i>Python unit 2</i>	<i>AI and machine learning</i>
<i>Declarative Knowledge – 'Know What'</i>						
Skills						
<i>Procedural Knowledge – 'Know How'</i>	<p>Describe what algorithms and programs are and how they differ</p> <ul style="list-style-type: none"> - 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 <p>Describe the semantics of assignment statements</p> <ul style="list-style-type: none"> - Receive input from the keyboard and convert it to a numerical value - Use simple arithmetic expressions in assignment statements to calculate values 	<p>Explain the difference between data and information</p> <p>Critique online services in relation to data privacy</p> <p>Identify what happens to data entered online</p> <p>Explain the need for the Data Protection Act</p> <p>Recognise how human errors pose security risks to data</p> <p>Implement strategies to minimise the risk of data being compromised through human error</p> <p>Define hacking in the context of cyber security</p> <p>Explain how a DDoS attack can impact users of online services</p> <p>Identify strategies to reduce the chance of a</p>	<p>Identify columns, rows, cells, and cell references in spreadsheet software</p> <p>Use formatting techniques in a spreadsheet</p> <p>Use basic formulas with cell references to perform calculations in a spreadsheet (+, -, *, /)</p> <p>Use the autofill tool to replicate cell data</p> <p>Explain the difference between data and information</p> <p>Explain the difference between primary and secondary sources of data</p> <p>Collect data</p> <p>Analyse data</p> <p>Create appropriate charts in a spreadsheet</p>	<p>Recall that a general-purpose computing system is a device for executing programs</p> <p>Recall that a program is a sequence of instructions that specify operations that are to be performed on data</p> <p>Explain the difference between a general-purpose computing system and a purpose-built device</p> <p>Describe the function of the hardware components used in computing systems</p> <p>Describe how the hardware components used in computing systems work together in order to execute programs</p> <p>Recall that all computing systems, regardless of</p>	<p>Write simple Python programs that display messages, assign values to variables, and receive keyboard input</p> <p>Locate and correct common syntax errors</p> <p>Describe the semantics of assignment statements</p> <p>Use simple arithmetic expressions in assignment statements to calculate values</p> <p>Receive input from the keyboard and convert it to a numerical value</p> <p>Use relational operators to form logical expressions</p> <p>Use binary selection (if, else statements) to control the flow of program execution</p>	<p>Defining Artificial Intelligence</p> <p>Understanding the difference between AI and machine learning</p> <p>Learning different ways in which AI and machine learning are being used in computing</p> <p>Learning Google teachable machine to implement basic AI and machine learning skills</p> <p>To discuss the validity of AI in society</p> <p>To think about the ethical implications of AI</p>



Curriculum Map

	<p>Generate and use random integers</p> <ul style="list-style-type: none"> - Use binary selection (if, else statements) to control the flow of program execution - Use relational operators to form logical expressions <p>Describe how iteration (while statements) controls the flow of program execution</p> <ul style="list-style-type: none"> - Use multi-branch selection (if, elif, else statements) to control the flow of program execution <p>Use iteration (while loops) to control the flow of program execution</p> <ul style="list-style-type: none"> - Use variables as counters in iterative programs <p>Combine iteration and selection to control the flow of program execution</p> <ul style="list-style-type: none"> - Use Boolean variables as flags 	<p>brute force attack being successful</p> <p>Explain the need for the Computer Misuse Act</p> <p>List the common malware threats</p> <p>Examine how different types of malware causes problems for computer systems</p> <p>Question how malicious bots can have an impact on societal issues</p> <p>Compare security threats against probability and the potential impact to organisations</p> <p>Explain how networks can be protected from common security threats</p> <p>Identify the most effective methods to prevent cyberattacks</p>	<p>Use the functions SUM, COUNTA, MAX, and MIN in a spreadsheet</p> <p>Analyse data</p> <p>Use a spreadsheet to sort and filter data</p> <p>Use the functions AVERAGE, COUNTIF, and IF in a spreadsheet</p> <p>Use conditional formatting in a spreadsheet</p> <p>.</p>	<p>form, have a similar structure ('architecture')</p> <p>Analyse how the hardware components used in computing systems work together in order to execute programs</p> <p>Define what an operating system is, and recall its role in controlling program execution</p> <p>Describe the NOT, AND, and OR logical operators, and how they are used to form logical expressions</p> <p>Use logic gates to construct logic circuits, and associate these with logical operators and expressions</p> <p>Describe how hardware is built out of increasingly complex logic circuits</p> <p>Recall that, since hardware is built out of logic circuits, data and instructions alike need to be represented using binary digits</p> <p>Provide broad definitions of 'artificial intelligence' and 'machine learning'</p> <p>Identify examples of artificial intelligence and machine learning in the real world</p>	<p>Generate and use random integers</p> <p>Use multi-branch selection (if, elif, else statements) to control the flow of program execution</p> <p>Describe how iteration (while statements) controls the flow of program execution</p> <p>Use iteration (while loops) to control the flow of program execution</p> <p>Use variables as counters in iterative programs</p> <p>Combine iteration and selection to control the flow of program execution</p> <p>Use Boolean variables as flags</p>	
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Curriculum Map

				<p>Describe the steps involved in training machines to perform tasks (gathering data, training, testing)</p> <p>Describe how machine learning differs from traditional programming</p> <p>Associate the use of artificial intelligence with moral dilemmas</p> <p>Explain the implications of sharing program code</p>		
Key Questions	<p>How can I use sequence, selection and iteration to develop a program to solve a problem?</p> <p>What is the difference between, and appropriately I can use if and if, then and else statements.</p> <p>Can I use a variable and relational operators within a loop to govern termination.</p> <p>Can I use loops and a sequence of selection statements in programs, including an IF, THEN and ELSE statement</p>	<p>What are the modern dangers of technology relating to safety and security that affects both individuals and organisations?</p> <p>What are the vulnerabilities of networking hardware and software?</p> <p>How does an organisation or individual protect themselves from network threats?</p>	<p>Can I use criteria to evaluate the quality of solutions and identify improvements making some refinements to future solutions.</p> <p>How can I analyse and evaluate data to become information.</p> <p>Do I know that poor quality data leads to unreliable results, and inaccurate conclusions for individuals and organisations?</p>	<p>How instructions are stored and executed within a computer system? How is binary used to store various data types?</p> <p>How can computers collect data from various input devices, including sensors and application software.</p> <p>What is the difference between hardware and application software, and their roles within a computer system.</p> <p>I know that digital computers use binary to represent all data.</p>	<p>How can I use computational thinking to solve complex problems?</p> <p>How can I use sequence, selection and iteration to develop a program to solve a problem? I can represent solutions using a structured notation.</p> <p>I know that different algorithms exist for the same problem.</p> <p>I know that programming bridges the gap between algorithmic solutions and computers.</p>	<p>What is AI?</p> <p>What is machine learning?</p> <p>How have these processes been implemented in wider society?</p> <p>What are the possible dangers of AI?</p> <p>What are the ethical implications of utilising AI in computing, surveillance and media industries?</p>
Assessment	Combination of test and portfolio of work	End of unit test	End of unit online test and practical assessment	Micro:Bit programming test	Combination of test and portfolio of work	End of unit test



Curriculum Map

<p>Literacy/Numeracy/ SMSC/Character</p>	<p>Problem solving and algorithmic thinking. Peer support and experimentation. Confidence. Resilience. Initiative. Video Game responsibility</p>	<p>Understanding modern technological terminologies. Integrity, Initiative, Aspiration, Creativity. Integrity.</p>	<p>Initiative, Aspiration, Resilience. Using Microsoft Excel for mathematical calculations</p>	<p>Combining hardware and software terminologies. Problem solving and algorithmic thinking. Confidence. Resilience. Initiative.</p>	<p>Creativity, Resilience, Initiative. Peer support. Algorithmic Thinking</p>	<p>Understanding modern technological terminologies. Integrity, Initiative, Aspiration, Creativity. Integrity.</p>
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