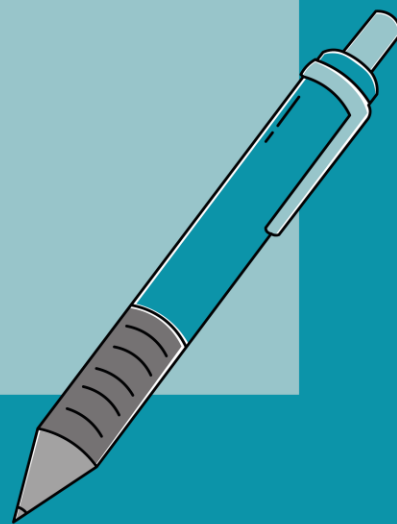


COMPUTING CURRICULUM OVERVIEW

KS3 overview



Manchester
Communication
Academy



Year 7

Year 7	Autumn	Spring	Summer
Topic	Digital Literacy and E-Safety	Data Handling - Spreadsheet Skills	Scratch - Programming
Declarative knowledge	<p>Students will learn what cyberbullying is and the ways in which people can be affected by cyberbullying.</p> <p>Students will learn what safety tips and advice they would give to someone to prevent them from being a victim of cyberbullying.</p> <p>Students will learn ways in which people can be affected by social networking.</p> <p>Students will know what safety tips and advice they would give to someone to help keep them safe when using social media.</p> <p>Students will learn what online Fake News is and ways in which people can be affected by online Fake News</p> <p>Students will know what the term "Digital Footprint" means?</p> <p>Some students will learn what Hacking, Online Grooming and Malware are.</p>	<p>Students will learn what a cell referencing is.</p> <p>Students will learn what the difference between data and information is.</p> <p>Students will learn the difference between primary and secondary sources of data.</p> <p>Students will learn what the autofill tool does in a spreadsheet.</p> <p>Students will learn what simple functions such as: SUM, MAX, MIN, COUNTA, COUNTIF and AVERAGE do.</p> <p>Students will learn what charts and graphs are used for in a spreadsheet.</p>	<p>Students will learn what Computational Thinking is</p> <p>Students will learn the different aspects of Computational Thinking.</p> <p>Students will learn what an algorithm is.</p> <p>Students will learn that different algorithms exist for the same problem</p> <p>Students learn what a variable is.</p> <p>Students will learn what the three programming constructs, Sequence, Selection and Iteration are.</p>
Procedural knowledge	<p>Students create a digital artifact/app using online animation (Powtoon) in a form that will explain how to keep themselves and</p>	<p>Students will learn how to navigate a spreadsheet via its rows and columns, and become familiar with the cell referencing system by completing activities on a spreadsheet.</p>	<p>Students will learn how to use computational thinking techniques such as abstraction, decomposition, pattern recognition and algorithm to solve problem</p> <p>Students will learn how to use logical</p>

	<p>others safe online.</p> <p>Students will learn how to prevent Cyberbullying by researching the topic on the resources provided by the teacher.</p> <p>Students will learn how to add e-safety images on the animation app.</p> <p>Students will learn how to add meaningful text on cyberbullying, social media, hacking, etc. on the animation app.</p> <p>Students will learn how to add meaningful transitions and timelines on the animation app.</p> <p>Students will learn how to use complementary colours on background and text.</p> <p>Students will learn how to prevent Hacking by researching the topic on the resources provided by the teacher.</p> <p>Students will learn how to identify and spot fake news online by researching the topic on the resources provided by the teacher.</p> <p>Students will learn how to apply privacy settings on social media accounts.</p> <p>Students will learn how to apply tips and techniques to keep themselves and others safe on social media.</p>	<p>Students will learn how to locate, select ranges of cells and change cells' background colour and border properties by completing various activities on a spreadsheet document.</p> <p>Students will learn how to enter text into cells of a spreadsheet.</p> <p>Students will learn how to perform simple calculations on the data using basic formulas and cell references by completing various activities on a google sheet.</p> <p>Students will learn how to use the autofill tool to duplicate cells and continue a linear pattern.</p> <p>Students will learn how to combine the autofill tool with basic formulas to quickly populate a results column with calculations.</p> <p>Students will learn how to use simple functions such as: SUM, MAX, MIN, COUNTA, COUNTIF and AVERAGE by completing various activities on a google sheet.</p> <p>Students will learn how to present data on charts and graphs by completing various activities on a google sheet.</p>	<p>reasoning to predict outcomes by predicting the outputs of various scratch programs.</p> <p>Students learn how to use variables in the creation of their Scratch programs.</p> <p>Students will learn how to create programs which make use of sequencing (following instructions in order).</p> <p>Students will learn how use mathematical operation such as +, -, /, *, <, >, = in their scratch programs.</p> <p>Students will learn how to create programs which make use of selection (using the IF blocks) in their scratch games.</p> <p>Students will learn how to create programs which make use of repetition/loops (using the forever/repeat blocks) in their scratch games.</p>
<p>Assessment Outcomes</p>	<ul style="list-style-type: none"> - Describe the term cyber bullying - Be able to logging in, use keyboard shortcut, create file and folders - Explain the effects of cyberbullying, social media and cyber-security 	<ul style="list-style-type: none"> - Know what a cell referencing is. - Know the difference between data and information is - difference between primary and secondary sources of data - Can collect data and enter into spreadsheet software to analyse - Can use basic formulas 	<ul style="list-style-type: none"> - Know what an algorithm is and can use logical reasoning to predict outcomes. - Explain what a variable is - Know what the three programming constructs, Sequence, Selection and Iteration are. - Can create a program with the use a variable, sequence, selection and range of operators and

	<ul style="list-style-type: none"> - Understand a range of ways to use technology safely, respectfully, responsibly and securely 	with cell references for calculations in a spreadsheet (+, -, *, /)	expressions
Prior Knowledge	<p>Students know how to use technology safely, respectfully and responsibly;</p> <p>Students know how to recognise acceptable/unacceptable behaviour online</p> <p>Students can identify a range of ways to report concerns about content and contact.</p>	<p>Students know how to use technology purposefully to create, organize, store, manipulate and retrieve digital content.</p> <p>Students know how to use search technologies effectively, appreciate how results are selected and ranked.</p>	<p>Students know how to design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p> <p>Students have basic understanding of how to use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p>
Future learning	<p>Students will build on these knowledge and skills in the Cybersecurity Topic in Year 9 where this learn the following;</p> <p>Students will learn the value of their data being held by an organisation and what these organisations might use it for.</p> <p>Students will then learn about social engineering and other common cybercrimes.</p> <p>Students will learn about methods to protect against cyber-attacks.</p>	<p>Students will build on these knowledge and skills in the Collecting, Presenting and Interpreting Data unit for BTEC Digital Information Technology qualification in KS4.</p> <p>Students will import the data into a spreadsheet.</p> <p>Students will apply data processing methods to manipulate the data.</p> <p>Students will use formulae to produce data summaries.</p> <p>Students will produce a dashboard to select and display data summaries.</p>	<p>Students will build on these knowledge and skills in the Introduction to Python Programming (textual base programming) and Mobile App Development in Year 8 where they will learn the following;</p> <p>Students will learn how algorithm and program differs</p> <p>Students will learn how to create programs that use input and output in python (textual base programming).</p> <p>Students will learn how to create a program that uses variable, sequence and arithmetic operations.</p> <p>Students will learn how to create programs that use selection in python.</p>
Why are they studying this?	<p>Computing National Curriculum</p> <p>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</p>	<p>Computing National Curriculum</p> <p>Collecting and analysing data and meeting the needs of known users.</p>	<p>Computing National Curriculum</p> <p>Understand several key algorithms that reflect computational thinking;</p> <p>Use logical reasoning to compare the utility of alternative algorithms for the same problem</p> <p>Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems;</p>

	As professionals we also want our students to study this topic because we want them to understand the safe use of the internet and be able to protect themselves and others in a digital world.		
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Year 8

Year 8	Autumn	Spring	Summer
Topic	Computing System	Mobile App Development	Intro to Python Programming Techniques
Declarative knowledge	<p>Students will learn what a Computer System is.</p> <p>Students will learn what an input and output device is with examples.</p> <p>Students will learn what a communication device is with examples.</p> <p>Students will learn what general purpose and purpose built computer systems are.</p> <p>Students will learn how to define what software is.</p> <p>Students will learn what an Operating System is.</p> <p>Students will know the difference between hardware and application software</p> <p>Students will learn what system architecture is and recognise that all computer systems have the same basic architecture.</p>	<p>Students will learn what Decomposition is.</p> <p>Students will learn what abstraction is in app development.</p> <p>Students will understand the need to establish user needs when completing a creative project.</p> <p>Students will learn what Success Criteria is in app development.</p> <p>Students will learn the importance of milestones in app development.</p> <p>Students will learn the importance of evaluation in app development.</p> <p>Students will learn what variables are and the need for giving them a meaningful name in a program.</p> <p>Students will learn what event-driven procedures are in programming.</p> <p>.</p>	<p>Students will learn what a computer program is.</p> <p>Students will learn what variable is and the semantics of assignment statements.</p> <p>Students will learn what a casting is in programming.</p> <p>Students will learn what sequence programming construct is.</p> <p>Students will learn what selection programming construct is.</p> <p>Students will learn what iteration programming constructs is.</p> <p>Students will know that a program written in a programming language needs to be translated in order to be executed by a machine.</p>

	<p>Students will learn what the purpose of the three main components inside the computer (secondary storage, RAM and CPU) are.</p> <p>Students will learn why computers use binary.</p> <p>Students will learn what binary and boolean logic are.</p> <p>Some students will learn the terms artificial intelligence and machine learning and where they are used.</p>		
<p>Procedural knowledge</p>	<p>Students will learn how the CPU performs the Fetch - Decode - Execute cycle by completing activities on their booklet in google classroom.</p> <p>Students will learn how the CPU, Memory and Secondary Storage works together.</p> <p>Students will learn how to convert binary to denary and vice versa by completing activities in their booklet.</p> <p>Students will learn how to draw simple logic gates using AND, NOT and OR by completing activities in their booklet.</p> <p>Students will learn how to draw a logic circuit with more than one gate and complete the truth table for AND, NOT and OR by completing activities in their booklet.</p>	<p>Students will learn how to apply decomposition to break down a larger problem into more manageable steps by breaking down success criteria of an app into smaller chunks.</p> <p>Students will learn how to devise success criteria for an app they are creating</p> <p>Students will learn how to use logical reasoning to compare the utility of alternative algorithms for the same problem.</p> <p>Students will learn how to implement and customise GUI elements to meet the needs of the user for their app</p> <p>Student will learn how to use a block-based programming language to create a sequence, variables and user input in an event-driven programming environment</p> <p>Students will learn how to develop a partially completed application to include additional functionality.</p> <p>Students learn how to identify and fix common coding errors using App Lab.</p> <p>Students learn how to use event-</p>	<p>Students will learn how to predict the outcome of a simple python program.</p> <p>Students will learn how to write simple Python programs that display messages and assign values to variables by completing activities in their booklets.</p> <p>Students will learn how to create a python program that receives keyboard input by completing input activities in their booklets.</p> <p>Students will learn how receive input from the keyboard and convert it to a numerical value (casting a variable)</p> <p>Students will learn how to locate and correct common syntax errors by debugging their program codes.</p> <p>Students will learn how to use simple arithmetic expressions in assignment statements to calculate values.</p> <p>Students will learn how to use relational operators to form logical expressions.</p> <p>Students will learn how to use binary selection (if, else statements) to control the flow of program execution by completing selection activities in their booklets</p>

		<p>handling programming language to include sequencing, selection and iteration.</p> <p>Students will learn know how to reflect and react to user feedback to improve their app</p> <p>Students will learn how to evaluate the success of the programming project using their success criteria.</p>	<p>Students will learn how to use multi-branch selection (if, elif, else statements) to control the flow of program execution.</p>
Assessment Outcomes	<ul style="list-style-type: none"> - Explain what a Computer System is. - Know that a range of digital devices can be considered a computer system - Explain what an input and output device is with examples - Define what software is - Know the difference between hardware and application software - Explain the role of the CPU, RAM and Secondary Storage - Convert binary to denary, vice versa - Know how the AND, OR and NOT gate works 	<ul style="list-style-type: none"> - Explain what Decomposition is. - The Importance of Success Criteria is in app development. - The Importance of Milestones is in app development. - The Importance of evaluation is in app development. - What variables are and the need for giving them a meaningful name in a program. - Can use logical reasoning to algorithms to solve a problem - How to use a block-based programming language to create a sequence, selection, variables and user input in an event-driven programming environment 	<ul style="list-style-type: none"> - Define what algorithms and programs are and how they differ. - Be able to identify, sequence, selection and iterations - What variable is and the semantics of assignment statements. - create a program that use variable, sequence and arithmetic operation to control the flow of the program execution - How to use simple arithmetic expressions in assignment statements to calculate values - How to use relational operators to form logical expressions. - Explain algorithms and programs that use repetition and two-way selection.
Prior Knowledge	<p>Students can select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals.</p>	<p>Students can use logical reasoning to predict outcomes.</p> <p>Students know how to use variables in the creation of their Scratch programs.</p> <p>Students know how to create programs which make use of sequencing (following instructions in order).</p> <p>Students can use mathematical operation such as +, -, /, *, <, >, = in a scratch</p>	<p>Students can use logical reasoning to predict outcomes.</p> <p>Students can use a block-based programming language to create a sequence, variables and user input in an event-driven programming environment</p> <p>Students can use mathematical operation such as +, -, /, *, <, >, = in a scratch program.</p>

		program.	Students can create a block-based program that makes use of variables, sequence, selection and iteration.
Future learning	<p>Students will develop these knowledge and skills further in the KS4 GCSE Computer Science and BTEC Digital Information Technology qualifications where this learn the following;</p> <p>Students will learn how the CPU, RAM and Secondary Storage works.</p> <p>Students will learn why Computers use binary and how data are represented in binary.</p> <p>Students will learn how to create simple logic circuits using AND, OR and NOT gates. Students will learn the impact of technology in modern society.</p>	<p>Students will develop these knowledge and skills further in Python Programming scheme of learning in Year 8 summer term where students will the following;</p> <p>Students will learn how to use variables, input, output, selection in textual based programming (python).</p> <p>Students how to write simple Python programs that display messages and assign values to variables.</p> <p>Students will learn how to use multi-branch selection (if, elif, else statements) to control the flow of program execution.</p>	<p>Students will develop these knowledge and skills further in Physical Computing scheme of learning in Year 9 where students will the following;</p> <p>Students will learn how to use the BBC Micro:bit.</p> <p>Students will learn how to use an IDE to write Python programs for the micro:bit.</p> <p>Students will learn how to locate and correct common syntax errors in their programs</p> <p>Students will learn how to keep track of data using variables and other data structures.</p>
Why are they studying this?	<p>Computing National Curriculum</p> <p>Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits</p> <p>Understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example conversion between binary and decimal]</p> <p>Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems</p> <p>Understand how instructions are stored and executed within a</p>	<p>Computing National Curriculum</p> <p>Use logical reasoning to compare the utility of alternative algorithms for the same problem.</p> <p>Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems;</p> <p>Create, re-use, revise and re-purpose digital artifacts for a given audience, with attention to trustworthiness, design and usability</p>	<p>Computing National Curriculum</p> <p>Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems</p> <p>Understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits.</p> <p>Use logical reasoning to compare the utility of alternative algorithms for the same problem</p>

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Year 9

Year 9	Autumn	Spring	Summer
Topic	Cybersecurity	Intro to Web Development with HTML	Physical Computing
Declarative knowledge	<p>Students will learn what social engineering is with examples, such as phishing and blagging.</p> <p>Students will learn what the Data Protection Act is.</p> <p>Students will learn what the Computer Misuse Act is.</p> <p>Students will learn what hacking is in the context of cybersecurity.</p> <p>Students will learn what Phishing is in the context of cybersecurity.</p> <p>Students will learn what Brute Force Attack is.</p> <p>Students will learn the impact of DDoS attacks on online services.</p> <p>Students will learn what malware is and identify different types of malwares.</p>	<p>Students will learn what HTML is.</p> <p>Students will learn that most HTML tags has an opening and closing tag</p> <p>Students will learn what HTML various tags are to display information on a web page.</p> <p>Student will learn what CSS is</p> <p>Students will learn what a search engine is.</p> <p>Students will learn the benefits of using CSS to style pages instead of in-line formatting.</p>	<p>Students will learn what the BBC Micro:bit is.</p> <p>Students will learn what a program is.</p> <p>Students will know the importance of testing a program.</p> <p>Students will refresh their Python programming skills and encounter a range of programming patterns that arise frequently in physical computing applications.</p>
Procedural knowledge	Students will learn how to identify and outline pieces of advice they will give	Students will learn how to type in HTML tags on notepad to create a simple	Students will learn how to use the BBC Micro:bit by completing activities in their booklet.

	<p>to someone to stop them from becoming the victim of a phishing attack by completing activities in their booklet.</p> <p>Students will learn how to pick out parts of an email that make it suspicious and describe why it's suspicious by completing these activities in their booklet.</p> <p>Students will learn how to identify what happens to data entered online and critique online services in relation to data privacy.</p> <p>Students will learn how to use Brute Force Attack to gain unauthorized access to someone else's account by completing activities in their booklet.</p> <p>Students will learn how to prevent Brute Force Attack by answering questions in their booklet.</p> <p>Students will learn how to manipulate a computer program that has been set to output how many attempts it took to find the password, as well as how long it took the computer to do it.</p> <p>Students will learn how to perform DDoS attacks in unplug activities.</p> <p>Students will learn how to identify and implement strategies</p>	<p>web page by completing this activity in their booklet.</p> <p>Students will learn how to use HTML tags to structure static web pages by completing this activity in their booklet.</p> <p>Students will learn how to modify HTML tags to improve the appearance of web pages.</p> <p>Students will learn how to display heading and body text in a web page.</p> <p>Students will learn how to display a text in Bold, Italic Underline on a web page by completing this activity in their booklet.</p> <p>Students will learn how to display images within a web page by completing the image activity in their booklet.</p> <p>Students will learn how to display lists within a web page by completing the list activity in their booklet</p> <p>Students will know how use hyperlinks within a web page by completing the hyperlink activity in their booklet</p> <p>Students will know how to apply HTML tags to construct a web page structure from a provided design</p> <p>Students will learn how search engines 'crawl' through the World Wide Web and how they select and rank results.</p> <p>Students will learn how to analyse how search engines select and rank results when searches are made.</p> <p>Students will learn how to use CSS to style static web pages.</p>	<p>Students will learn how to use an IDE to write Python programs for the micro:bit.</p> <p>Students will learn how to locate and correct common syntax errors in their programs</p> <p>Students will learn how to keep track of data using variables and other data structures.</p> <p>Students will learn how to use built-in components for output and input in the microbit</p> <p>Students will learn how to test and debug Python programs for the micro:bit.</p> <p>Students will learn how to select hardware components that are fit for purpose.</p> <p>Students will learn how to write programs that interact with the physical world such as using the micro:bit's built-in input and output devices.</p> <p>Students will know to select and design their project purposefully, apply what they have learnt by building a prototype</p> <p>Students will learn how to test, revise, and refine the design of a project by creating a prototype of their micro:bit and bitbot project</p>
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	<p>to minimize the risk of data being compromised through human error.</p> <p>Students will learn how different malware can infect computer systems and how to prevent them by completing various activities in their booklet.</p>		
<p>Assessment Outcomes</p>	<ul style="list-style-type: none"> - What social engineering is with examples, such as phishing and blagging? - Explain what Brute Force attack is - Explain how to perform DDoS attacks. - Identify what happens to data entered online and critique online services in relation to data privacy - Recognise how human errors pose security risks to data - Explain how networks can be protected from common security threats 	<ul style="list-style-type: none"> - What HTML is. - Explain the difference between opening and closing tag - Explain how various HTML tags are used to display text on a web page. - Understands how web pages are displayed on web browser and how the World Wide Web Works - Identify how search engines 'crawl' through the World Wide Web and how they select and rank results - Use HTML tags to create webpages 	<ul style="list-style-type: none"> - describe what the micro:bit is - Explain how to use variables and data structures to keep track of information - Be able to predict the outcome of a program with sequence, selection and iteration - Use an IDE to write Python programs for the micro:bit, locate and correct common syntax errors
<p>Prior Knowledge</p>	<p>Students should know what Hacking is</p> <p>Students should know what Malware is.</p> <p>Students should know how to prevent Hacking.</p> <p>Students should know how to apply tips and techniques to keep themselves and others</p>	<p>Students should understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.</p>	<p>Students can use logical reasoning to predict outcomes.</p> <p>Students can use a block-based programming language to create a sequence, variables and user input in an event-driven programming environment</p> <p>Students can use mathematical operation such as +, -, /, *, <, >, = in a block-base program.</p>

	safe online.		Students can create a block-based program that makes use of variables, sequence, selection and iteration.
Future learning	<p>Students will develop these knowledge and skills further in the 1.5 System Security topic in GCSE Computer Science or BTEC Digital Information Technology qualification in KS4. This topic cover the following;</p> <p>Students will identify threats to computer systems and networks such as Malware, SQL Injection</p> <p>Students will identify vulnerabilities and prevention such as Penetration testing, User access level, Encryption and Physical security</p>	<p>Students will develop these knowledge and skills further in Component 1; User Interface topic in BTEC Digital Information Technology qualification in KS4. This topic cover the following;</p> <p>Students will explore user interface design and development principles</p> <p>Students will investigate how to use project planning techniques to manage a digital project</p> <p>Student will discover how to develop and review a digital user interface</p>	<p>Students will develop these knowledge and skills further in the Programming Techniques and Project topic in GCSE Computer Science in KS4. This topic cover the following;</p> <p>Students will learn more programming techniques such as file handling, string handling, nested IFs and Loops, procedures and function</p> <p>Students will learn how to design, write, test and refine a programming project.</p>
Why are they studying this?	<p>Computing National Curriculum</p> <p>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</p> <p>As professionals we also want our students to study this topic because we want them to understand the importance of cyber security and be able to protect themselves and others against cyber-crimes in a digital world.</p>	<p>Computing National Curriculum.</p> <p>Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals</p> <p>As professionals we also want our students to know how simple web pages are created and be able to fill in job gaps around web development gaps in the local area.</p>	<p>Computing National Curriculum</p> <p>Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems.</p> <p>Use logical reasoning to compare the utility of alternative algorithms for the same problem</p> <p>Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems.,</p>

