

# Curriculum Planning

## Subject - Nurture ICT

# 1 Year Plan

Half Term	Key Subject Content	Sequencing	Rationale	Careers, Industry Links and Cultural Capital	Reading	SEMH
Half Term 1: Sep – Oct	Programming with Scratch	<ul style="list-style-type: none"> <li>- Write programs that display messages, receive keyboard input, and use simple arithmetic expressions in assignment statements</li> <li>- Locate and correct common syntax errors</li> <li>- Create lists and access individual list items</li> <li>- Use selection (**if-elif-else* statements) to control the flow of program execution</li> <li>- Perform common operations on lists or individual items</li> <li>- Use iteration (while statements) to control the flow of program execution</li> <li>- Perform common operations on lists or individual items</li> <li>- Perform common operations on strings or individual characters</li> <li>- Use iteration (for statements) to iterate over list items</li> <li>- Perform common operations on lists or strings</li> <li>- Use iteration (for loops) to iterate over lists and strings</li> <li>- Use variables to keep track of counts and sums</li> <li>- Combine key programming language features to develop solutions to meaningful problems</li> <li>- Apply all of the skills covered in this unit</li> </ul>	<p>This unit introduces learners to how data can be represented and processed in sequences, such as lists and strings. The lessons cover a spectrum of operations on sequences of data that range from accessing an individual element to manipulating the entire sequence.</p> <p>Great care has been taken so that the selection of problems used in the programming tasks are realistic and engaging: learners will process solar system planets, book texts, capital cities,</p>	<p>People who study ICT and computing could look for employment in the following: media: broadcast engineer, multimedia broadcaster, sound technician); the military (armed forces technical officer, intelligence officer, satellite technician) the financial sector (credit analyst,</p>	<p>Pupils are encouraged to take part in shared reading of texts with consideration given to pupil reading age and ability.</p> <p>Use of instructional guides to devise and test a sequence will encourage comprehension.</p>	<p>SEMH Addressed via BOXALL strands linked to specific pupil need.</p> <p>Opportunities to address:</p> <p>A – Giving purposeful attention</p> <p>B – Participating Constructively</p> <p>C - Connecting up experiences</p> <p>D – Showing Insightful Involvement</p>

			leaked passwords, word dictionaries, ECG data, and more. A range of pedagogical tools are employed throughout the unit, with the most prominent being pair programming, live coding, and worked examples.	commodity broker, financial risk analyst). Web designer Systems analyst Computer games developer User experience developer Working in digital technology (a rapidly expanding industry)		E - Engages cognitively with peers  Opportunities to minimise:  Q - Disengaged  R – Self-Negating  By providing an enriching curriculum with ample change to reward success and celebrate progress
Half Term 2: Oct – Dec	Media Animations	<ul style="list-style-type: none"> <li>- Add, delete, and move objects</li> <li>- Scale and rotate objects</li> <li>- Use a material to add colour to objects</li> <li>- Add, move, and delete keyframes to make basic animations</li> <li>- Play, pause, and move through the animation using the timeline</li> <li>- Create useful names for objects</li> <li>- Join multiple objects together using parenting</li> <li>- Use edit mode and extrude</li> <li>- Use loop cut and face editing</li> <li>- Apply different colours to different parts of the same model</li> <li>- Use proportional editing</li> <li>- Use the knife tool</li> <li>- Use subdivision</li> <li>- Add and edit set lighting</li> <li>- Set up the camera</li> <li>- Compare different render modes</li> </ul>	Films, television, computer games, advertising, and architecture have been revolutionised by computer-based 3D modelling and animation. In this unit learners will discover how professionals create 3D animations using the industry-standard software package, Blender. By completing this unit learners will gain a	People who study ICT and computing could also look for employment in the following: media: broadcast engineer, multimedia broadcaster, sound technician);	Pupils are encouraged to take part in shared reading of texts with consideration given to pupil reading age and ability.  Use of multi-media texts will allow pupils to access a range of reading sources to	SEMH Addressed via BOXALL strands linked to specific pupil need.  Opportunities to address:  A – Giving purposeful attention

		<ul style="list-style-type: none"> <li>- Create a 3–10 second animation</li> <li>- Render out the animation</li> </ul>	<p>greater understanding of how this important creative field is used to make the media products that we consume. Sessions will take learners through the basics of modelling, texturing, and animating; outputs will include 3D models and short videos</p>	<p>the military (armed forces technical officer, intelligence officer, satellite technician) the financial sector (credit analyst, commodity broker, financial risk analyst).</p> <p>Web designer Systems analyst Computer games developer User experience developer Working in digital technology (a rapidly expanding industry)</p>	<p>enrich their understanding of animation.</p>	<p>B – Participating Constructively</p> <p>C - Connecting up experiences</p> <p>D – Showing Insightful Involvement</p> <p>E - Engages cognitively with peers</p> <p>Opportunities to minimise:</p> <p>Q - Disengaged</p> <p>R – Self-Negating</p> <p>By providing an enriching curriculum with ample change to reward success and celebrate progress</p>
Half Term 3: Jan – Feb	Data Science	<ul style="list-style-type: none"> <li>- Define data science</li> <li>- Explain how visualising data can help identify patterns and trends in order to help us gain insights</li> <li>- Use an appropriate software tool to visualise data sets and look for patterns or trends</li> </ul>	<p>In this unit, learners will be introduced to data science, and by the end of the unit they will be</p>	<p>People who study ICT and computing could</p>	<p>Pupils are encouraged to take part in shared reading of texts with</p>	<p>SEMH Addressed via BOXALL strands linked</p>

		<ul style="list-style-type: none"> <li>- Recognise examples of where large data sets are used in daily life</li> <li>- Select criteria and use data set to investigate predictions</li> <li>- Evaluate findings to support arguments for or against a prediction</li> <li>- Define the terms 'correlation' and 'outliers' in relation to data trends</li> <li>- Identify the steps of the investigative cycle</li> <li>- Solve a problem by implementing steps of the investigative cycle on a data set</li> <li>- Use findings to support a recommendation</li> <li>- Identify the steps of the investigative cycle</li> <li>- Identify the data needed to answer a question defined by the learner</li> <li>- Create a data capture form</li> <li>- Describe the need for data cleansing</li> <li>- Apply data cleansing techniques to a data set</li> <li>- Visualise a data set</li> <li>- Visualise a data set</li> <li>- Analyse visualisations to identify patterns, trends, and outliers</li> <li>- Draw conclusions and report findings</li> </ul>	<p>empowered by knowing how to use data to investigate problems and make changes to the world around them. Learners will be exposed to both global and local data sets and gain an understanding of how visualising data can help with the process of identifying patterns and trends.</p>	<p>also look for employment in the following: media: broadcast engineer, multimedia broadcaster, sound technician); the military (armed forces technical officer, intelligence officer, satellite technician) the financial sector (credit analyst, commodity broker, financial risk analyst). Web designer Systems analyst Computer games developer User experience developer Working in digital technology (a rapidly</p>	<p>consideration given to pupil reading age and ability.</p> <p>Individual/group analysis of data charts will promote analytical reading comprehension skills.</p>	<p>to specific pupil need.</p> <p>Opportunities to address:</p> <p>A – Giving purposeful attention</p> <p>B – Participating Constructively</p> <p>C - Connecting up experiences</p> <p>D – Showing Insightful Involvement</p> <p>E - Engages cognitively with peers</p> <p>Opportunities to minimise:</p> <p>Q - Disengaged</p> <p>R – Self-Negating</p> <p>By providing an enriching curriculum with ample</p>
--	--	---	--	---	--	---

				expanding industry)		change to reward success and celebrate progress
Half Term 4: Feb – April	Audio-visual representations	<ul style="list-style-type: none"> <li>- Describe how digital images are composed of individual elements</li> <li>- Recall that the colour of each picture element is represented using a sequence of binary digits</li> <li>- Define key terms such as ‘pixels’, ‘resolution’, and ‘colour depth’</li> <li>- Describe how an image can be represented as a sequence of bits</li> <li>- Describe how colour can be represented as a mixture of red, green, and blue, with a sequence of bits representing each colour’s intensity</li> <li>- Compute the representation size of a digital image, by multiplying resolution (number of pixels) with colour depth (number of bits used to represent the colour of individual pixels)</li> <li>- Describe the trade-off between representation size and perceived quality for digital images</li> <li>- Perform basic image editing tasks using appropriate software and combine them in order to solve more complex problems requiring image manipulation</li> <li>- Explain how the manipulation of digital images amounts to arithmetic operations on their digital representation</li> <li>- Describe and assess the creative benefits and ethical drawbacks of digital manipulation [Education for a Connected World](<a href="https://www.gov.uk/government/publications/education-for-a-connected-world">https://www.gov.uk/government/publications/education-for-a-connected-world</a>)</li> <li>- Recall that sound is a wave</li> <li>- Explain the function of microphones and speakers as components that capture and generate sound</li> <li>- Define key terms such as ‘sample’, ‘sampling frequency/rate’, ‘sample size’</li> <li>- Describe how sounds are represented as sequences of bits</li> <li>- Calculate representation size for a given digital sound, given its attributes</li> <li>- Explain how attributes such as sampling frequency and sample size affect characteristics such as representation size and perceived quality, and the trade-offs involved</li> </ul>	<p>In this unit, learners will focus on making digital media such as images and sounds, and discover how media is stored as binary code. You will draw on familiar examples of composing images out of individual elements, mix elementary colours to produce new ones, take samples of analogue signals to illustrate these ideas, and then bring all these things together to form one coherent narrative.</p> <p>The unit has a significant practical aspect; you will use design software (GIMP and Audacity in this case) to manipulate images and sounds. This will help you to understand how the underlying principles of digital</p>	<p>People who study ICT and computing could also look for employment in the following: media: broadcast engineer, multimedia broadcaster, sound technician); the military (armed forces technical officer, intelligence officer, satellite technician) the financial sector (credit analyst, commodity broker, financial risk analyst). Web designer</p>	<p>Pupils are encouraged to take part in shared reading of texts with consideration given to pupil reading age and ability.</p>	<p>SEMH Addressed via BOXALL strands linked to specific pupil need.</p> <p>Opportunities to address:</p> <p>A – Giving purposeful attention</p> <p>B – Participating Constructively</p> <p>C - Connecting up experiences</p> <p>D – Showing Insightful Involvement</p> <p>E - Engages cognitively with peers</p> <p>Opportunities to minimise:</p>

		<p>" - Perform basic sound editing tasks using appropriate software and combine them in order to solve more complex problems requiring sound manipulation "</p> <ul style="list-style-type: none"> <li>- Recall that bitmap images and pulse code sound are not the only binary representations of images and sound available</li> <li>- Define 'compression', and describe why it is necessary</li> </ul>	representations are applied in real settings	Systems analyst Computer games developer User experience developer Working in digital technology (a rapidly expanding industry)		<p>Q - Disengaged</p> <p>R – Self-Negating</p> <p>By providing an enriching curriculum with ample change to reward success and celebrate progress</p>
Half Term 5: April – May	Cyber Security	<ul style="list-style-type: none"> <li>- Explain the difference between data and information</li> <li>- Critique online services in relation to data privacy</li> <li>- Identify what happens to data entered online</li> <li>- Explain the need for the Data Protection Act</li> <li>- Recognise how human errors pose security risks to data</li> <li>- Implement strategies to minimise the risk of data being compromised through human error</li> <li>- Define hacking in the context of cyber security</li> <li>- Explain how a DDoS attack can impact users of online services</li> <li>- Identify strategies to reduce the chance of a brute force attack being successful</li> <li>- Explain the need for the Computer Misuse Act</li> <li>- List the common malware threats</li> <li>- Examine how different types of malware causes problems for computer systems</li> <li>- Question how malicious bots can have an impact on societal issues</li> <li>- Compare security threats against probability and the potential impact to organisations</li> <li>- Explain how networks can be protected from common security threats</li> <li>- Identify the most effective methods to prevent cyberattacks</li> </ul>	<p>This unit takes learners on a journey of discovery of techniques that cybercriminals use to steal data, disrupt systems, and infiltrate networks.</p> <p>The learners will start by considering the value their data holds and what organisations might use it for. They will then learn about social engineering and other common cybercrimes, and finally look at</p>	<p>People who study ICT and computing could also look for employment in the following:</p> <p>media: broadcast engineer, multimedia broadcaster, sound technician); the military (armed forces technical officer, intelligence</p>	<p>Pupils are encouraged to take part in shared reading of texts with consideration given to pupil reading age and ability.</p> <p>Newspaper and articles on cyber security breaches will provide opportunities to decode issues raised in the news.</p>	<p>SEMH Addressed via BOXALL strands linked to specific pupil need.</p> <p>Opportunities to address:</p> <p>A – Giving purposeful attention</p> <p>B – Participating Constructively</p> <p>C - Connecting up experiences</p>

			<p>methods to protect against these attacks.</p>	<p>officer, satellite technician) the financial sector (credit analyst, commodity broker, financial risk analyst).</p> <p>Web designer Systems analyst Computer games developer User experience developer Working in digital technology (a rapidly expanding industry)</p>		<p>D – Showing Insightful Involvement</p> <p>E - Engages cognitively with peers</p> <p>Opportunities to minimise:</p> <p>Q - Disengaged</p> <p>R – Self-Negating</p> <p>By providing an enriching curriculum with ample change to reward success and celebrate progress</p>
<p>Half Term 6: June – July</p>	<p><b>Physical Computing</b></p>	<ul style="list-style-type: none"> <li>- Describe what the micro:bit is</li> <li>- List the micro:bit's input and output devices</li> <li>- Use a development environment to write, execute, and debug a Python program for the micro:bit</li> <li>- Write programs that use the micro:bit's built-in input and output devices</li> <li>- Write programs that use GPIO pins to generate output and receive input</li> <li>- Write programs that communicate with other devices by sending and receiving messages wirelessly</li> </ul>	<p>This unit applies and enhances the learners' programming skills in a new engaging context: physical computing, using the BBC micro:bit. In the first half of the unit, learners will get acquainted with the host of components</p>	<p>People who study ICT and computing could also look for employment in the following: media: broadcast engineer,</p>	<p>Pupils are encouraged to take part in shared reading of texts with consideration given to pupil reading age and ability.</p>	<p>SEMH Addressed via BOXALL strands linked to specific pupil need.</p> <p>Opportunities to address:</p>

		<ul style="list-style-type: none"> <li>- Design a physical computing artifact purposefully, keeping in mind the problem at hand, the needs of the audience involved, and the available resources</li> <li>- Decompose the functionality of a physical computing system into simpler features</li> <li>- Implement a physical computing project, while following, revising, and refining the project plan</li> <li>- Implement a physical computing project, while following, revising, and refining the project plan</li> </ul>	<p>built into the micro:bit, and write simple programs that use these components to interact with the physical world. In the process, they will refresh their Python programming skills and encounter a range of programming patterns that arise frequently in physical computing applications. In the second half, learners will work in pairs to build a physical computing project. They will be required to select and design their project purposefully, apply what they have learnt by building a prototype, and keep a structured diary throughout the process.</p>	<p>multimedia broadcaster, sound technician); the military (armed forces technical officer, intelligence officer, satellite technician) the financial sector (credit analyst, commodity broker, financial risk analyst).</p> <p>Web designer Systems analyst Computer games developer User experience developer Working in digital technology (a rapidly expanding industry)</p>		<p>A – Giving purposeful attention</p> <p>B – Participating Constructively</p> <p>C - Connecting up experiences</p> <p>D – Showing Insightful Involvement</p> <p>E - Engages cognitively with peers</p> <p>Opportunities to minimise:</p> <p>Q - Disengaged</p> <p>R – Self-Negating</p> <p>By providing an enriching curriculum with ample change to reward success and celebrate progress</p>
--	--	---	--	--	--	---

