

Sequenced	9.1 Data representation with images and sound	9.2 Further programming with python	9.3 Cyber security
Key Knowledge	To know: - How images are composed of individual elements - That the colour of each picture element is represented using a sequence of binary digits - Key terms 'pixels', 'resolution', and 'colour depth' - An image can be represented as a sequence of bits - Colour can be represented as a mixture of RGB - The representation size of a digital image - The trade-off between representation size and perceived quality for digital images - How the manipulation of digital images amounts to arithmetic operations on their digital representation - The function of microphones and speakers - Key terms such as 'sample', 'sampling frequency/rate', 'sample size' - How sounds are represented as sequences of bits	To know: - How to write programs that display messages, receive keyboard input, and use simple arithmetic expressions in assignment statements - How to use selection (if-elif-else statements) to control the flow of program execution - Common syntax errors - How to create lists and access individual list items - Common operations on lists or individual items - How iteration is used (while statements) to control the flow of program execution - How iteration (for loops) is used to iterate over lists and strings - How variables keep track of counts and sums	To know: - The difference between data and information - What happens to data that is entered online - The need for the Data Protection Act - How human errors pose security risks to data - Hacking in the context of cybersecurity - How a DDoS attack can impact the users of online services - Strategies to reduce a brute force attack - The need for the Computer Misuse Act (1990) - The common malware threats - Recognise the most effective methods to prevent cyberattacks
Key Skills	To be able to: - Describe how digital images are composed of individual elements - Recall that the colour of each picture element is represented using a sequence of binary digits - Define terms: 'pixels', 'resolution', 'colour depth' - Describe how an image can be represented as a sequence of bits - Describe how colour can be represented as RGB - Compute the representation size of an image - Describe the trade-off between representation size and perceived quality for digital images - Perform basic image editing tasks - Explain the function of microphones and speakers - Define key terms such as 'sample', 'sampling frequency/rate' and 'sample size'	To be able to: - Write programs that display messages, receive keyboard input, and use simple arithmetic expressions in assignment statements - Use selection (if-elif-else statements) to control the flow of program execution - Locate and correct common syntax errors - Create lists and access individual list items - Perform common operations on lists or individual items - Use iteration (while statements) to control the flow of program execution - Use iteration (for loops) to iterate over lists and strings - Use variables to keep track of counts and sums	To be able to: - Explain the difference between data and information - Identify what happens to data that is entered online - Explain the need for the Data Protection Act - Define hacking in the context of cybersecurity - Explain how a DDoS attack can impact the users of online services - Identify strategies to reduce the chance of a brute force attack being successful - Explain the need for the Computer Misuse Act - List the common malware threats - Examine how different types of malware cause problems for computer systems - Identify the most effective methods to prevent cyberattacks
	Tier 3 key vocabulary	Tier 3 key vocabulary	Tier 3 key vocabulary
Subject specific	Digital image, binary image representation, picture elements, pixels, resolution, colour depth, bitmap, RGB colour, representation size, compression, Sound, waves, microphone, speaker, analogue, digital, sampling rate, sample size	Input, output, variables, assignment, expressions, selection, Boolean/logical expression (condition), list, index, list item, Iteration, while, for, indentation	Data science, visualisation, insight, infographic, Data, prediction, criteria, outliers, correlation, PPDAC, investigative cycle, data capture, data source, data cleansing, conclusion