# KS3 Computing Curriculum Coverage: 2024 – 2025

**Year 9**

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