**CURRICULUM OVERVIEW 2024 – 2025**

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| **YR 9** | **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Content** | Python programming with sequences of data | Media – Animations | Data science | Representations – going audiovisual | Cybersecurity | Physical computing (to be changed to An Hour of Code soon) |
| **Key new knowledge** | - Write programs that display messages, receive keyboard input, and use simple arithmetic expressions in assignment statements- Locate and correct common syntax errors- Create lists and access individual list items- Use selection (\*\*if-elif-else\* statements) to control the flow of program execution- Perform common operations on lists or individual items- Use iteration (while statements) to control the flow of program execution- Perform common operations on lists or individual items- Perform common operations on strings or individual characters- Use iteration (for statements) to iterate over list items- Perform common operations on lists or strings- Use iteration (for loops) to iterate over lists and strings- Use variables to keep track of counts and sums- Combine key programming language features to develop solutions to meaningful problems- Apply all of the skills covered in this unit | - Add, delete, and move objects- Scale and rotate objects- Use a material to add colour to objects- Add, move, and delete keyframes to make basic animations- Play, pause, and move through the animation using the timeline- Create useful names for objects- Join multiple objects together using parenting- Use edit mode and extrude- Use loop cut and face editing- Apply different colours to different parts of the same model- Use proportional editing- Use the knife tool- Use subdivision- Add and edit set lighting- Set up the camera- Compare different render modes- Create a 3–10 second animation- Render out the animation | - Define data science- Explain how visualising data can help identify patterns and trends in order to help us gain insights- Use an appropriate software tool to visualise data sets and look for patterns or trends- Recognise examples of where large data sets are used in daily life- Select criteria and use data set to investigate predictions- Evaluate findings to support arguments for or against a prediction- Define the terms ‘correlation’ and ‘outliers’ in relation to data trends- Identify the steps of the investigative cycle- Solve a problem by implementing steps of the investigative cycle on a data set- Use findings to support a recommendation- Identify the steps of the investigative cycle- Identify the data needed to answer a question defined by the learner- Create a data capture form- Describe the need for data cleansing- Apply data cleansing techniques to a data set- Visualise a data set- Visualise a data set- Analyse visualisations to identify patterns, trends, and outliers- Draw conclusions and report findings | - 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 key terms such as ‘pixels’, ‘resolution’, and ‘colour depth’- Describe how an image can be represented as a sequence of bits- Describe how colour can be represented as a mixture of red, green, and blue, with a sequence of bits representing each colour’s intensity- 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)- Describe the trade-off between representation size and perceived quality for digital images- Perform basic image editing tasks using appropriate software and combine them in order to solve more complex problems requiring image manipulation- Explain how the manipulation of digital images amounts to arithmetic operations on their digital representation- Describe and assess the creative benefits and ethical drawbacks of digital manipulation [Education for a Connected World](https://www.gov.uk/government/publications/education-for-a-connected-world)- Recall that sound is a wave- Explain the function of microphones and speakers as components that capture and generate sound- Define key terms such as ‘sample’, ‘sampling frequency/rate’, ‘sample size’- Describe how sounds are represented as sequences of bits- Calculate representation size for a given digital sound, given its attributes- Explain how attributes such as sampling frequency and sample size affect characteristics such as representation size and perceived quality, and the trade-offs involved"- Perform basic sound editing tasks using appropriate software and combine them in order to solve more complex problems requiring sound manipulation"- Recall that bitmap images and pulse code sound are not the only binary representations of images and sound available- Define ‘compression’, and describe why it is necessary | - Explain the difference between data and information- Critique online services in relation to data privacy- Identify what happens to data entered online- Explain the need for the Data Protection Act- Recognise how human errors pose security risks to data- Implement strategies to minimise the risk of data being compromised through human error- Define hacking in the context of cyber security- Explain how a DDoS attack can impact 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 causes problems for computer systems- Question how malicious bots can have an impact on societal issues- Compare security threats against probability and the potential impact to organisations- Explain how networks can be protected from common security threats- Identify the most effective methods to prevent cyberattacks | - Describe what the micro:bit is- List the micro:bit’s input and output devices- Use a development environment to write, execute, and debug a Python program for the micro:bit- Write programs that use the micro:bit’s built-in input and output devices- Write programs that use GPIO pins to generate output and receive input- Write programs that communicate with other devices by sending and receiving messages wirelessly- Design a physical computing artifact purposefully, keeping in mind the problem at hand, the needs of the audience involved, and the available resources- Decompose the functionality of a physical computing system into simpler features- Implement a physical computing project, while following, revising, and refining the project plan- Implement a physical computing project, while following, revising, and refining the project plan |
| **Assessments** | Formative questioning andteacher observation.Summative end of unitassessment. | Formative questioning andteacher observation.Summative end of unitassessment. | Formative questioning andteacher observation.Summative end of unitassessment. | Formative questioning andteacher observation.Summative end of unitassessment. | Formative questioning andteacher observation.Summative end of unitassessment. | Formative questioning andteacher observation.Summative end of unitassessment. |