ICT
Curriculum Map: Year 9

Students in year 9 rotate between Design Technology, Food Technology, ICT and Textiles throughout the academic year

Content is mapped to the Computing National Curriculum

Micro:bit Animation Project

Analysis:
Students begin their project by working together to create steps; an algorithm, and a flowchart for a familiar process.

NC5:
Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems

NC3 *use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions*

Students revisit algorithms and create step-by-step instructions for a process. They will use block-programming resources to create a program based on this algorithm.

BBC Micro:bit is a pocket-sized computer. Students will familiarise themselves with it as an example of how software and hardware work together. It has an LED light display, buttons, sensors and input/output features. Students will program the micro: bit and interact with it.
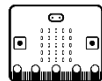
Students are introduced to the concepts of abstraction (removing unnecessary data and decomposition (breaking down a complex problem in to smaller parts)

Analysis:
Project requirements and criteria are defined. Abstraction and decomposition are used to identify and specify exactly what is required of the program

NC6:
Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits

Microbit Investigation
Students set up and investigate the Micro:bit computer., discovering Inputs, Outputs and Sensors-

Students will share their investigations and any adaptations with the class.

Design:
Students investigate how the program should be developed, all the tasks the program must complete, and how each task is to be performed. This is done by developing an algorithm via a structured flowchart.

Design:
Students create the initial model of their program, based on the algorithm, creating a flipbook animation.

NC7: *undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users*

NC8: *create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability*

NC2: *Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem*

Coding and testing
Students plan and transfer their design to the Micro:bit based on their algorithm, flowchart and animation model

Project evaluation
Students revisit their code and ensure that it meets project requirements. Documentation is updated and they present their work to the class.