Bomere and the XI Towns Federation Knowledge Organiser - Computing

Topic: Programming B - Sensing Movement

Class/Year Groups: Wrekin

Term: Summer

What you already know?

This unit presumes that pupils are already confident in their understanding of sequence, repetition and selection independently within programming

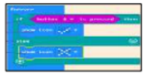
Using Micro:bit Software

-Software Interface: Just like other programming software, the micro:bit interface has programming blocks and a programming area. The emulator gives a simulation for testing code.

-Basic Blocks: Can be used to do things like display images, text and pictures on the LED display. They should be placed into the 'on start' or 'forever' blocks.

-Input Blocks: Enables the user to create 'triggers' using different parts of the micro:bit device, e.g. 'on button … pressed.'

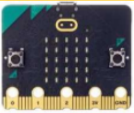
-Logic Blocks: Allow conditions to be set. E.g. 'If, then, else' blocks allow us to set actions for when certain conditions are met (true), and alternative actions for when they are not met (false).



-Math Blocks: Includes numbers and sums in programs. The 'pick random number' block can allow different codes to run dependent on the random number generated.

What you will learn:

The Basics of Micro:bits



-What is a Micro:bit? A micro:bit is a pocket-sized computer. We can write programs on our computers which can then be transferred to micro:bits to run.
-Micro:bits have an LED light display, buttons, sensors and many input/output features that we can program.

The Parts of a Micro:bit - Front

1. A and B buttons: make things happen.

2. LED Display: shows words, pictures, numbers.

3. Light Sensor: Measures the light that falls onto the micro:bit.

4.Input and Output Pins: Connects the micro:bit to other devices.

The Parts of a Micro:bit - Rear

5. Temperature Sensor
6. Compass
7. Accelerometer – Detects movement
8. Radio Communication – to communicate with other micro:bits and devices.
9. USB Port – Connects device to computer. 10. Reset Button
11. Battery Socket – to power away from the computer.
12. Processor – The 'brain' of the device.

Transferring to Micro:bit

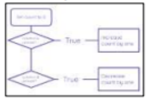
Micro:bit can be connected to the computer using a USB cable.

1. Select 'download'
2. Locate the file in the downloads folder.
3. Copy the file from the MICROBIT drive.
4. Run the program on the micro:bit.

-Micro:bit will only run code that has been downloaded. If code is changed in the editor, it will need to be downloaded again in order to run on the micro:bit.

Sensing Inputs

-There are a number of input sensors on micro:bits, including the buttons, light sensor, accelerometer, compass, temperature sensor and GPIO pins.



-We can create algorithms that enable different codes to run depending upon what is detected by different sensors.

-Remember to trial your programs and to debug them if there are sequence, keying, or logical errors.

Vocabulary:

Micro:bit	small computers that perform different actions based on programs written on computer software. Programs are then downloaded to the micro:bit.
LED display	shows words, pictures, numbers
light sensor	measures the light that falls onto the micro:bit.
input and output pins	connects the micro:bit to other devices
USB port	connects device to computer
accelerometer	detects movement

National Curriculum Objectives:

- Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information