1. INTRODUCTION

Programming is done by websites. No Apps have to be downloaded.
You can program in either Makecode or Python. Makecode is in fact Scratch.
Websites (URLs): Makecode https://makecode.microbit.org Python https://python.microbit.org/v/3

Both websites include a Micro Bit simulator; a virtual Micro Bit. The simulator shows an image of a Micro Bit and allows you to see the state of the LEDs and press buttons etc. With the simulator you can test your programs without a real Micro Bit!

1.1 Useful Websites

Micro Bit pin layout:	Pin Layout	
Micro Bit error codes:	Error Codes	
How to control LED strings:	LED Strings	
RGB colour chart:	Colour to RGB values	Useful for choosing LED colours

2. MAKECODE PROGRAMMING https://makecode.microbit.org

Under the section “My Projects”, **either** click “New Project” (with big “+” character) **or** a previous project, if you have one.
Create a program

2.1 Simulator

There is a vertical grey drag bar to the right of the simulator image of the micro bit. On a low resolution screen it may need to be dragged down to show the controls. 6 horizontal button icons; 1 to 6 left to right. Run/stop via button 1.
Also to run again (and again), click left arrow (hide the simulator) then click right arrow (show the simulator)

2.2 Downloading to the Micro Bit

Plug in the Micro Bit via USB; the device appears as a hard drive, that you can see using the computer file browser.

The website “Download” button (bottom left) transfers the hex file to download folder on your computer; then copy and paste from the download folder to the Micro Bit hard drive folder.

2.3 Saving Your Work

The hex file is also your project file, containing all your programming for your project.
If working at school, save your hex files in your pupil name folder on the school server.
If working out of school, make sure that you save your hex files in a secure place that you can remember where it is!

2.4 Using a Saved Project

On the main screen, click the “Import” button (right hand side, half-way down), then use the computer file browser to locate the hex file.

3. PYTHON PROGRAMMING https://python.microbit.org/v/3

Important – all programs need the first line to be:

from microbit import *
This makes the Python interpreter aware of the Micro Bit functions. If you forget to include this line then Python will shows lots of errors!

3.1 Simulator

This is located, top, right on the main screen.

3.2 Downloading to the Micro Bit

Plug in the Micro Bit via USB; the device appears as a hard drive, that you can see using the computer file browser.
The website “Save” button (bottom right) transfers the hex file to download folder on your computer; then copy and paste from the download folder to the Micro Bit hard drive folder.

3.3 Saving Your Work

Click the three vertical dots, just to the right of the “Save button”; a “Save Python Script” box pops up. Click the box; this causes the Python script to be saved in the “Download” folder of your computer. All Python scripts have a file name that ends in “.py”.
If working at school, save your .py files in your pupil name folder on the school server.
If working out of school, make sure that you save your .py files in a secure place that you can remember where it is!

3.4 Using a Saved Project

On the main screen, click the “Open” button (bottom, just right of centre), then use the computer file browser to locate the .py file.

4. USEFUL INFORMATION COMMON TO BOTH MAKECODE AND PYTHON

4.1 Running on the Micro Bit

The Micro Bit can only run one program at a time.

The Micro Bit has “non volatile” memory – it remembers the last program loaded even when power is removed.

The Micro Bit gets its power from a USB connection OR the battery pack. It is safe to have both USB and battery connected at the same time. If the battery pack is connected, a running program will keep running when USB is disconnected.

To run the program again (and again), press the reset button (single button on the non-LED size of the board).

To pause the program, press and hold the reset button for about three seconds. To start the program again, briefly press the reset button.

****IMPORTANT**** Pause a running program before downloading a new program; the download will fail otherwise.