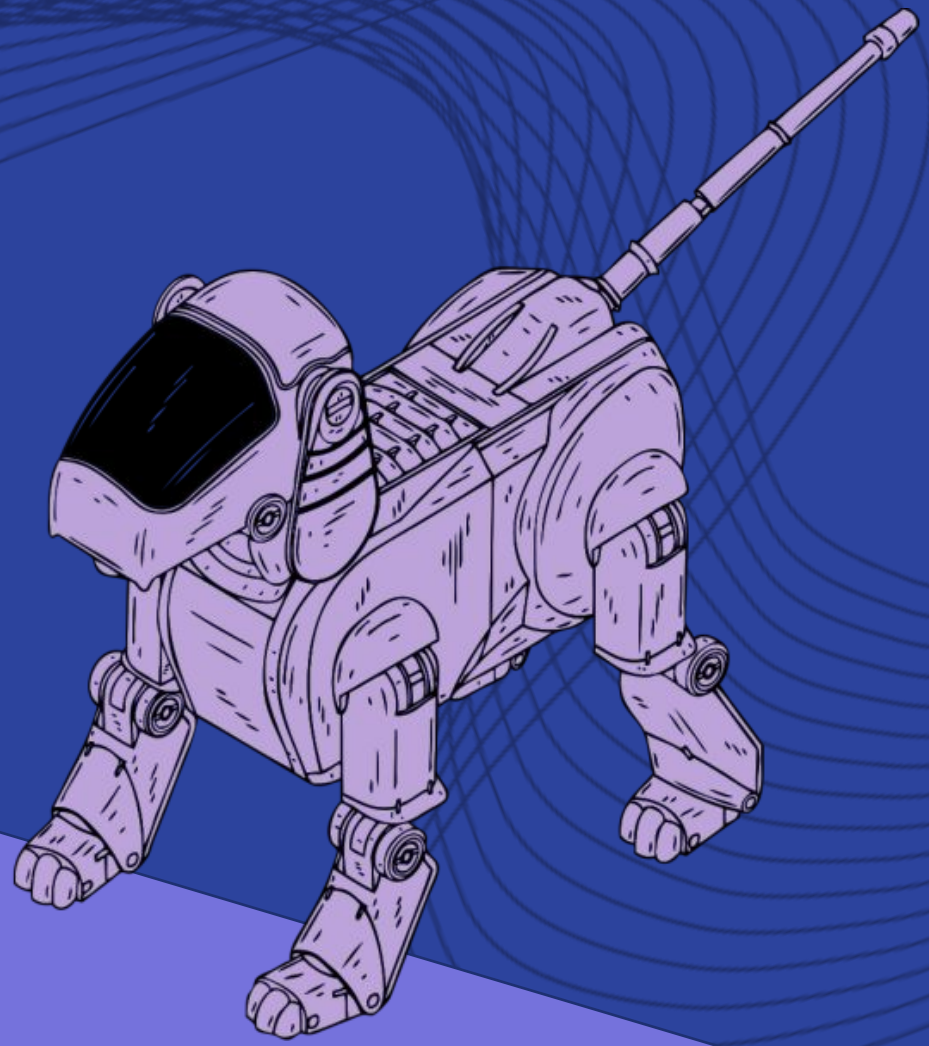
BBC Micro:Bit

Level 1 – Introduction

Robotics



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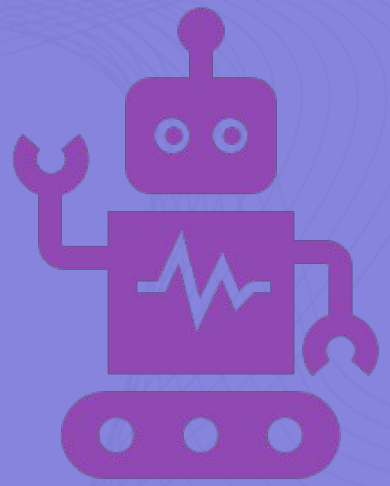
Introduction

Micro:Bits are pocket-sized computers with the potential to create whatever your imagination can code!

The Micro:Bit helps you to understand how computers work in this new tech-savvy world!



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Task

Learning about Micro:Bits

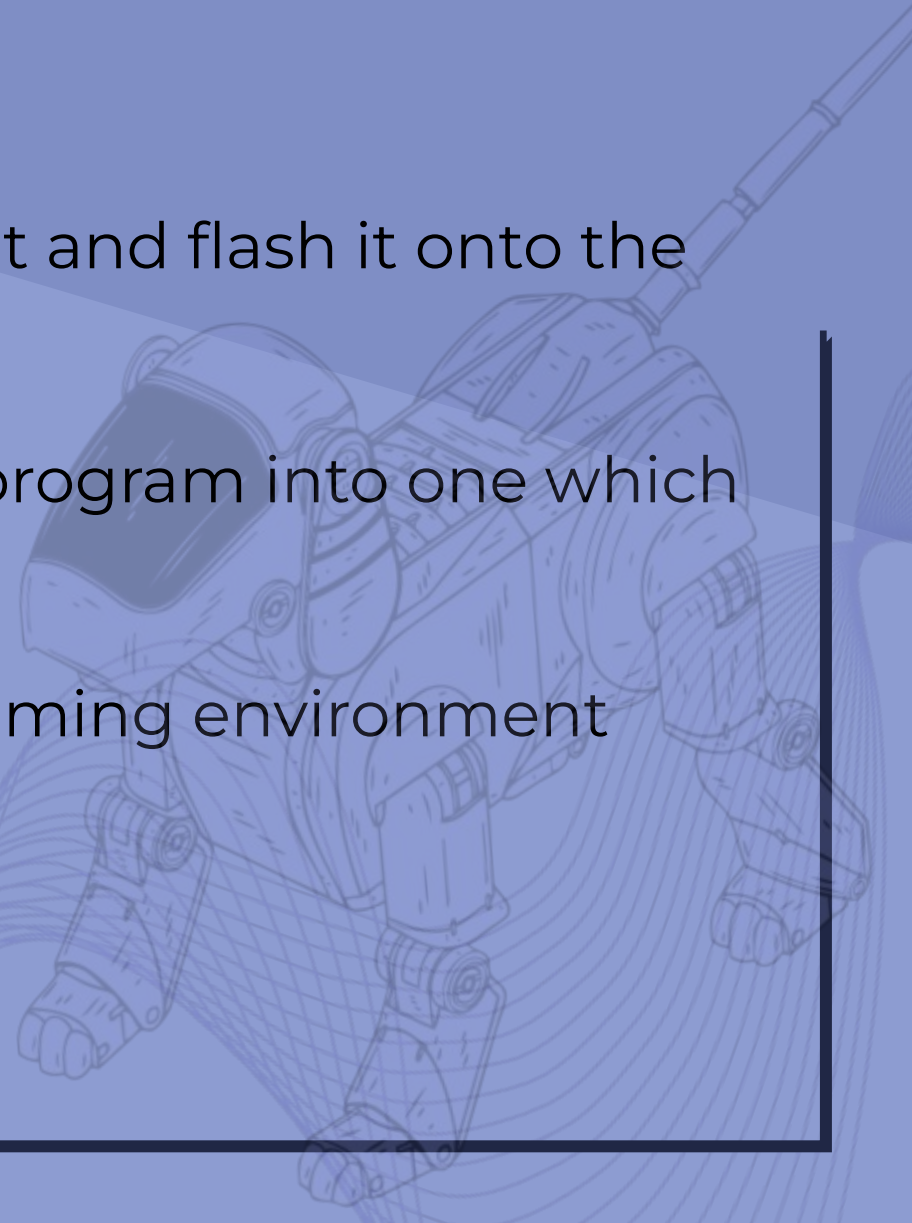
Today, we are going to understand...

- What a Micro:Bit is,
- The various components of the device,
- The various programming environments,
- How to write a simple program,

Process

Success Criteria:

- ✔ ALL: To code a simple program, compile it and flash it onto the device.
- ✔ MOST: To be able to develop the simple program into one which is unique.
- ✔ SOME: To be able to explore the programming environment and share new programming ideas.



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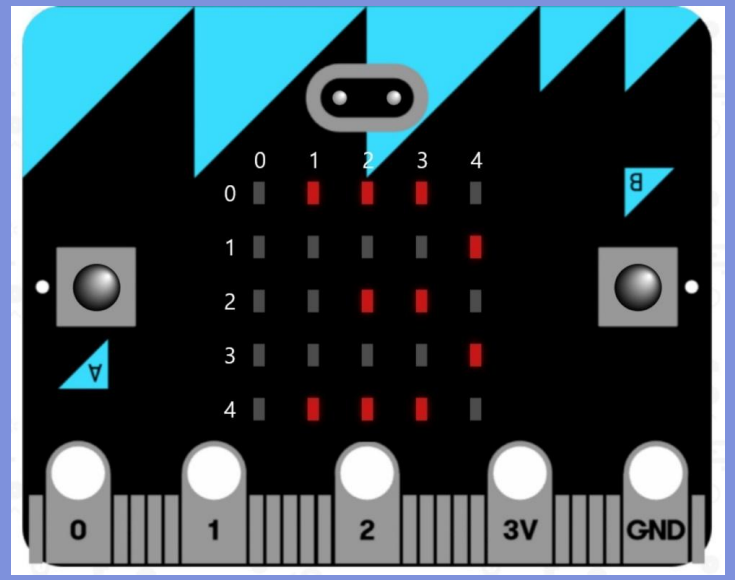
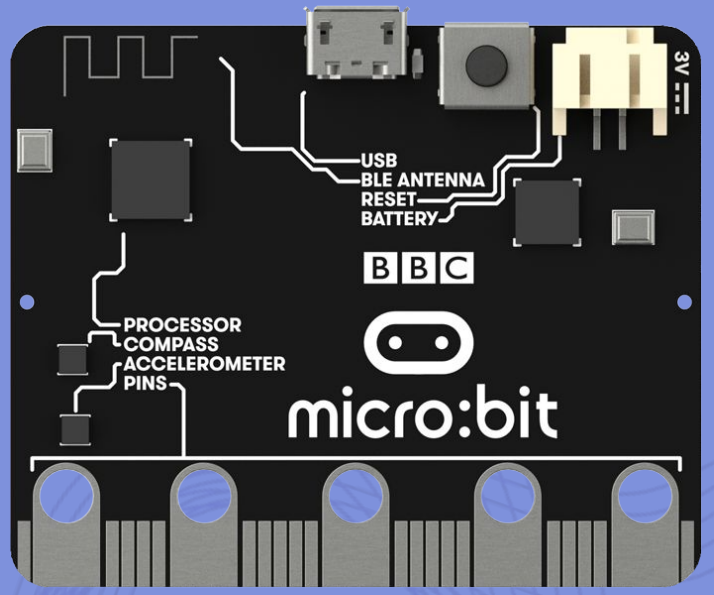
Step 1

What is the BBC Micro:Bit?

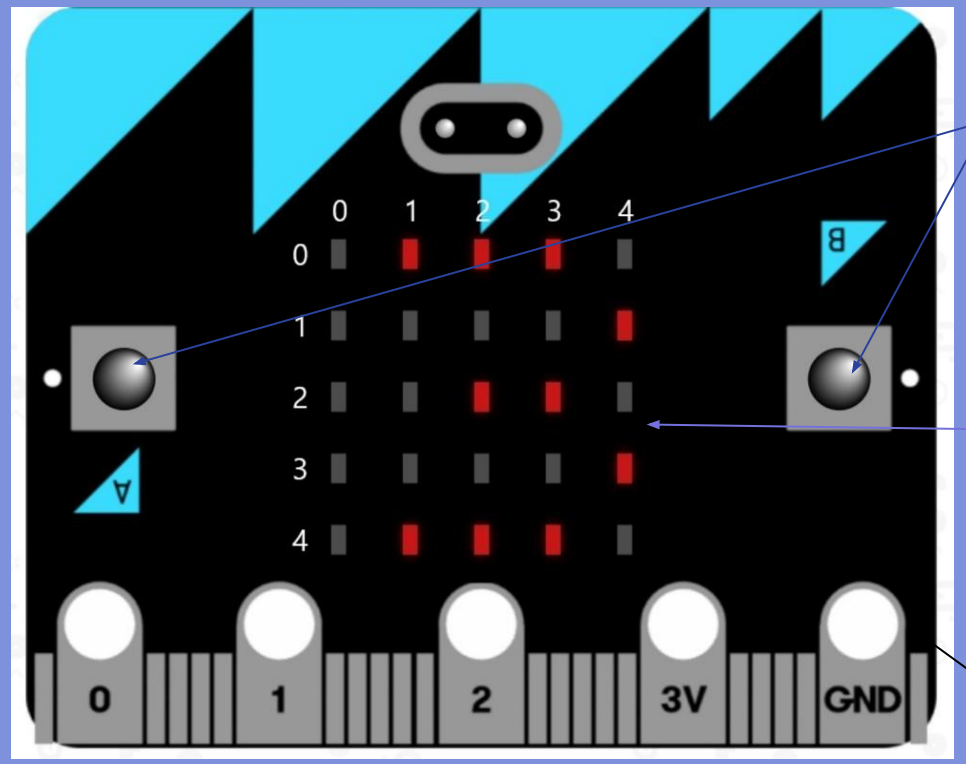
The BBC Micro:Bit is a pocket-sized, fully programmable computer, with many different features, that when programmed lets it interact with you and your world!





Step 2

What features does the Micro:Bit have?



Two Buttons

These can be independently programmed to produce different actions when pressed. They can also be programmed to produce actions if pressed together.

25 programmable LEDs

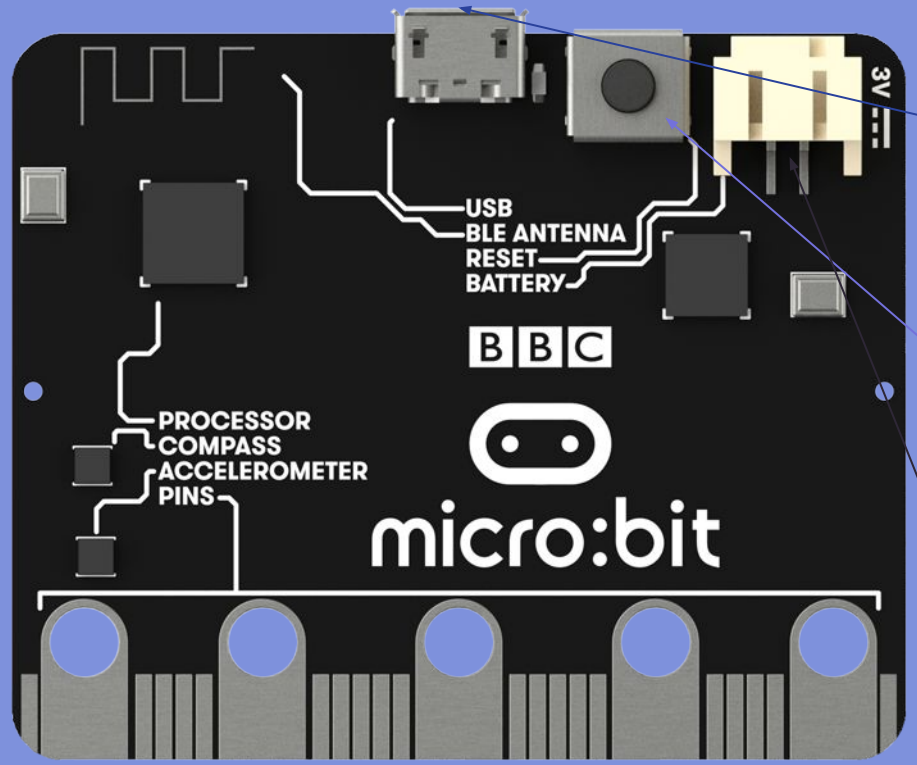
These can be programmed to display text, numbers or the objects in simple games!

Input/Output Connectors

Different 'external' devices can be attached to the Micro:Bit – such as a motor or a speaker.

Step 3

What features does the back of the Micro:Bit have?



USB Connector

Enabling the Micro:Bit to connect to the PC in order to ‘flash’ your programs onto it.

Reset Button

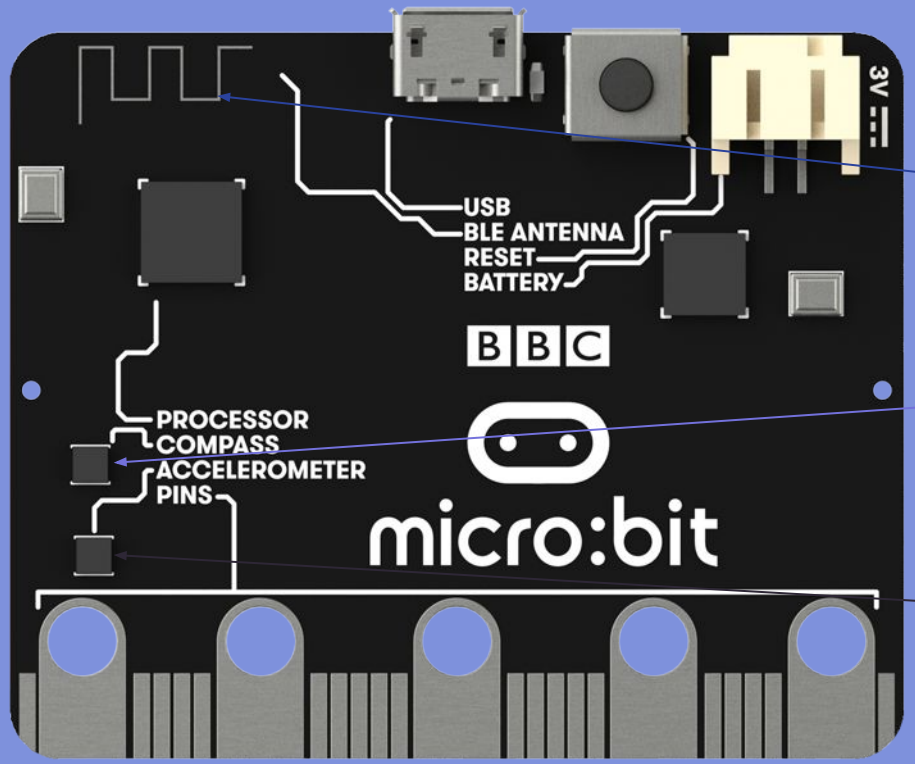
This is used to reset/restart your program, when it is in use.

Battery Connection

This can be used to connect the battery pack so you can use the Micro:Bit as a mobile device.

Step 4

What other features does the back of the Micro:Bit?



Bluetooth Antenna
Enabling the Micro:Bit to connect to devices wirelessly.

A Compass
This can be used to create programs which requires data about which way the Micro:Bit is facing.

An Accelerometer
This can be used to sense movements in the Micro:Bit device.

How do we program the BBC Micro:Bit?

It’s all done via the BBC website! There are a wide range of languages that can be used to program the device.

We will be using ‘Blocks’ (which is a bit like Scratch) to begin with, then we may dabble with a bit of Python!

Code it

First we code our program.
We can check it works by using the online Micro:Bit emulator.

Compile it

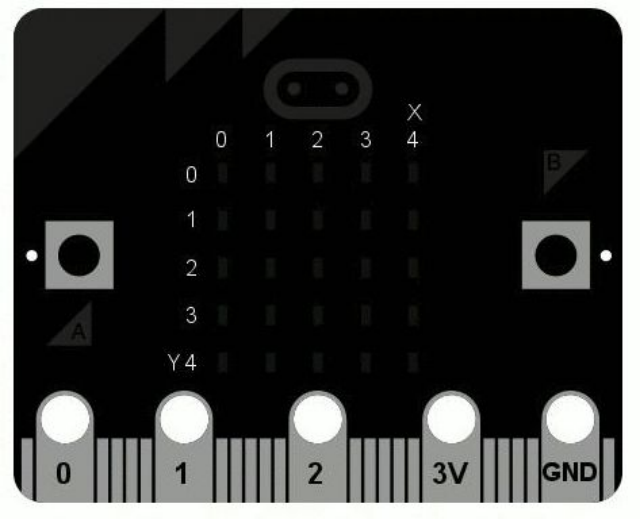
Then we compile the code. This is where our code is converted into binary (zeros and ones) so that the Micro:Bits CPU can process the program.

Flash it

Finally, we transfer the compiled program onto the device.
Flashing is where the code is stored on the Micro: Bit's memory chip, ready to be executed – run.

Class Activity

Lets code a really simple program which displays the word ‘Hello World’.

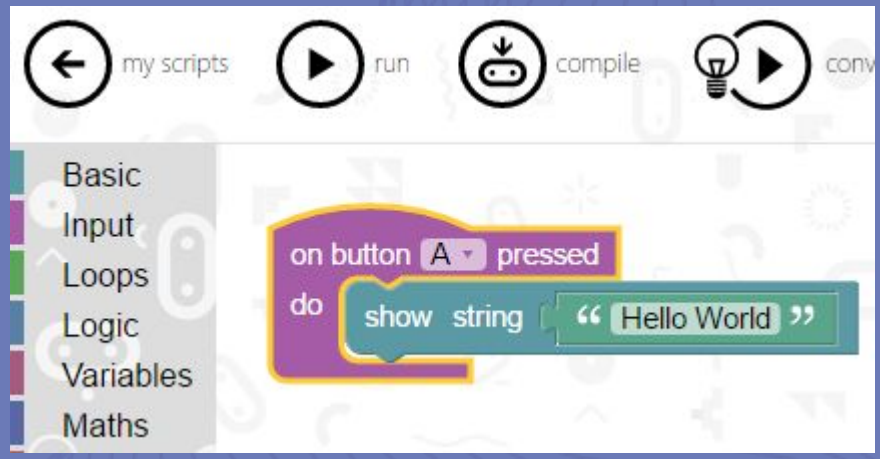


We will then compile the program and finally flash it onto the device.

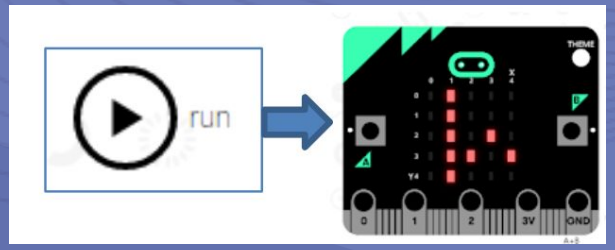
Step 1 – Coding

Creating a new project

- Go to www.microbit.co.uk/create-code
- click on ‘New Project’.
- Create the following script:
  - Use an INPUT script to start the code block,
  - Then use a BASIC show string to write the text to be displayed.



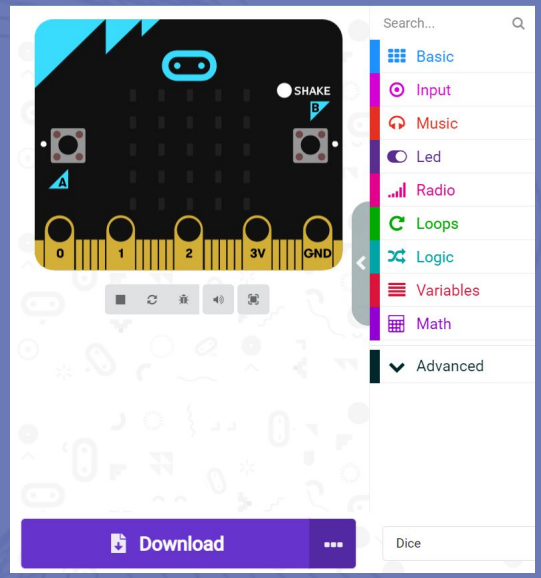
- Finally, click RUN and try out the code on the Micro:Bit emulator:



Step 2

Compiling and Flashing the code

- Press the COMPILE button,
- Once the HEX file has downloaded, go into your documents and find it.
- Now plug in your device to an available USB port.



- Open the device up as if it were a USB memory stick.
- Now drag the HEX file into the opened device folder (as if you were transferring files to a memory stick).
- Now the FLASHING will be complete and you can try out your software on your Micro:Bit.

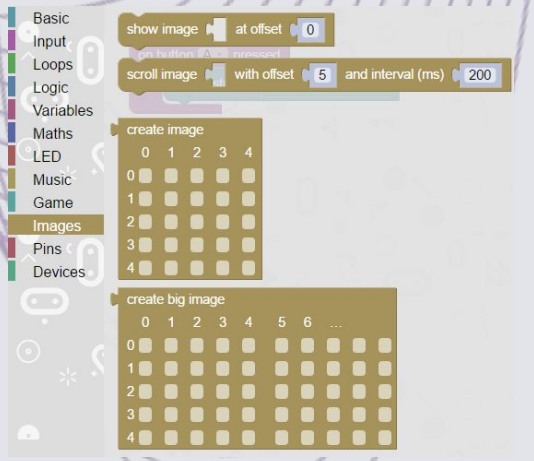
Extension:

Continue to practice the...

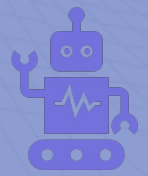
Code it → Compile it → Flash it

...process by coding your own messages and flashing them onto your device.

Play around and see what you can discover. Try out the 'Create Image' script for example!



Links to everyday life



Robotics

The coding of the Micro:Bit itself is actually classed as robotics, since you are coding a device that interacts with its surrounding and even other people.

Creativity

This project makes you think deeply about just how much art can actually be incorporated into technology which we see all around us every single day.

Wider World

As a society in the 21st century, we are surrounded by technology absolutely everywhere, sometimes even to the point it can be intimidating. Starting with projects like this is a great way to start learning about technology.

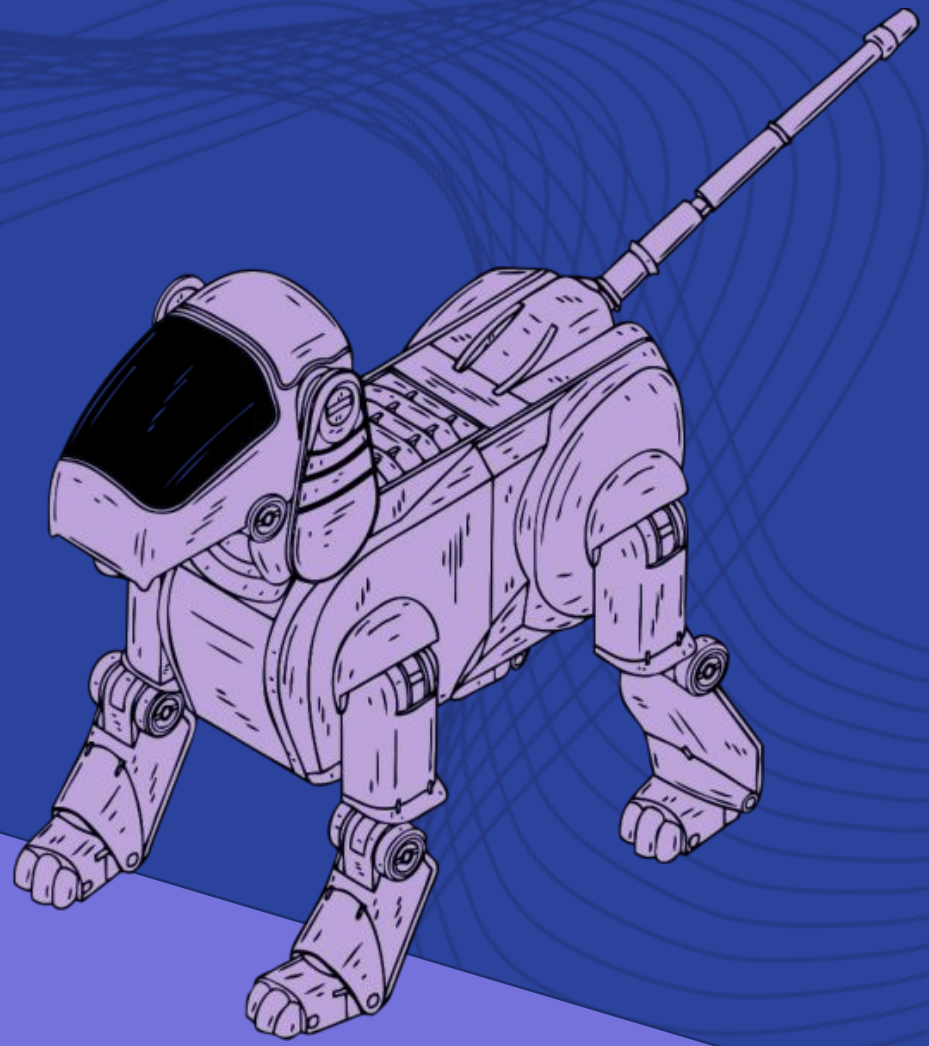
Conclusion

Learning outcomes

- ✔ I understand what a Micro:Bit is,
- ✔ I understand the various components of the device,
- ✔ I understand the various programming environments,
- ✔ I am able to write a simple program.

Congratulations!

You have completed the first Micro:bit project



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