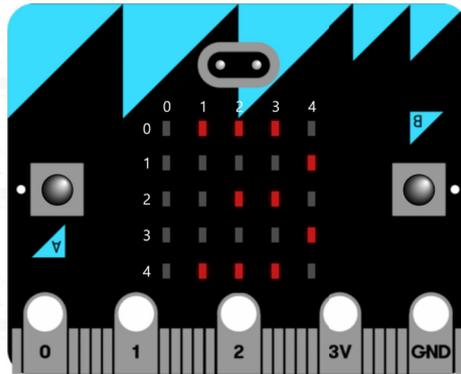


BBC micro:bit



www.penguintutor.com/microbit



Introduction to the micro:bit

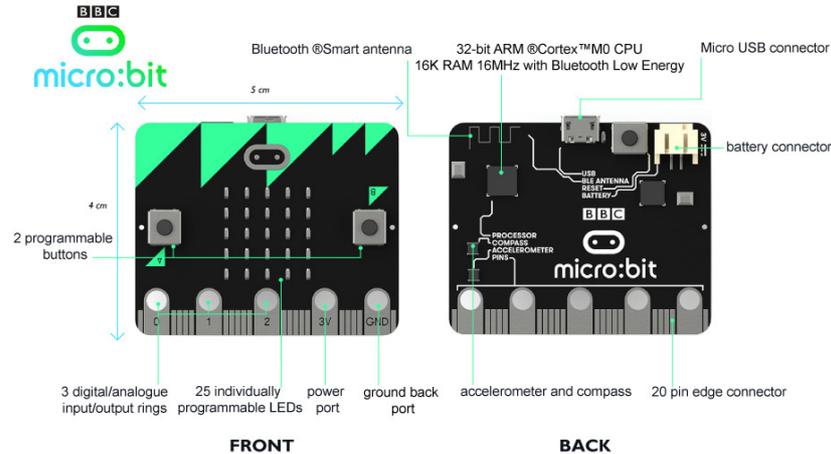
Look at what the micro:bit is, the 4 official programming languages and a simple example of physical computing.

micro:bit from the BBC designed to teach programming

Given away to all year 7 pupils during 2016

Also available to buy for about £13 (inc VAT)
Kitronic, The Pi Hut, Pimoroni & Maplin

micro:bit hardware

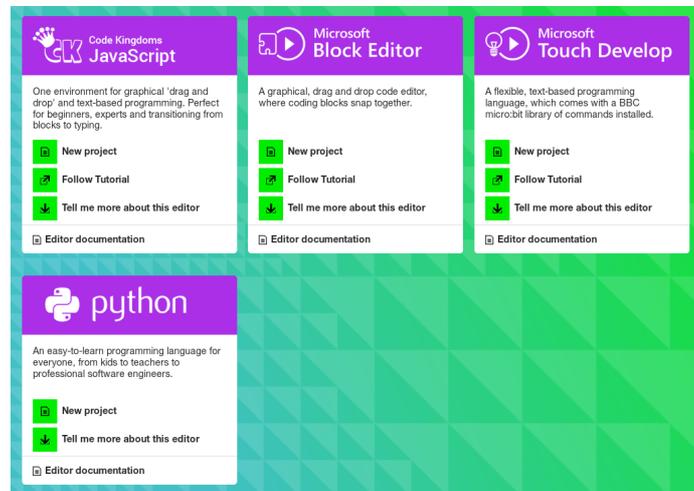


This is not a full computer running a full operating system like the Raspberry Pi, but instead an embedded system useful for teaching program and simple physical computing – ie computers interacting with the real world using sensors and outputs.

Immediately visible are the 5 x 5 LED array and 2 buttons (switches)

Also includes compass and accelerometer

www.microbit.co.uk



There are 4 different programming languages available through the microbit website.

These range from block based languages to standard text based programming languages.

Develop in a browser and then download a hex file that can be dragged and dropped to the micro:bit

You could also program using C/C++ - see <https://lancaster-university.github.io/microbit-docs/>

Also Espruino (JavaScript based)
<http://www.espruino.com/>

What is computing?



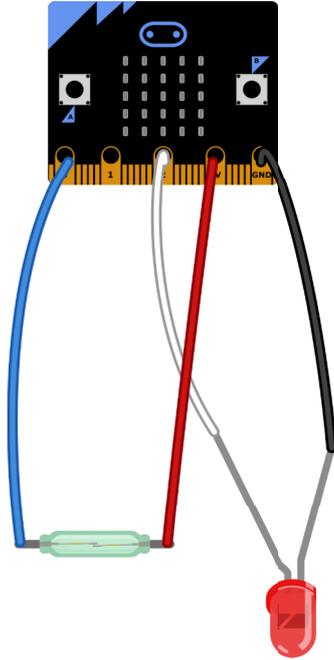
Computing is all about inputs, outputs and processing

inputs eg. keyboard, touch screen, data

outputs eg. screen, speakers, printers

Processing – which goes on within the computer.

An example of physical computing



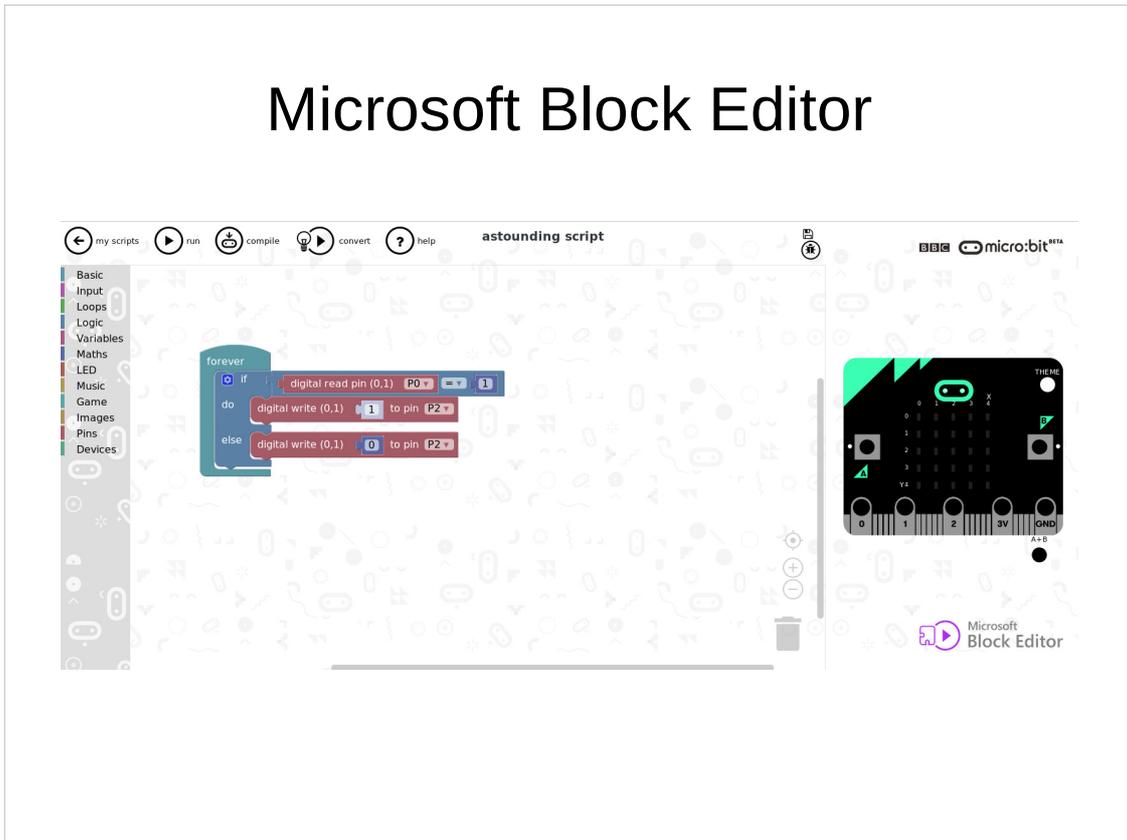
We can demonstrate this using a single sensor as input – reed switch and a LED as an output

The processing part in terms of the stored program.

We will look at the different programming languages on how they can process the input to change the output.

Use each of the 4 programming languages – performing the same function.

Microsoft Block Editor

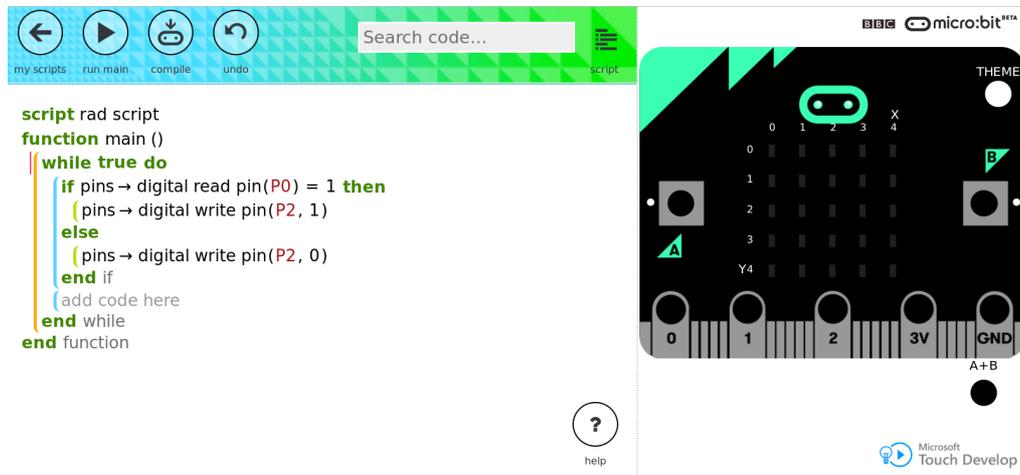


Easiest to get started with for those new to programming.

Similar to Scratch in that you drag blocks over.

See emulator on the right.

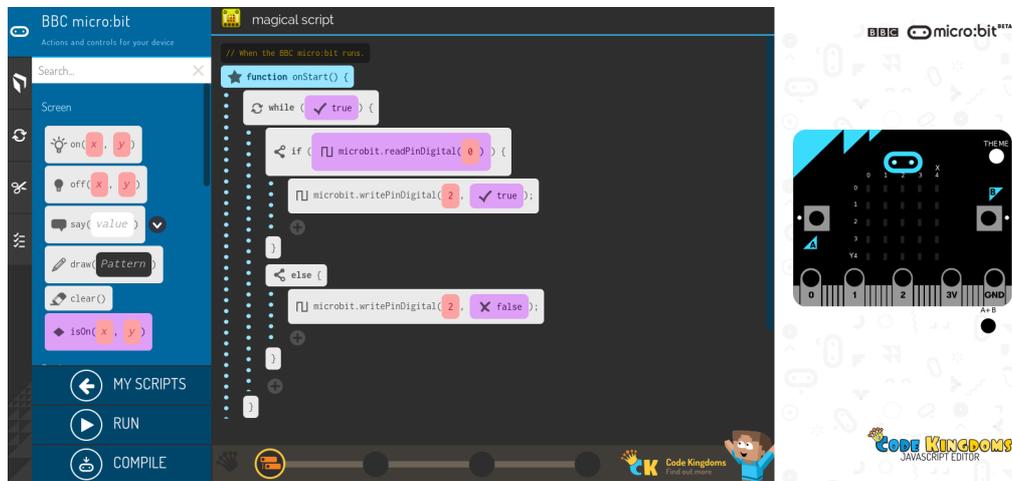
Microsoft Touch Develop



Microsoft also provide a Touch Develop which is partway between the block based editor and a text programming language.

You can drag blocks on, but then have to enter some bits yourself.

Code Kingdom (JavaScript)



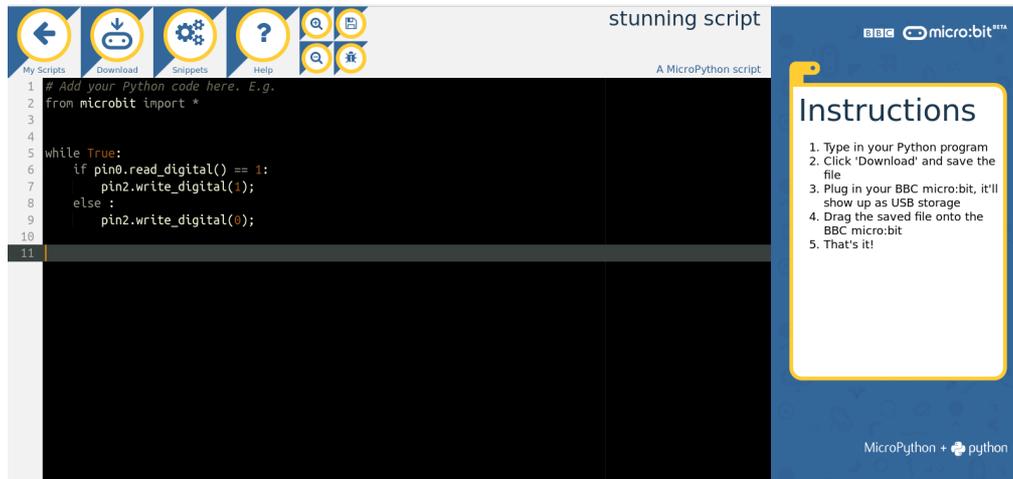
Code Kingdom JavaScript based

Similar to Touch Develop.

Found it a bit tricky to get right in my first attempt particularly the error messages. Perhaps better for those that have followed the other Code Kingdom online materials.

If using Code Kingdom anyway then it's worth trying.

MicroPython



Full text based programming language.

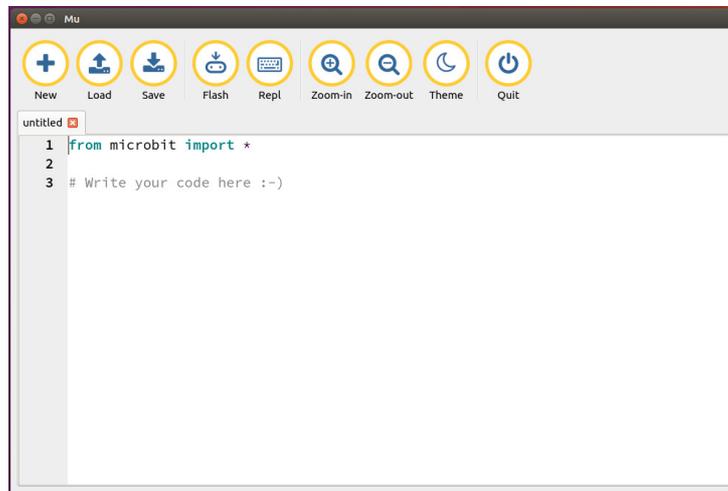
Less hand holding, but very flexible and powerful.

Recommended programming language for those progressing beyond the block based languages.

It's not too difficult to learn and enforces good programming practices.

Good when progressing beyond the micro:bit as this is a professional programming language that is popular in schools and other educational establishments. Transfers well to the Raspberry Pi etc.

Python Mu Editor



Under development – look out for new version in next couple of weeks

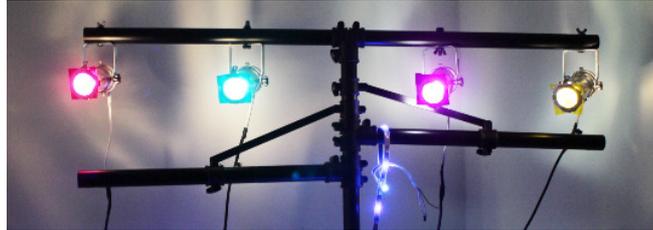
Improved editor currently for micro:bit, but future version will be an educational IDE for all python (including PyGame Zero).

With micro:bit allows to flash direct to the micro:bit and provides means to copy files directly to/from the micro:bit.

Also includes programming “suggestions” - such as help on functions available and arguments.

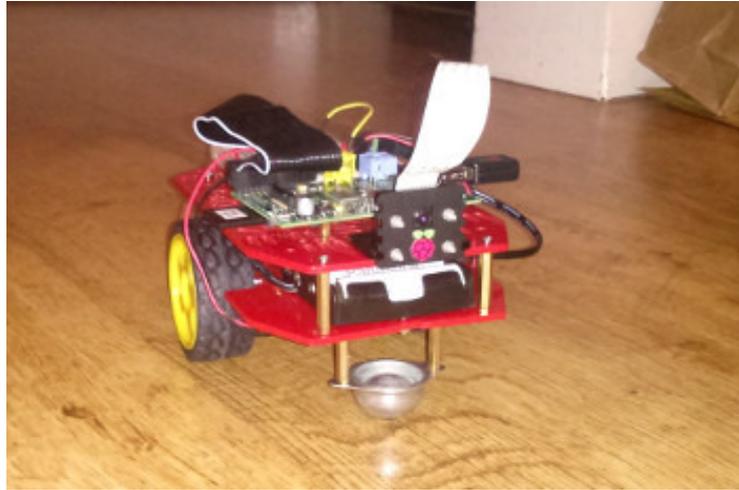
<http://codewith.mu/>

Getting more adventurous



Can do more than the basics. For example it could be used to control much brighter LEDs such as these disco lights (still low voltage so safe for use in schools).

Controlling a Robot



Used the accelerometer to control a robot.

Unfortunately not able to use BlueTooth with these (memory constraints etc.), so I used it connected to a intermediate computer (eg. Raspberry Pi or PC).

More information

- micro:bit website: www.microbit.co.uk
- Presentation: www.penguintutor.com/microbit
- IET Lessons: <https://www.microbit.co.uk/iet>

- @stewartwatkiss @penguintutor



Go to the penguintutor website - where you can find this presentation and other information.

Also giving demonstration at Bedworth Raspberry Jam and hope to do something similar at the Redditch Slice of Pi club.