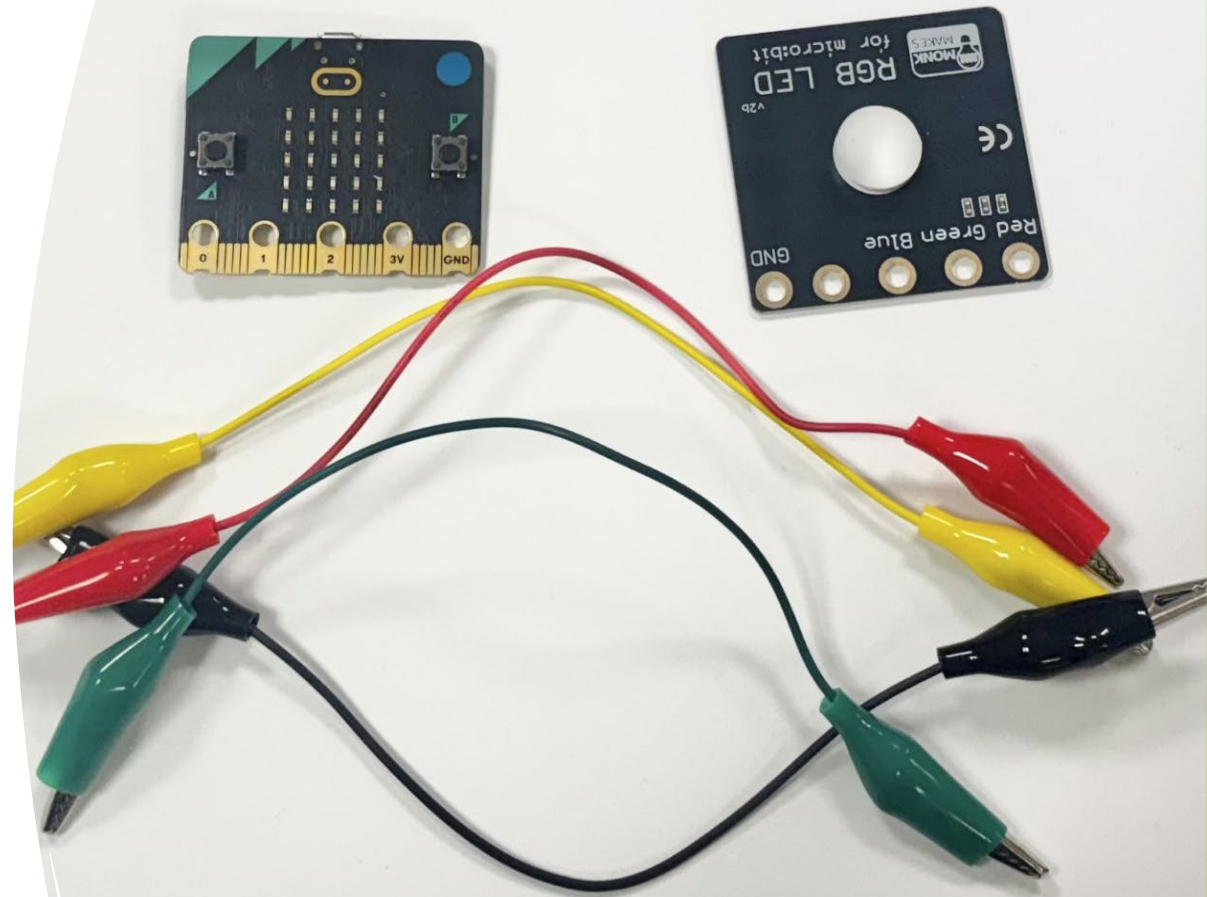
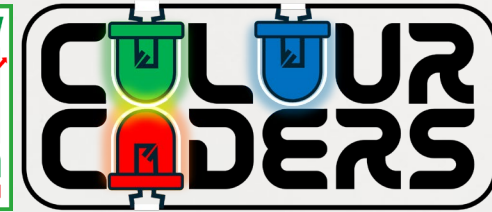


# ► Teacher Coding Guide



# You will need:

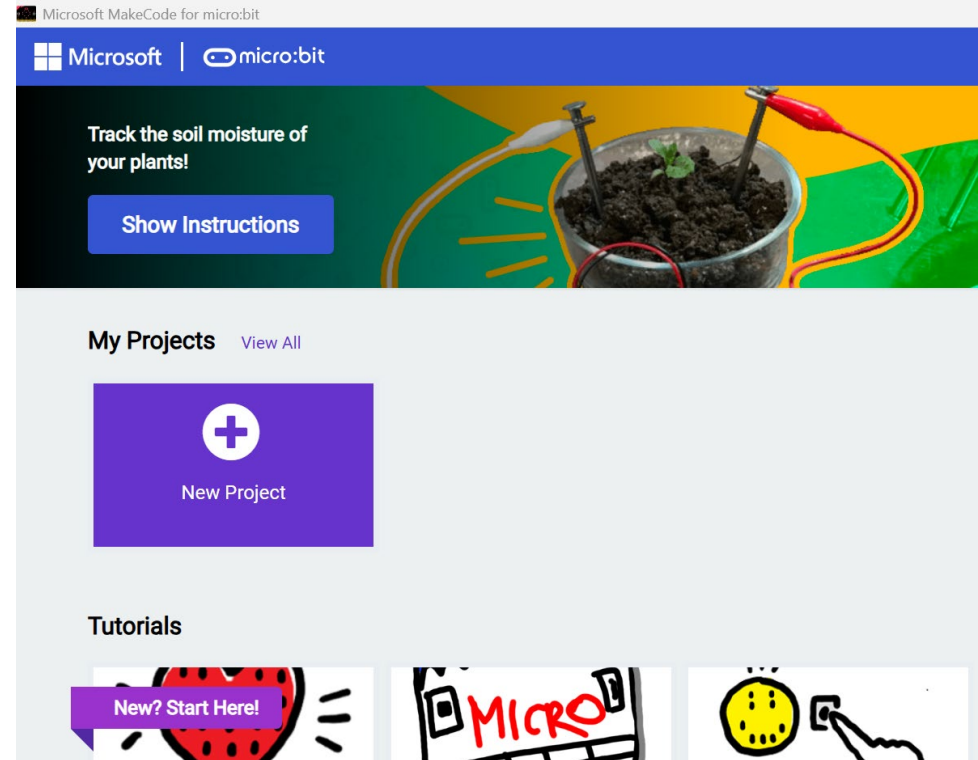
- ▶ A micro:bit
- ▶ RGB LED for micro:bit
- ▶ 4 Crocodile clip wires (any colours)
- ▶ A device with access to MakeCode - the free to access block coding platform designed for micro:bit



# Accessing MakeCode

- ▶ As this is designed as a coding task for pupils with little to no coding experience it is expected that pupils will use the **block coding** options though for more advanced pupils there are options available that use Python.

You have can access MakeCode in a variety of ways depending on which type of device you want to use and whether or not you will have internet access.



- Online with a desktop/laptop/Chromebook with a USB port - access via your browser and [www.makecode.microbit.org](https://www.makecode.microbit.org)
- Offline with a desktop/laptop/Chromebook with a USB port - download the MakeCode app [Offline | micro:bit](#)
- Using an iPad or Android tablet - [Mobile apps | micro:bit](#) - your kit only includes a USB-A to USB mini cable, if you do not have a suitable cable port on your device or if a suitable cable is not available for the device port you can also transfer your code via Bluetooth.

# Step 1

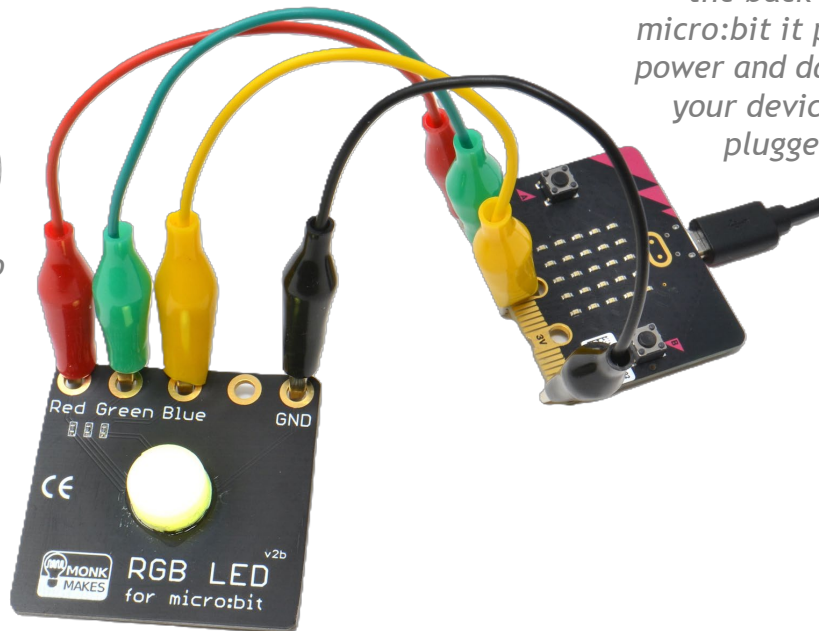
## Connect your wires

The crocodile clip wires are used to connect corresponding ports on the RGB LED board and the micro:bit.

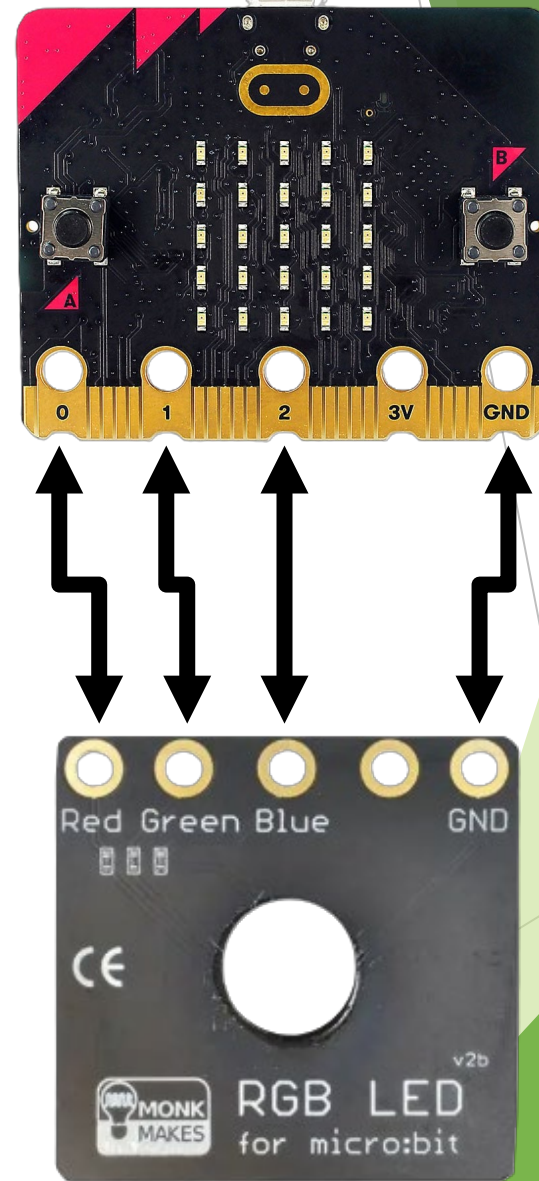
*It doesn't matter which colour wires are used.*



Squeeze to open



*The microUSB plugs into the back of the micro:bit it provides a power and data link to your device when plugged in*

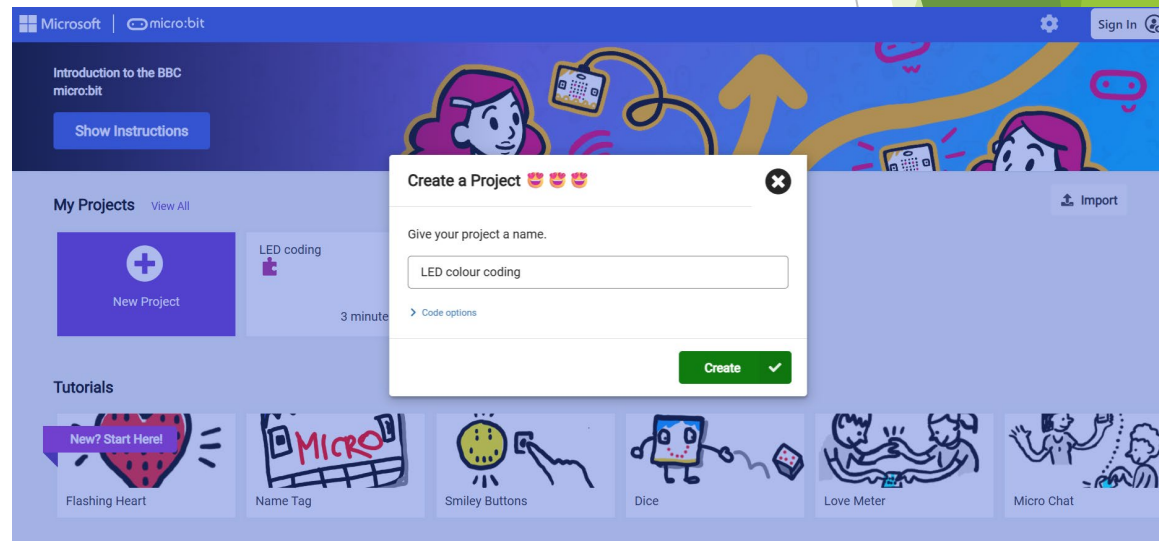
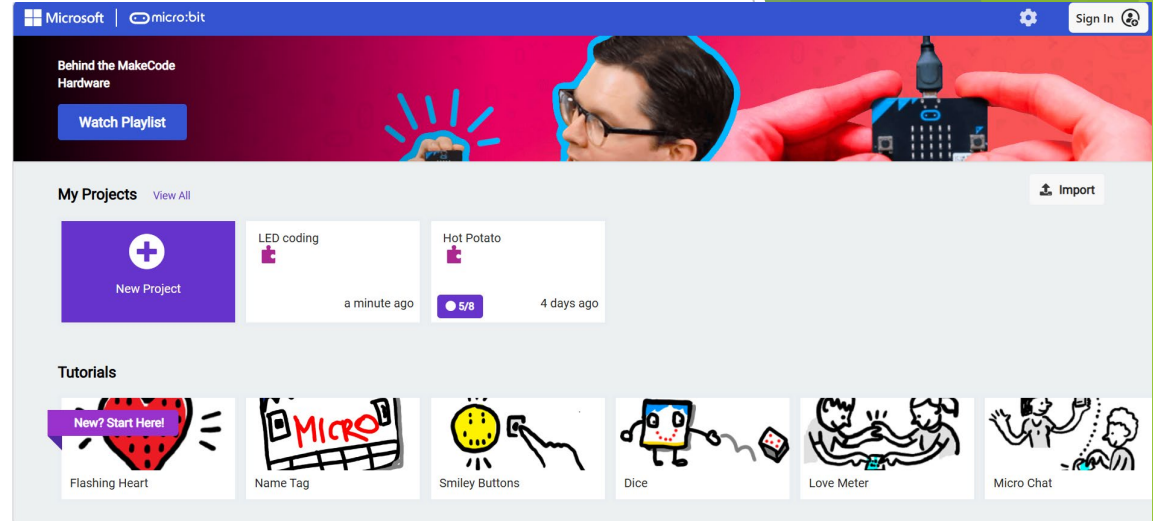
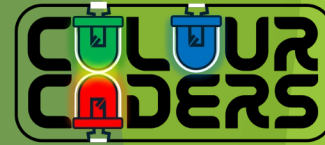




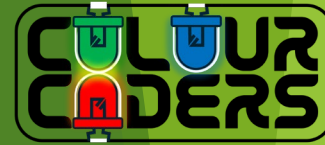
# Step 2

## Let's code

- ▶ Access Microsoft MakeCode
- ▶ Click on new project and name it 'LED colour coding', this will open a new project screen.



# MakeCode Basics



Microsoft | micro:bit

Blocks JavaScript

on start forever

Search...

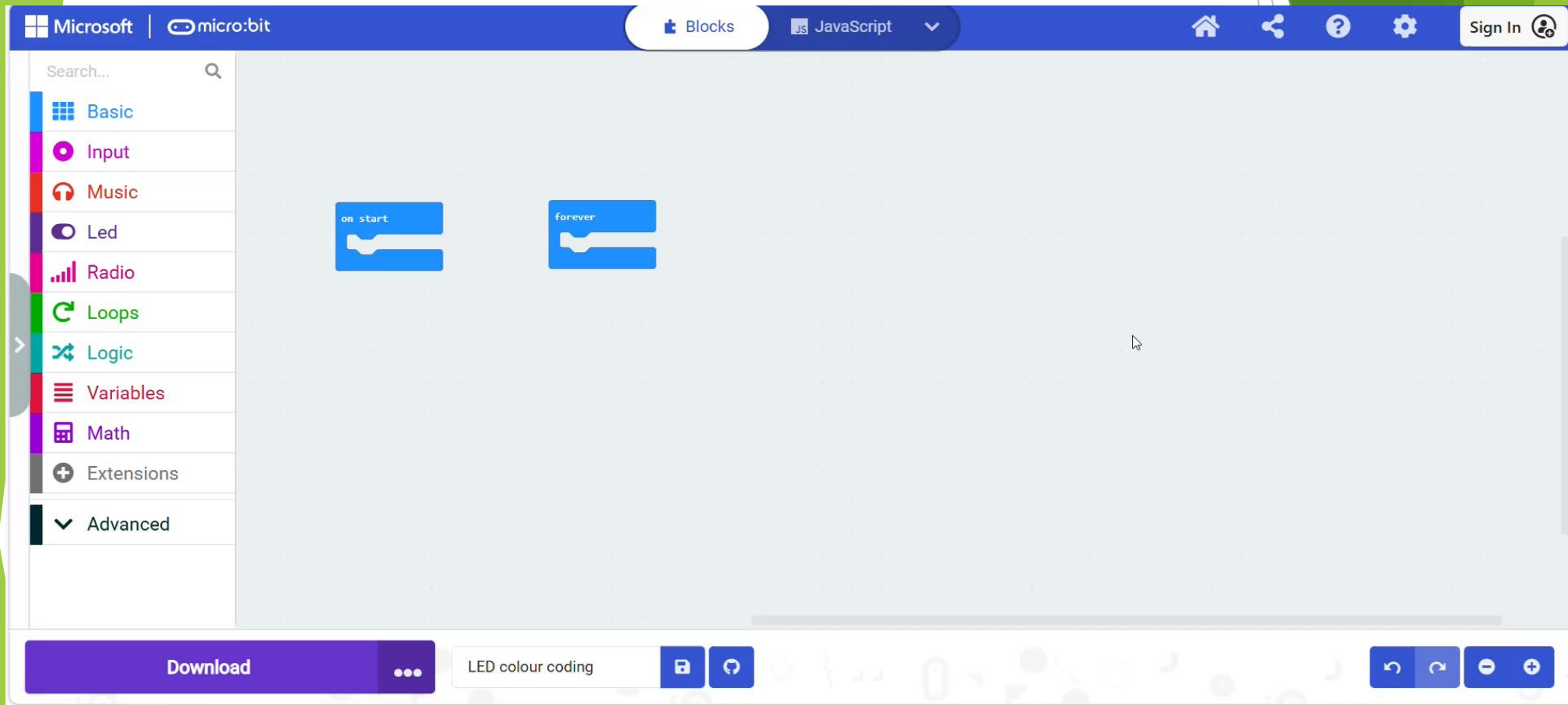
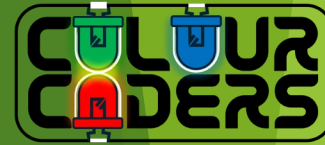
- Basic
- Input
- Music
- Led
- Radio
- Loops
- Logic
- Variables
- Math
- Extensions
- Advanced

Download

LED colour coding

Navigation icons: back, forward, zoom in, zoom out

# Building the Code

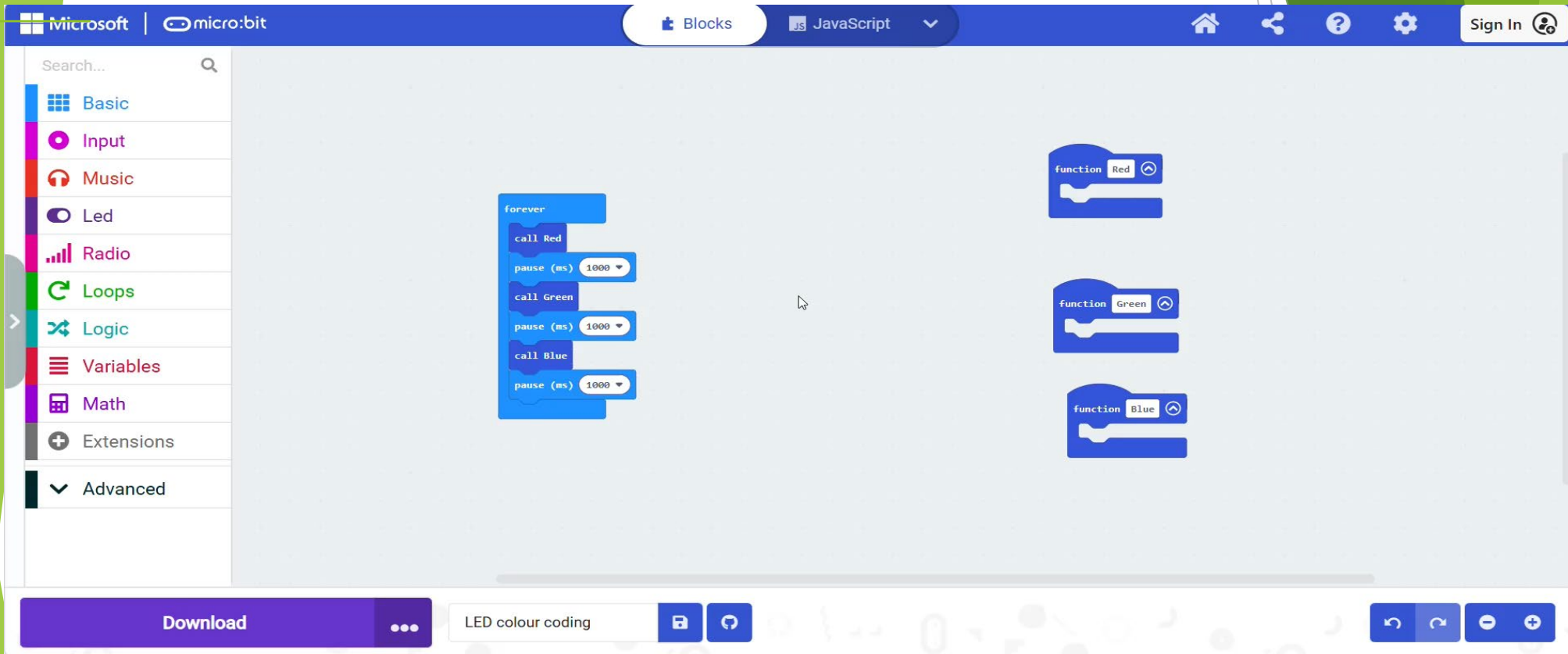


## Why do we use 1023?

We use an analogue pin as they can read a range of voltages (Digital pins can only read 0 or 1), typically between 0V and 3.3V for micro:bit but microcontrollers, like the one inside a micro:bit can't process a continuous voltage they need to convert it into a number. This is done by an ADC - Analog-to-Digital Conversion.

Micro:bit uses a 10-bit ADC,  $2^{10} = 1024$  different values ranging from 0 to 1023

# Coding the Primary Colours - Red, Green & Blue

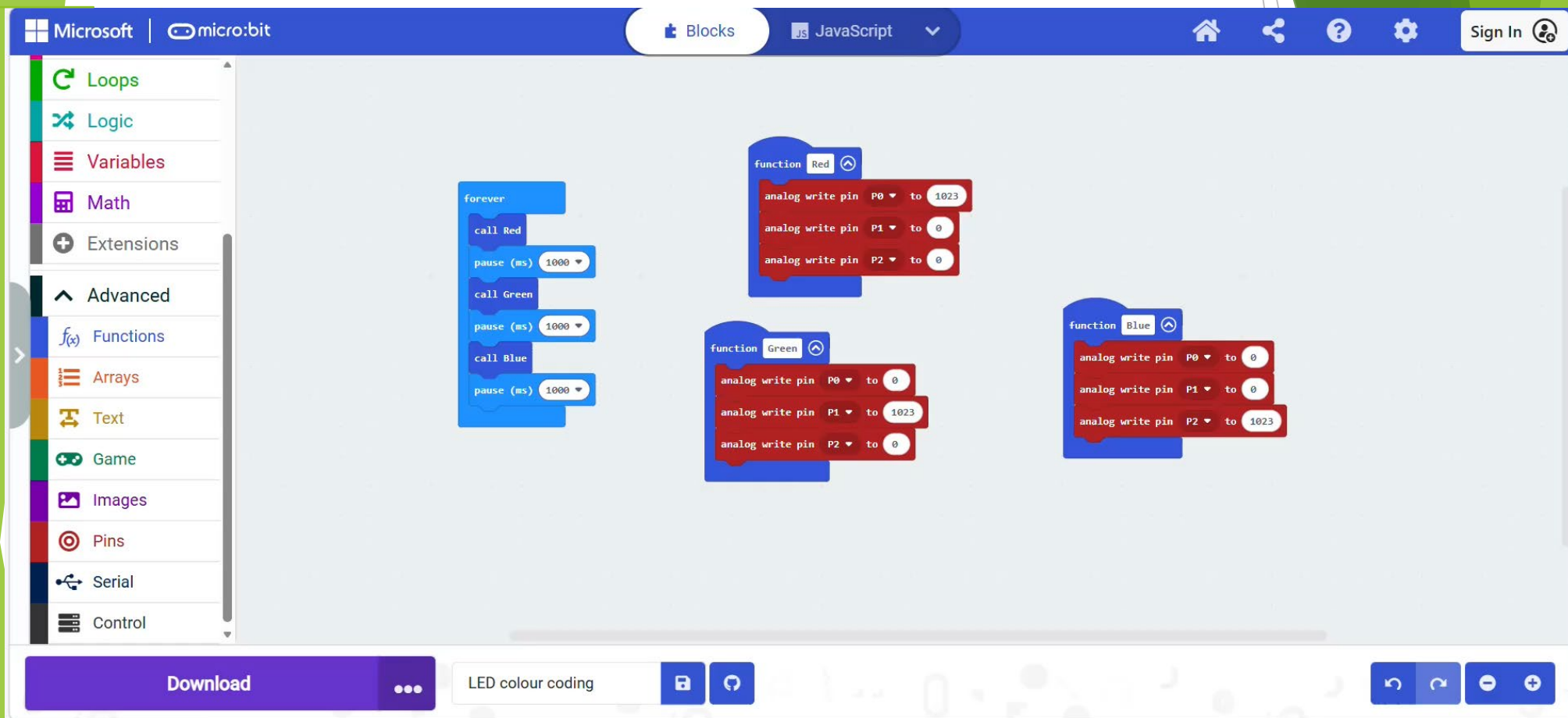


## Duplicate

Select the block/locks you want to duplicate and right click on the mouse to duplicate, if using a Chromebook, tap two fingers on the track pad at the same time to bring up the duplicate option. Ctrl + C to *copy* and Ctrl + V to *paste* will also do this.



# Transferring the Code to the Micro:bit



## Using a tablet or mobile device?

Using iOS app on iPad [Transfer programs from MakeCode to your micro:bit on an iPad or iPhone - YouTube](#)

Using the Android app [Transferring programs from MakeCode to your micro:bit using the Android app - YouTube](#)

# Coding the Secondary Colours - Magenta, Cyan & Yellow



Microsoft | micro:bit

Blocks JavaScript

Sign In

Loops  
Logic  
Variables  
Math  
Extensions  
Advanced  
Functions  
Arrays  
Text  
Game  
Images  
Pins  
Serial  
Control

function Red

- analog write pin P0 to 1023
- analog write pin P1 to 0
- analog write pin P2 to 0

function Green

- analog write pin P0 to 0
- analog write pin P1 to 1023
- analog write pin P2 to 0

function Blue

- analog write pin P0 to 0
- analog write pin P1 to 0
- analog write pin P2 to 1023

forever

- call Red
- pause (ms) 1000
- call Green
- pause (ms) 1000
- call Blue
- pause (ms) 1000

Download

LED colour coding

Navigation icons: back, forward, zoom in, zoom out