Microbit Robotics Beginner Level 1

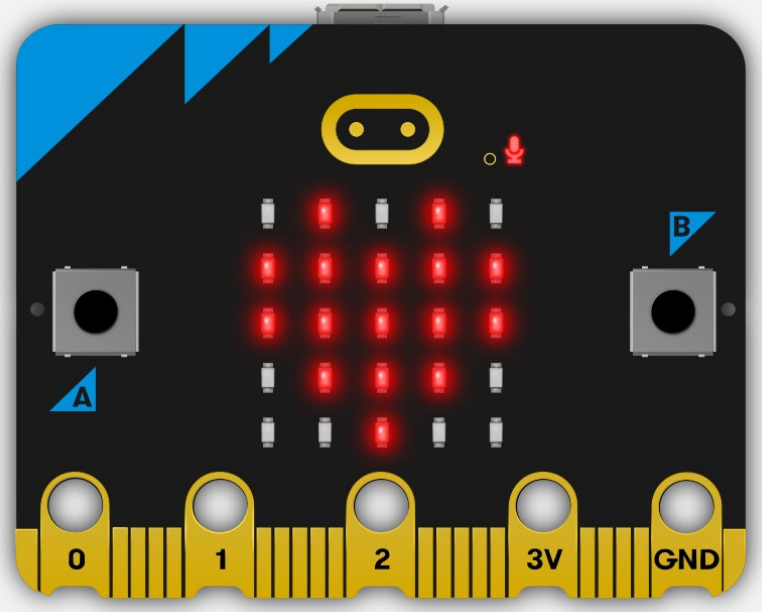
Lesson *3*

Introduction to WOM and Microbit

Presented by Advanced Superlogic Team

Review previous lesson

Send message via Radio – from Microbit to Microbit

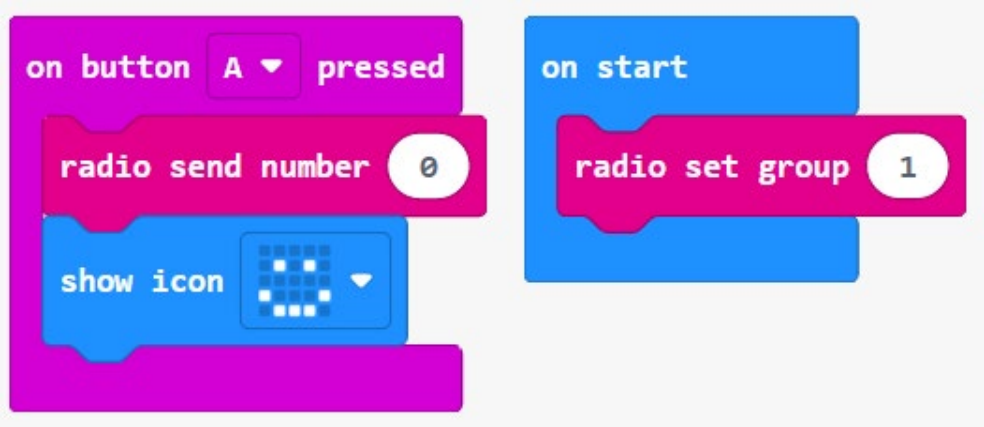


Radio – wave frequency can be sent and received from microbit, hence, we can use this function to communicate between microbit.

Mood Radio Project

This project uses the radio to share your mood with other micro:bits. When you press A, your friends will see a smiley face. When you press B, they will see a frowny face.

Mood Radio Project

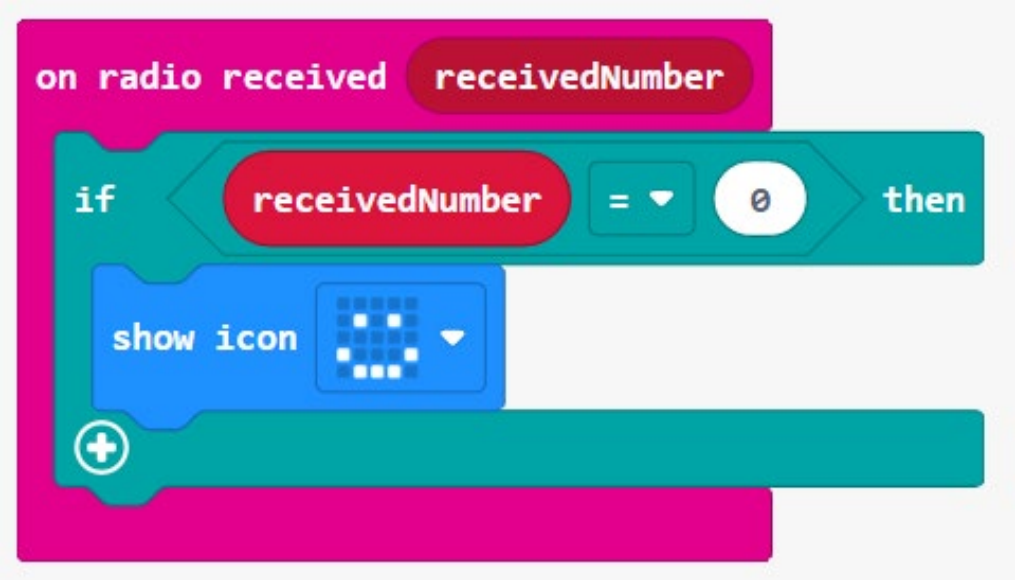


Sending a smiley

The micro:bit can't understand mood but it is pretty good with numbers. In fact, it can send numbers between micro:bits using the radio antenna, just like a phone can send text messages.

Let's add blocks that send a number when button A is pressed. We assume that 0 is the "mood code" to send for smiley.

Mood Radio Project



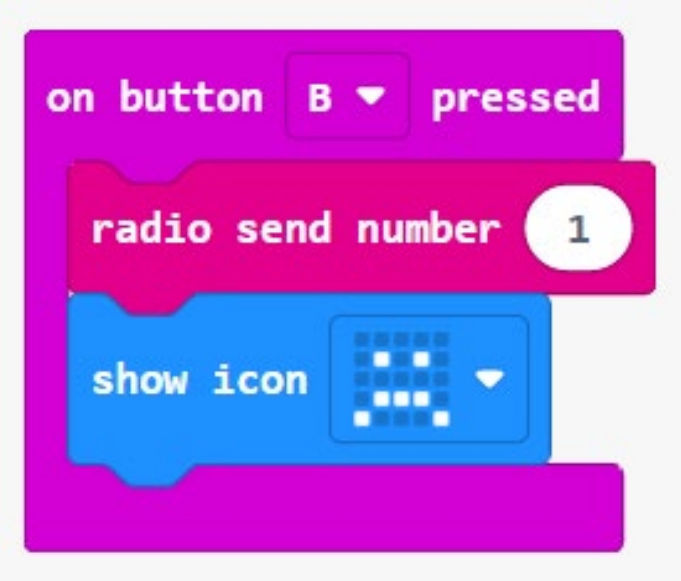
Receiving a smiley

We add a on received number block that will run code whenever a new “mood” message comes in.

The receivedNumber variable contains the numeric value that was sent.

Since we’ve decided that 0 is smiley, we add a conditional if then statement to show this icon.

Mood Radio Project – Sending Frowny



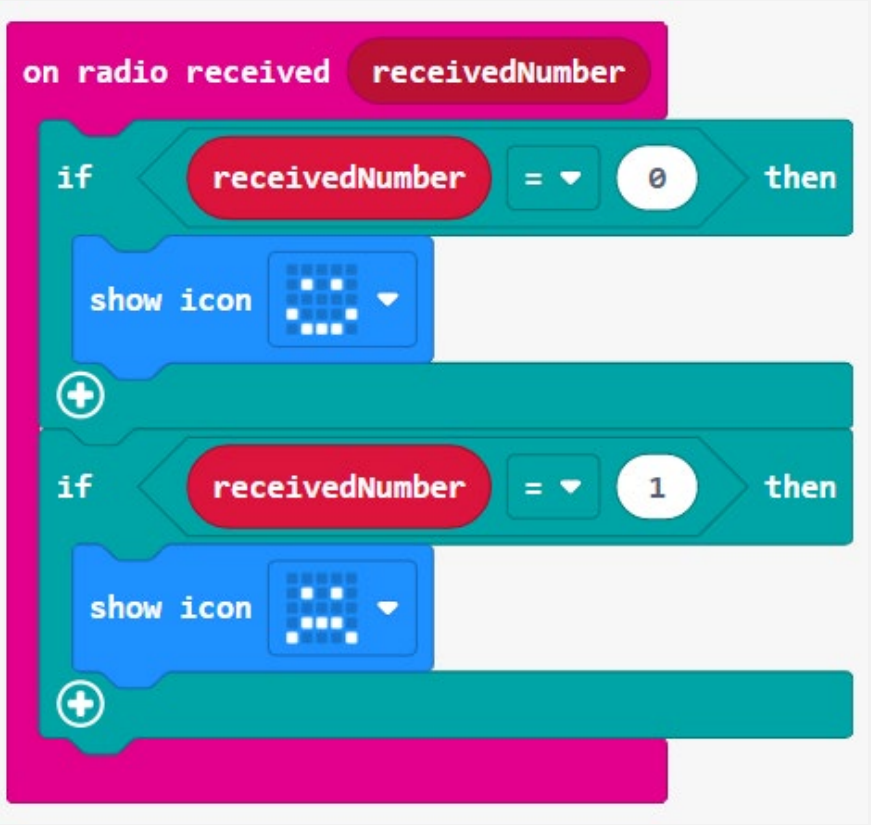
Sending a frowny

Adding another mood to our messaging app done in a similar way.

We decide that the “mood code” of 1 means frowny.

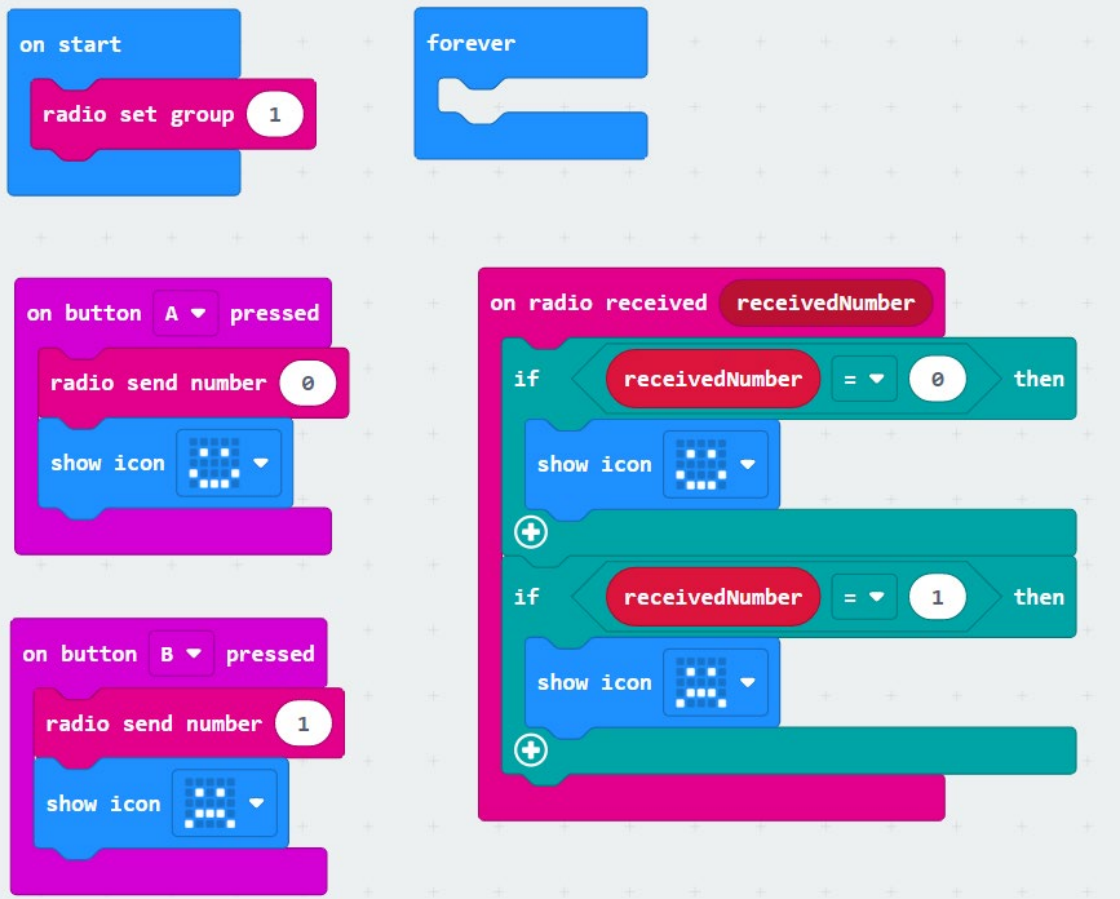
We can add a B button event that sends that code.

Mood Radio Project – Finalizing



If the on received number block, we add another conditional if then statement to handle the frowny “mood code”.

Full Code in your Microbit



This is the full coding scripts for your microbit sending message via radio project.

Radio group – channel from 0 to 255

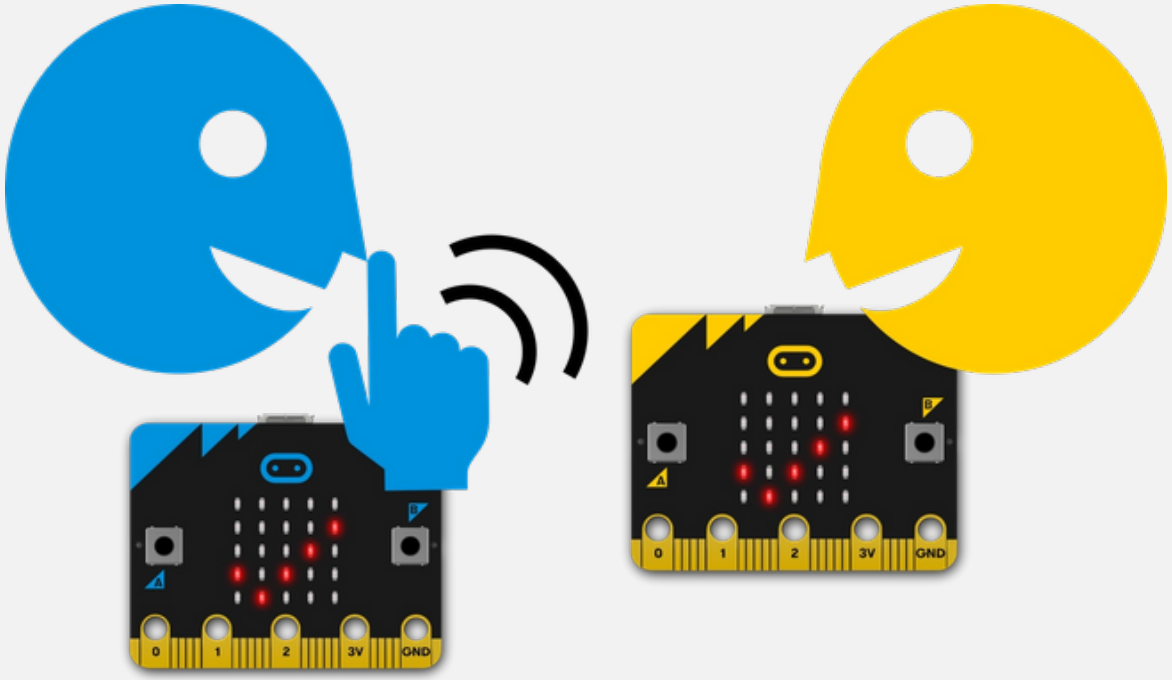
If you are to send your message to your friend, you must make sure your friend is using the same radio group.

Microbit can cater for channel from 0 to 255, which is 256 channels for 2 microbit to communicate with each other.

Mood Radio Project – Download and try it

Yay you have completed your program, faster download and try it with your friend.

Activity – Send secret codes to your friend (15 min)



Pair up with your friend and make it to 2 in 1 group, then select a channel for both of you.

Try giving different events (at least 5 events) to send some secret code to your friend and don't let other people know what you're sending.

(activity time - 15 minutes)

Introduction Microbit and WOM modules

Grouping
(2 – 3 people in 1 Group)

Today's Topic

1. World of Module Programmable Robot Kit
2. Introduction of Micro:bit
3. Introduction to few WOM modules
4. MakeCode Programming
5. Basic Module's Programming block

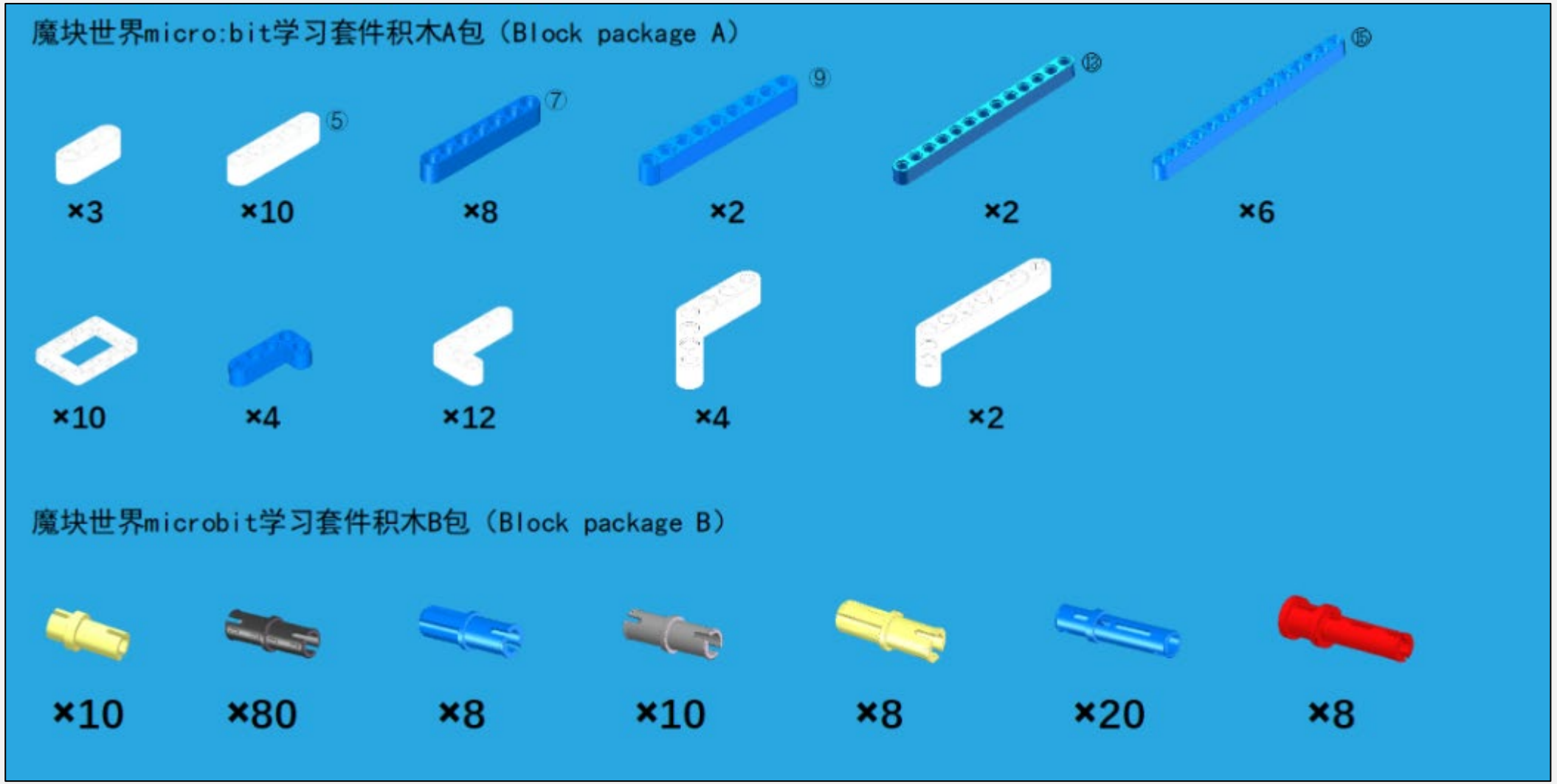
Learning Outcome

1. Understand Micro:bit and Module Sensor Kit
2. Able to program using MakeCode
3. Understand how Module's programming work
4. Able to program basic Module's programming

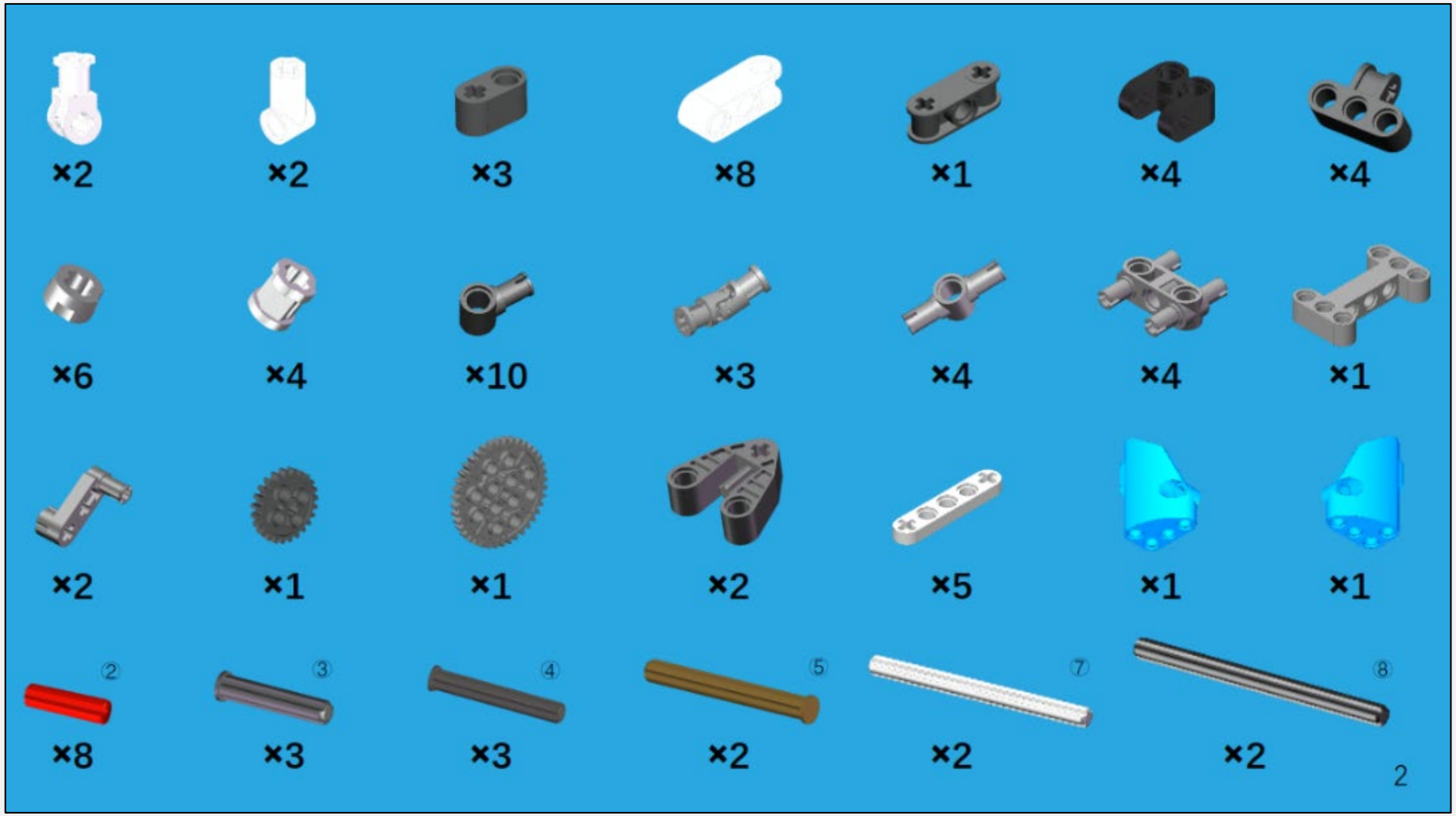
World of Module Programmable Robot Kit
(WOM)

This world of module programmable robot kit includes 1 professional sensor expansion board, 2 building block servos, 10 electronic sensor modules and 300+ building block parts

Building Block Lists

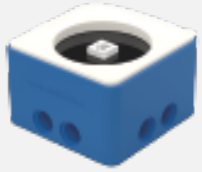


Building Block Lists



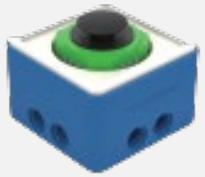
Electronic Modules

Electronic Modules

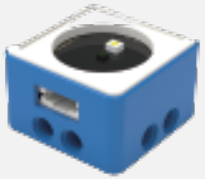


RGB Light Module

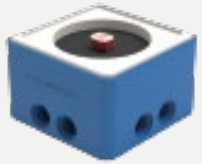
Button Module



Rocker Module



Color Recognition Module

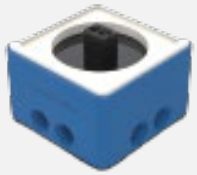


Photosensitive Module

Temperature
Humidity Module

Human body
Infrared Module

Ultrasonic Module



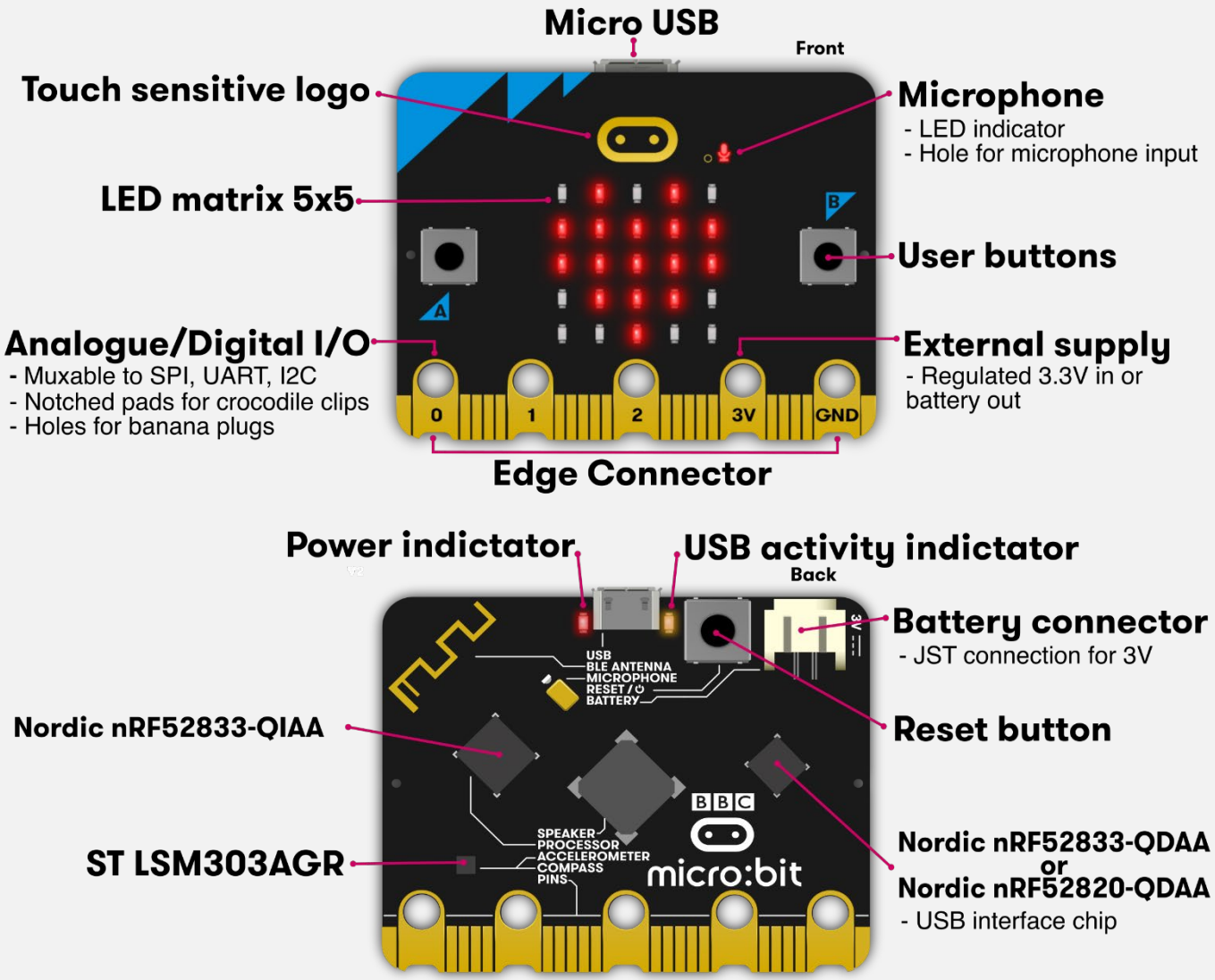
Infrared Module

Digital Tube Module

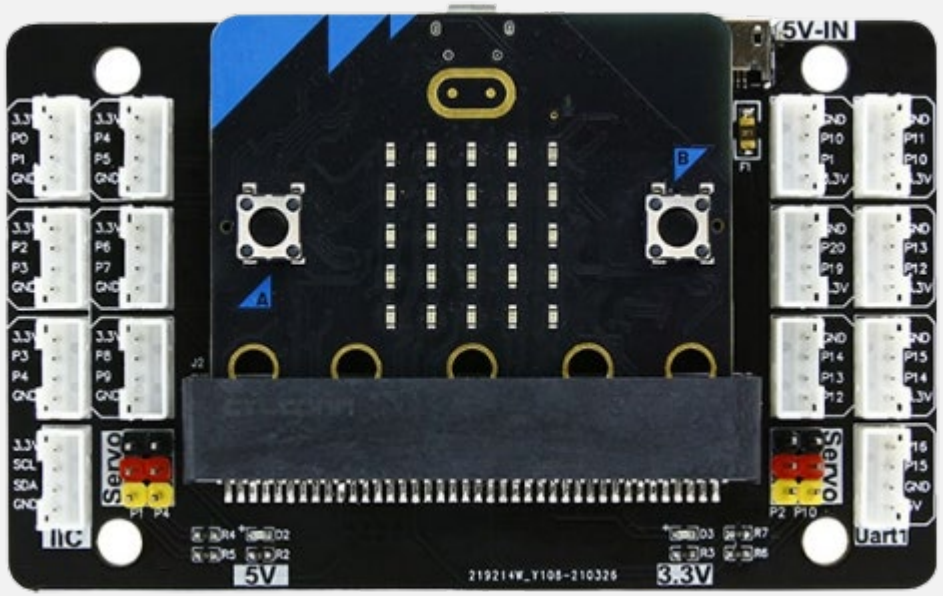
Servo

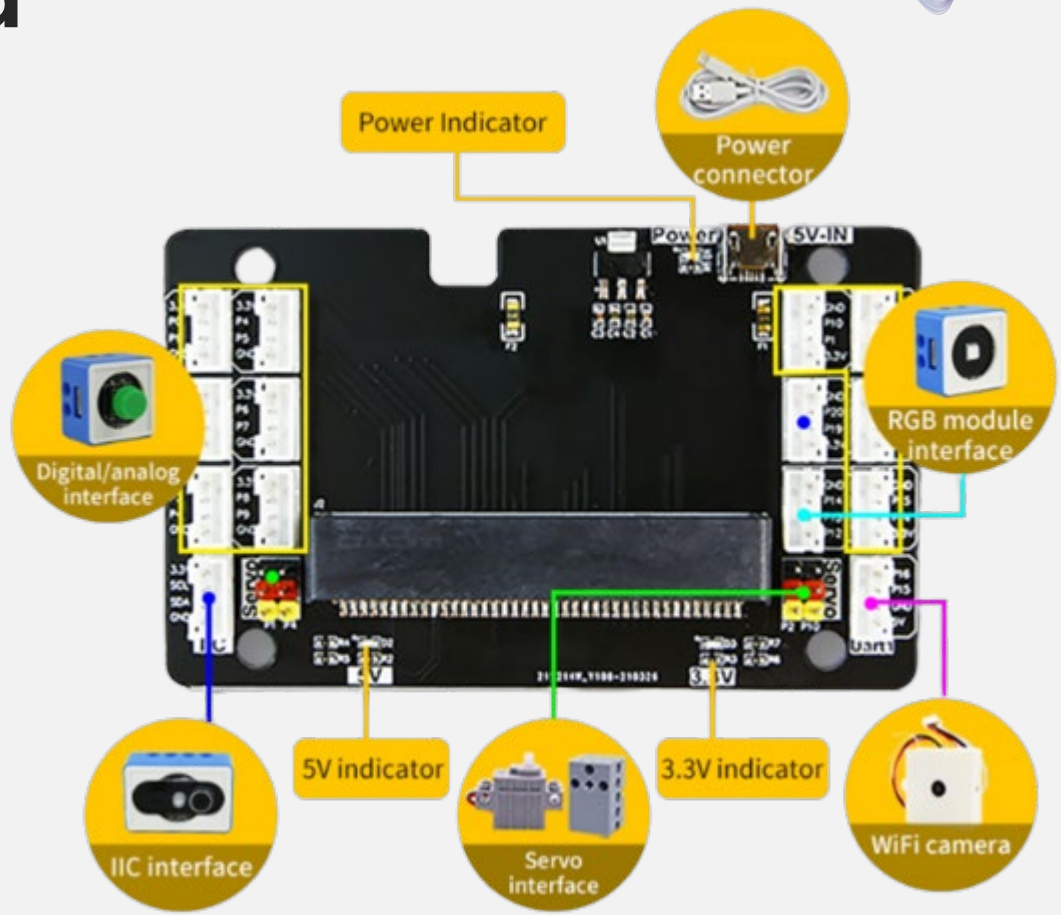
What is Micro:bit?

Micro:bit



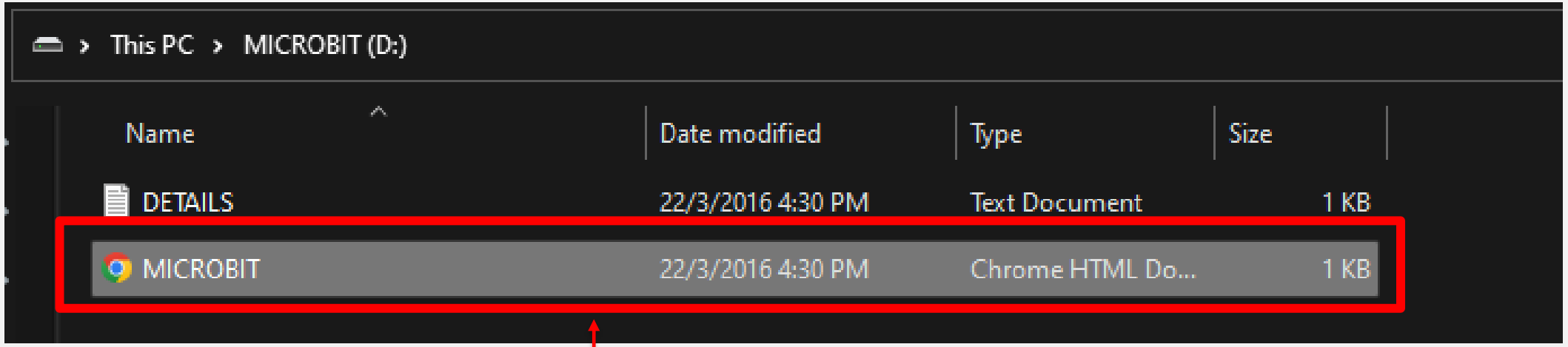
Micro:bit Expansion Board



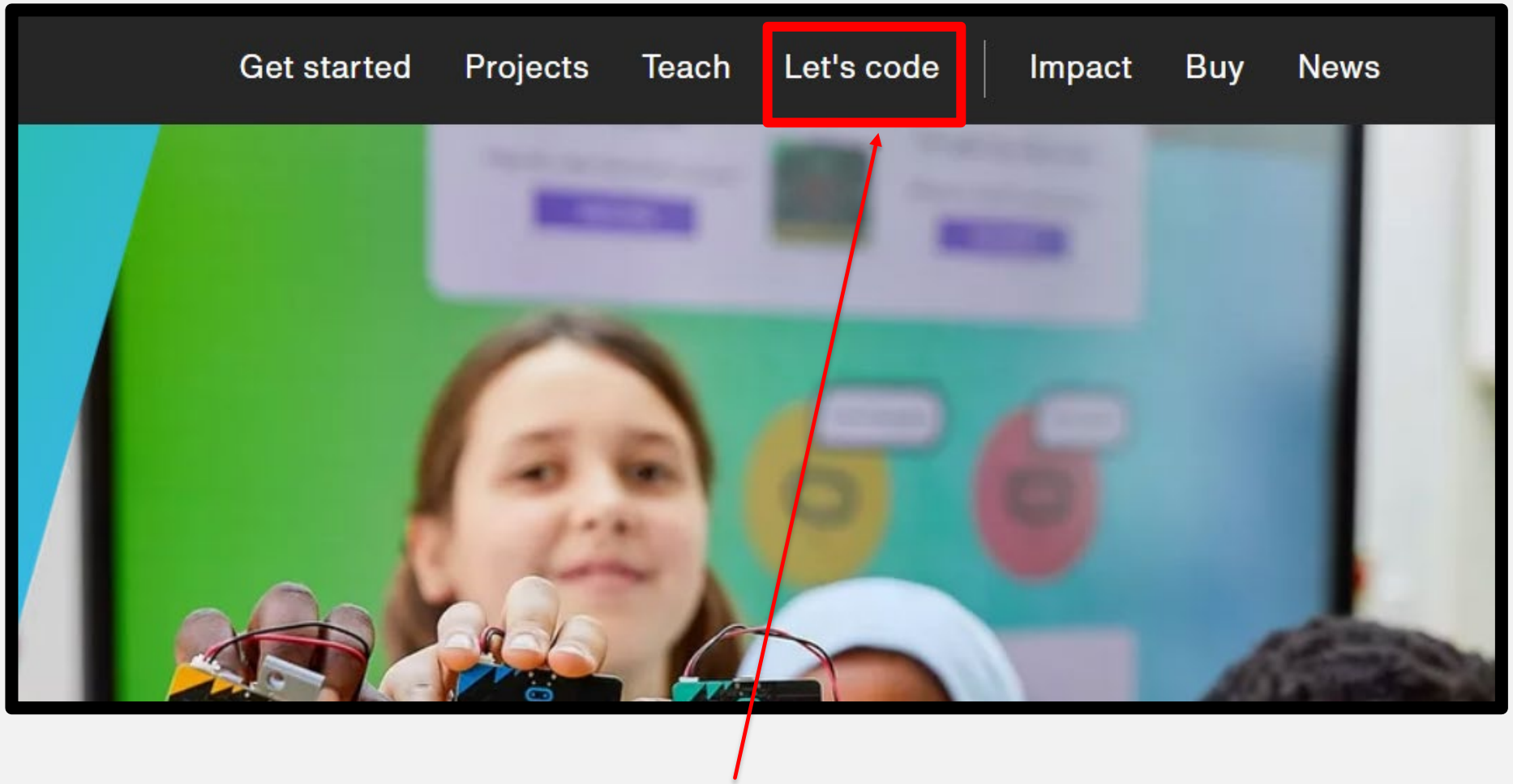


Let's program the Micro:bit

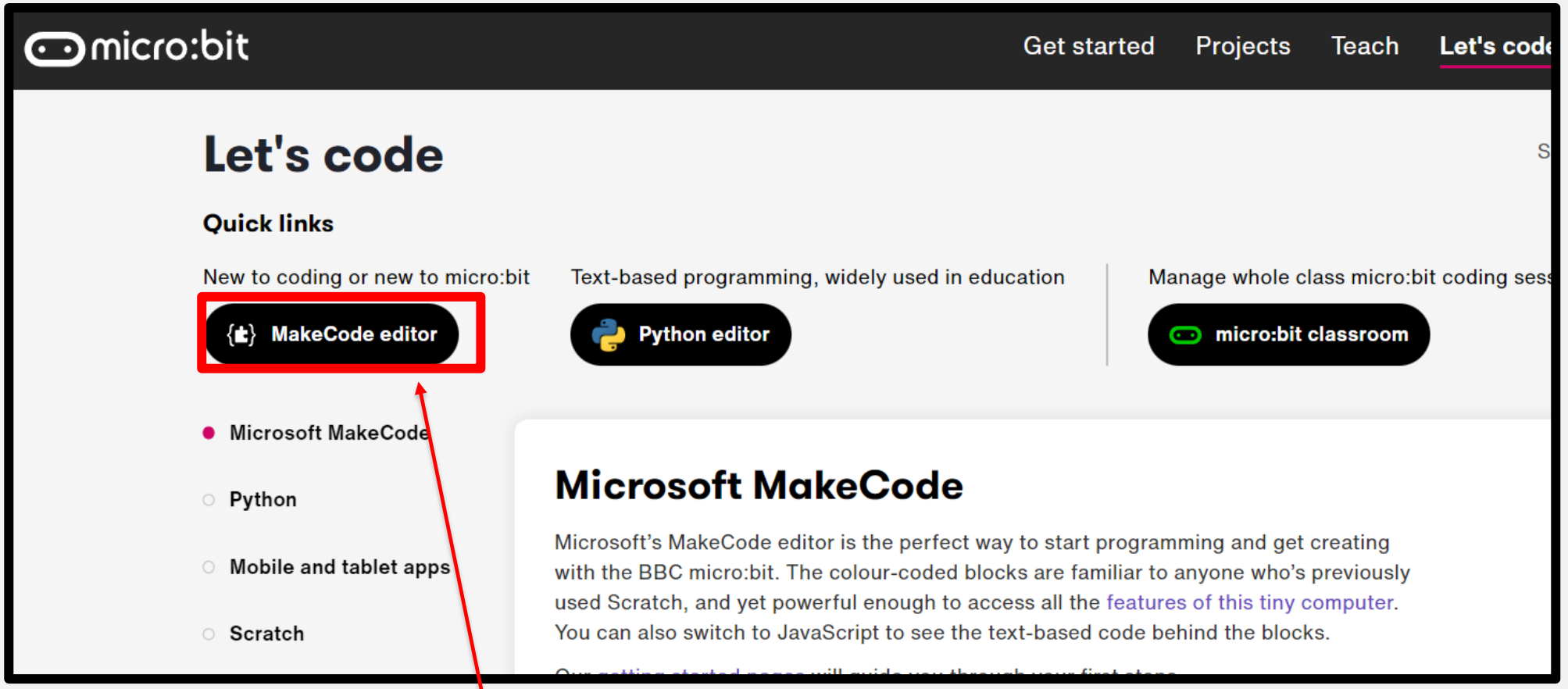
Connect the Micro:bit



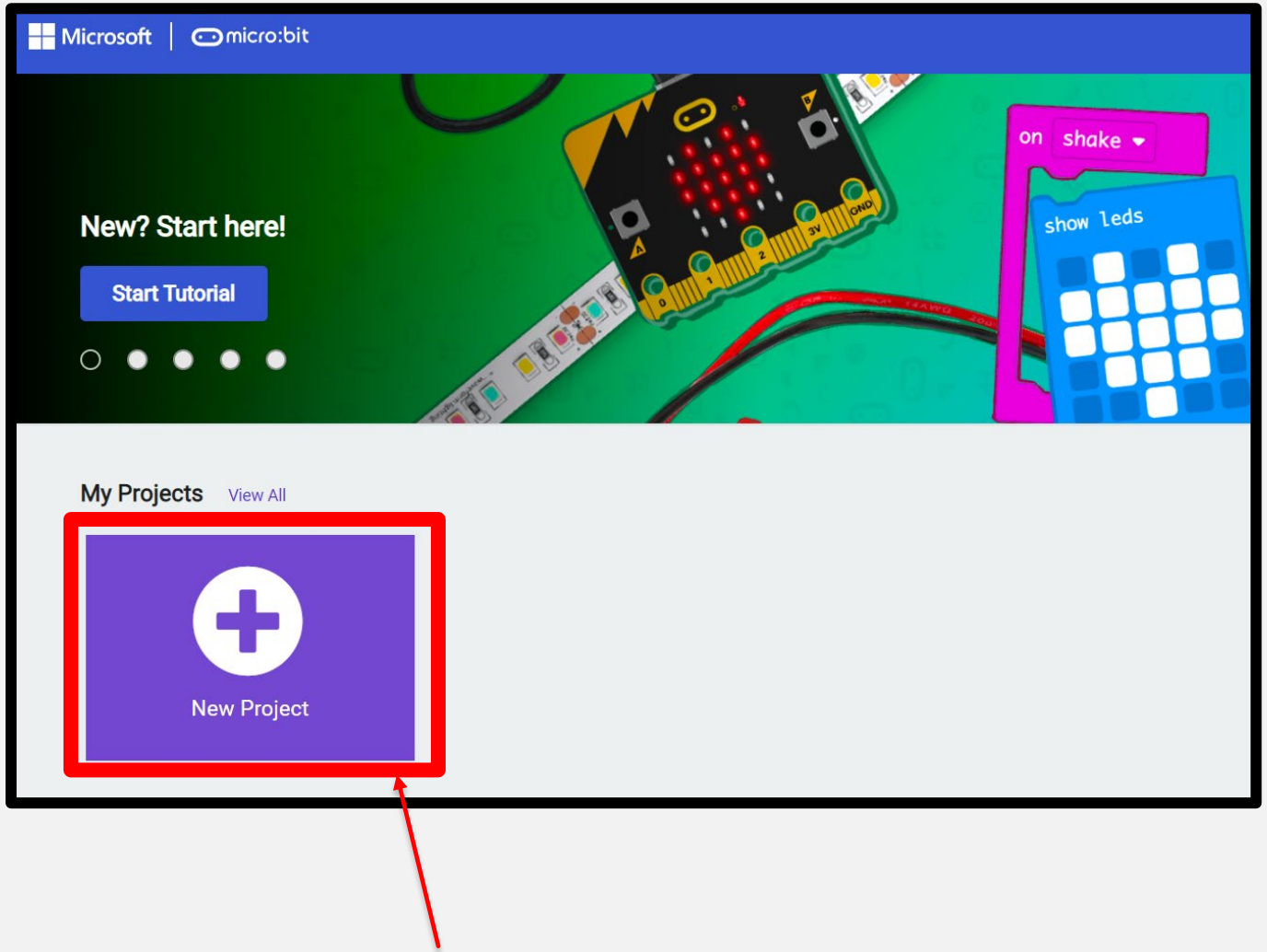
Click the MICROBIT to enter the official website



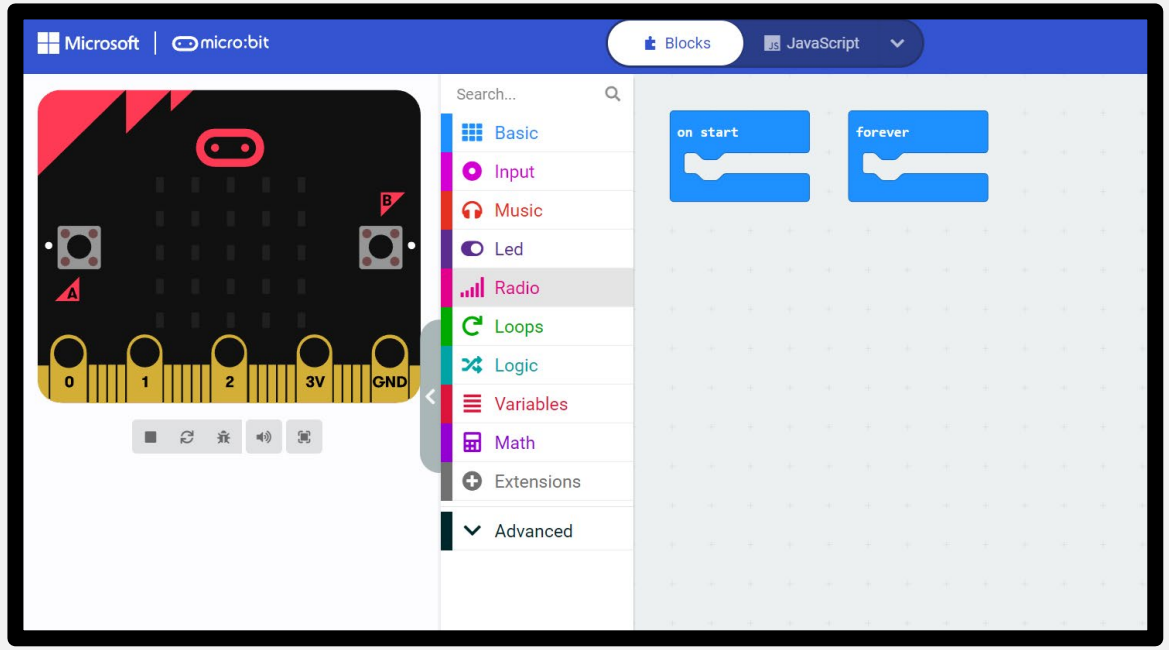
Click “Let ’s code”



Click "MakeCode editor"

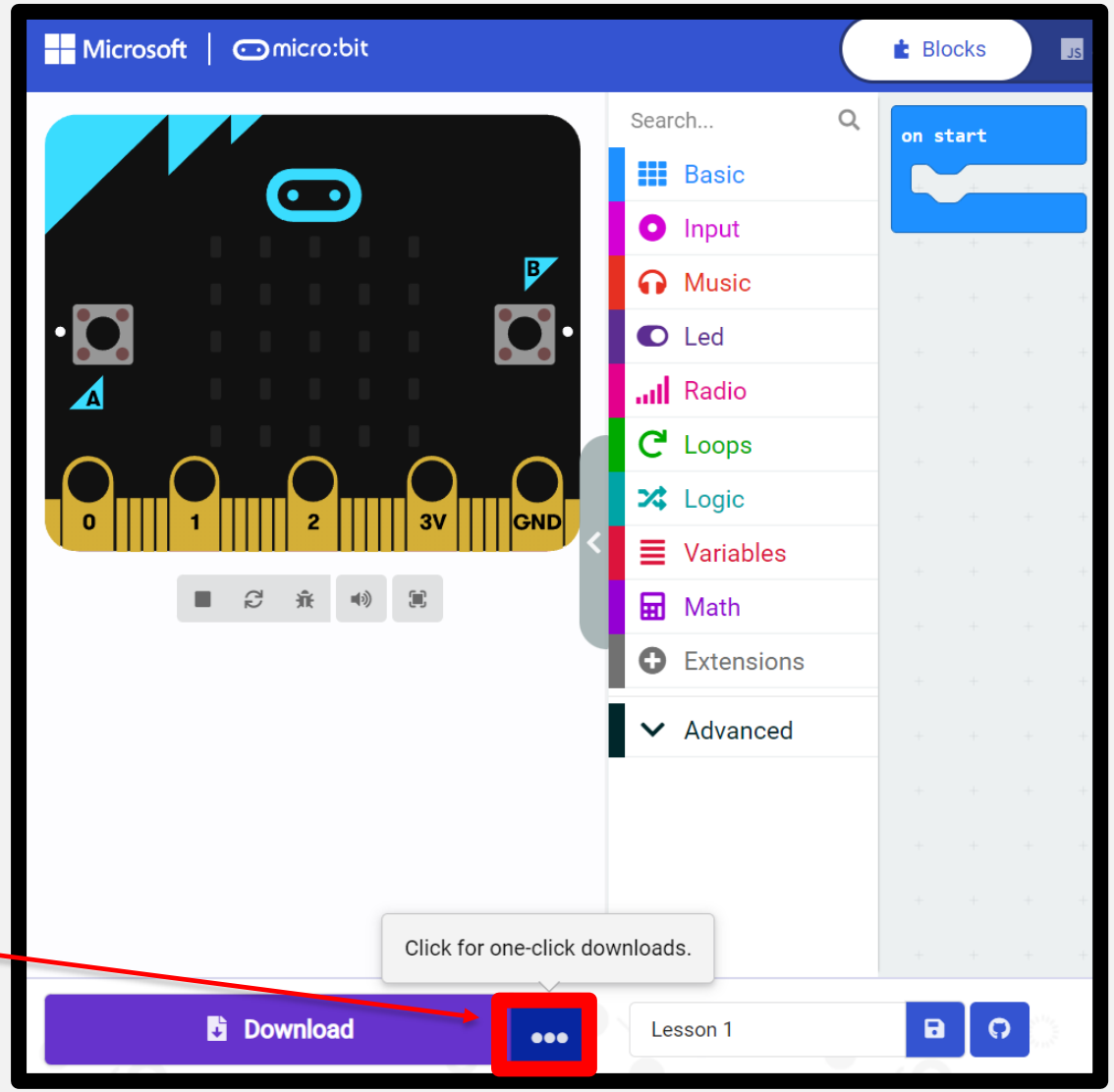


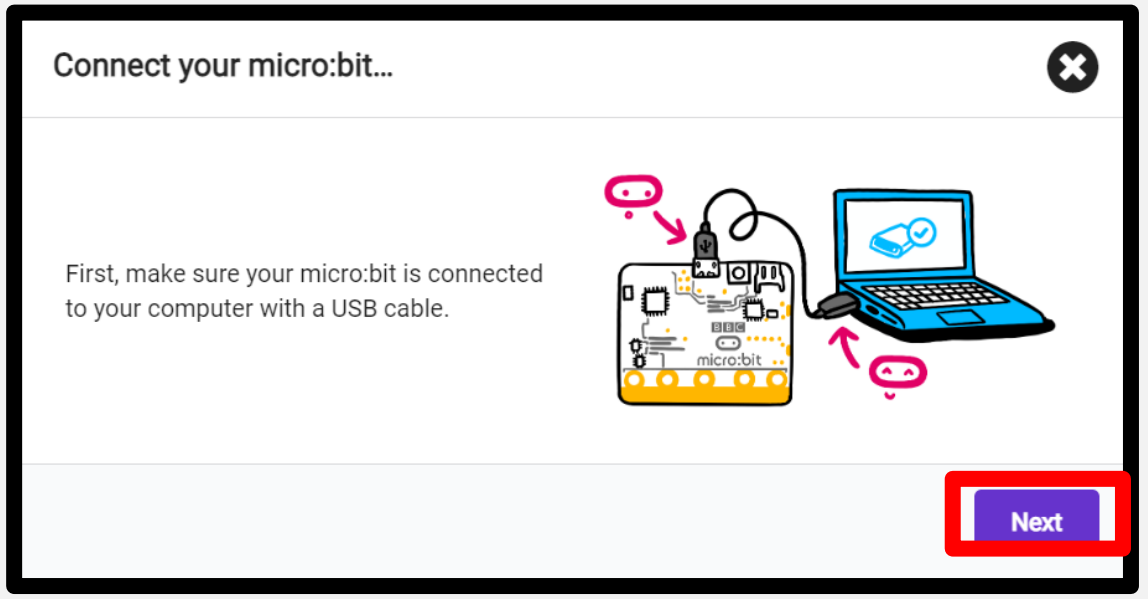
Click “New Project”

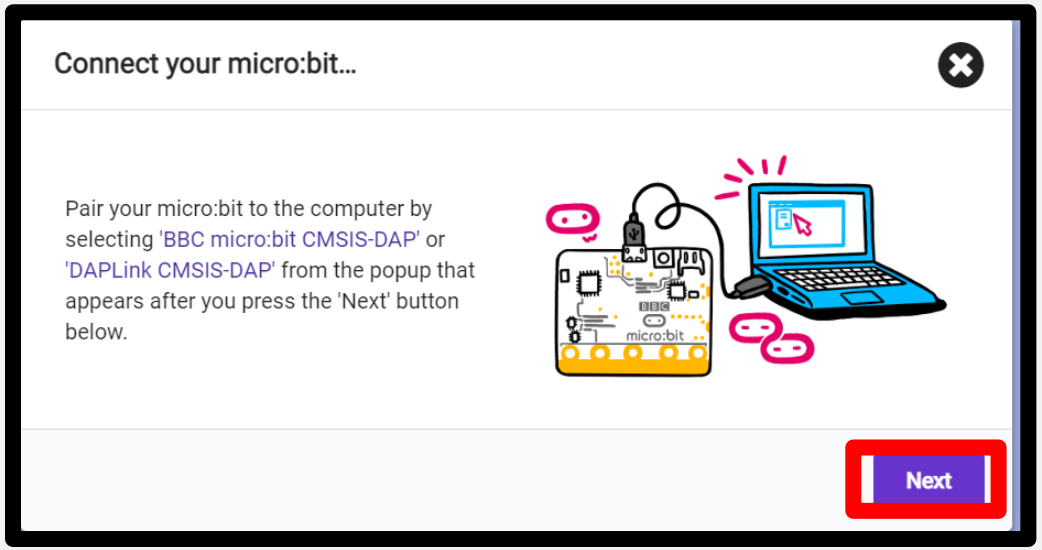


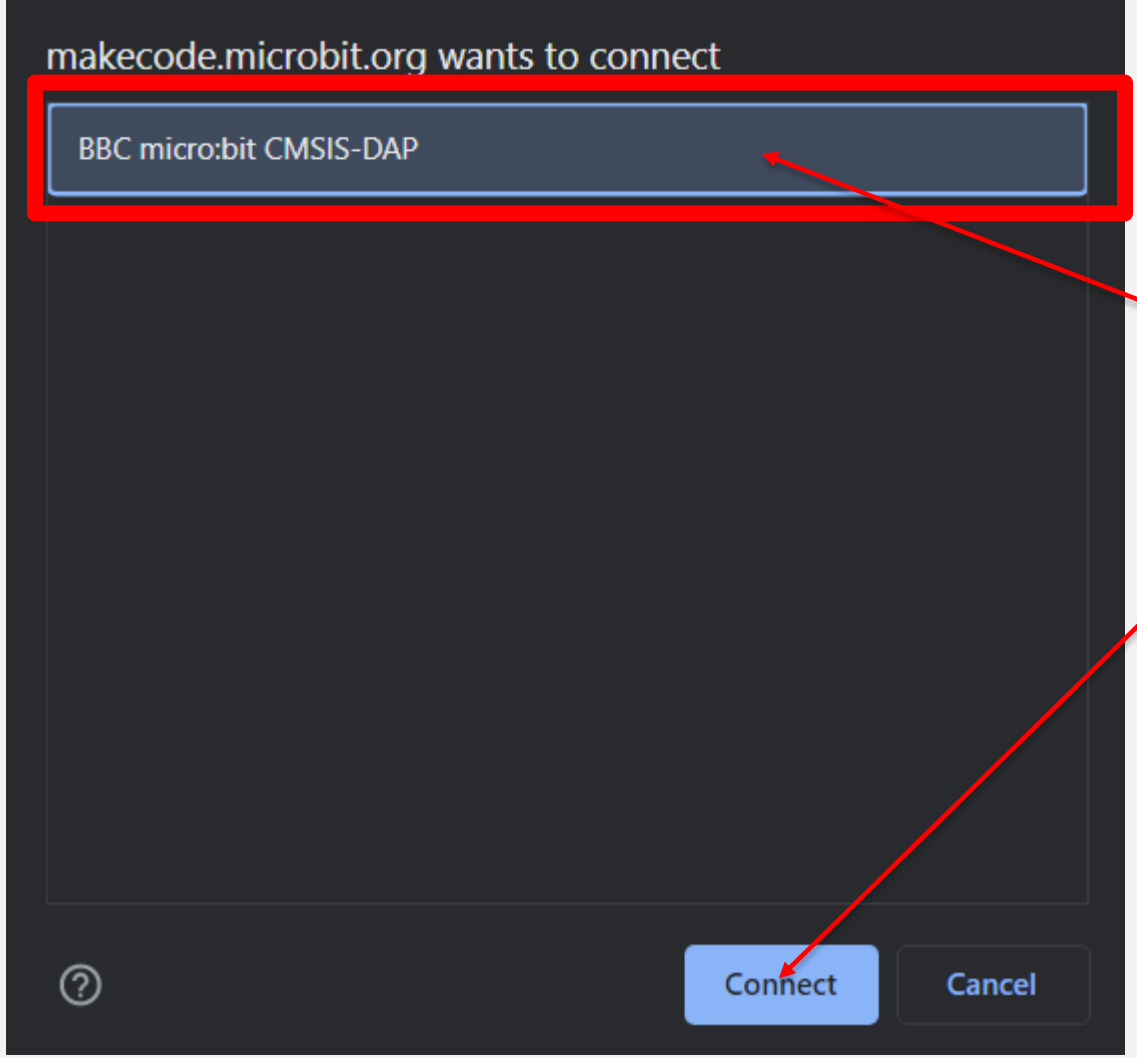
Before we start programming, let's connect our micro:bit first,

Click the three dots

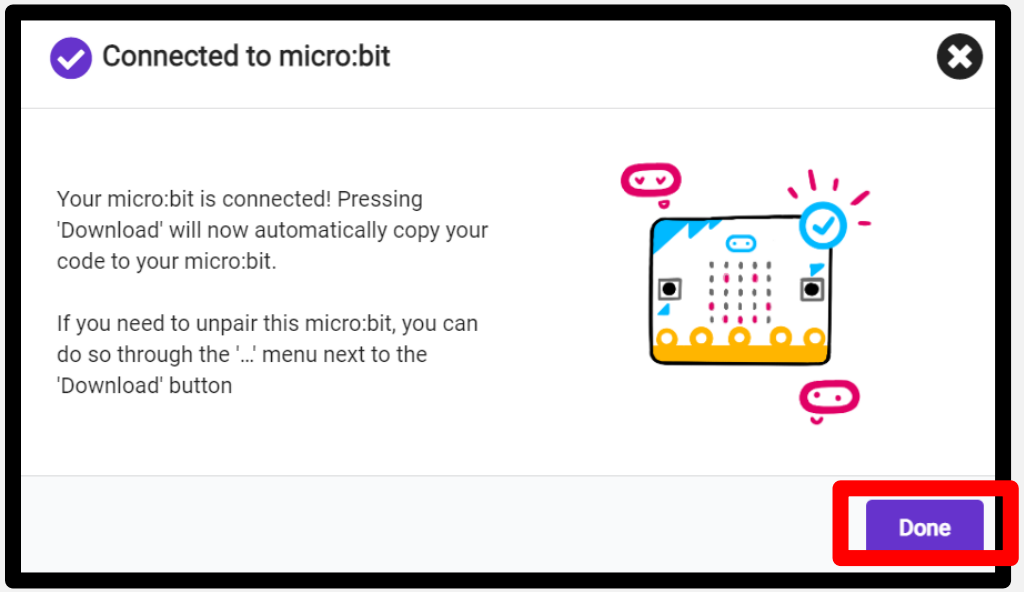




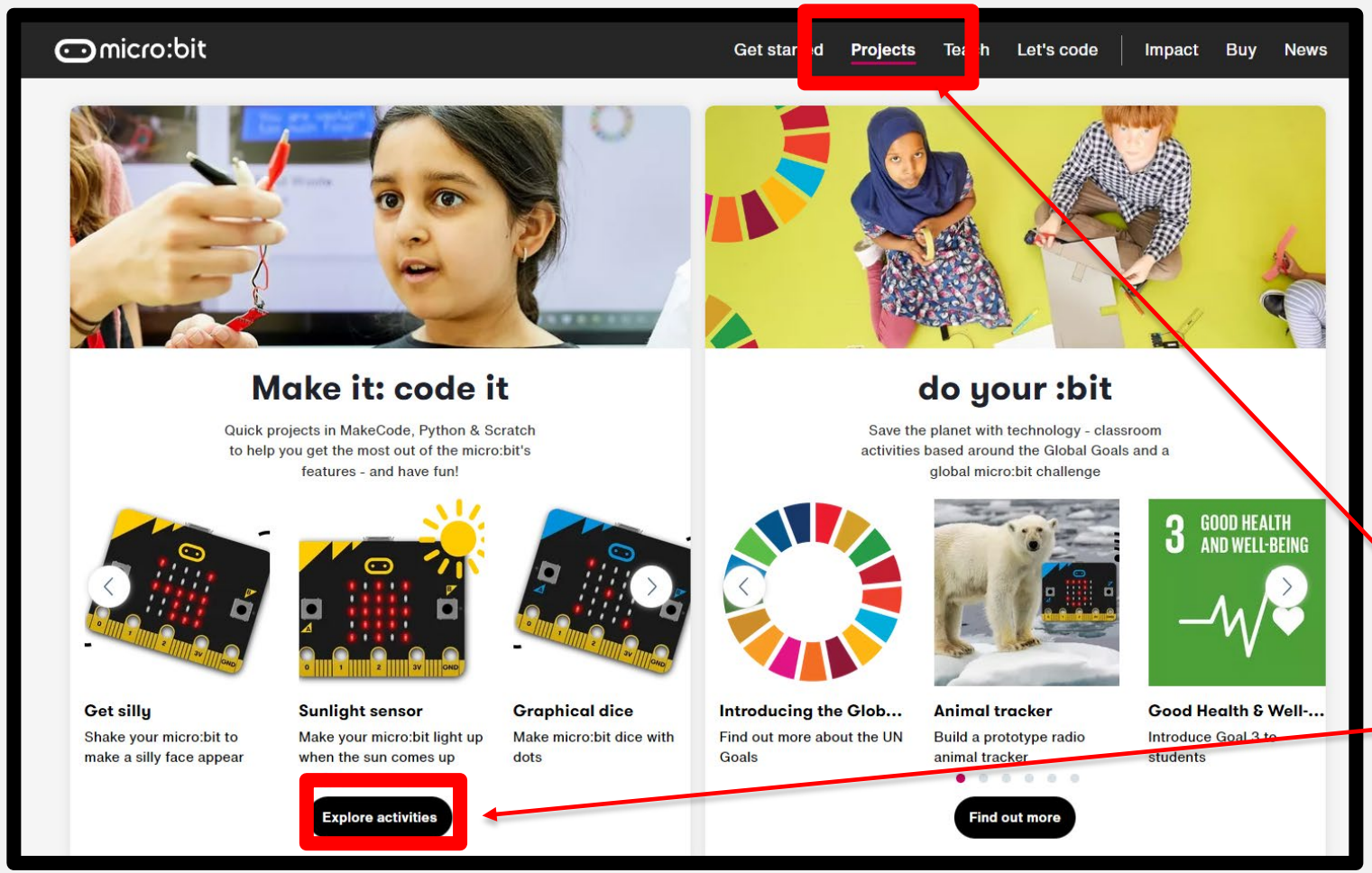




Click and then press connect button



Now you are ready to program your micro:bit!

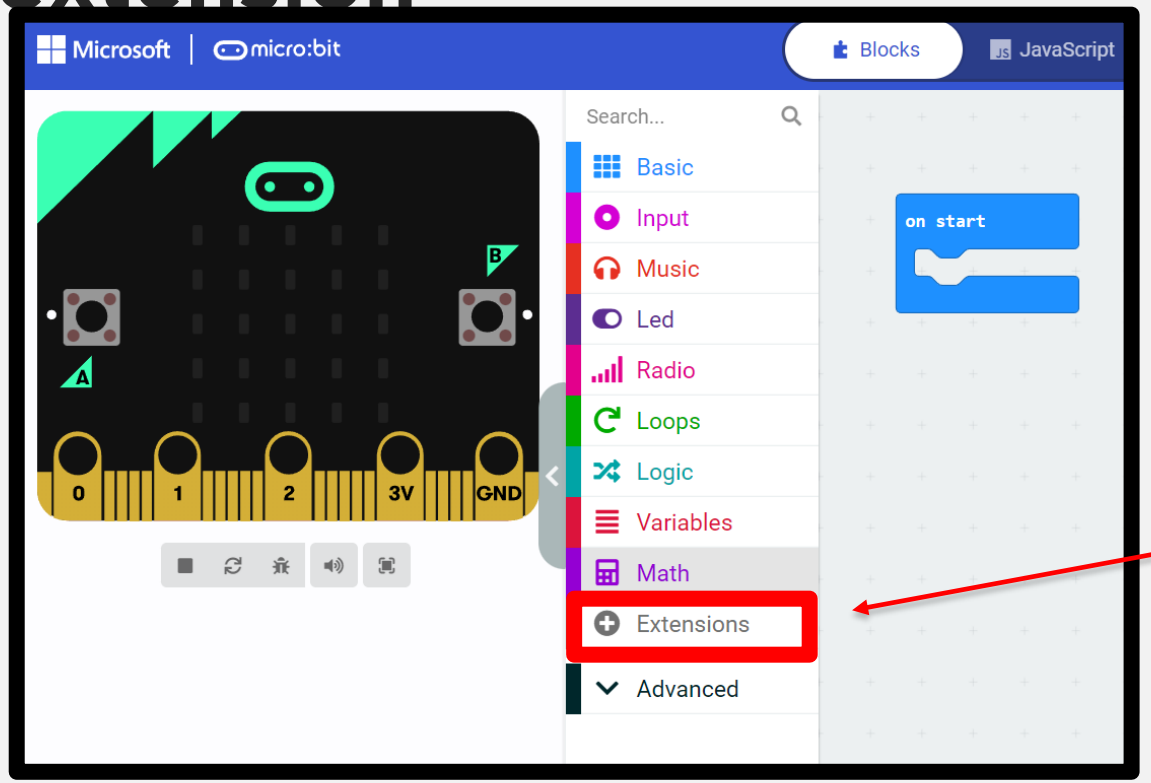


You can try these later!

Just click on Projects, and Explore activities

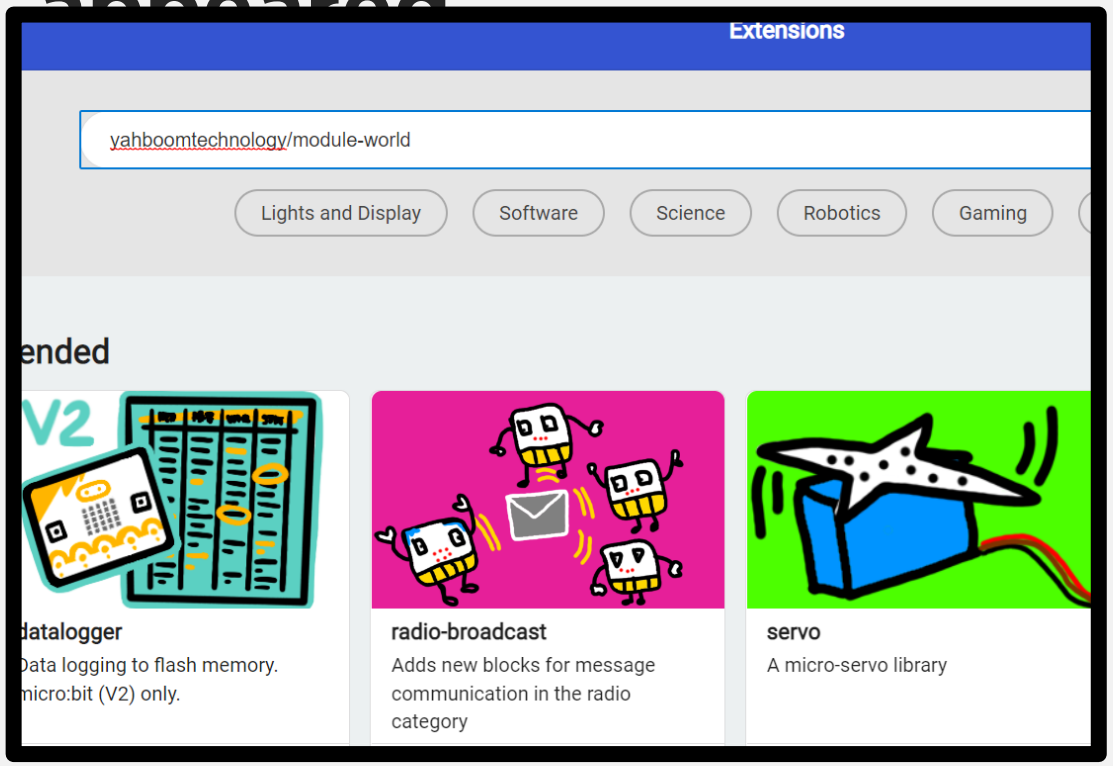
Let's program our Module's Sensor Kit

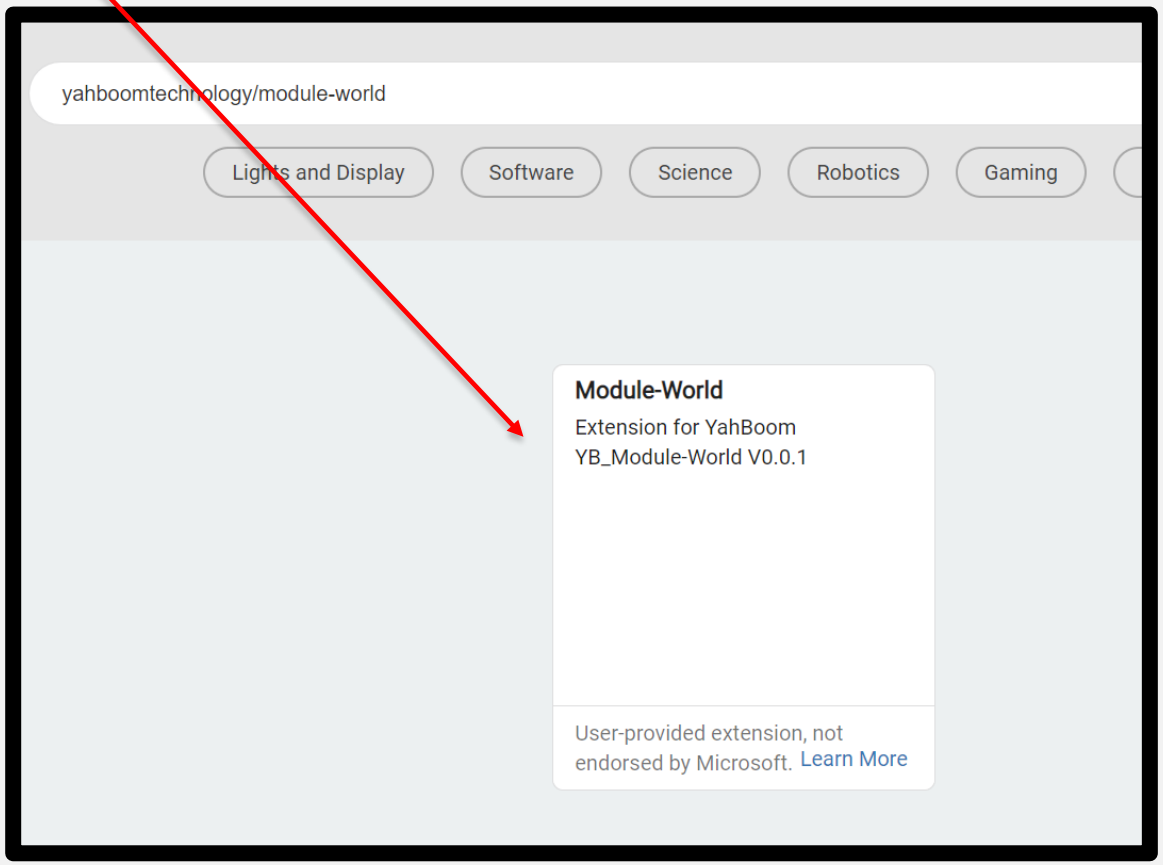
Firstly, to program the Micro:bit with the expansion board, we need to add extension



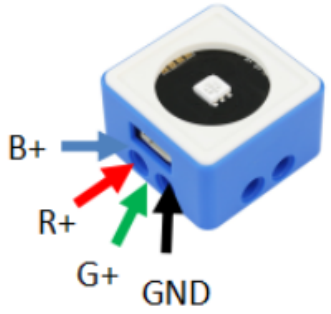
Click “Extensions”

Search and click the extension appeared



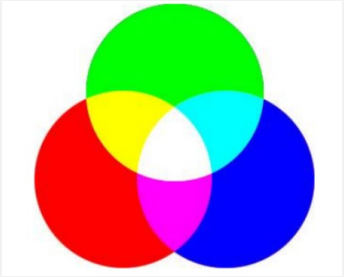


RGB Module



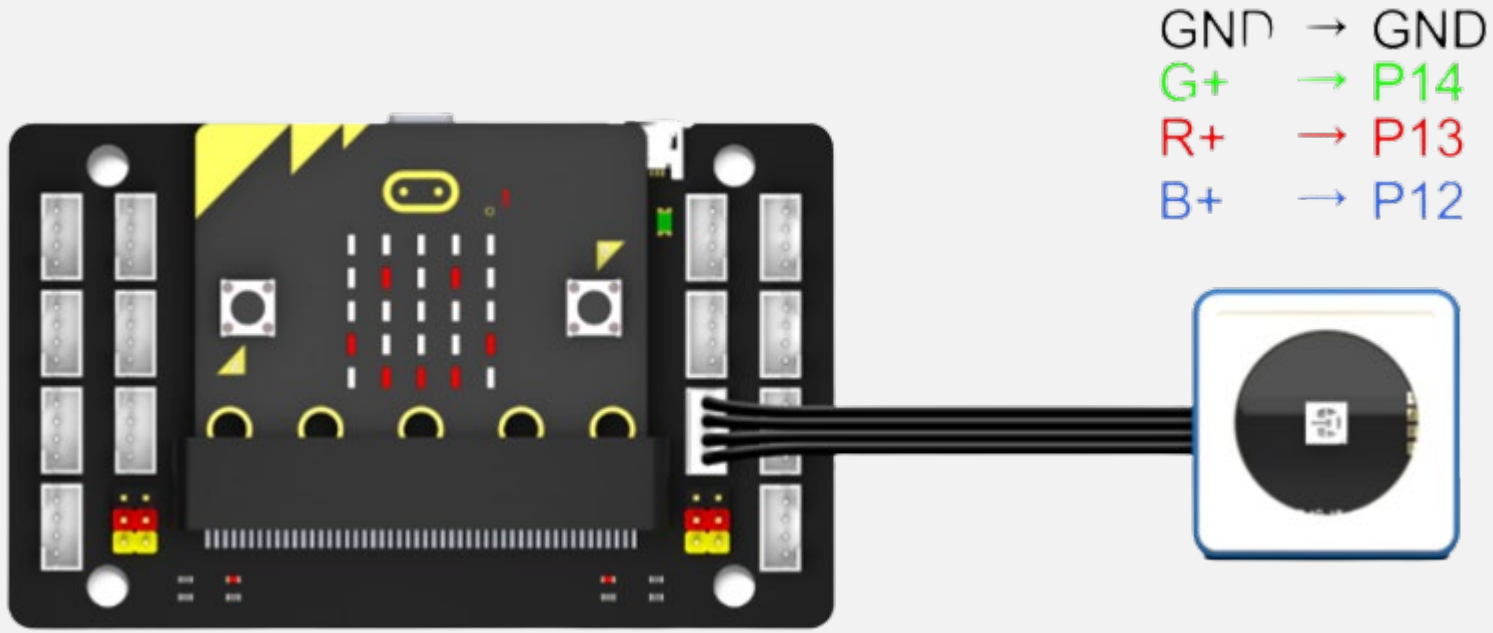
RGB: Three primary colors	GND: connect gnd
R+: Control the brightness of red	Working Voltage: 3.3V/5V
B+: Control the brightness of blue	Rated power: 0.2W
G+: Control the brightness of green	Size of module: 29.4mm*28.8mm

The brightness of each of the three red, green, and blue lights is adjustable



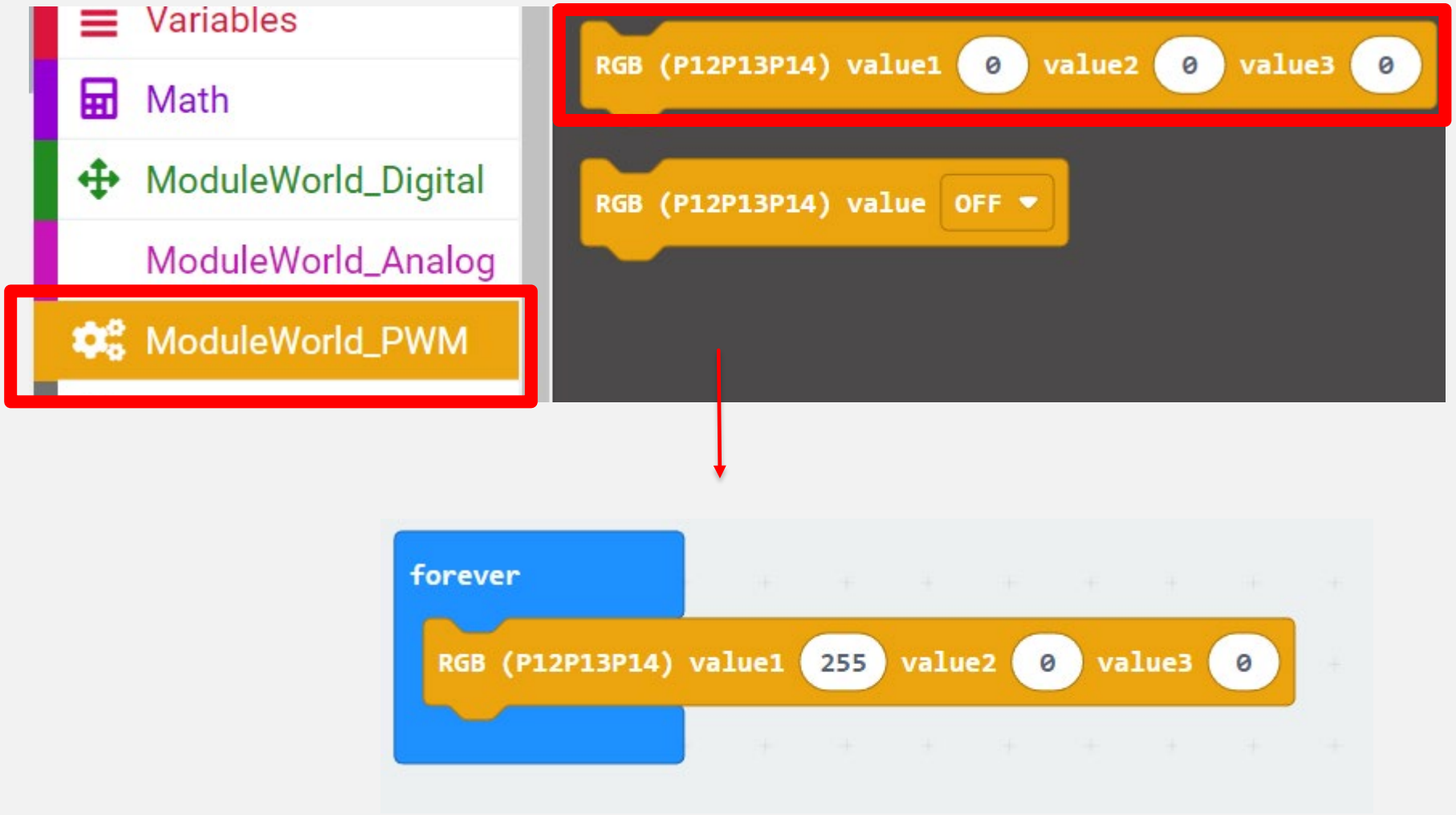
You can also call up different colors based on the RGB values assigned to different brightness.

Light up RGB



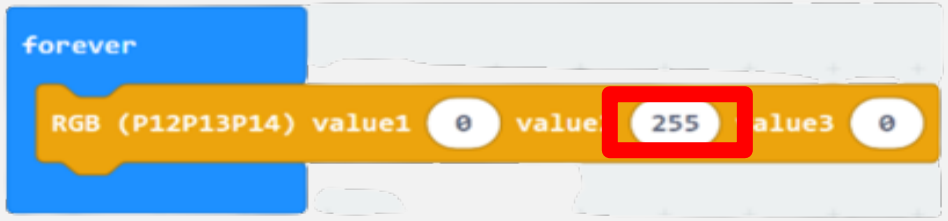
1. Connect RGB to expansion board

2. Combine blocks

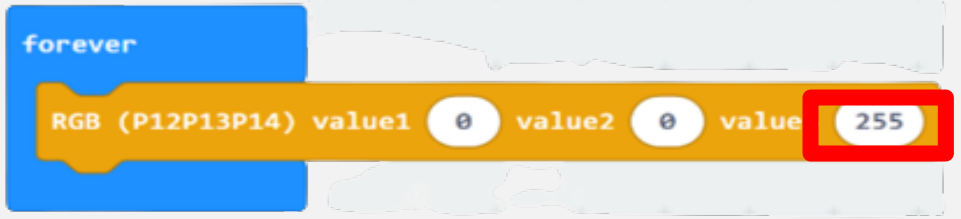


3. Changing the corresponding value will display different colour

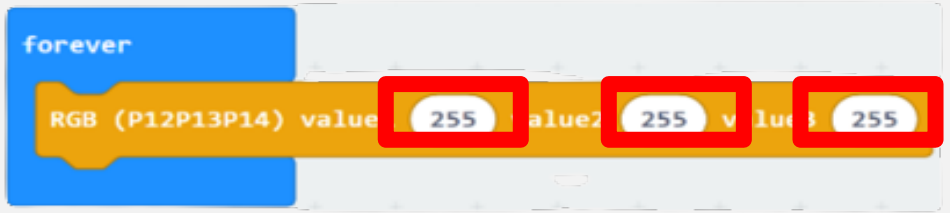
Green Light:



Blue Light:

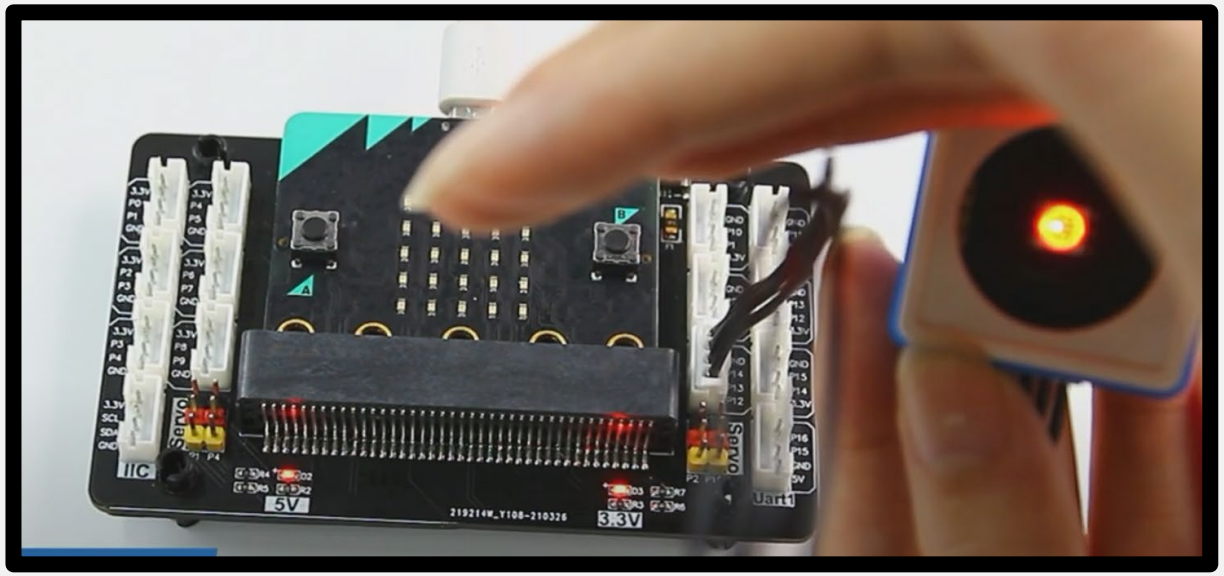


White Light:



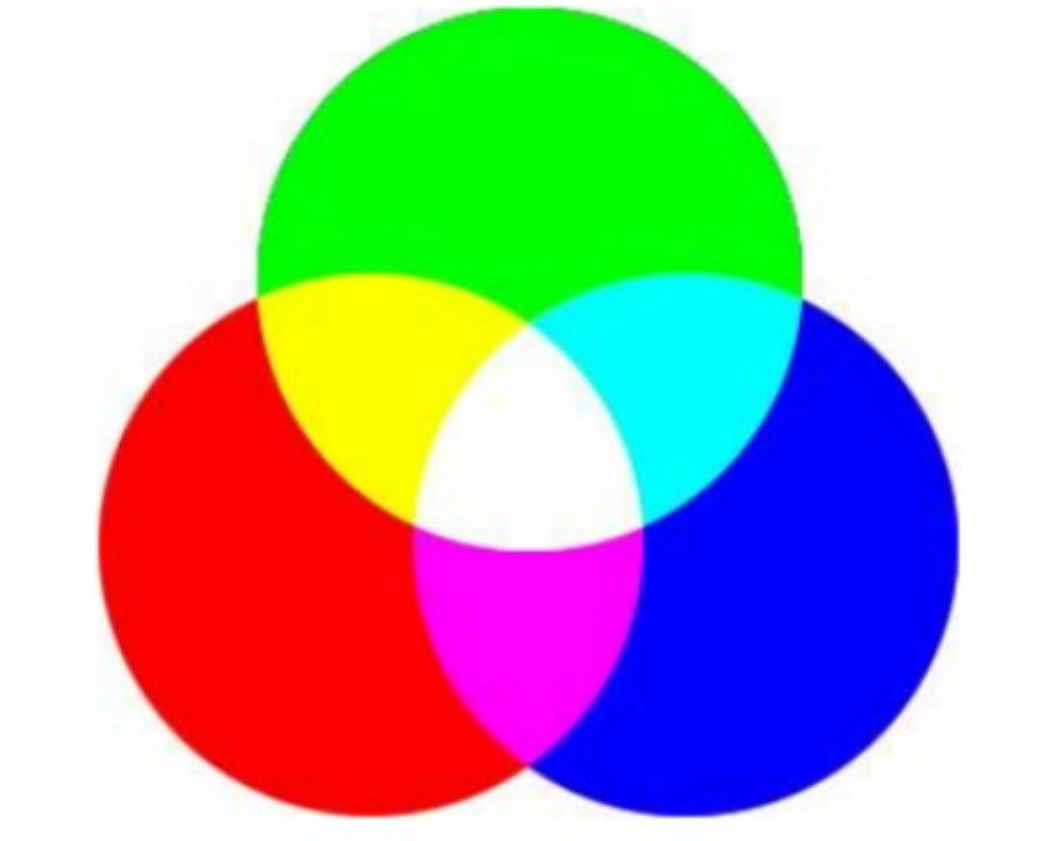
Close RGB Light:

4. Light appeared



After the program is downloaded successfully, RGB light become red.

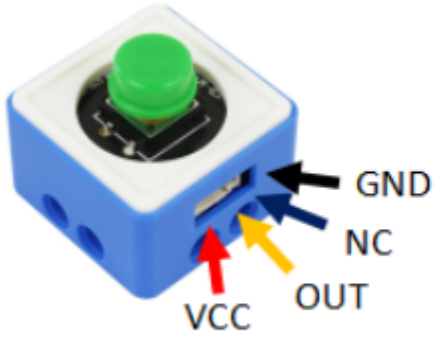
Challenge 1: Different Color



Can you program the light to display different colors like below:

1. Yellow
2. Cyan
3. Magenta

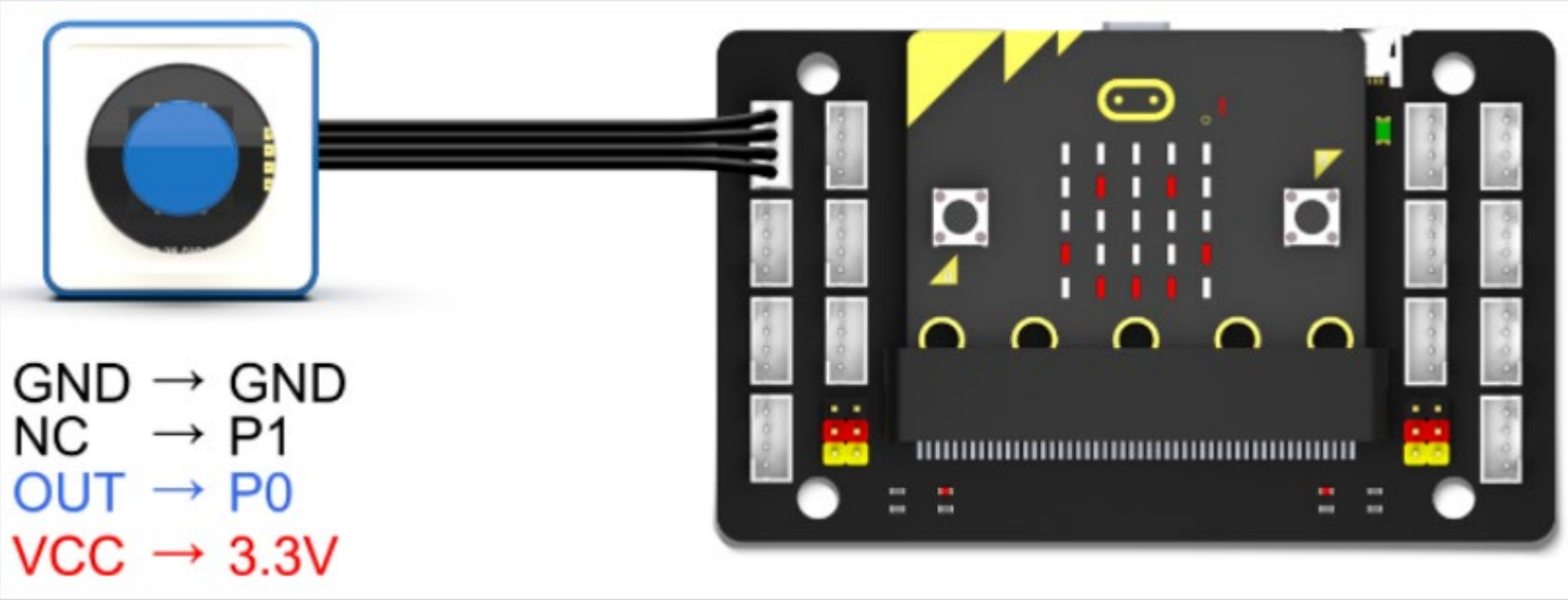
Button Module



NC: no need connect	VCC: connect 3.3V or 5V
GND: connect GND	OUT: press the key to output low level, release the output high level
Working Voltage: 3V/5V	Size of module:29.4mm*28.8mm

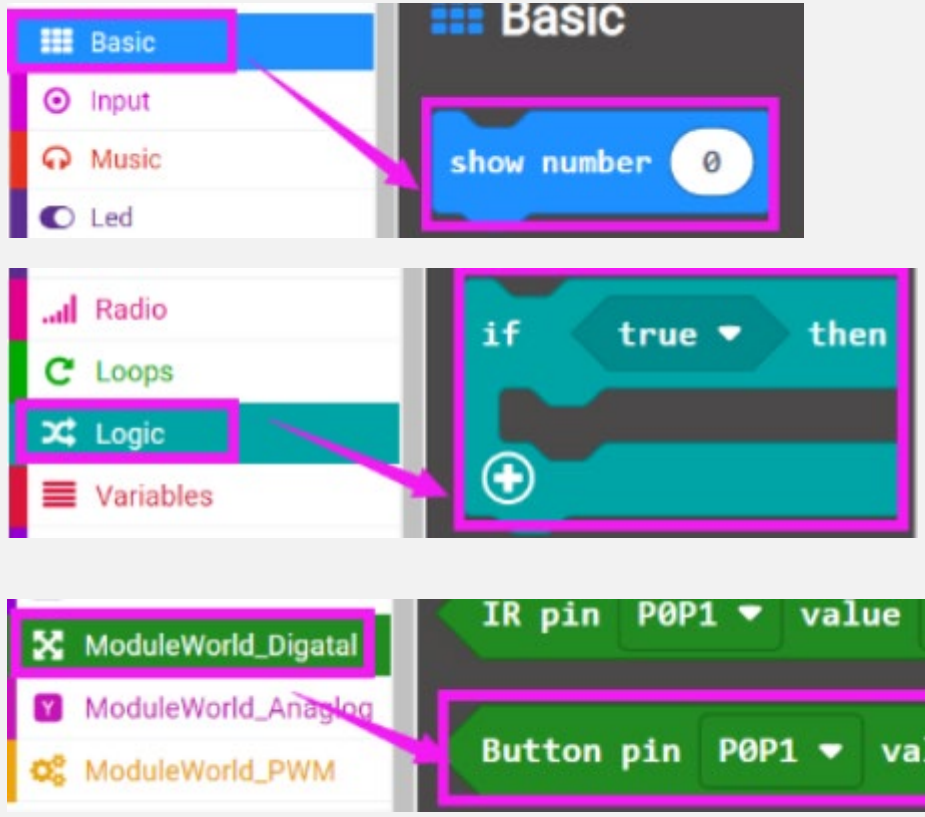
This button module is a self-resetting button

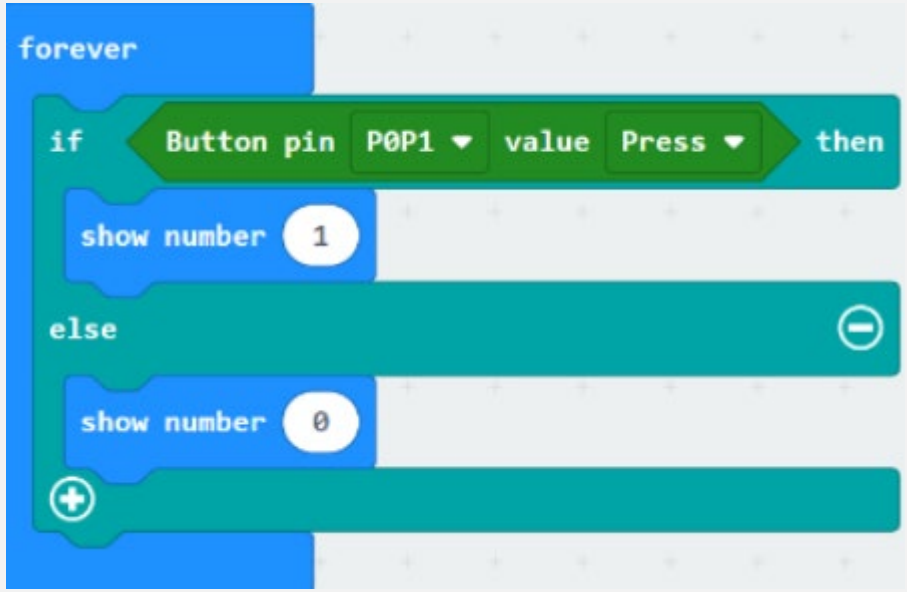
Button Detection



1. Connect Button to expansion board

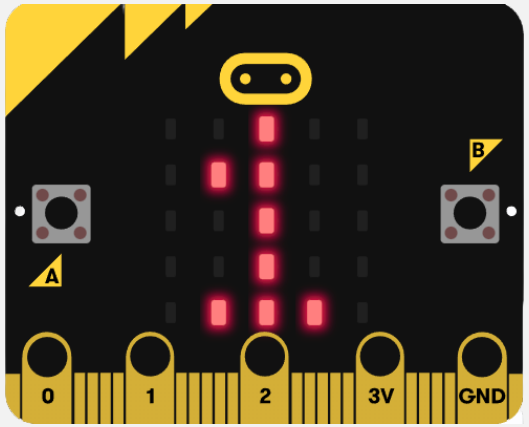
2. Combine Blocks



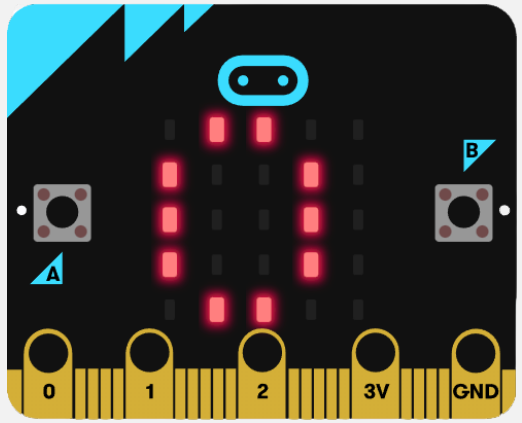


3. Number displayed

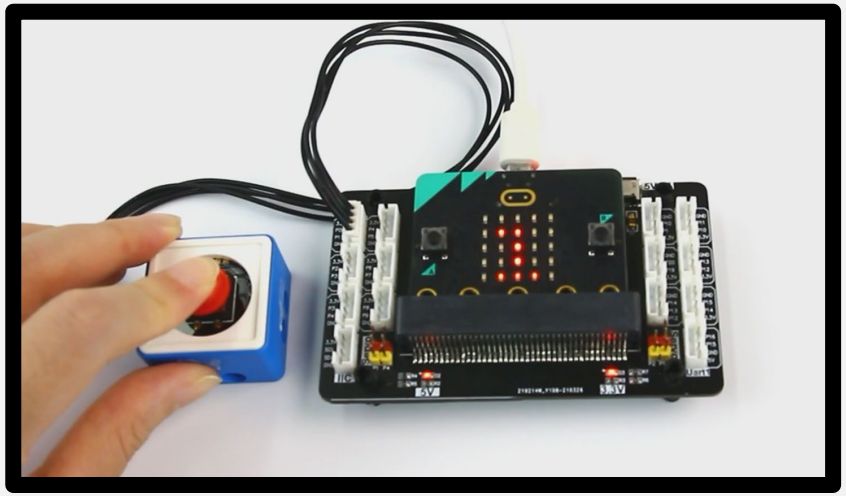
After the program is downloaded successfully,



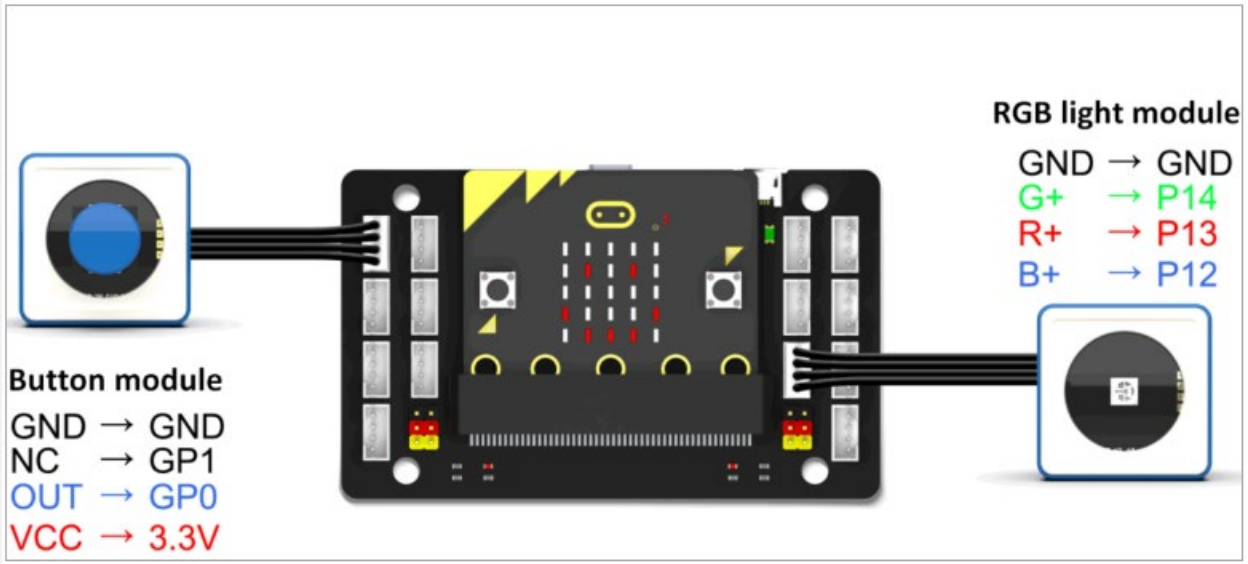
When we press button, Micro:bit dot matrix will display 1.



Otherwise, Micro:bit dot matrix will display 0.



Challenge 2: Button control light

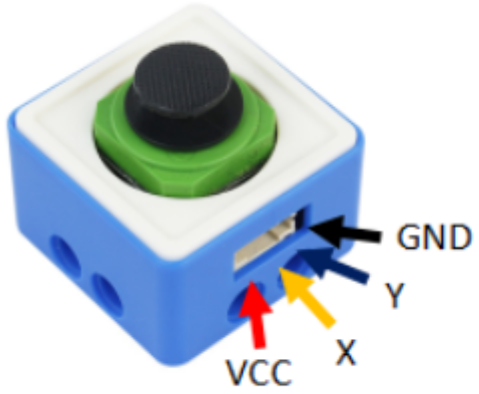


Connect your RGB light module to the expansion board to P14, P13, P12.

Try to program:

When the button is pressed, the RGB light module will light up.

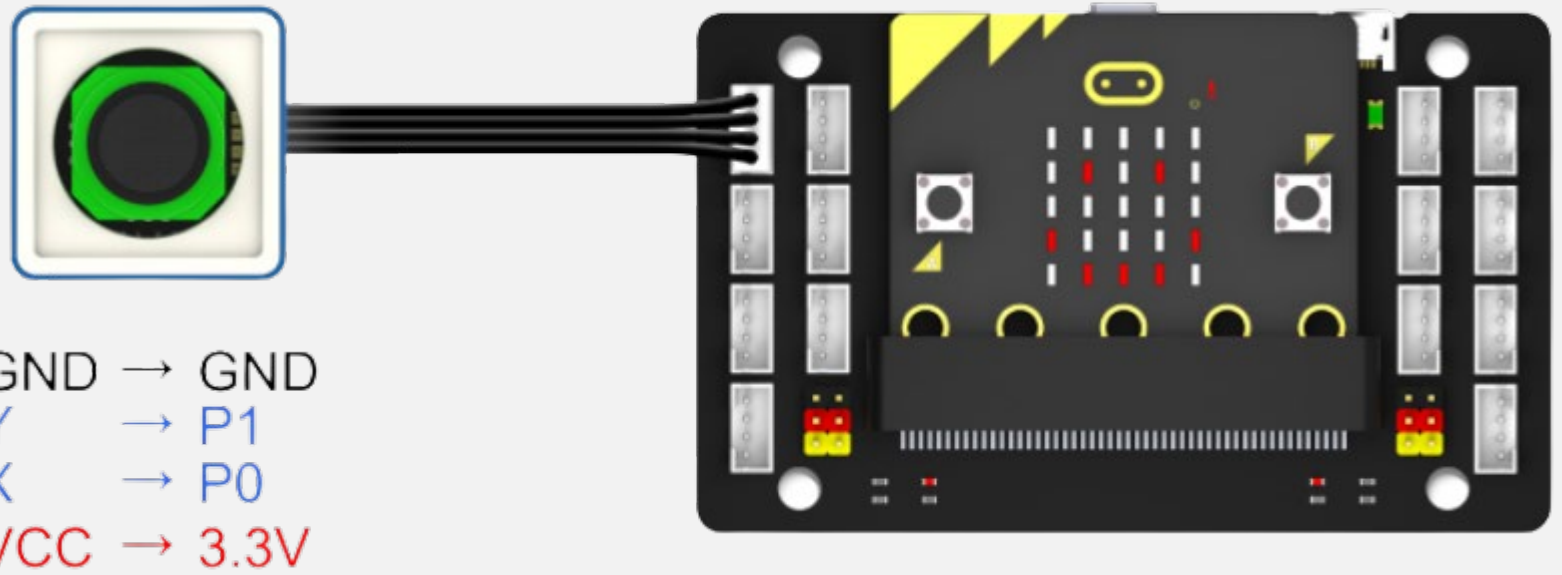
Rocker Module



GND:connect GND	VCC: connect 3.3V or 5V
X: Output coordinate analog value in X axis direction	Y: Output coordinate analog value in X axis direction
Working Voltage: 3.3V/5V	Size of module: 29.4mm*28.8mm

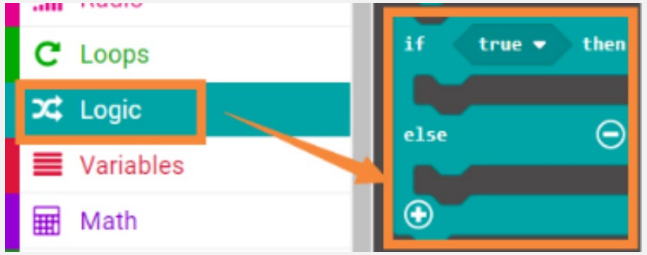
Rocker module can be regarded as a potentiometer with two channels, which can output the X-axis and Y-axis analog values.

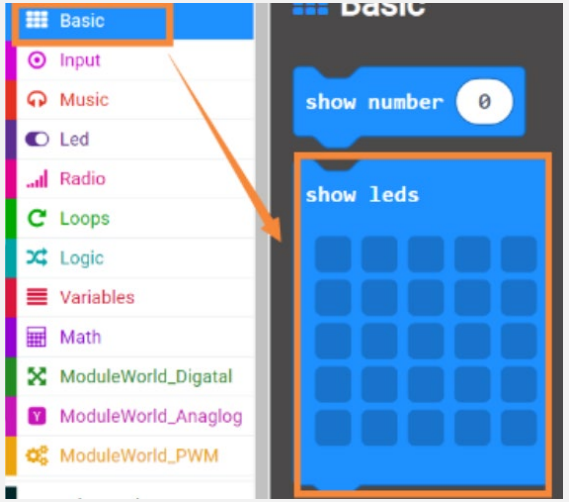
Control rocker

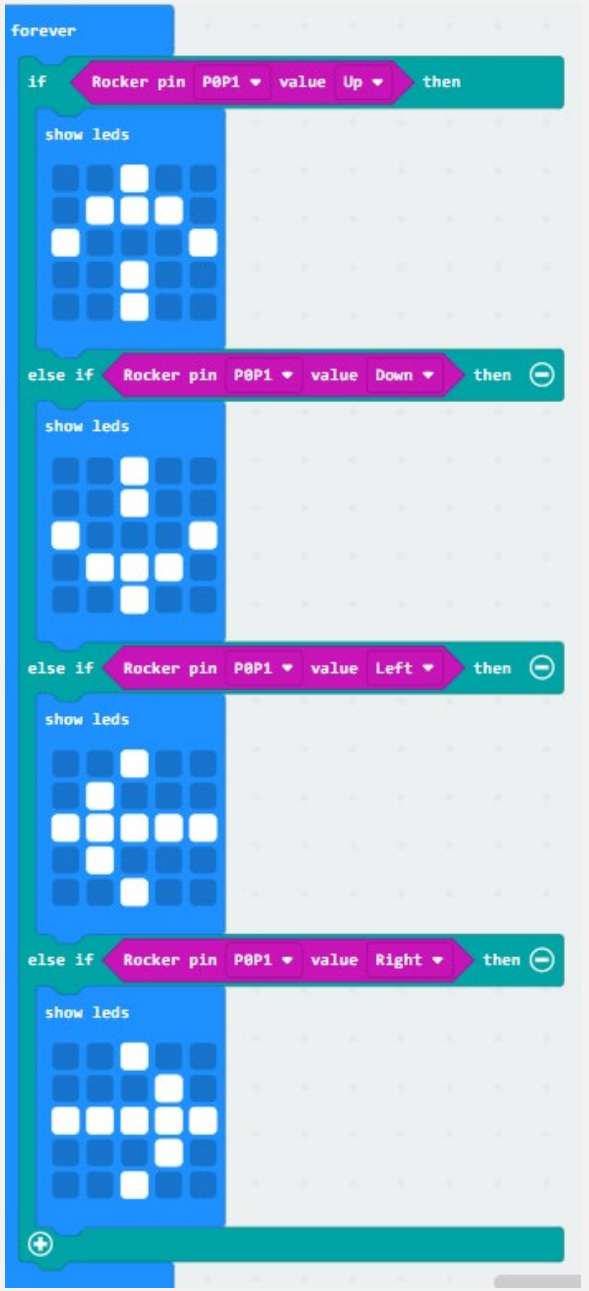


1. Connect Rocker to expansion board

2. Combine Blocks

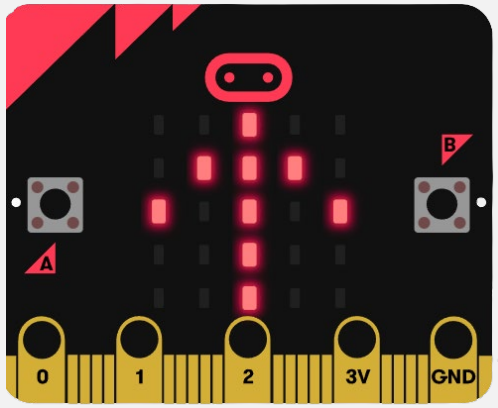




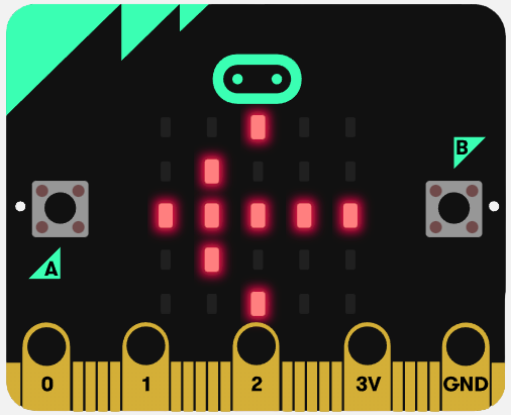


3. LED displayed

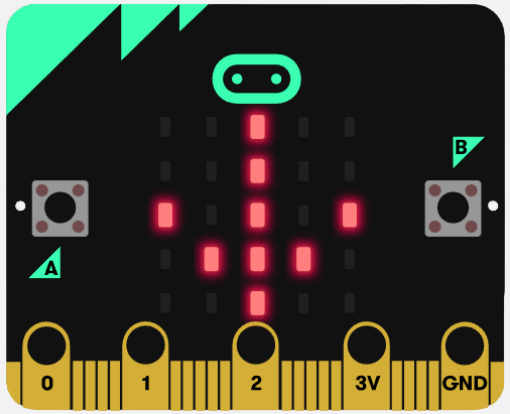
After the program is downloaded successfully,



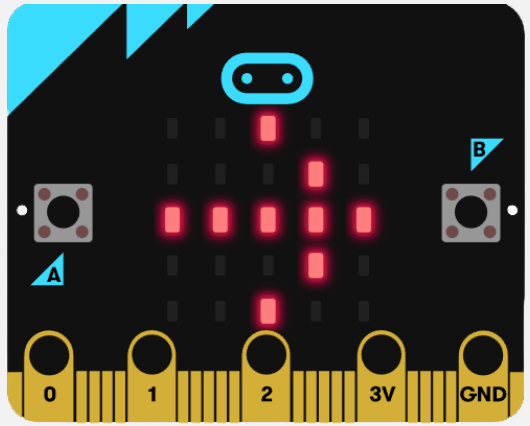
Joystick when pushed up



Joystick when pushed to the left

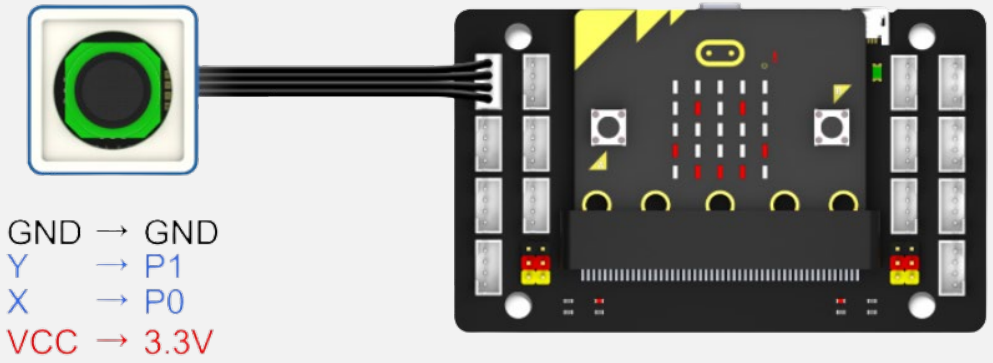


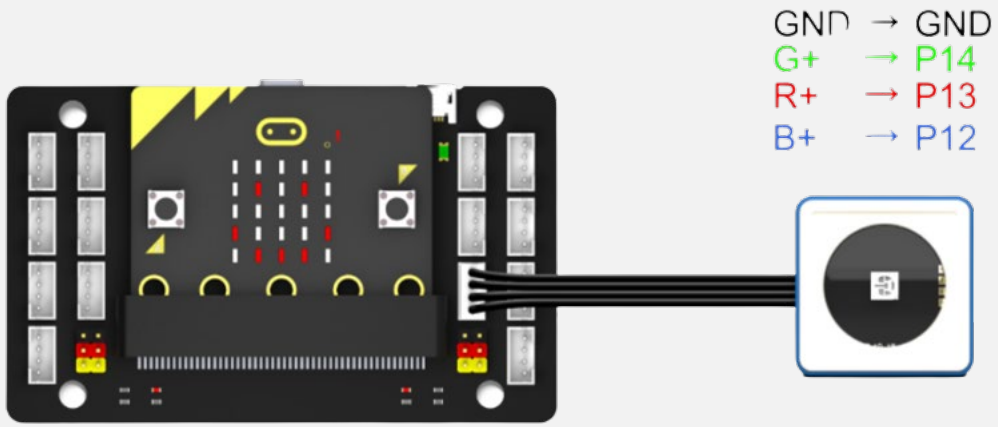
Joystick when pushed down



Joystick when pushed to the right

Challenge 3: Control different colour with Rocker





Challenge:

Connect your RGB light module to the expansion board.

Program as follows:

1. **Joystick Left → Red**
2. **Joystick Right → Green**
3. **Joystick Up → Blue**
4. **Joystick Down → White**

Summary

1. MakeCode is used to program Micro:bit.

2. There are 10 Modules with different functions.
   1. RGB Light
   2. Button
   3. Rocker
   4. Photosensitive
   5. Infrared
   6. Temperature and Humidity
   7. Ultrasonic
   8. Digital Tube
   9. Human Body Infrared
   10. Color Recognition

3. Modules and Servo need to connect correctly to their assigned pins

Do a quick self-check of your learning outcome...

1. How many modules do we have in our Microbit WOM box?
2. Which of the modules are outputs and which are inputs?
3. Can we connect RGB light sensor to P1 and P0 port?
4. Can I connect multiple modules on expansion board at the same time?
5. “The button module is a self-resetting button”, what does this statement mean?

Any Questions?

Thank you :)