



Smart Home Kit



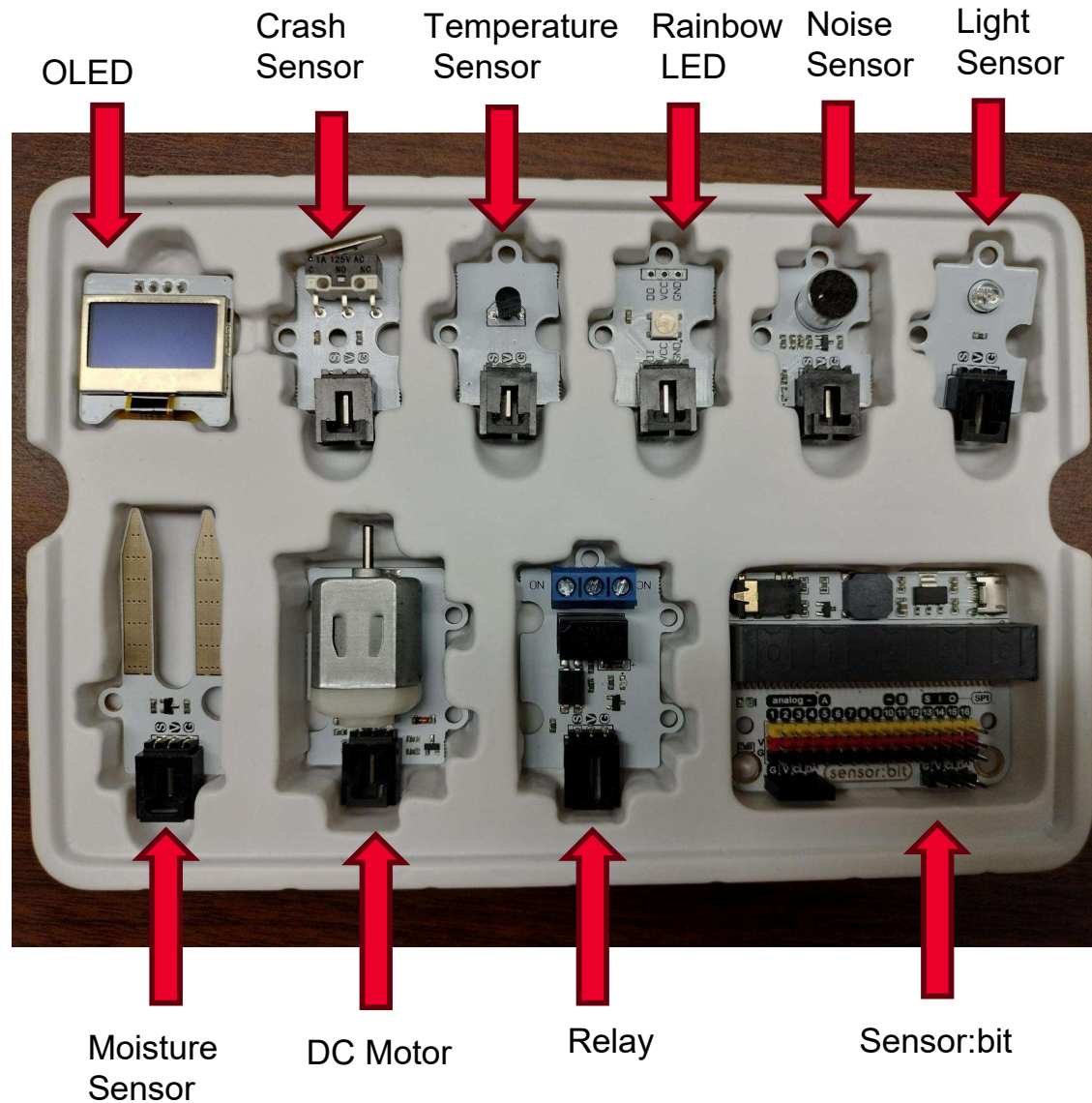
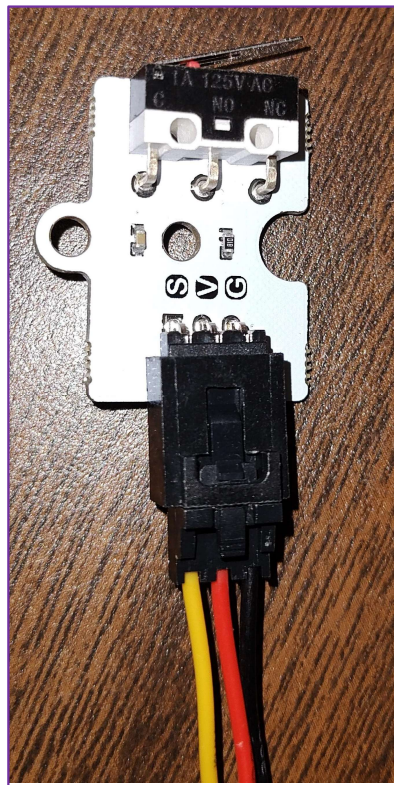
CODERS CS Team

Summer 2023



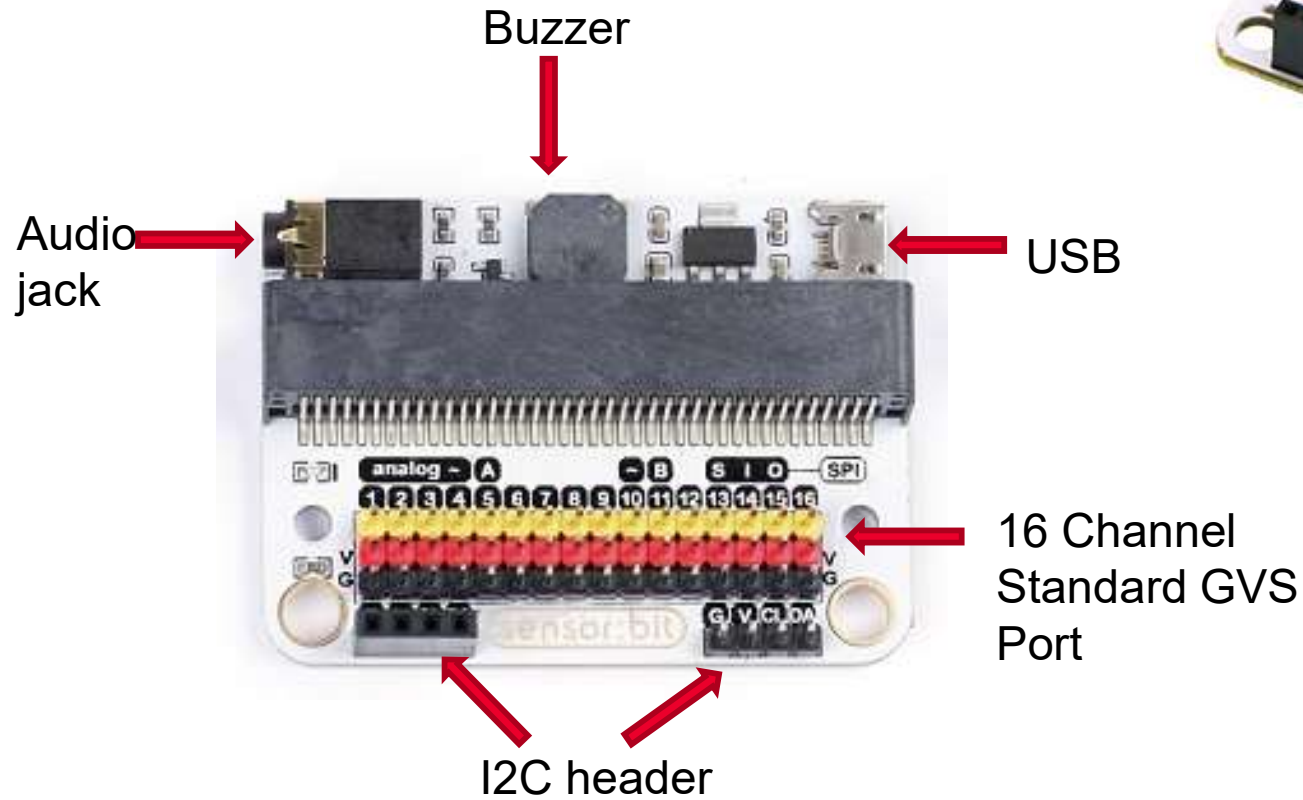
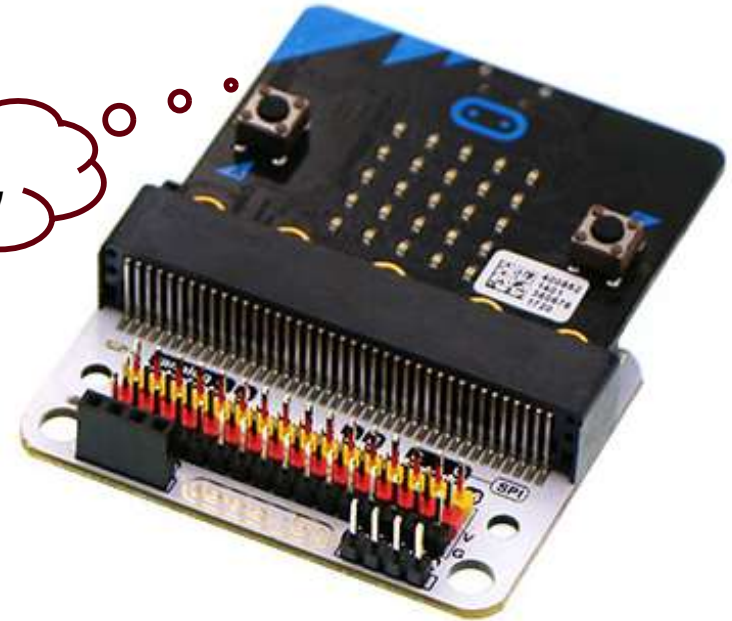
Meet Smart Home Kit!

https://elecfeaks.com/learn-en/microbitKit/smart_home_kit/smart_home_kit.html



||| Sensor:bit

You need a microbit!

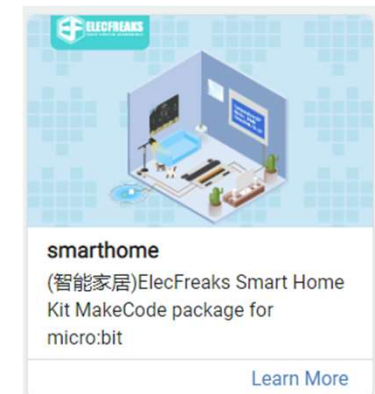
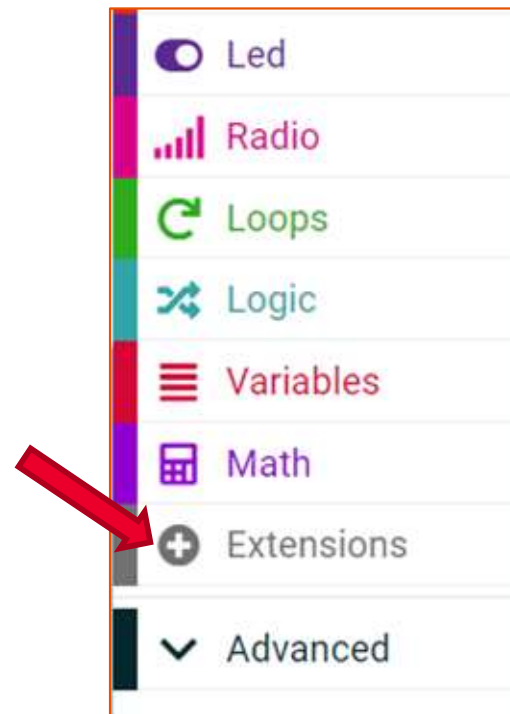
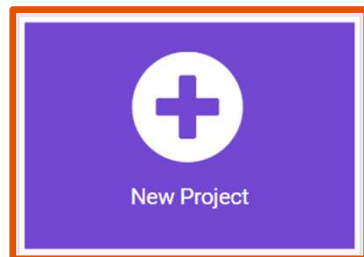




MakeCode-Project Setup

<https://makecode.microbit.org/>

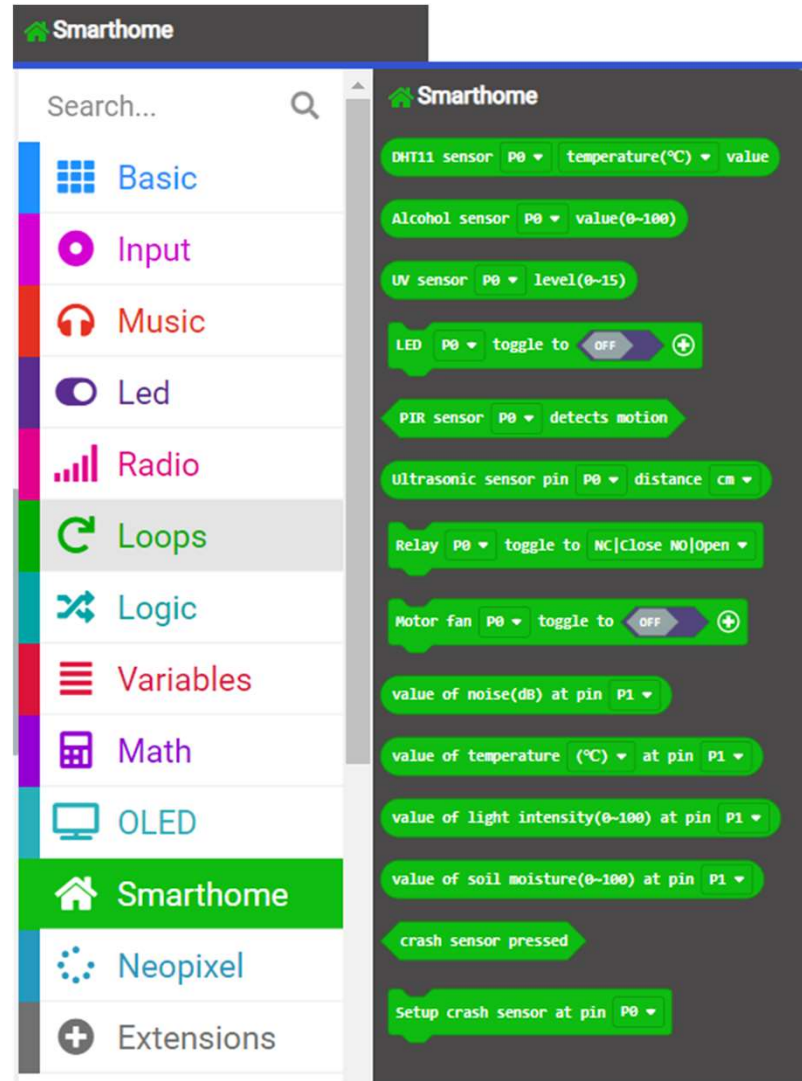
1. Create a new project, and give it a unique name
2. Click on **Extensions**
3. Find for **smarthome**
4. Add **smarthome** to your project





MakeCode: Sensors

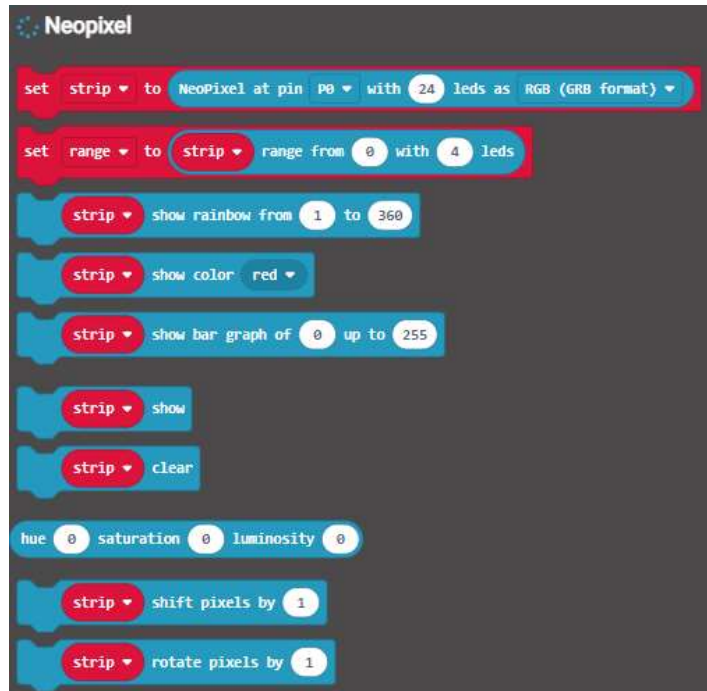
Sensors: Noise, Light, Temperature, Moisture, and Crash





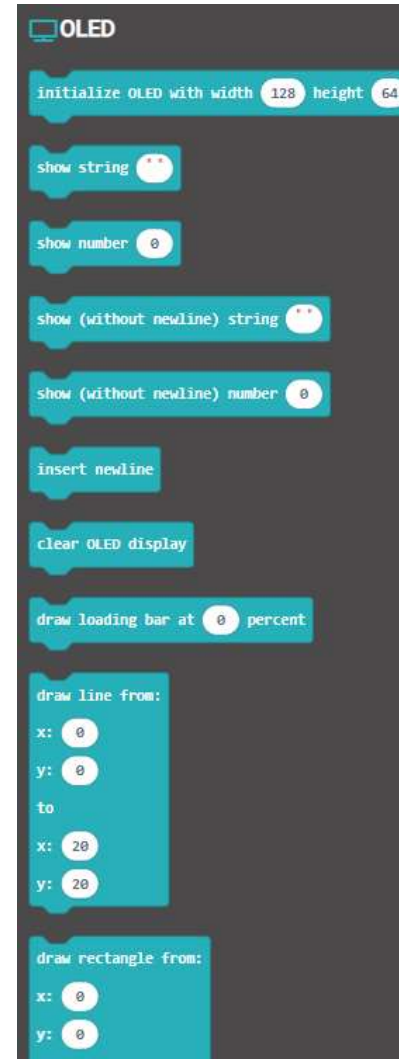
MakeCode: Actuators

Actuators: Rainbow LED (Neopixel), OLED, DC motor



Neopixel

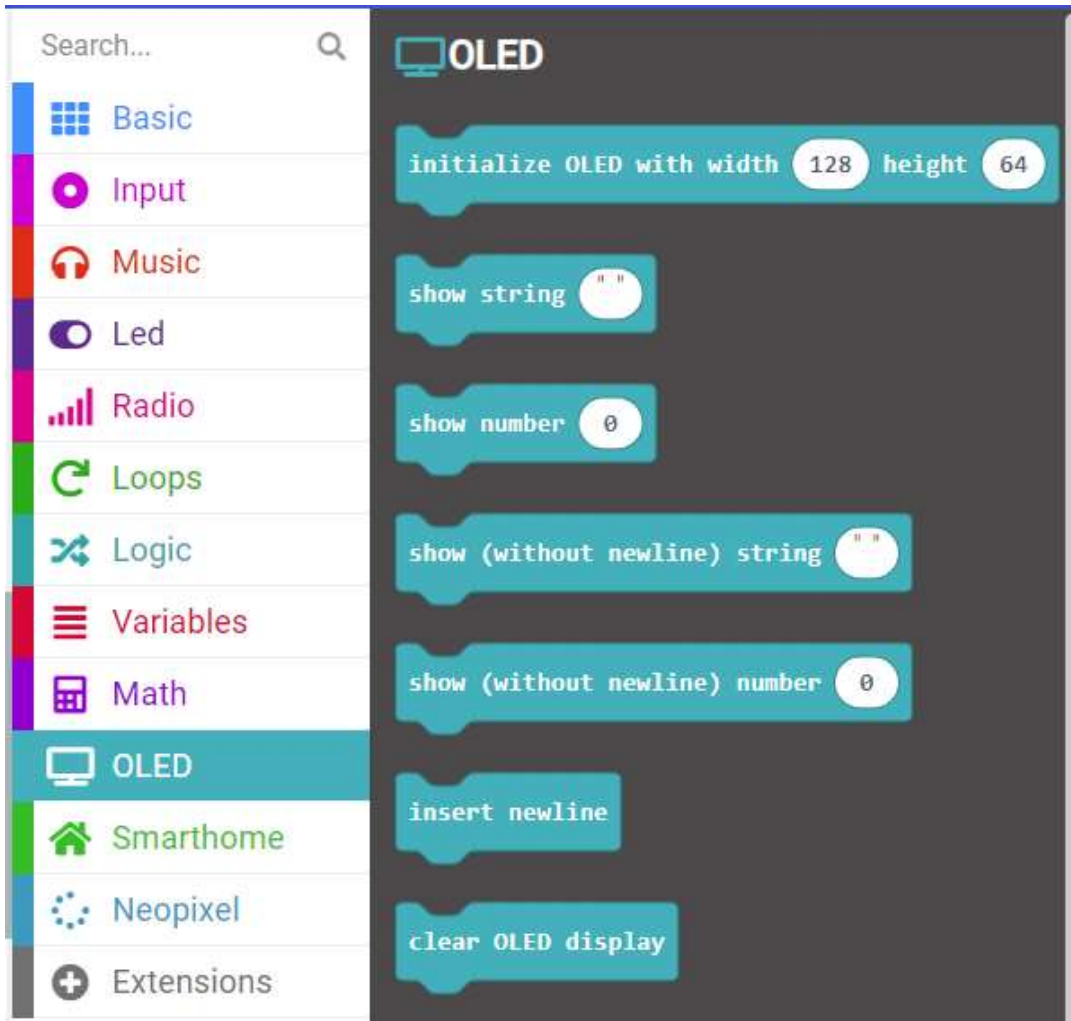
```
set strip to Neopixel at pin P0 with 24 leds as RGB (GRB format)
set range to strip range from 0 with 4 leds
strip show rainbow from 1 to 360
strip show color red
strip show bar graph of 0 up to 255
strip show
strip clear
hue 0 saturation 0 luminosity 0
strip shift pixels by 1
strip rotate pixels by 1
```



OLED

```
initialize OLED with width 128 height 64
show string ""
show number 0
show (without newline) string ""
show (without newline) number 0
insert newline
clear OLED display
draw loading bar at 0 percent
draw line from:
x: 0
y: 0
to
x: 20
y: 20
draw rectangle from:
x: 0
y: 0
```

MakeCode: OLED



- We connect the OLED to the I2C female pins of Sensor:bit

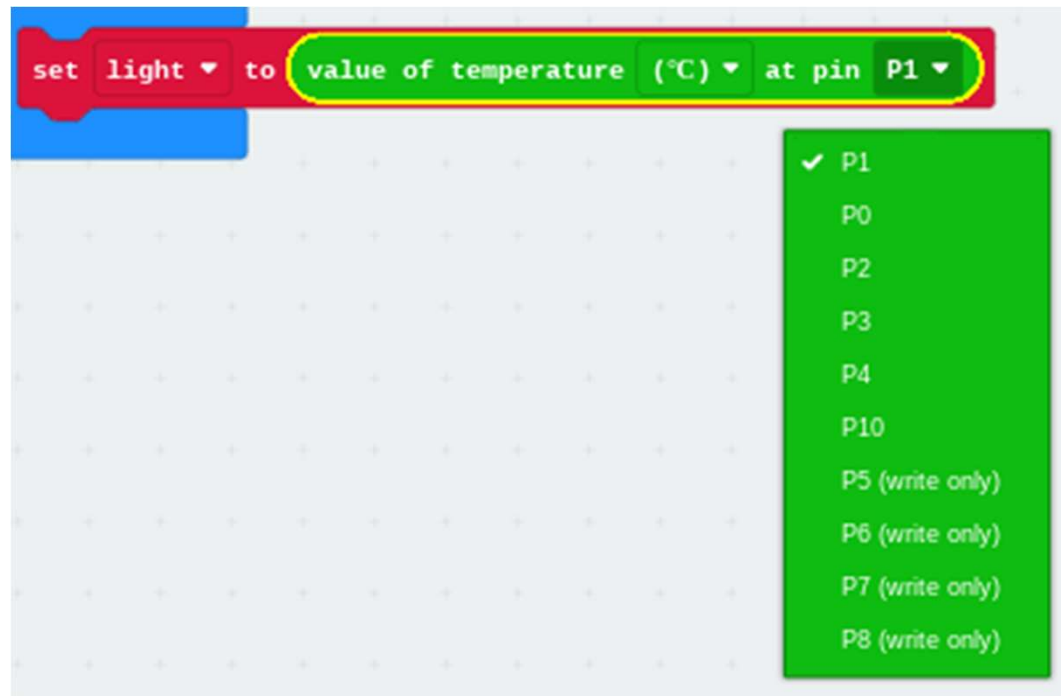


- Then, set width and height of OLED for showing value or string in your code (e.g., see Activity-1 code)
- Then, output number or string from the code



MakeCode: Pins

We can receive data from sensors connected to specific pins and send data to the pins for actuation.



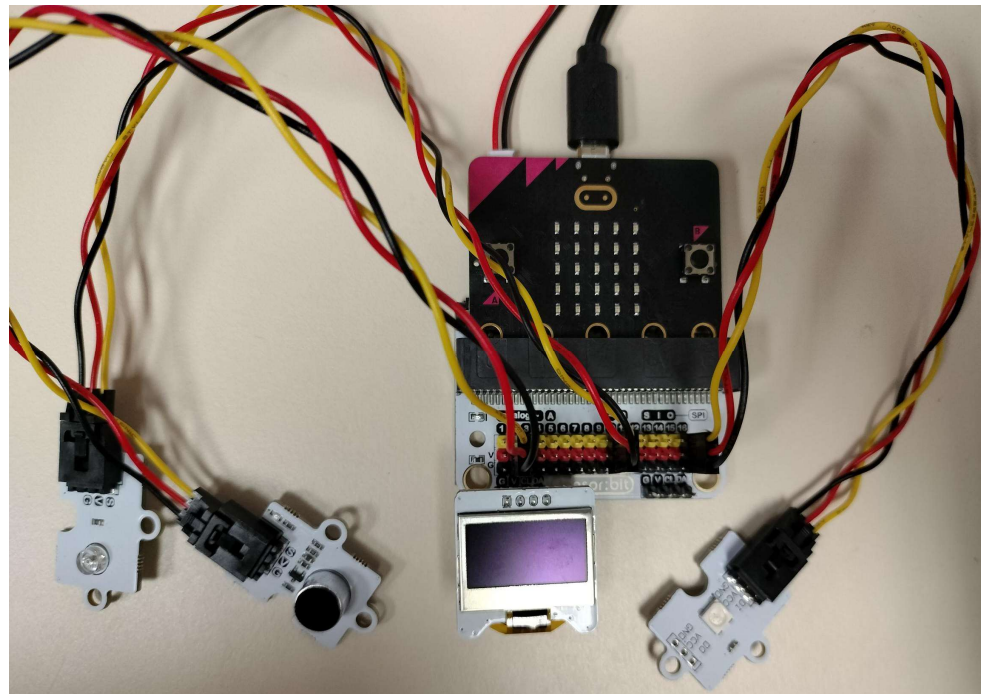


Activity-1: Ghostbuster

Goal: Activate the neopixel light at night if there is a noise.

Required items:

- Micro:bit
- Sensor:bit
- Noise sensor
- Light sensor
- Rainbow LED
- OLED



Steps:

- Connect light sensor to pin 4
- Connect noise sensor to pin 2
- Connect rainbow LED to pin 1

Activity-1: Code

Input:

- Read light intensity from pin 4
- Read noise level from pin 2

Logic:

- If the light intensity is below a certain threshold and the noise level is above a certain value, then turn on light.

Output:

- Set RGB value of light in pin 1

```
on start
  show icon
  clear OLED display
  initialize OLED with width 128 height 64
  set strip to NeoPixel at pin P1 with 1 leds as RGB (GRB format)

forever
  set light to value of light intensity(0-100) at pin P4
  set noise to value of noise(dB) at pin P2
  clear OLED display
  show string Light
  show number light
  show string Sound
  show number noise
  pause (ms) 1000
  if light < 45 and noise > 55 then
    strip show color indigo
    pause (ms) 5000
    strip show color black
```



Activity-2: It's Summer!

Goal: Turn on a fan when the temperature and moisture are high

Required items:

- Micro:bit
- Sensor:bit
- Temperature sensor
- Moisture sensor
- Motor with fan blades

Steps:

- Connect moisture sensor to pin 1
- Connect temperature sensor to pin 4
- Connect DC Motor to pin 2





Activity-2: Code

Input:

- Read moisture level from pin 1
- Read temperature from pin 4

Logic:

- If the moisture is above a certain threshold and the temperature is above a certain value, then turn on DC motor.

Output:

- DC motor rotation

```
on start
  show icon [grid icon]
  initialize OLED with width 128 height 64

forever
  set moisture to value of soil moisture(0-100) at pin P1
  set temperature to value of temperature (°F) at pin P4
  show string moisture
  show number moisture
  show string temp
  show number temperature
  pause (ms) 1000
  clear OLED display
  if moisture >= 20 and temperature > 70 then
    Motor fan P2 toggle to ON speed 25 %
  if moisture < 20 or temperature < 70 then
    Motor fan P2 toggle to OFF
```



Thank You

Any Questions?