

2024-2025 Quality Education Fund Thematic Network - Tertiary Institutes

# Progressive Development of STEAM Literacy through STEAM

## Education and Self-directed Learning

### 透過STEAM教育自主學習有序發展STEAM素養

# 自動灌溉系統

嗇色園主辦可譽中學暨可譽小學

# 目錄

- 01 所需配件
- 02 Micro:bit
- 03 Thingspeak
- 04 編程
- 05 接駁裝置
- 06 水泵頭

# 所需配件

Micro:bit

IoT 擴展板

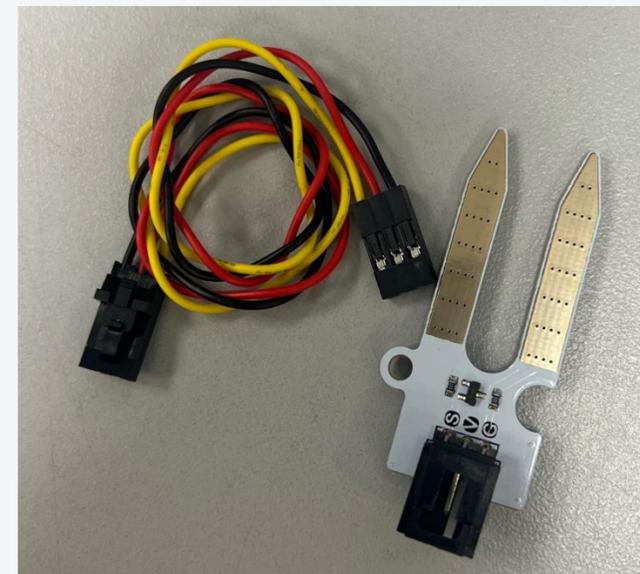
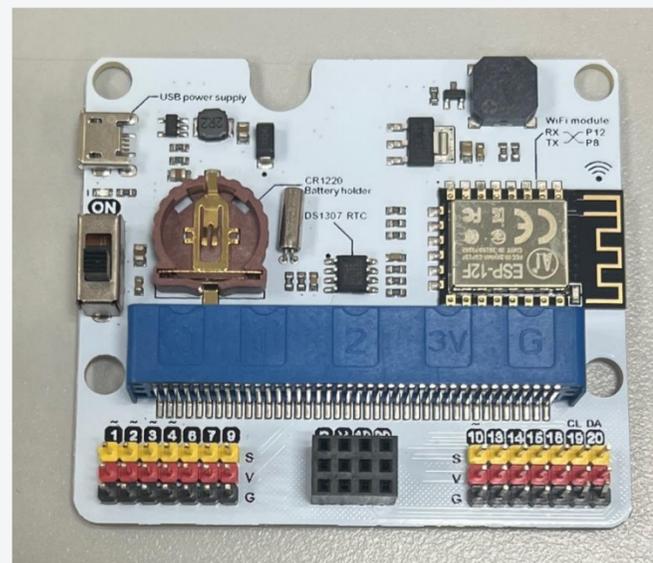
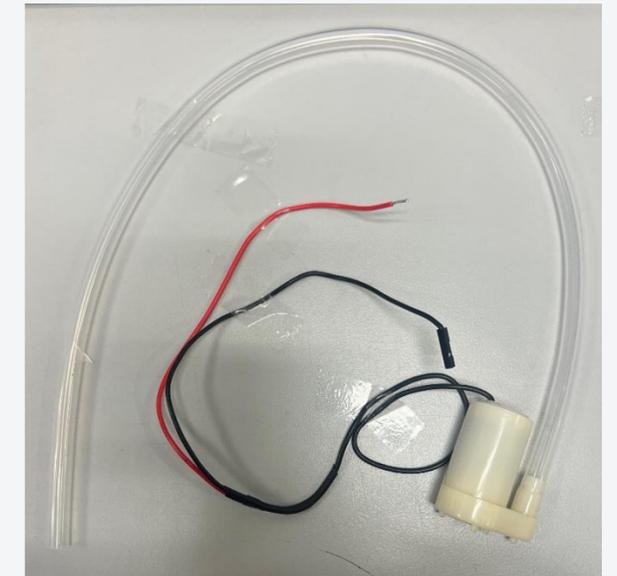
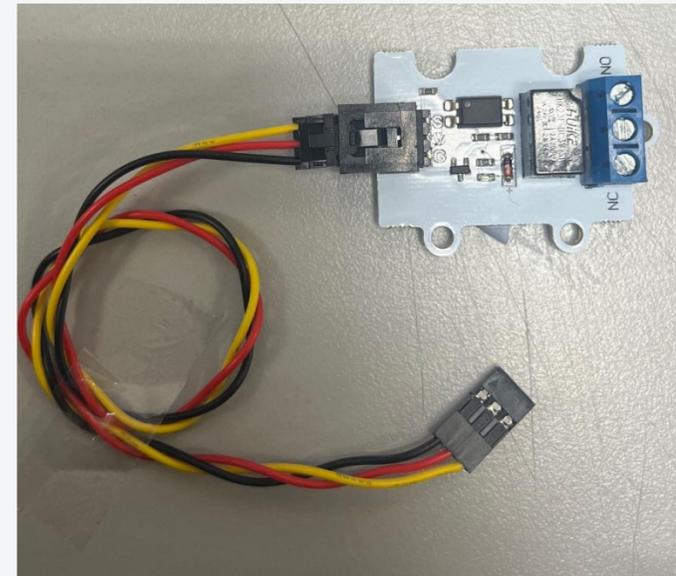
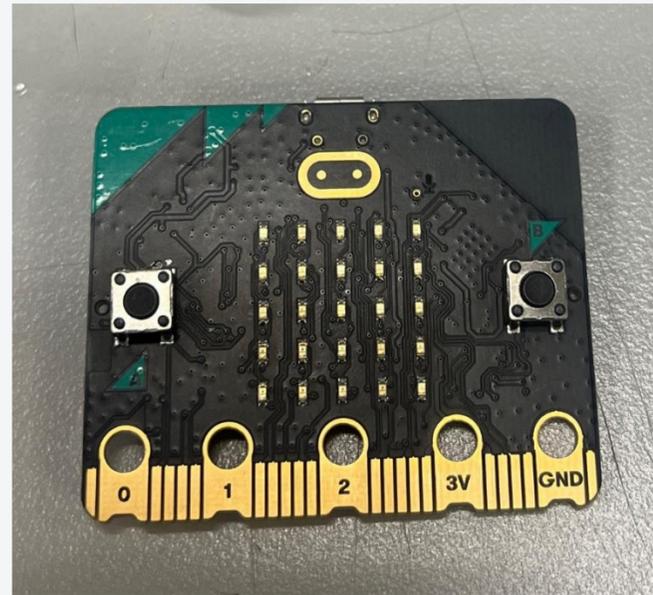
繼電器

土壤濕度計

水泵

杜邦線

供電裝置



# How to connect with ThingSpeak?

 ThingSpeak



# Login to ThingSpeak

ThingSpeak™ Channels Apps Devices Support Commercial Use How to Buy TC

## My Channels

New Channel Search by tag

Name	Created	Updated
EC Sensor	2023-09-26	2023-09-26 08:13

Private Public Settings Sharing API Keys Data Import / Export

## Help

Collect data in a ThingSpeak channel from a device, from another channel, or from the web.

Click **New Channel** to create a new ThingSpeak channel.

Click on the column headers of the table to sort by the entries in that column or click on a tag to show channels with that tag.

Learn to [create channels](#), explore and transform data.

Learn more about [ThingSpeak Channels](#).

## Examples

- [Arduino](#)
- [Arduino MKR1000](#)
- [ESP8266](#)
- [Raspberry Pi](#)
- [Netduino Plus](#)

## Upgrade

Need to send more data faster?

Need to use ThingSpeak for a commercial project?

Upgrade

1. Add new channel

ThingSpeak™ Channels Apps Devices Support

## DHT11

Channel ID: **2282557**  
Author: **mwa0000031385108**  
Access: Private

Private View Public View Channel Settings Sharing **API Keys** Data Import / Export

## Write API Key

Key **DB0XBLA9WRWQ6PIZ**

Generate New Write API Key

## Help

API keys enable you to write data to channels. API keys are auto-generated for each channel.

## API Keys Settings

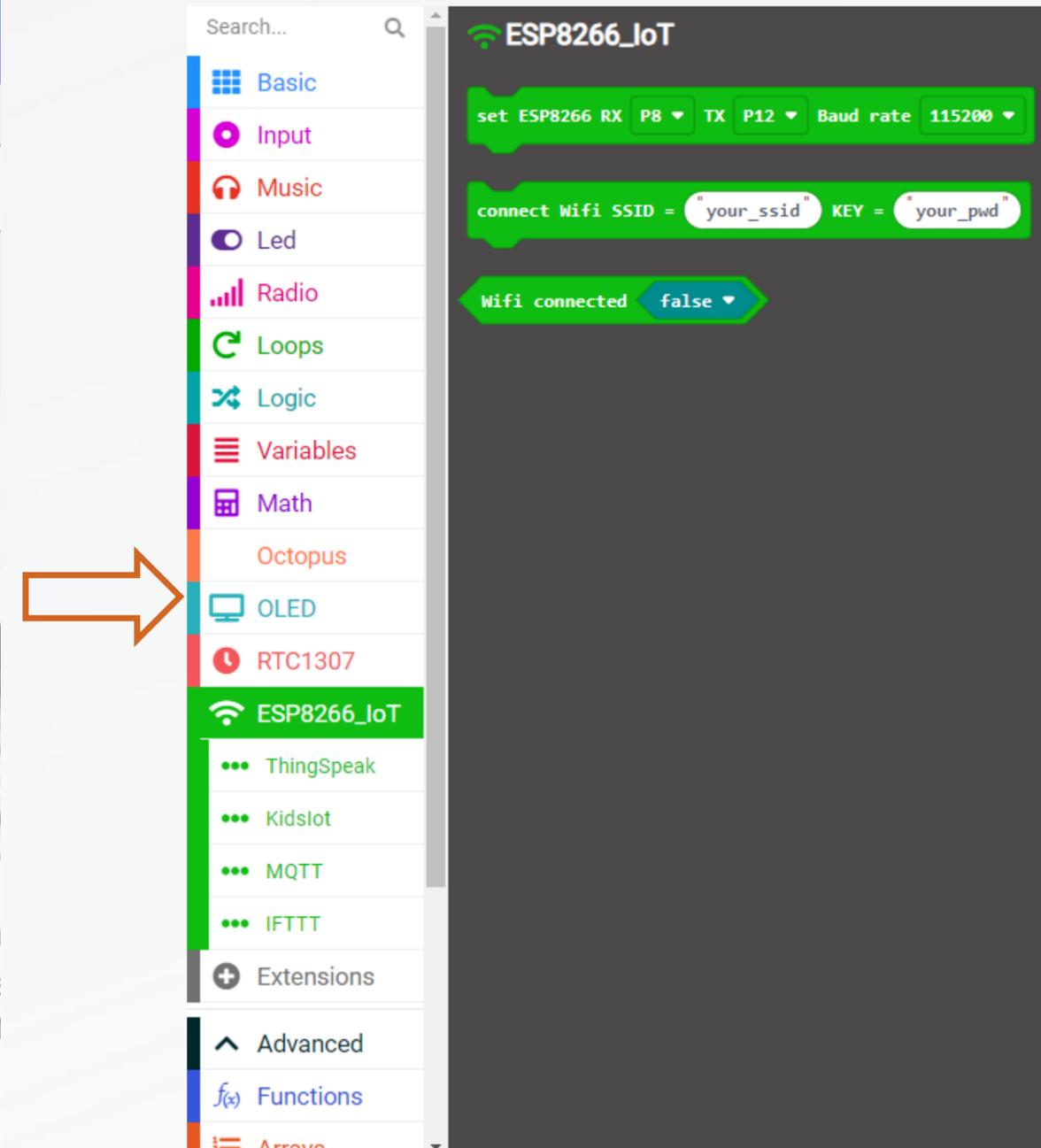
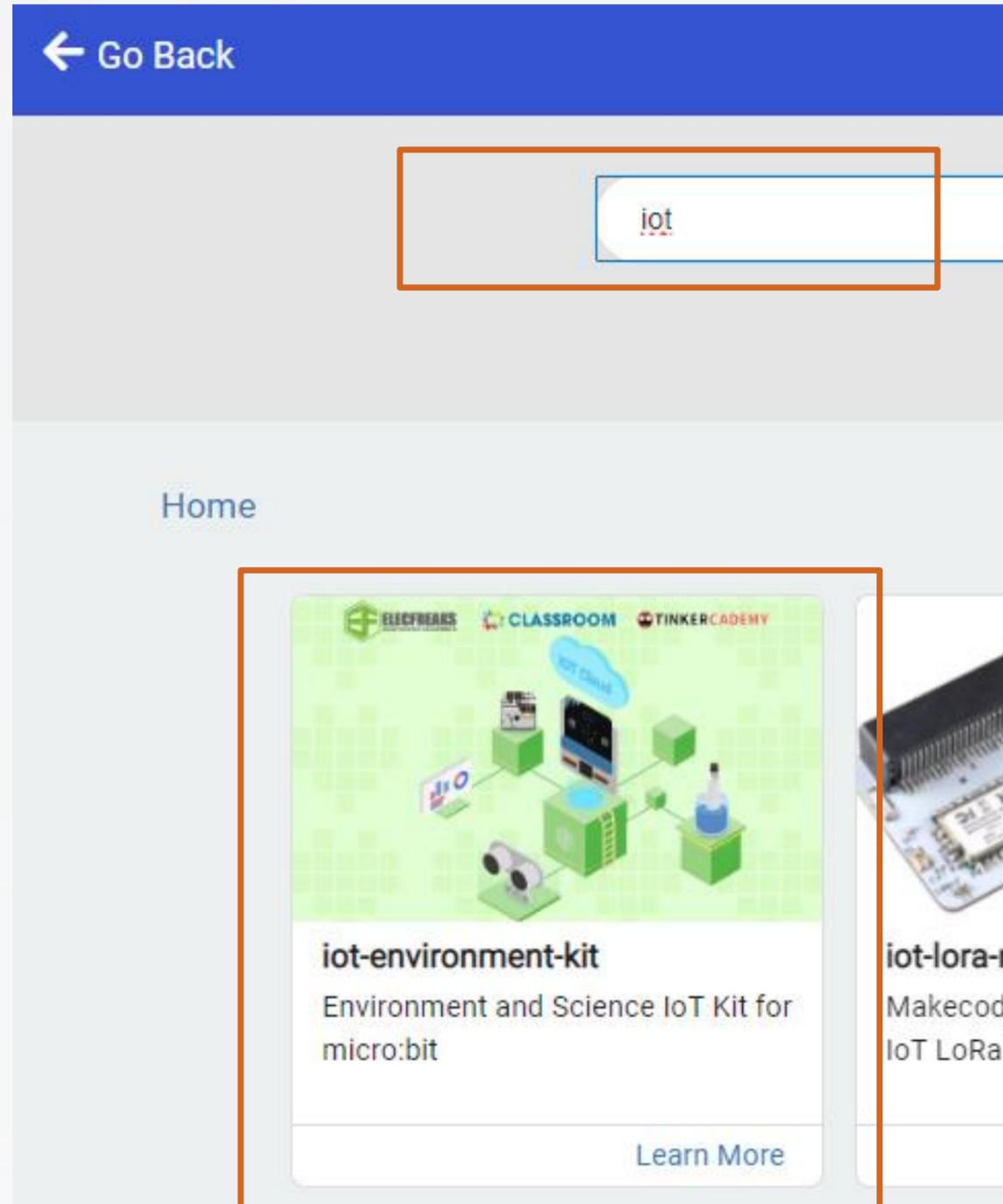
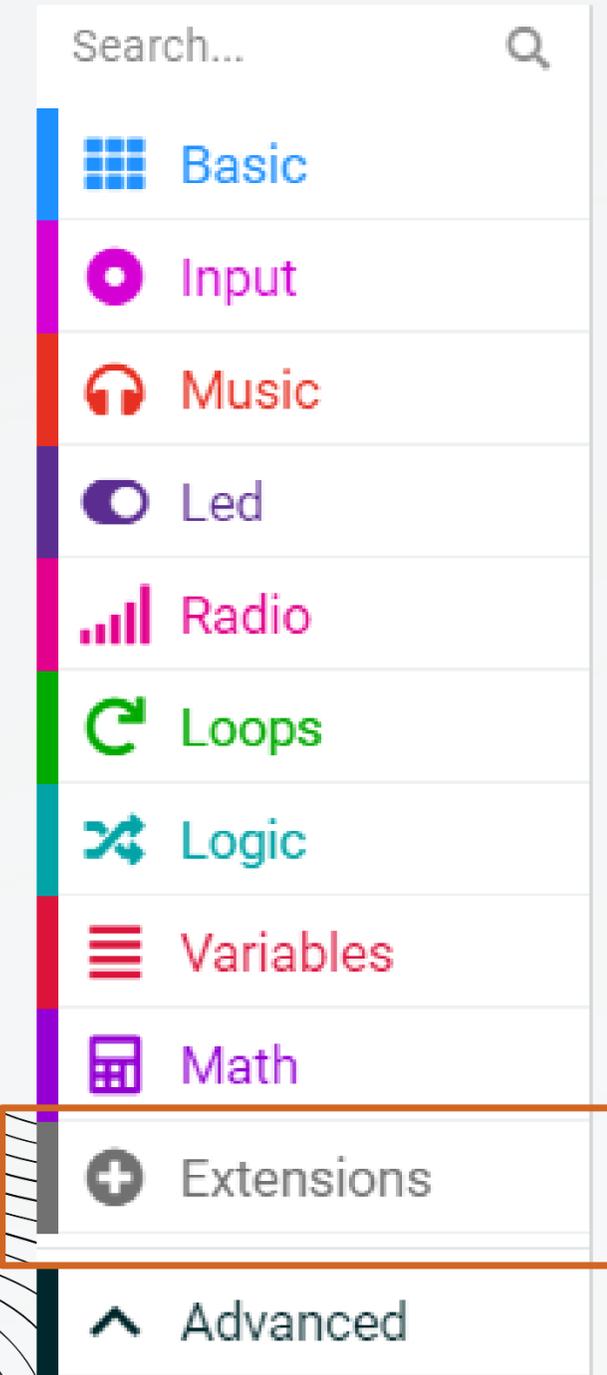
- **Write API Key:** Use this key to write data to the channel. If this key has been compromised, you should generate a new key.
- **Read API Keys:** Use these keys to read data from the channel feeds and charts. You can generate up to 10 read keys for the channel.

2. Find API Key

# Add extensions to Makecode

1. Click "Extensions"

2. Search "iot" and  
choose "datalogger"



# 編程

## Step 2

## Step 1

on start

Wi-Fi名稱: IoT      Wi-Fi密碼: eduhk+IoT+2018

set ESP8266 RX P8 TX P12 Baud rate 115200

connect Wifi SSID = "IoT" KEY = "eduhk+IoT+2018"

if Wifi connected true then

show icon

確保Wi-Fi連接成功

forever

show number analog read pin P1

connect thingspeak

set data to send ThingSpeak

Write API key = EXRPABTCUMBR1Q8T

Field 1 = analog read pin P1

Upload data to ThingSpeak

土壤濕度計

Thingspeak:  
Write API Key

P1-P4可以  
記錄Data

# 編程

## Step 3

The image shows a sequence of code blocks in a Scratch-like environment. The blocks are as follows:

- every 30000 ms**: A green loop block with a yellow circle around the value 30000.
- if analog read pin P1 < 700 then**: A teal conditional block with a red circle around the value 700. To its right is the text "根據實際測試數據而定".
- digital write pin P2 to 1**: A red block with yellow circles around P2 and 1. To its right is the text "水泵：0-關, 1-開".
- pause (ms) 5000**: A blue block.
- digital write pin P2 to 0**: A red block.
- else if analog read pin P1 ≥ 700 then**: A teal conditional block with a minus sign icon on the right.
- digital write pin P2 to 0**: A red block.

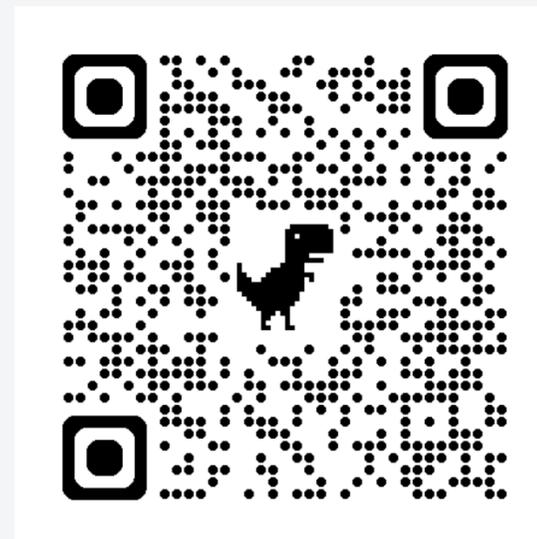
A plus sign icon is visible at the bottom left of the code area.

# 編程

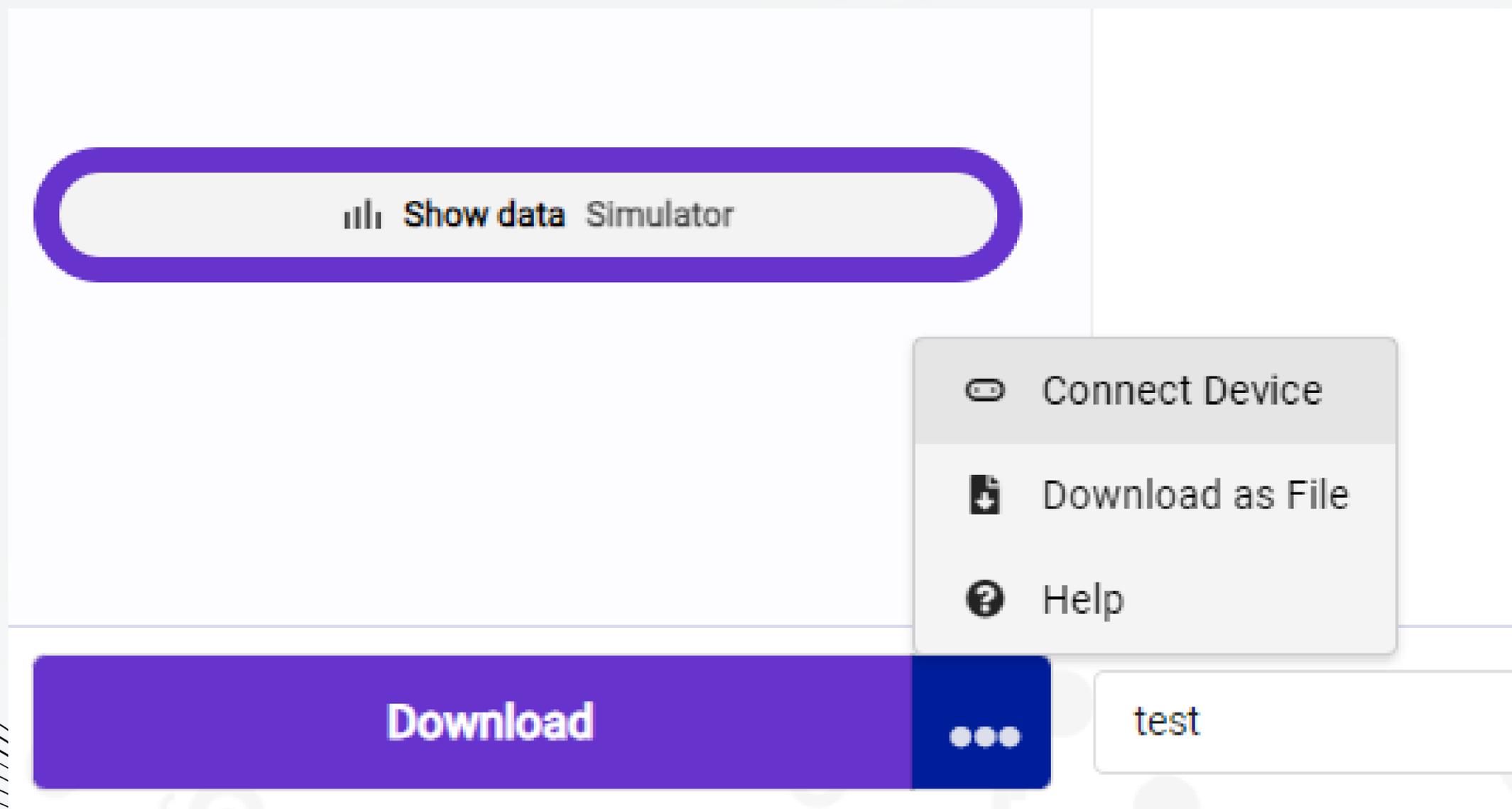
```
on start
  set ESP8266 RX P8 TX P12 Baud rate 115200
  connect Wifi SSID = "IoT" KEY = "eduhk+IoT+2018"
  if Wifi connected true then
    show icon [grid icon]

forever
  show number analog read pin P1
  connect thingspeak
  set data to send ThingSpeak
  Write API key = "EXRPABTCUMBR1Q8T"
  Field 1 = analog read pin P1
  Upload data to ThingSpeak

every 30000 ms
  if analog read pin P1 < 700 then
    digital write pin P2 to 1
    pause (ms) 5000
    digital write pin P2 to 0
  else if analog read pin P1 ≥ 700 then
    digital write pin P2 to 0
```

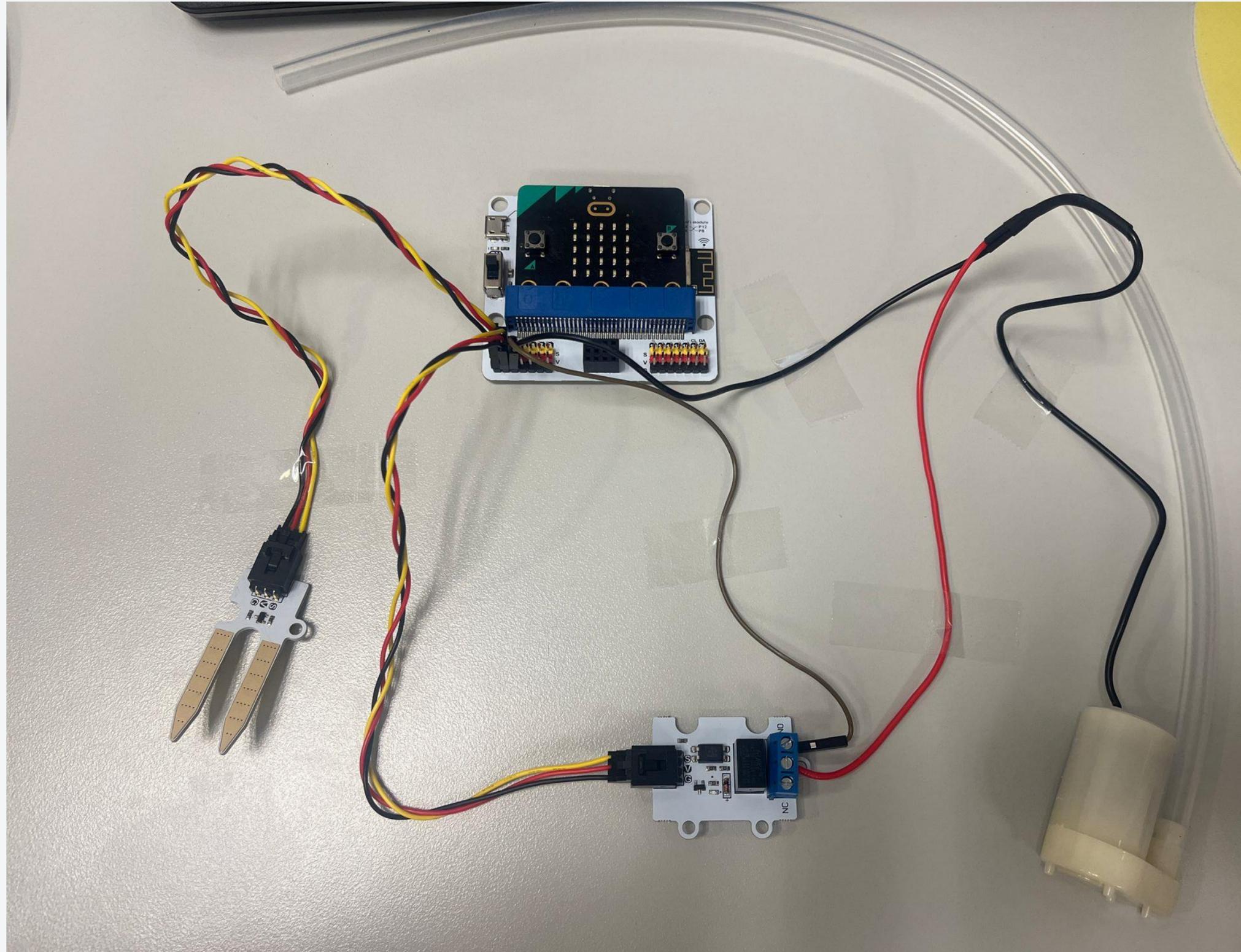


<https://makecode.microbit.org/S06157-49144-03922-94573>



1. **Connect Device**
2. **Download**





# 其他編程設定

```
on start
  set hour to 8
```

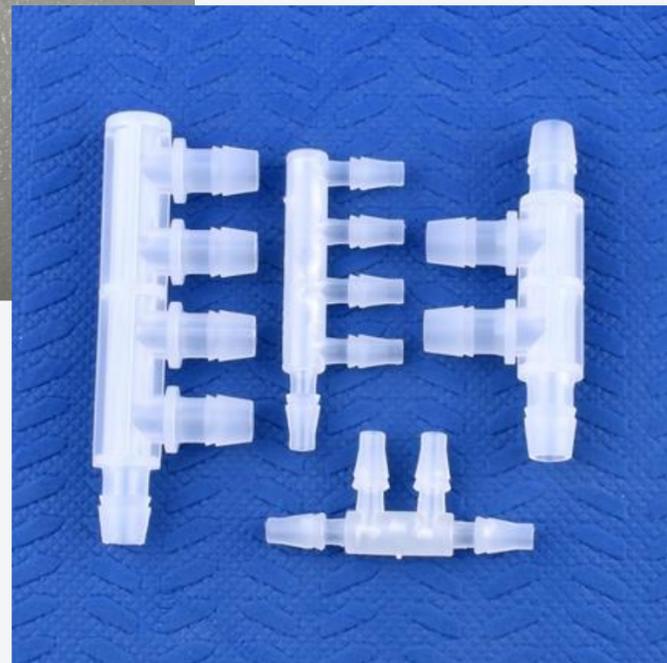
根據植物的特性設定灌溉時間

```
forever
  if (1024 - analog read pin P1) / 800 < 55 then
    digital write pin P0 to 1
    pause (ms) 7000
    digital write pin P0 to 0
    pause (ms) hour * 3600 * 1000
```

通過控制水泵開啟時間來控制灌溉水量

灌溉間隔時間

# 水泵



# 水泵



# Thanks for your attention

