

A photograph of a diverse family of four—two adults and two young children—gathered around a tablet device. They are all looking intently at the screen, which is held by the woman on the right. The man on the left is smiling warmly. The two children, a boy and a girl, are also focused on the tablet. A large, stylized blue 'X' is overlaid on the bottom right corner of the image.

arm

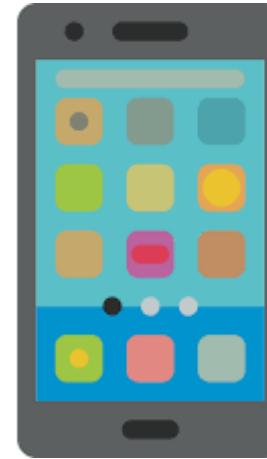
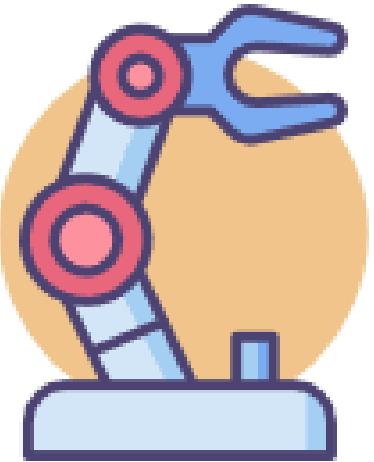
Team Arm 2022:

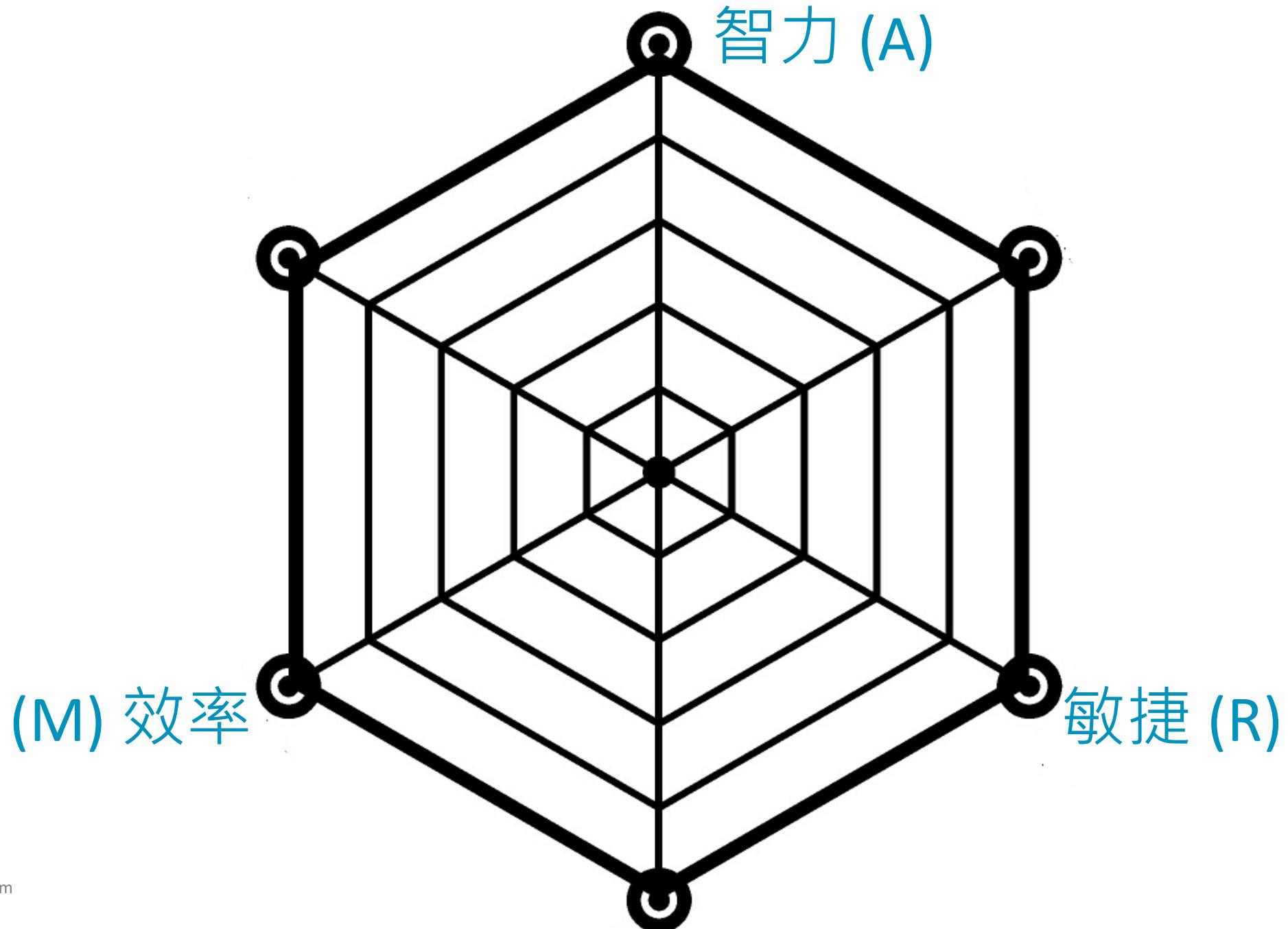
Code4Fun 2Gether

程式科技教育

Arm Taiwan Limited

# 這些都需要什麼 ???



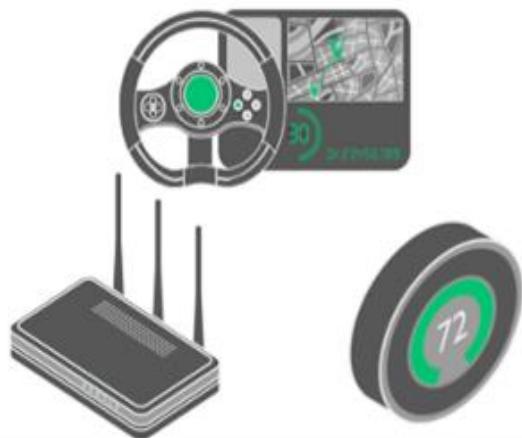


# Cortex-A

## Cortex - A

Highest performance

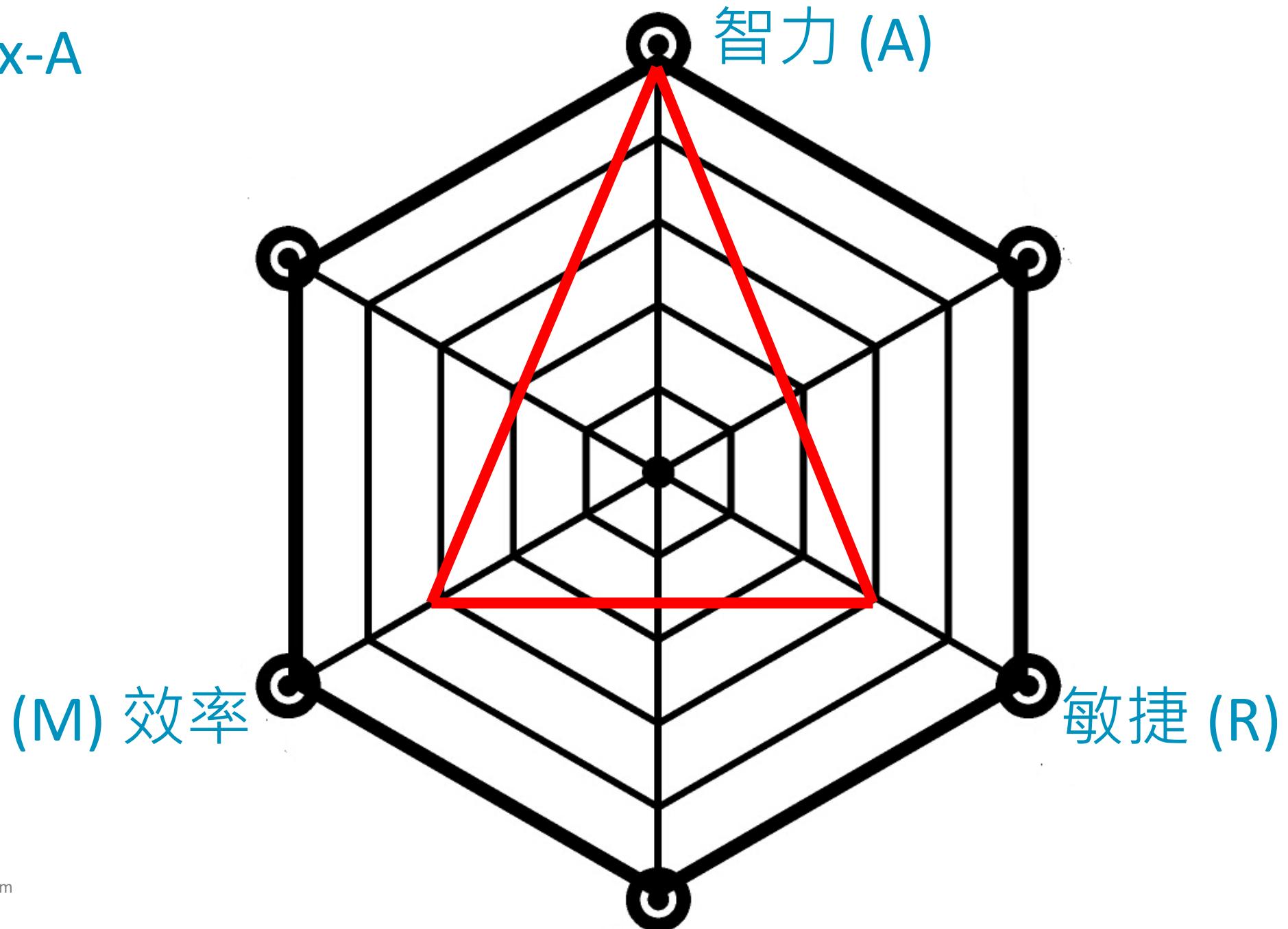
Optimised for  
rich operating systems



我最聰明

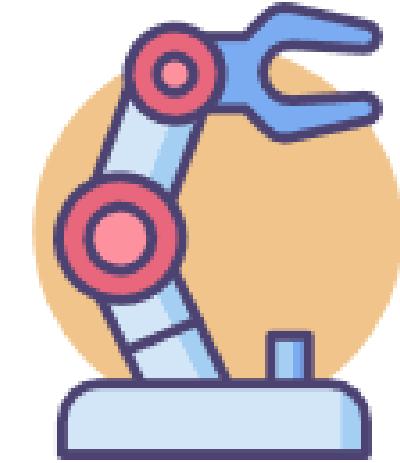


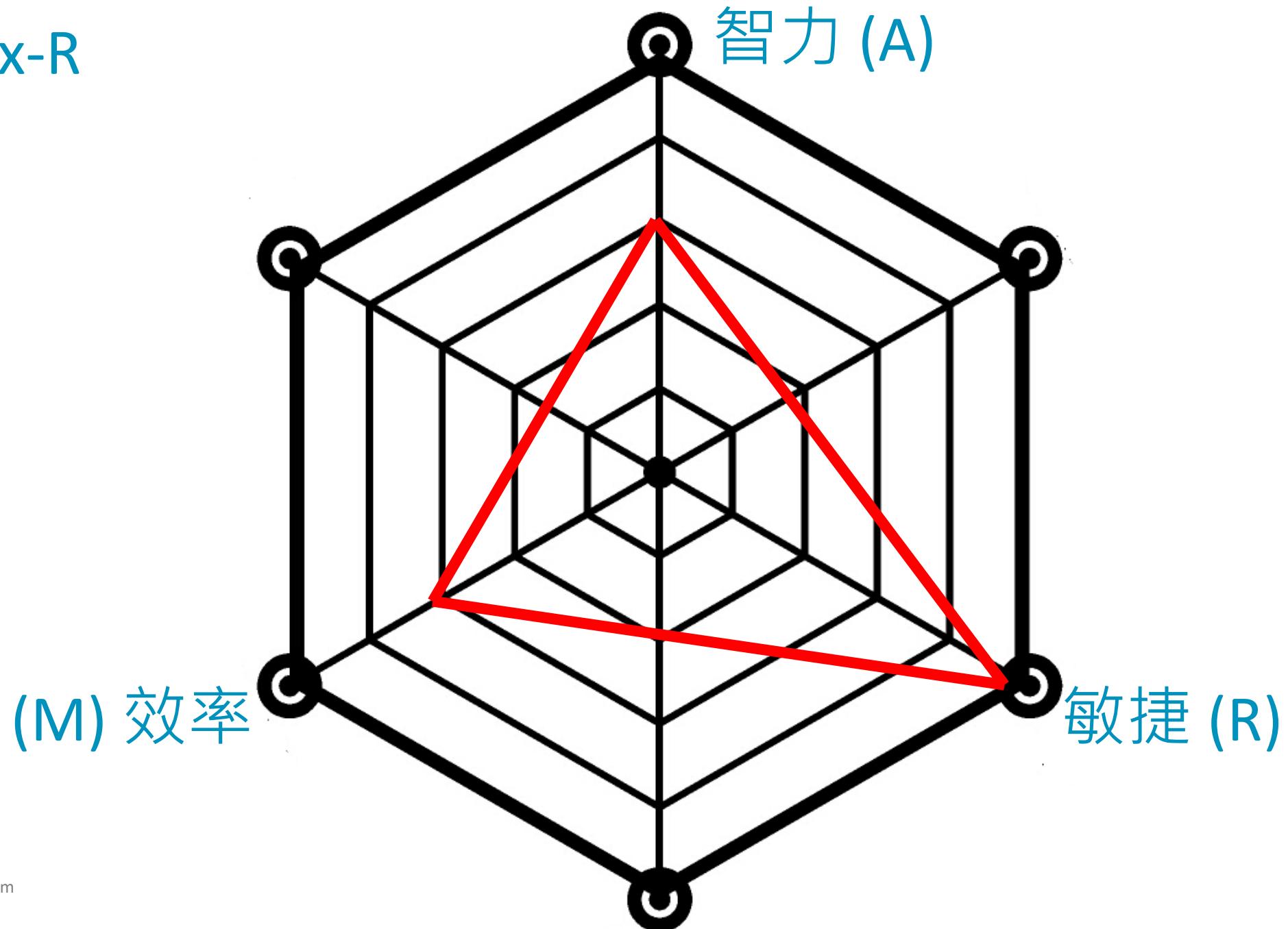
Cortex-A



# Cortex-R

反應最快





# Cortex-M



我最省電

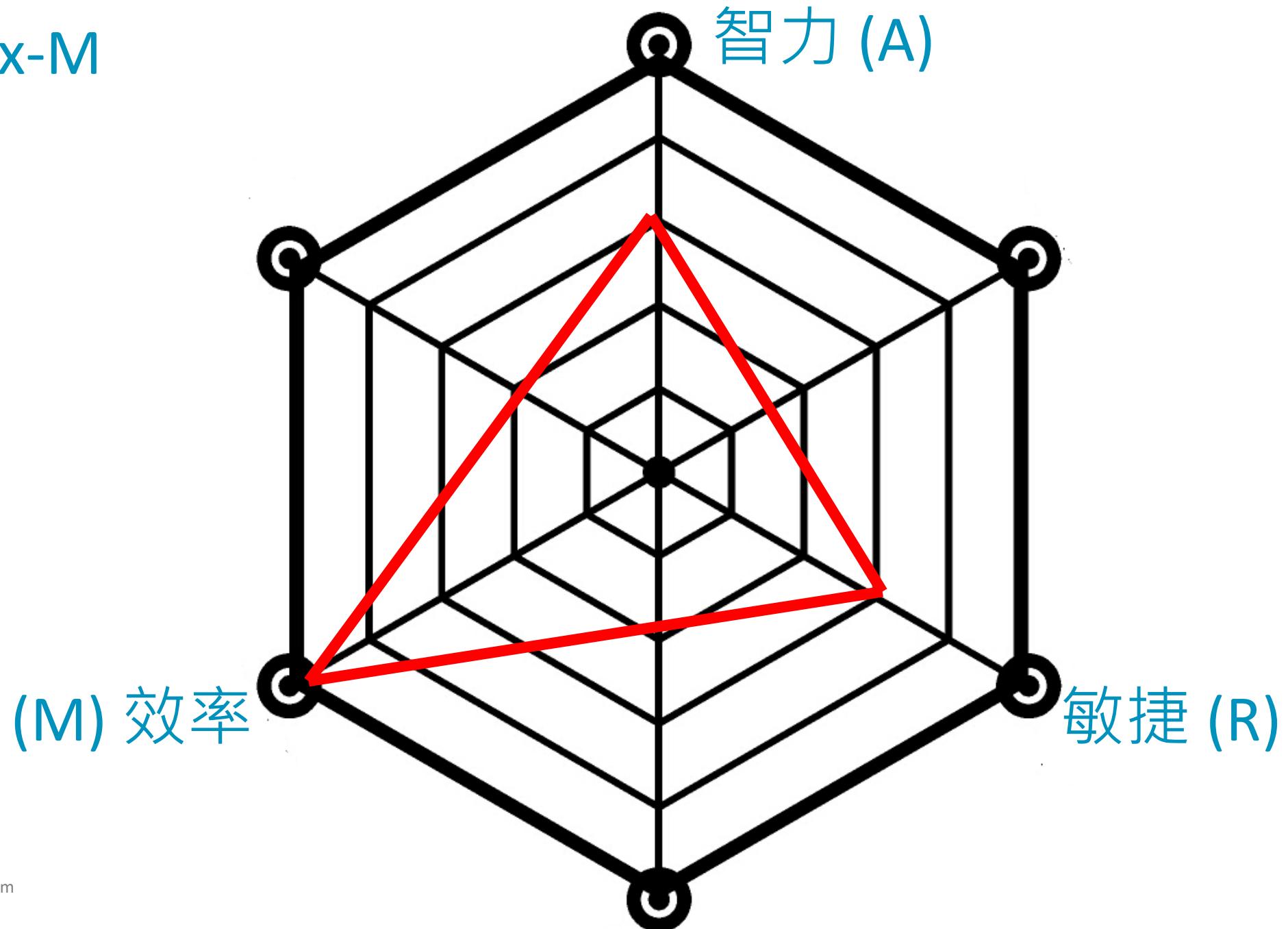


## Cortex - M

Smallest/lowest power

Optimised for  
discrete processing and  
microcontrollers





# Mali-GPU



# 大家都需要 Arm

## Cortex - A

Highest performance

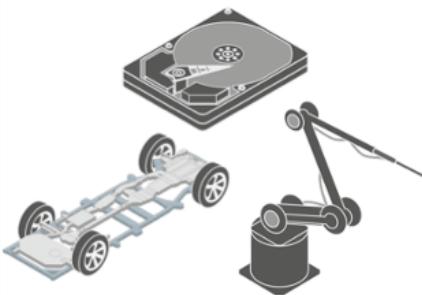
Optimised for rich operating systems



## Cortex - R

Fast response

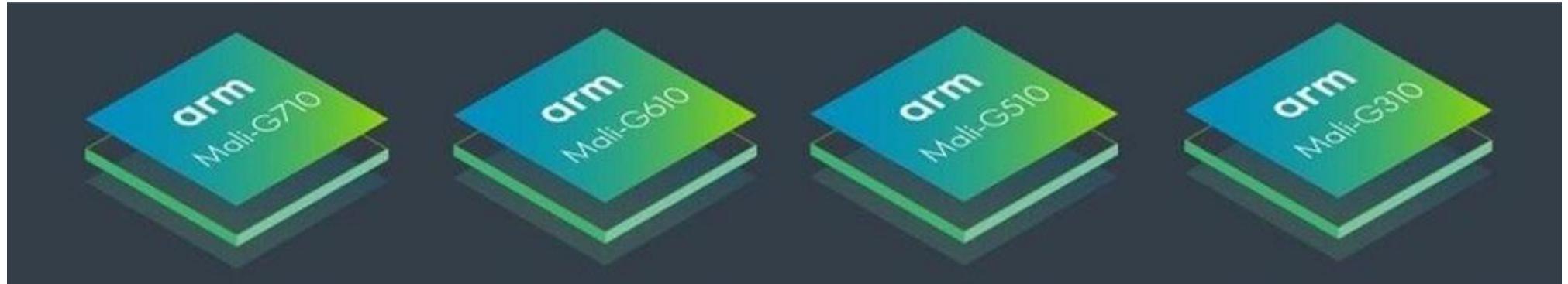
Optimised for high performance, hard real-time applications



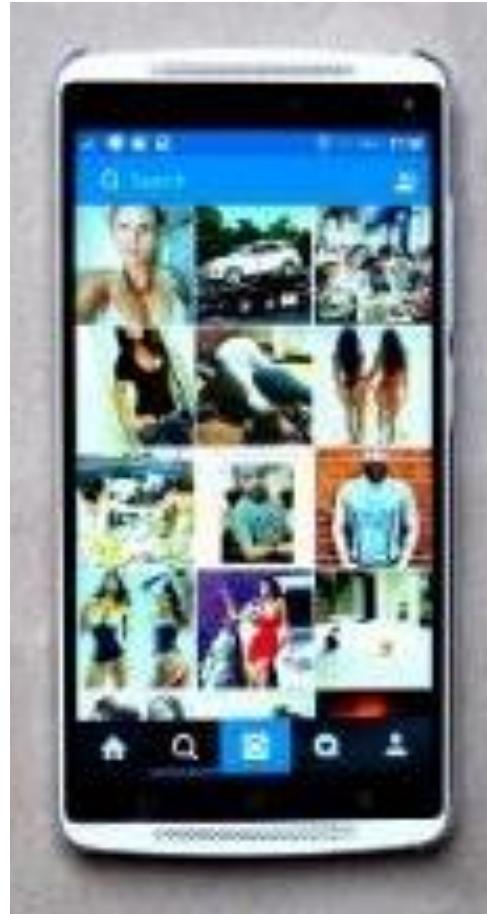
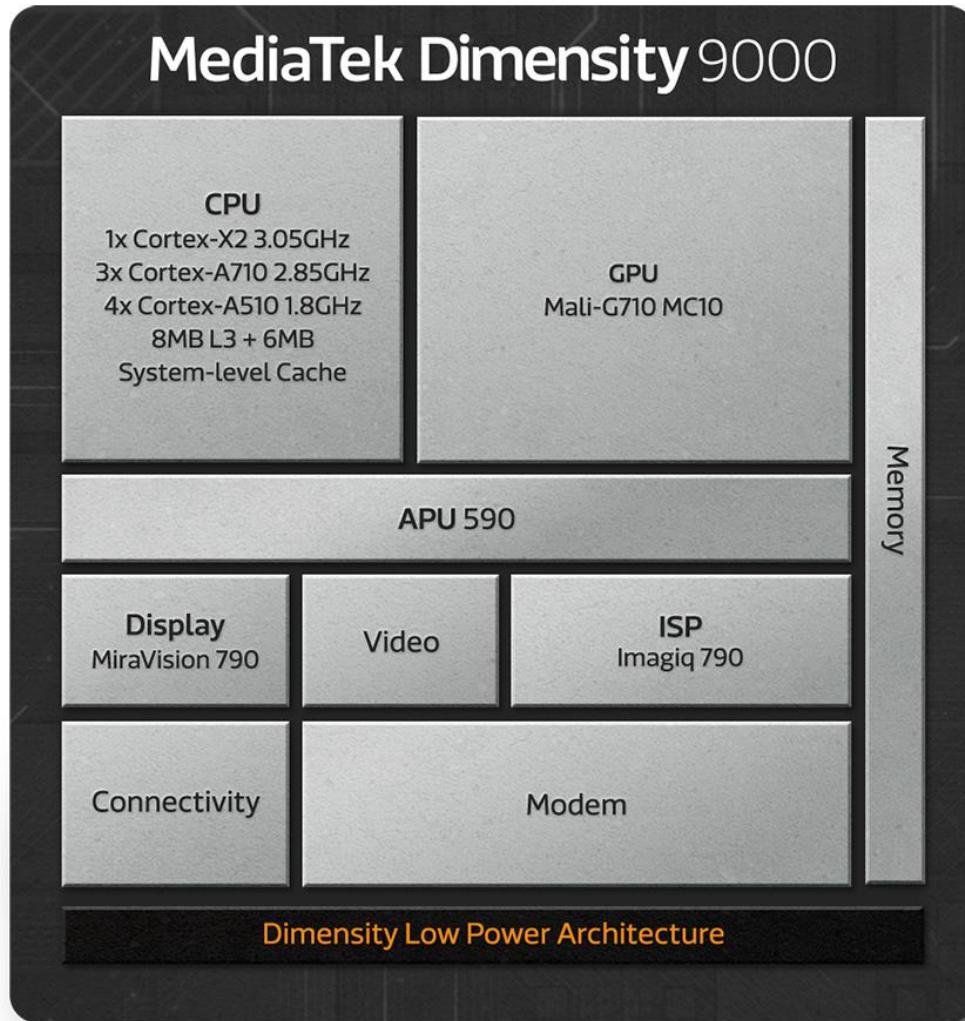
## Cortex - M

Smallest/lowest power

Optimised for discrete processing and microcontrollers



# MediaTek ?



MEDIATEK

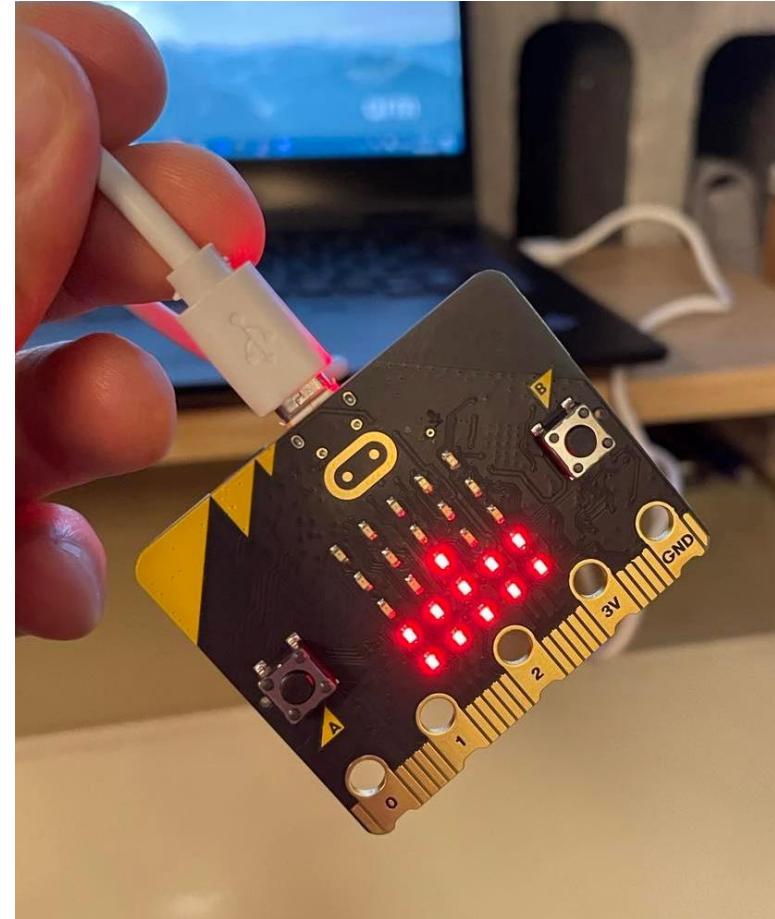
arm

# 【微型電腦】-好簡單，好上手，好好玩！

## micro:bit V2 摸的到、聽的到、會發聲、新大腦!!!



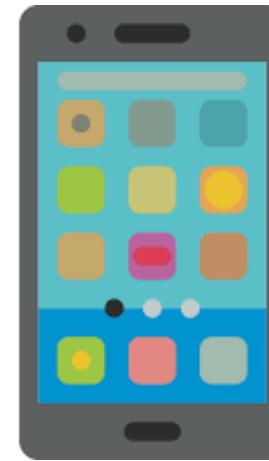
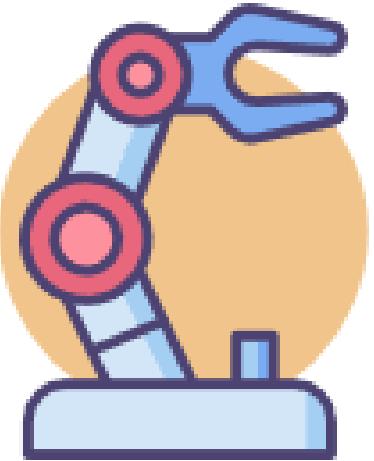
# 尋寶大挑戰



# Power On

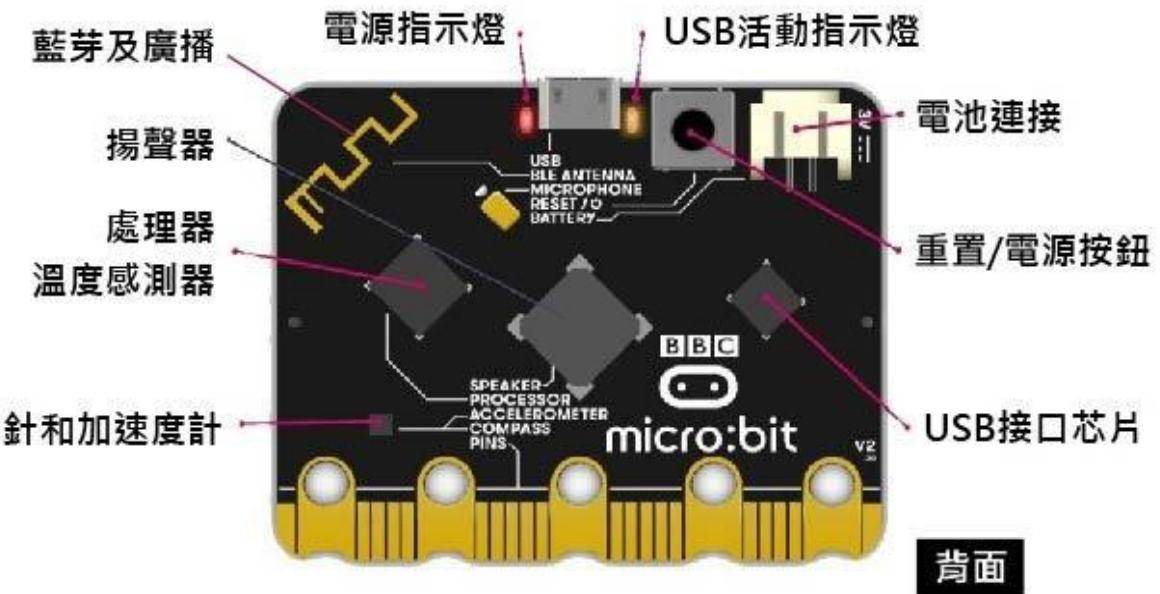
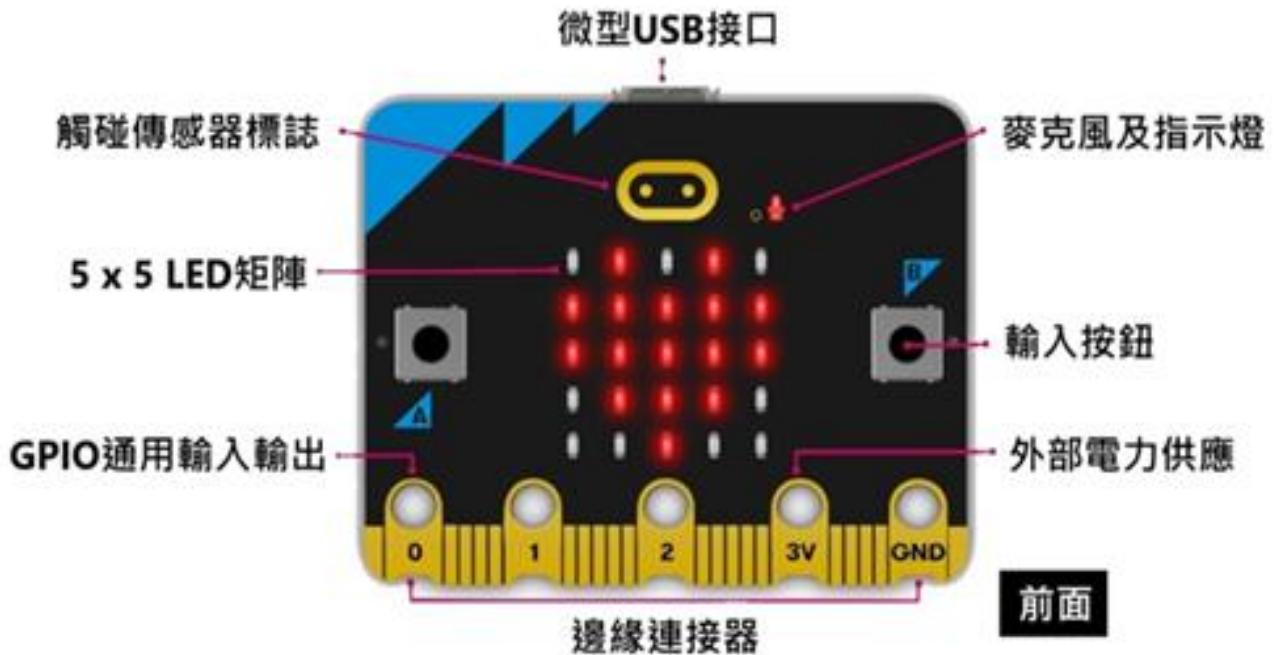


# 小測驗來了

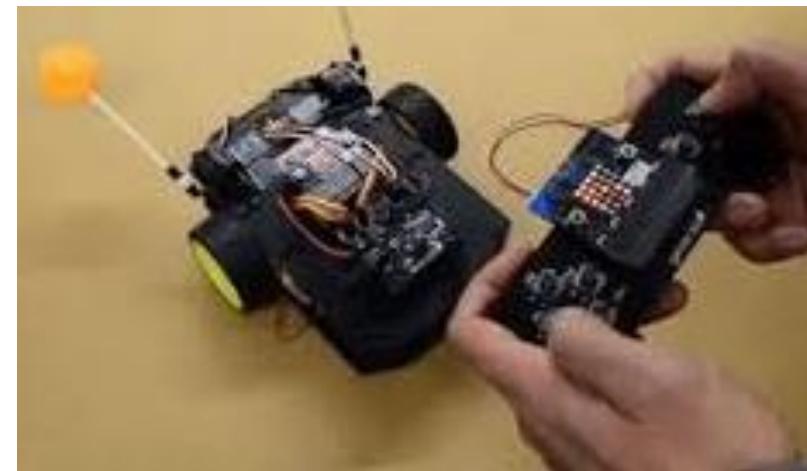
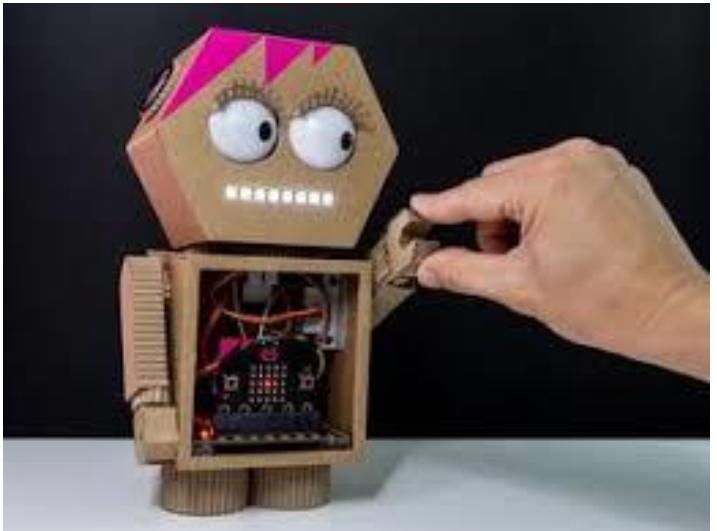


# 認識 micro:bit V2

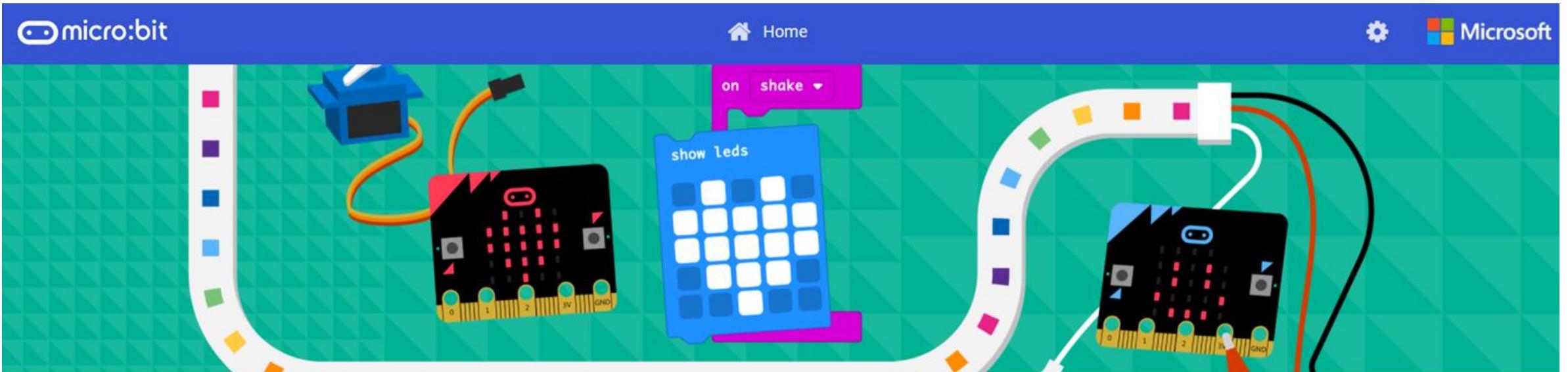
- V2具備多重感測器：



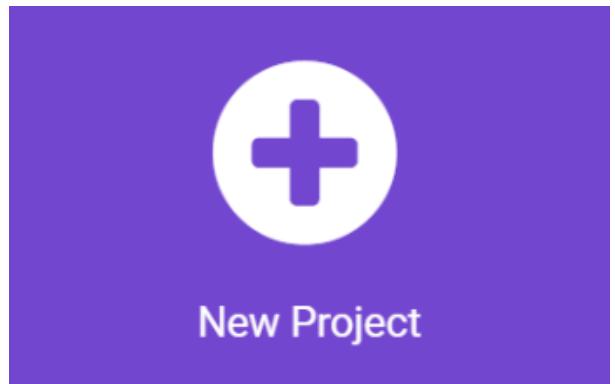
# 腦力激盪



# 認識 Makecode ([makecode.microbit.org](https://makecode.microbit.org))



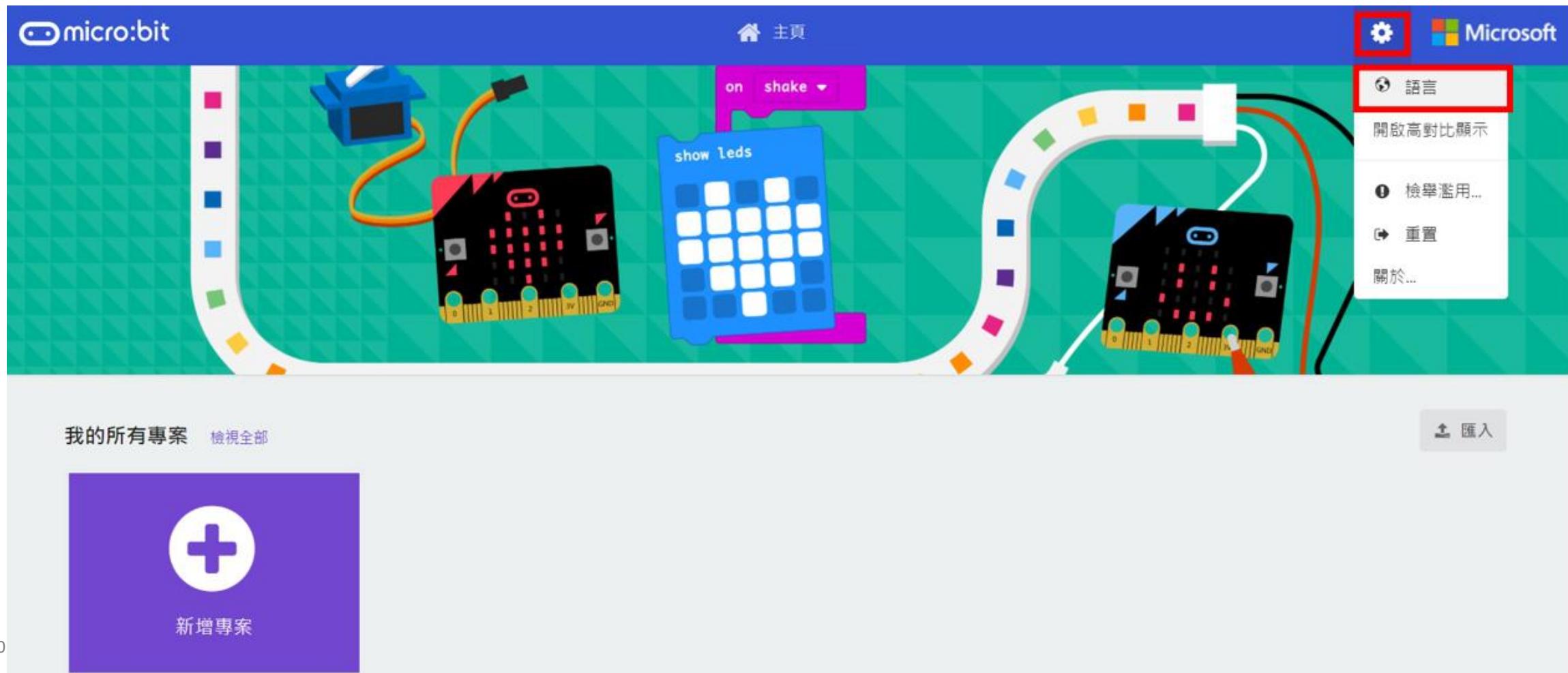
Microsoft MakeCode是以積木為基礎的編程環境，直覺式的操作搭配強大的功能，可以讓micro:bit對於各種輸入做出反應，並能切換為JavaScript、Python，是非常助於學習編程的免費平台。



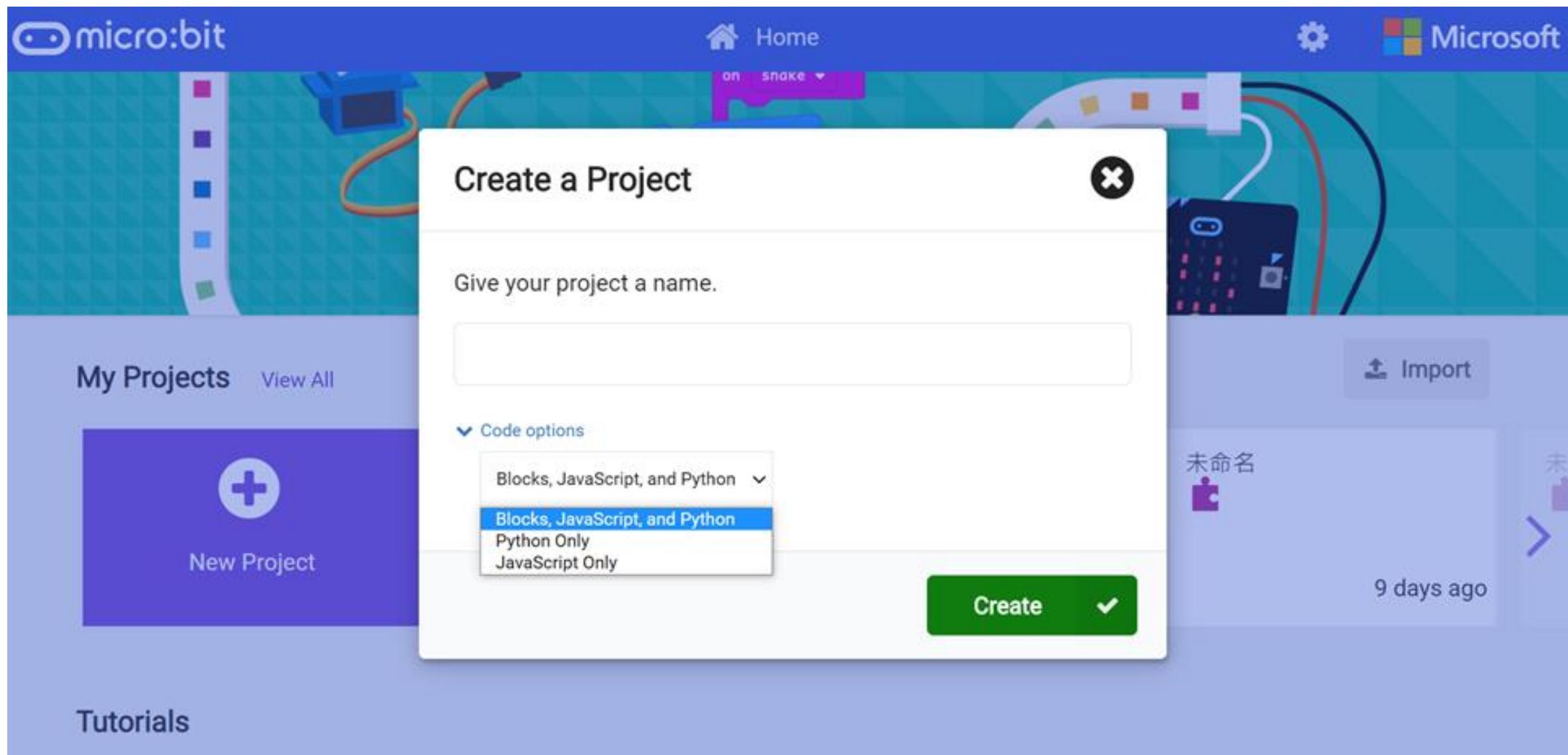
arm

# Makecode 將語言更改為English ([makecode.microbit.org](https://makecode.microbit.org))

- 請檢查您頁面呈現的語言，確保它是**英文版**。
- 如果為**中文版**，請參考下圖：按右上方的**"齒輪"**並點選**"語言"**進行修改。



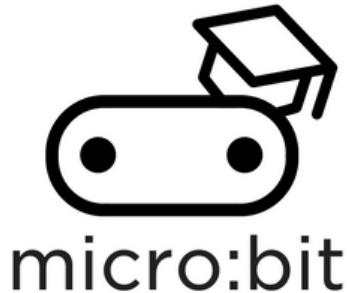
# 編程模式 : Blocks/JavaScript/Python



# 遠端教室 micro:bit Classroom



# 遠端教室 micro:bit Classroom



In the classroom

The image shows a screenshot of a website for "micro:bit classroom for teachers". The page has a green header with the text "micro:bit classroom for teachers" and "Making coding lessons more productive". Below the header, there is a paragraph of text: "Manage whole class coding lessons in minutes. Distribute code to your class, save and resume students' work, all without the need to register an account." At the bottom of the page is a button labeled "Visit micro:bit classroom". To the right of the website screenshot, there is a photograph of two young women sitting at a desk, looking at a laptop screen together. The laptop screen is partially visible, showing some graphical content. In the bottom right corner of the slide, there is a small blue logo consisting of four vertical bars of increasing height.

# micro:bit Classroom\_學生進入教室模式

- <https://classroom.microbit.org/joinactivity>
- 請先輸入上方網址進到教室登入畫面(如下圖)  
再依照今日課程的教室密碼進行輸入(一張圖片，示意如下)。



**Join classroom**

To join the classroom please enter the classroom name and PIN below

**Classroom name**

Colour      Animal      Transport      Object

Please select    Please select    Please select    Please select

**PIN**

Number

Continue

# micro:bit Classroom\_學生輸入教室密碼

- 依照圖片中的密碼：

(1)於Classroom name下拉式選單選擇4個對應的圖案及英文單字並於PIN輸入密碼。

**Join classroom**

To join the classroom please enter the classroom name and PIN below

**Classroom name**

Colour: Please select ▾

- Blue
- Green
- Indigo
- Lime
- Orange
- Pink

Animal: Please select ▾

Transport: Please select ▾

Object: Please select ▾

Continue

※此為示意圖

micro:bit | classroom - Beta

Instructions Editor Dashboard Student code Save classroom

Collapse joining details Expand joining details

**Classroom joining details**

Open the URL and enter the classroom name and PIN

Go to URL: [microbit.org/join](https://microbit.org/join)

Classroom name: Green Dog Airplane Sunglasses

PIN: 541986

# micro:bit Classroom\_學生輸入名字 (microbit.org/join)

 micro:bit | classroom – Beta

## Join classroom

To join the coding activity, please find your name or enter a new one

**Your name**

Catherine

or

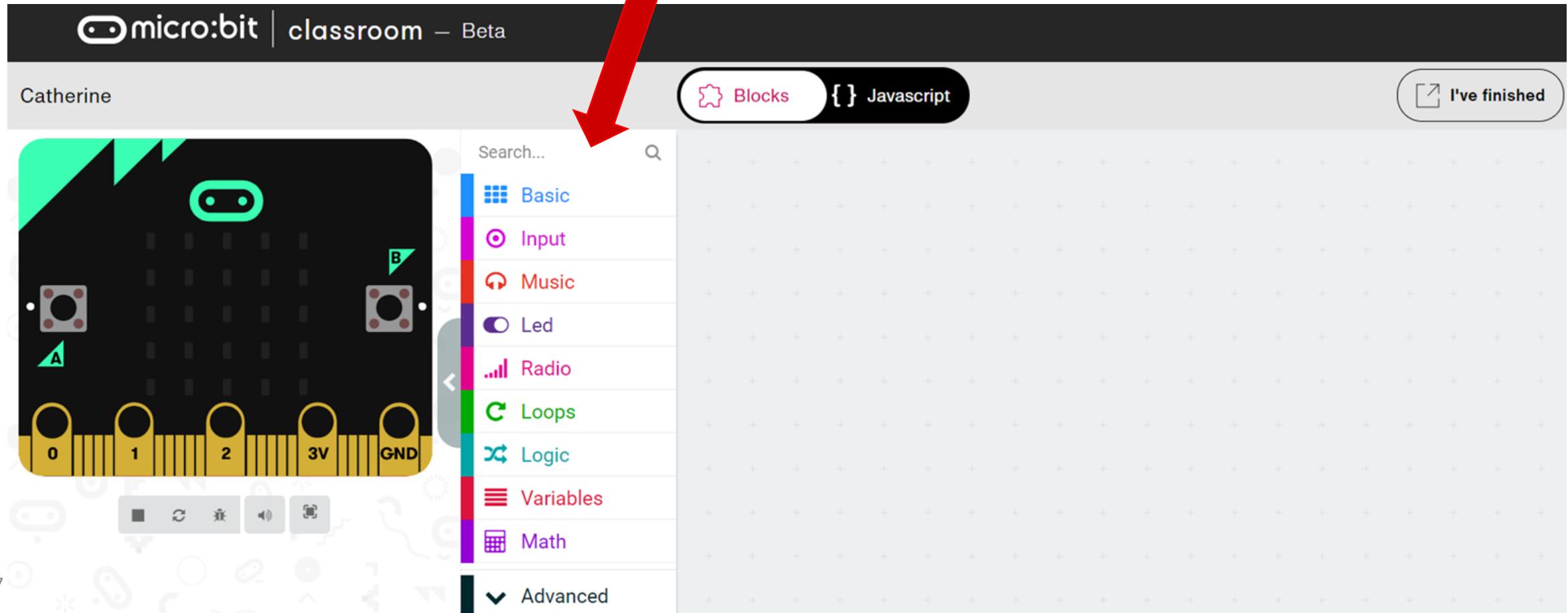
Find a name



Continue

# micro:bit Classroom\_成功進入教室模式

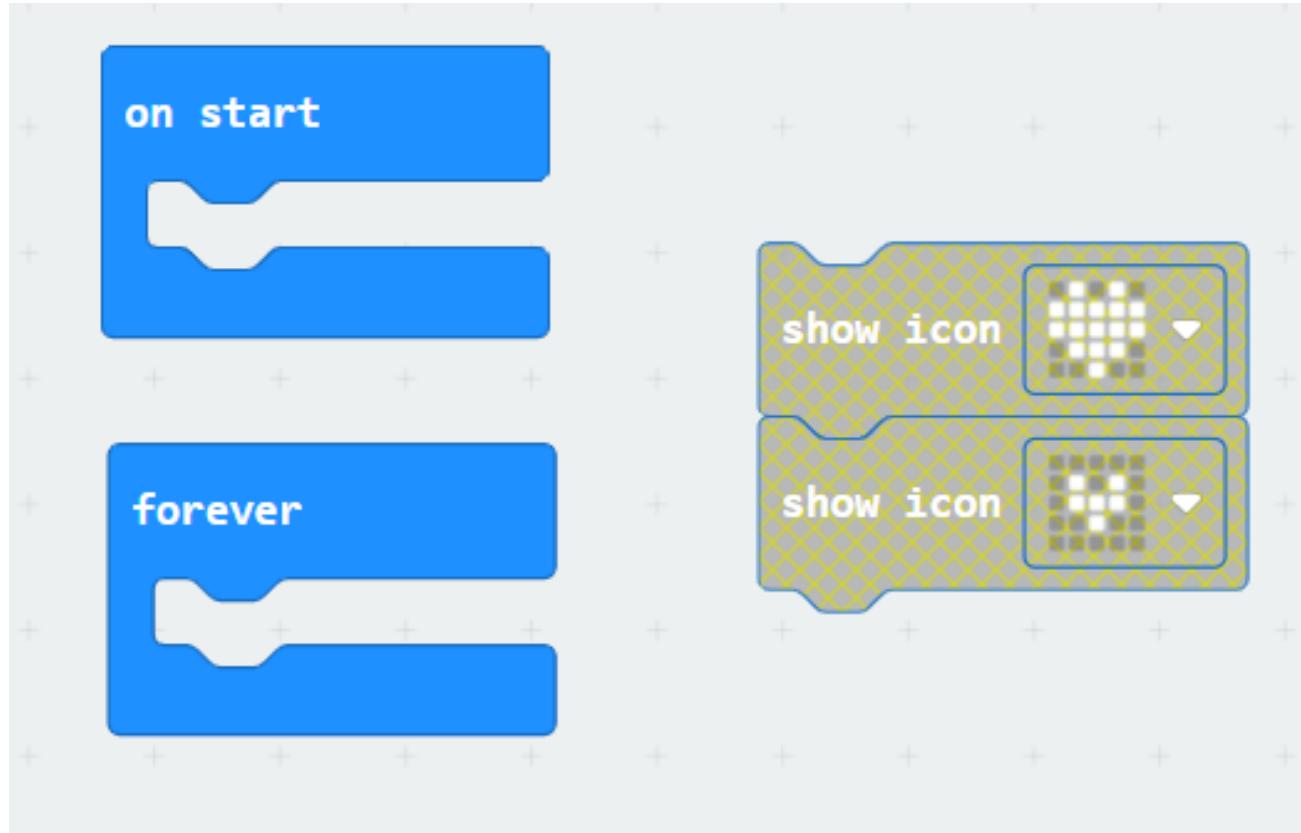
- 請確認下方各個顏色的積木是否為英文版本。  
如果仍顯示中文版，請關閉網頁並回到網址：[makecode.microbit.org](https://makecode.microbit.org)修改語言後，再次輸入教室網址：[microbit.org/join](https://microbit.org/join)及密碼，重新回到教室中。



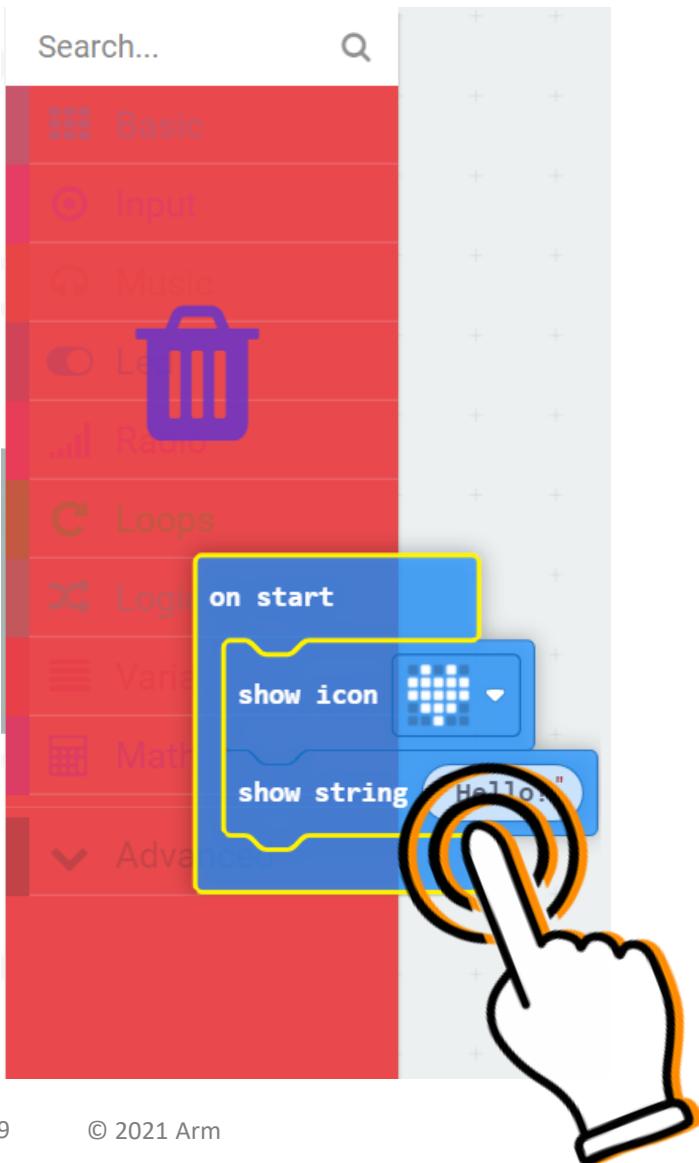
# #1 【on start】 v.s. 【forever】

microbit-start\_forever\_1

如何寫出 "一直閃爍愛心" 來表達對你愛愛愛不完?



# Makecode\_刪除及復原小技巧



## 刪除：

※(如左圖)將積木拖曳到menu，出現垃圾桶後放開積木  
※或是點選積木，按下鍵盤的 [ Delete ] 鍵

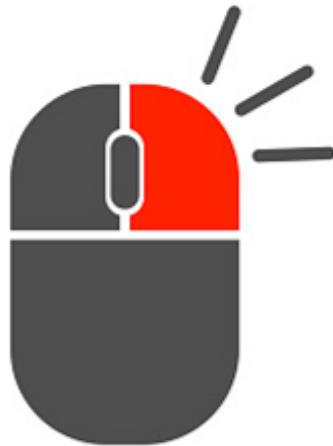
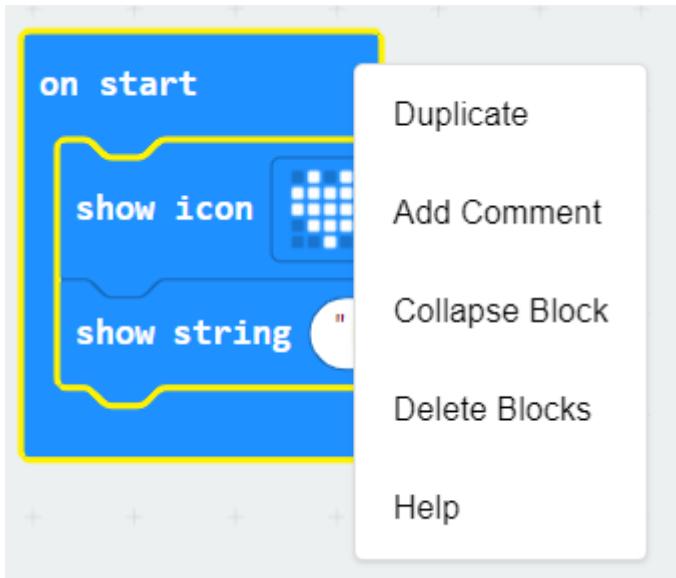
## 復原：

※(如右圖)點選左方箭頭  
※或是按下鍵盤的 [ Ctrl ] + [ Z ] 鍵



# Makecode\_右鍵操作技巧

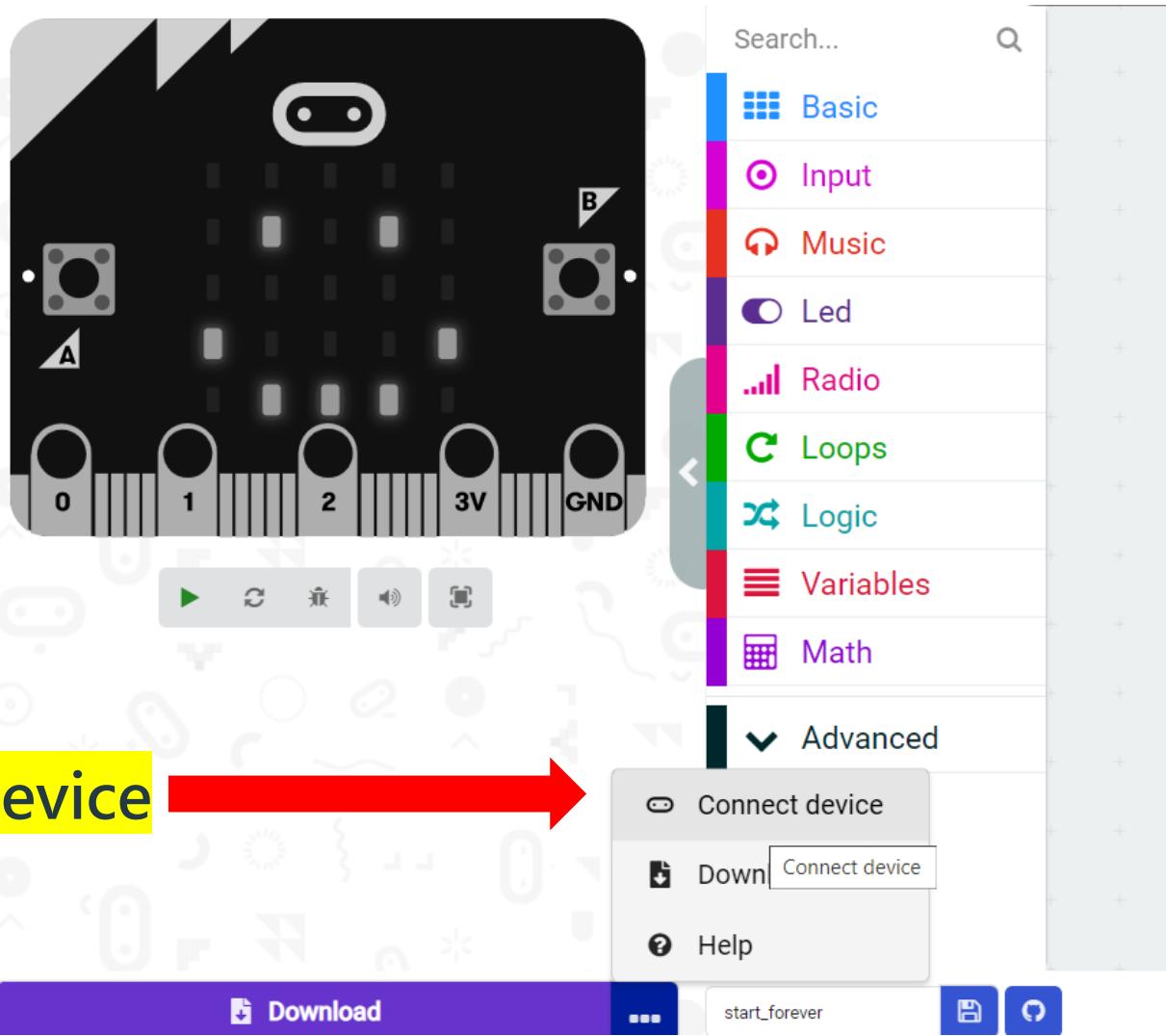
※將滑鼠游標放在積木上，點按右鍵叫出功能



Duplicate : 複製積木  
Add Comment : 添加註解  
Collapse Block : 摺疊積木  
Delete Blocks : 刪除積木  
Help : 連結到官網，向您解釋積木的用途

# 配對你的 micro:bit

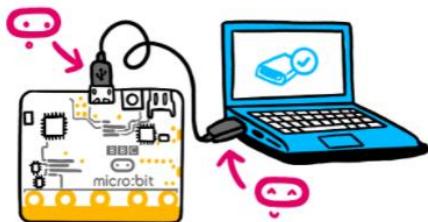
※點選 Connect device



# 配對你的 micro:bit

Connect your micro:bit...

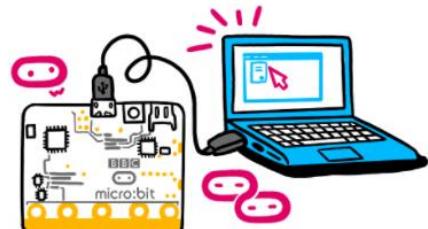
First, make sure your micro:bit is connected to your computer with a USB cable.



Next

Connect your micro:bit...

Pair your micro:bit to the computer by selecting 'BBC micro:bit CMSIS-DAP' or 'DAPLink CMSIS-DAP' from the popup that appears after you press the 'Next' button below.



Next

makecode.microbit.org wants to connect

"BBC micro:bit CMSIS-DAP"

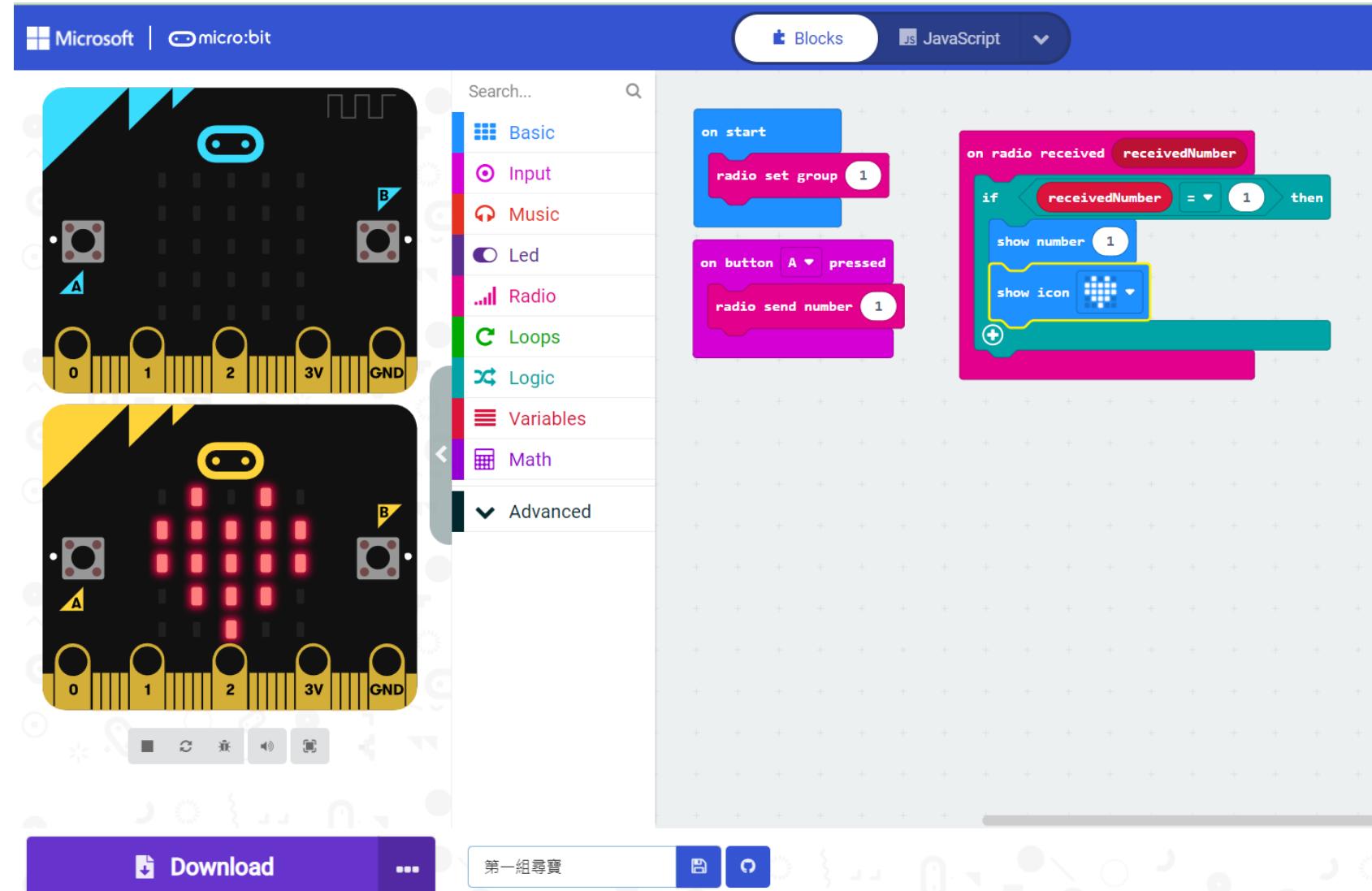
?

Connect

Cancel

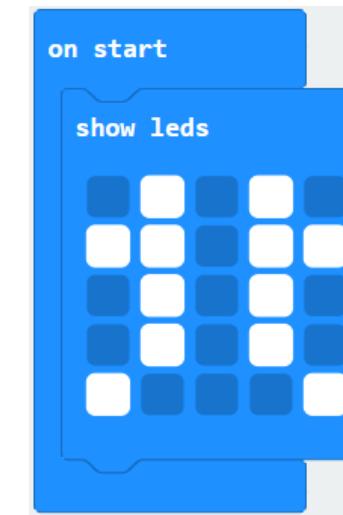
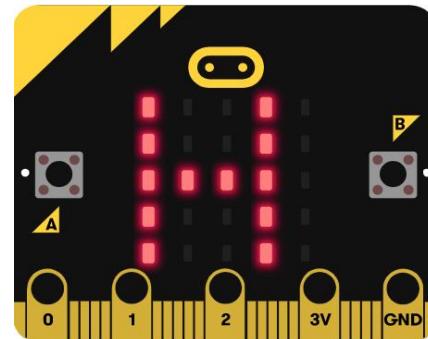
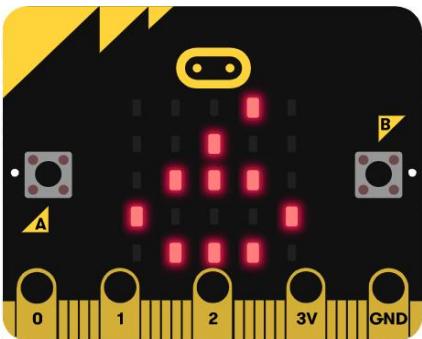
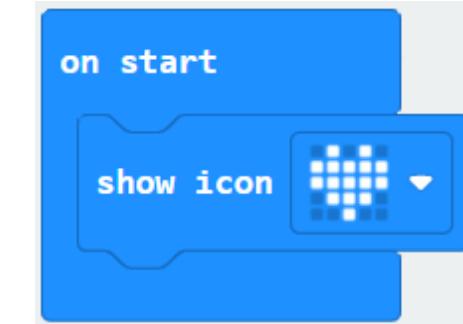
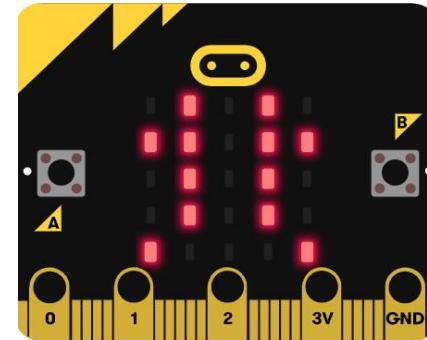
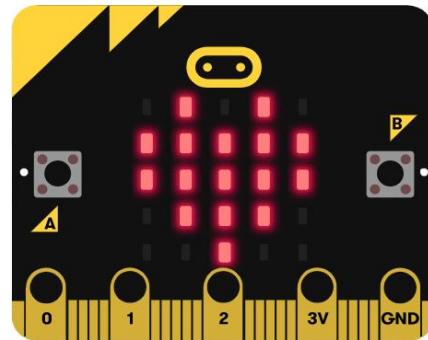
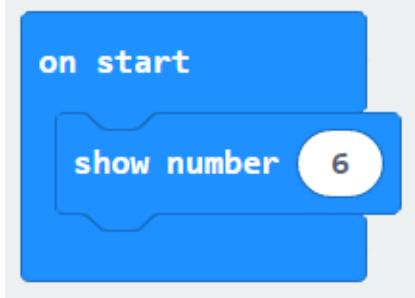
arm

# 下載程式hex檔案



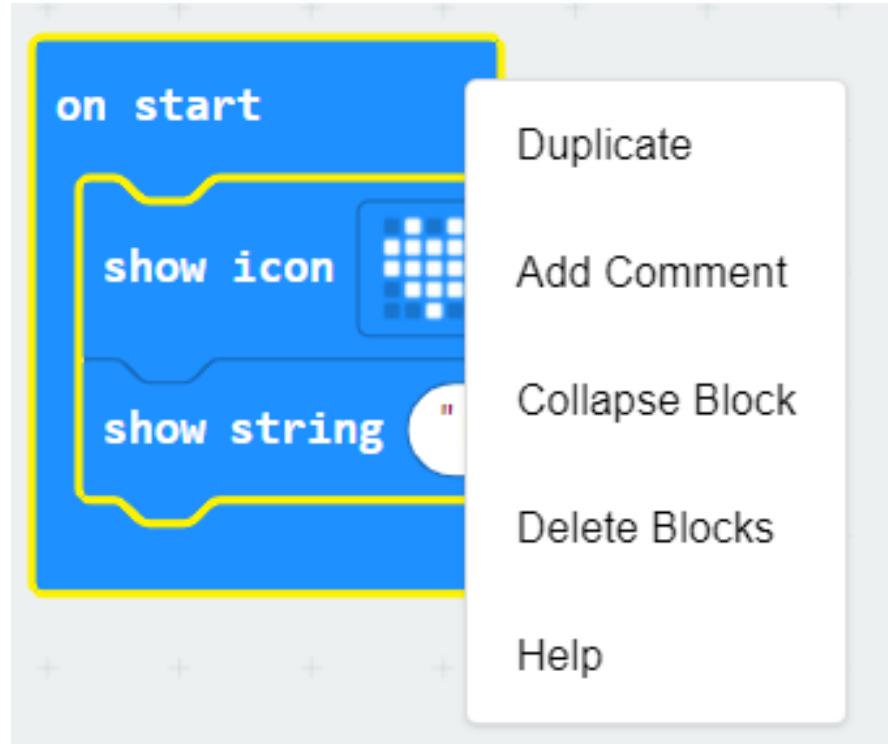
※點選左下角的Download  
即可下載程式\_hex.檔

# Makecode\_【Basic】基本常用項目



# Makecode\_右鍵操作技巧

※將滑鼠游標放在積木上，點按右鍵叫出功能



**Duplicate** : 複製積木

**Add Comment** : 添加註解

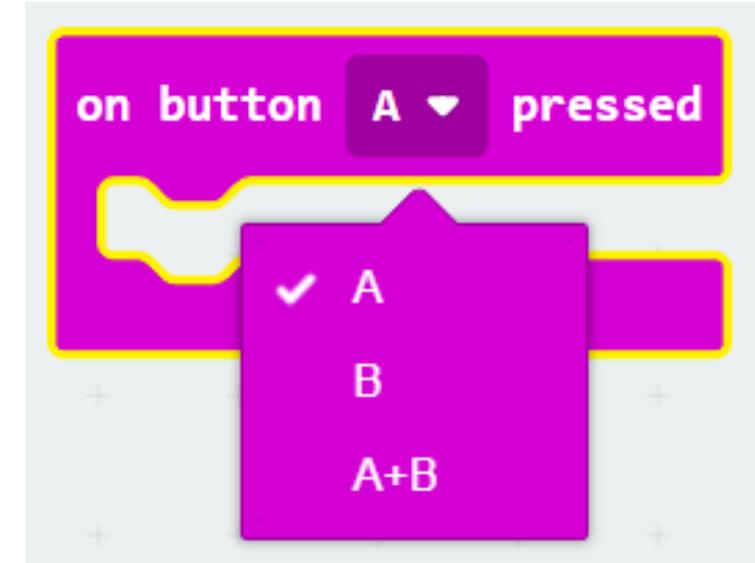
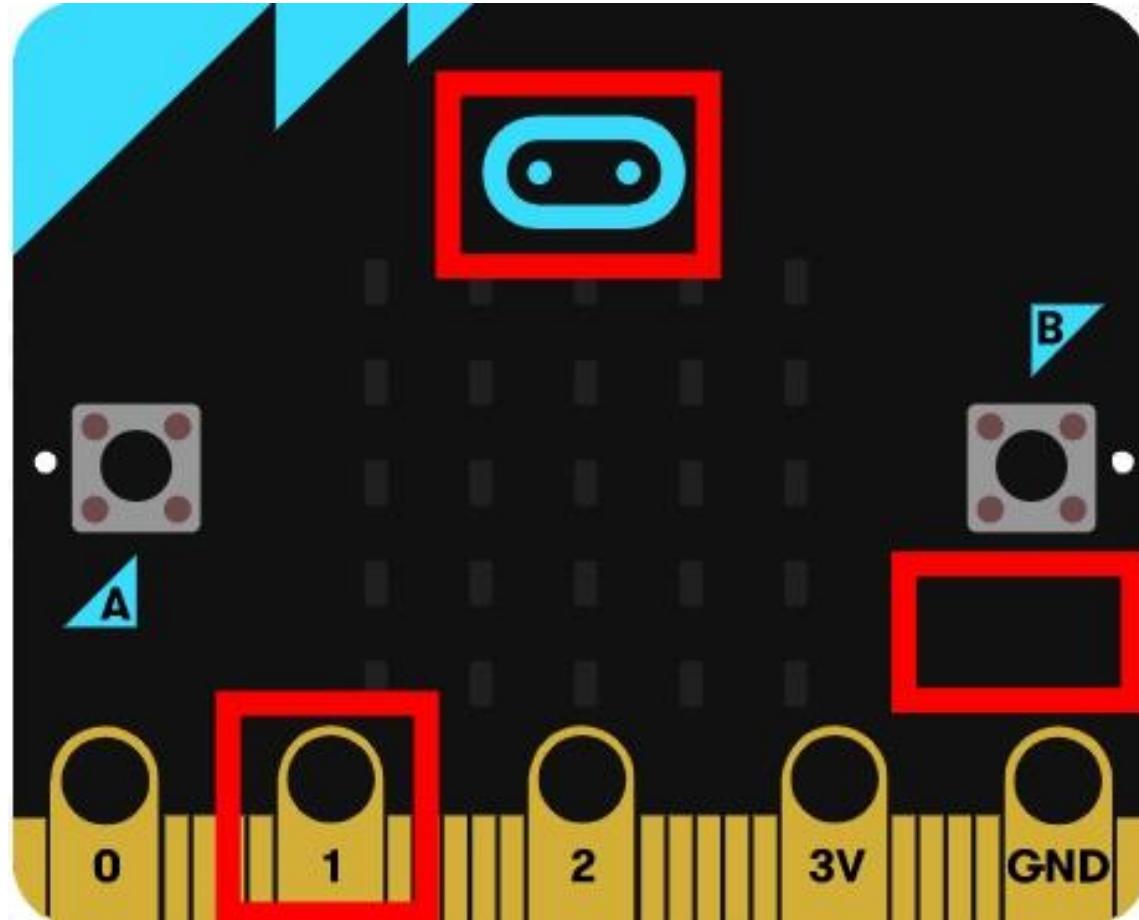
**Collapse Block** : 摺疊積木

**Delete Blocks** : 刪除積木

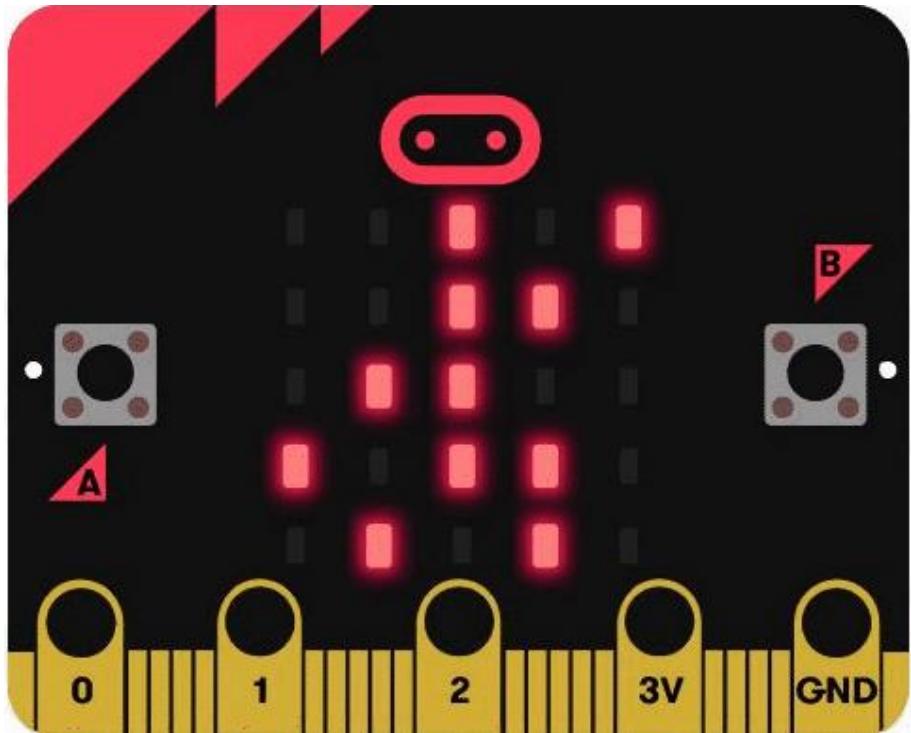
**Help** : 連結到官網，向您解釋積木的用途

## #2 Makecode A鍵, B鍵在哪裡?

microbit-press\_A\_B\_AB



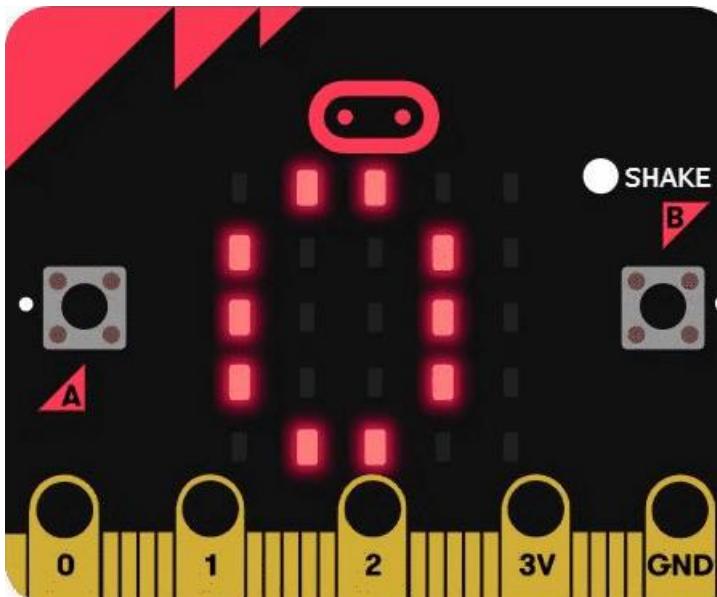
# #3 Makecode 動起來



```
forever
  show arrow North
  show string "Go!"
  repeat (4) times
    do
      show leds
      show leds
      show leds
      show leds
  end
  clear screen
  pause (ms) 5000
```

# #4 Makecode 計步器大挑戰

```
on start
  set steps ▾ to 0
  forever
    on shake ▾
      change steps ▾ by 1
    show number steps
```

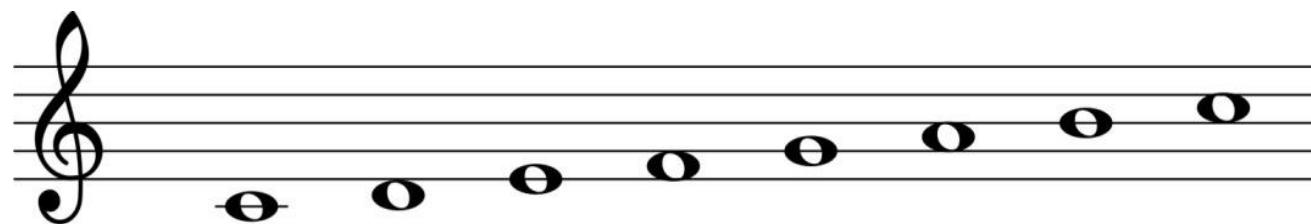
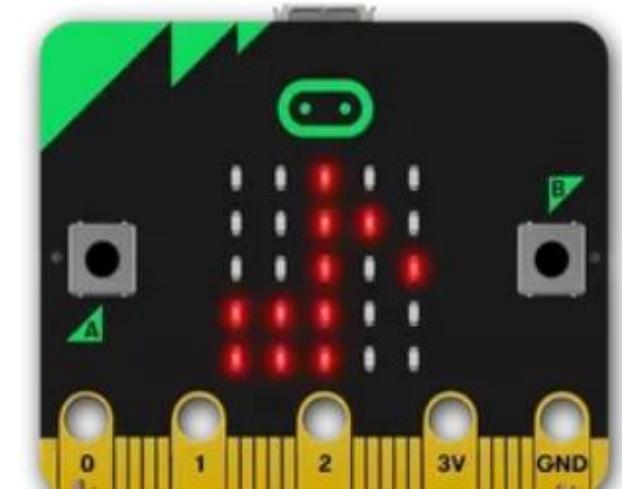
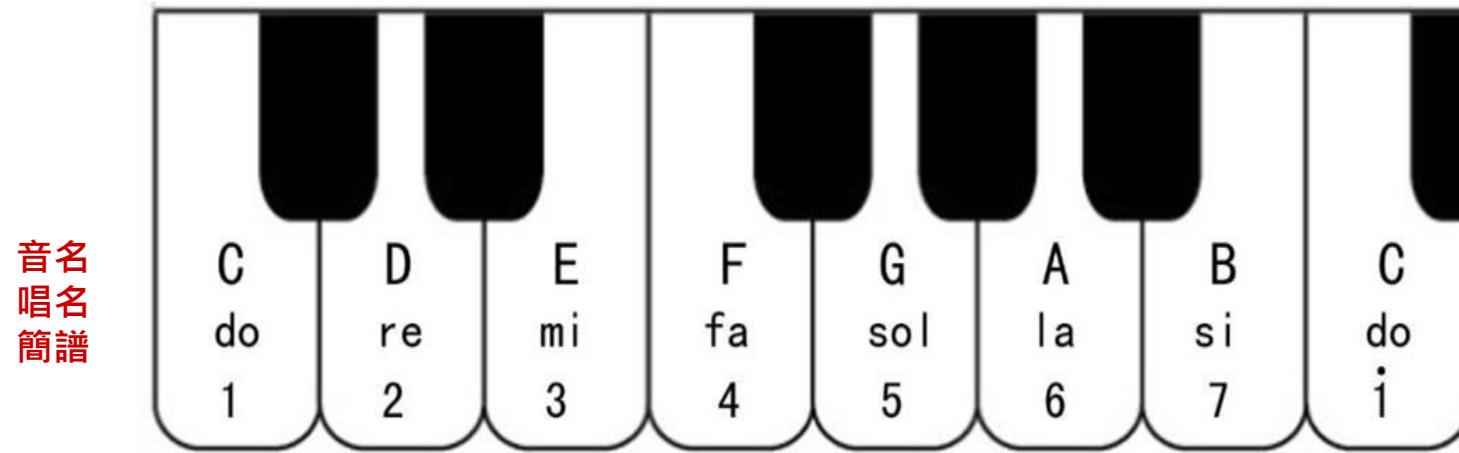


# #5 Makecode 聲浪太強

The screenshot shows the micro:bit MakeCode editor interface. On the left, there's a preview of the micro:bit board with red LEDs forming a grid pattern. A microphone icon indicates the sound level is at 128. Below the preview are buttons for 'Show console' and 'Simulator'. The main workspace on the right displays a script consisting of a 'forever' loop block containing a 'plot bar graph of sound level up to 255' block. To the right of the workspace is a sidebar with a search bar and categories: Basic, Input, Music, Led, Radio, Loops, Logic, Variables, Math, and Advanced.

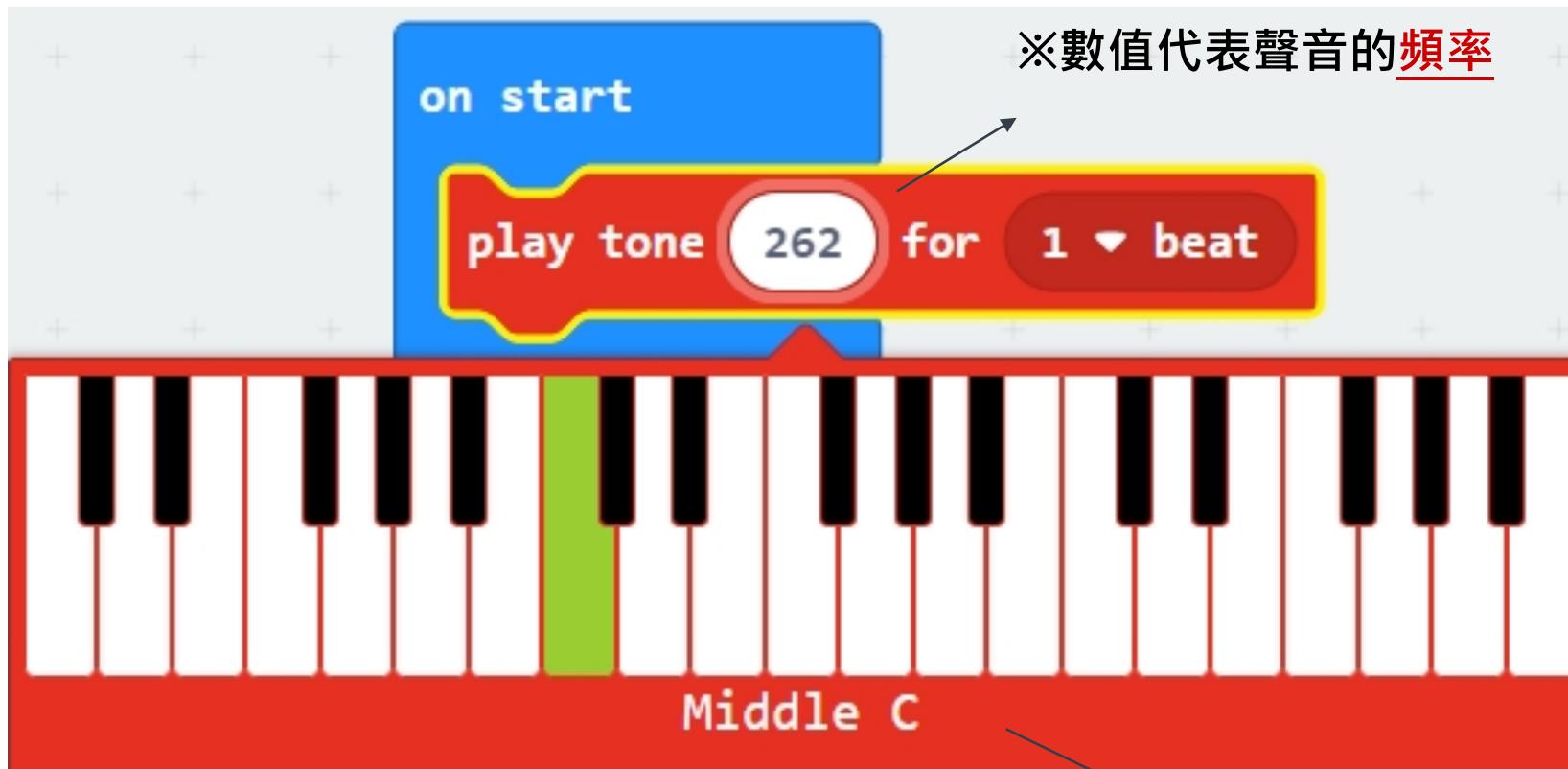
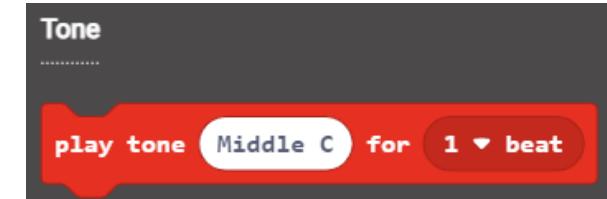
```
forever
  plot bar graph of sound level
    up to 255
```

# Makecode 認識音樂的規則 - 音名唱名

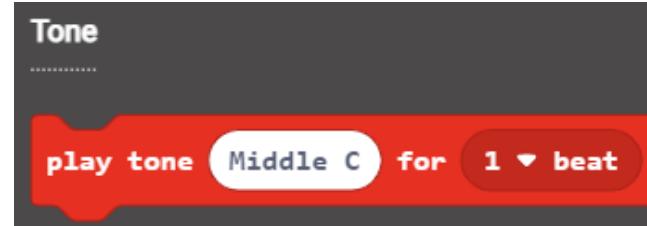


C	D	E	F	G	A	B	C
1	2	3	4	5	6	7	1
Do	Re	Mi	Fa	Sol	La	Ti	Do

# Makecode 創作你的音樂



# Makecode 自由創作你的音樂



※低音(Low)、中音(Middle)、高音(High)各有一組CDEFGAB可使用。



# #7 Makecode 猜猜什麼旋律

CDEC —拍 CDEC —拍  
EFG —拍 EFG

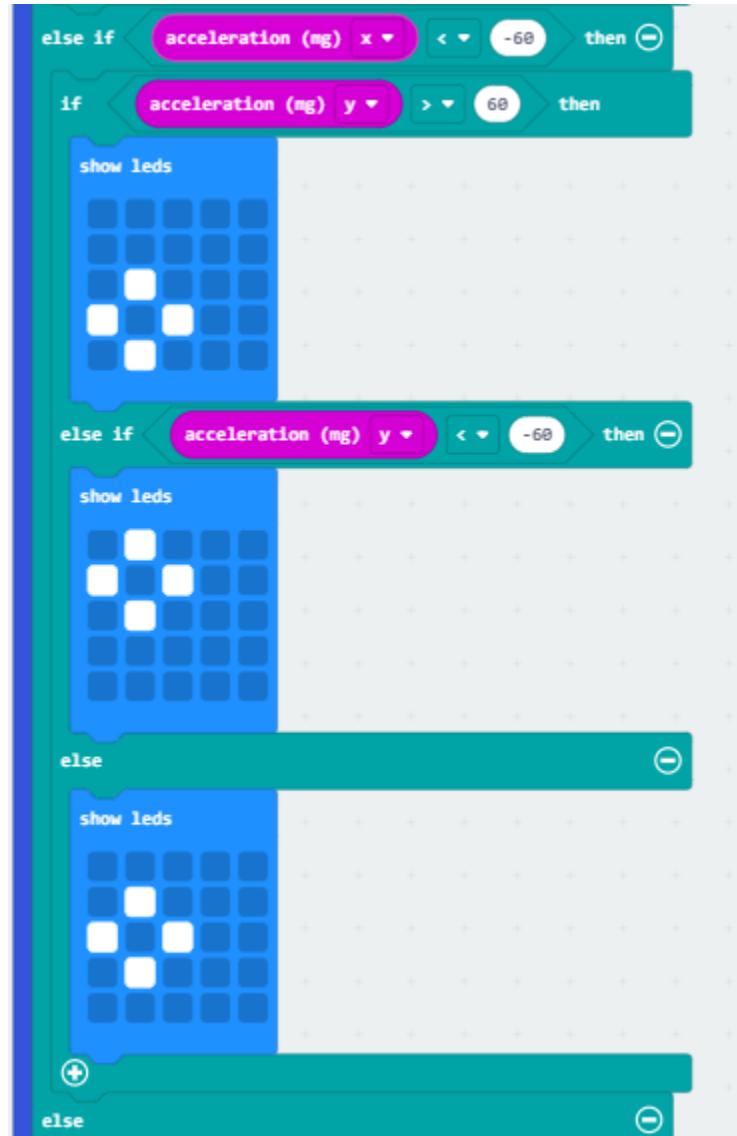
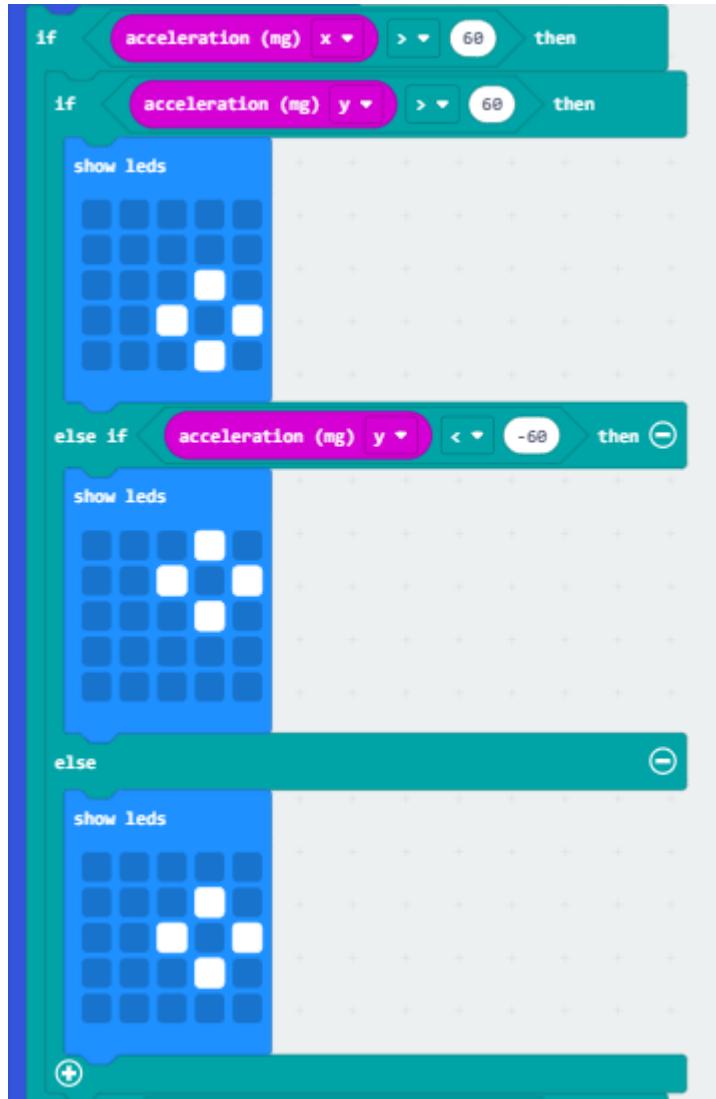


※休息一拍

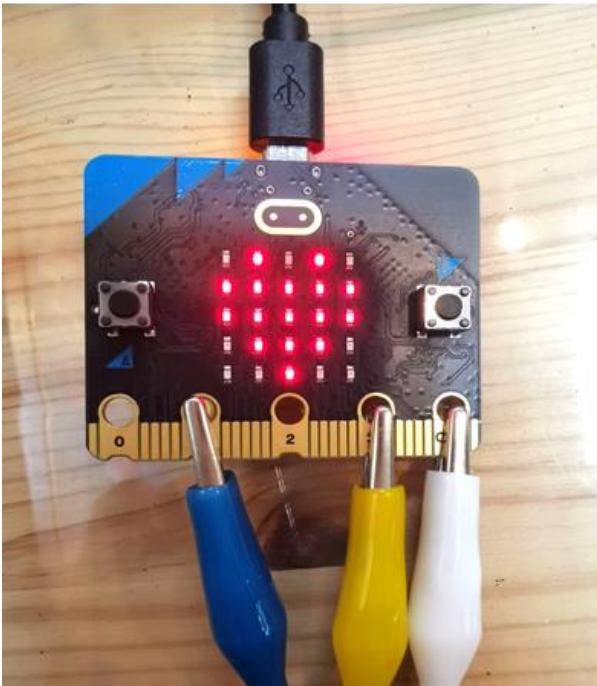


```
on start
  play tone Middle C for 1 ▾ beat
  play tone Middle D for 1 ▾ beat
  play tone Middle E for 1 ▾ beat
  play tone Middle C for 1 ▾ beat
  rest(ms) 1 ▾ beat
  play tone Middle C for 1 ▾ beat
  play tone Middle D for 1 ▾ beat
  play tone Middle E for 1 ▾ beat
  play tone Middle C for 1 ▾ beat
  rest(ms) 1 ▾ beat
  play tone Middle E for 1 ▾ beat
  play tone Middle F for 1 ▾ beat
  play tone Middle G for 1 ▾ beat
  rest(ms) 1 ▾ beat
  play tone Middle E for 1 ▾ beat
  play tone Middle F for 1 ▾ beat
  play tone Middle G for 1 ▾ beat
```

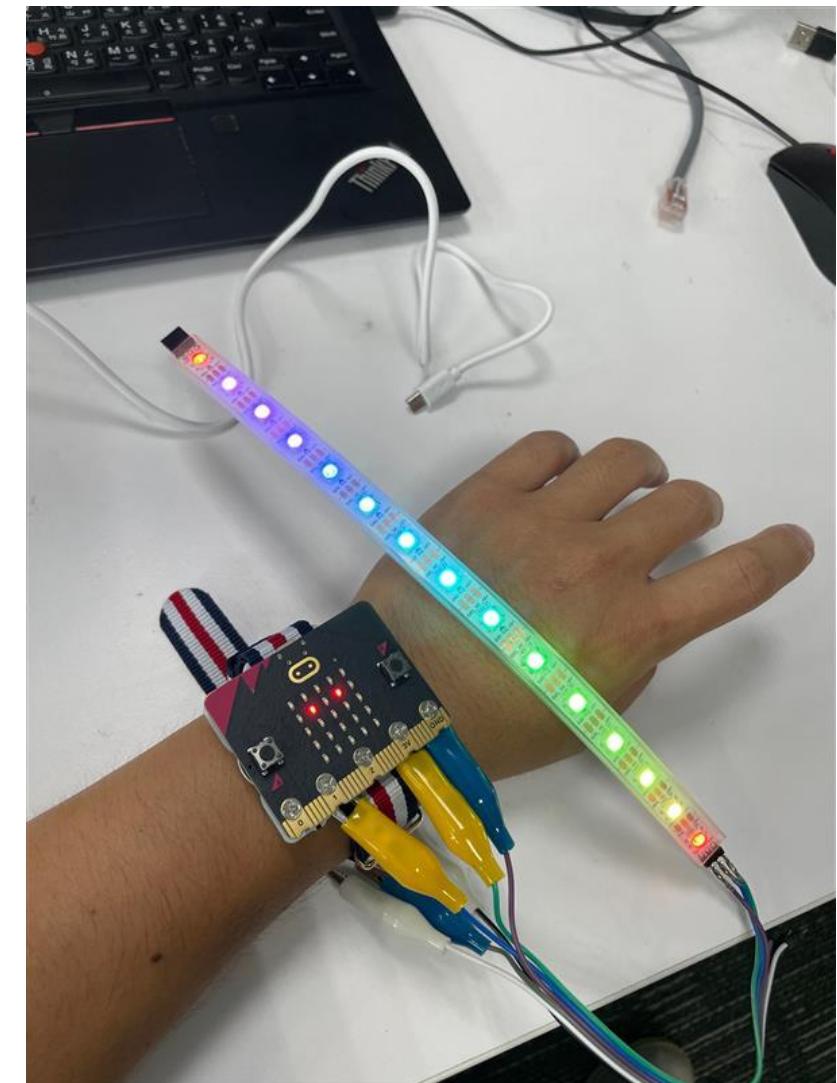
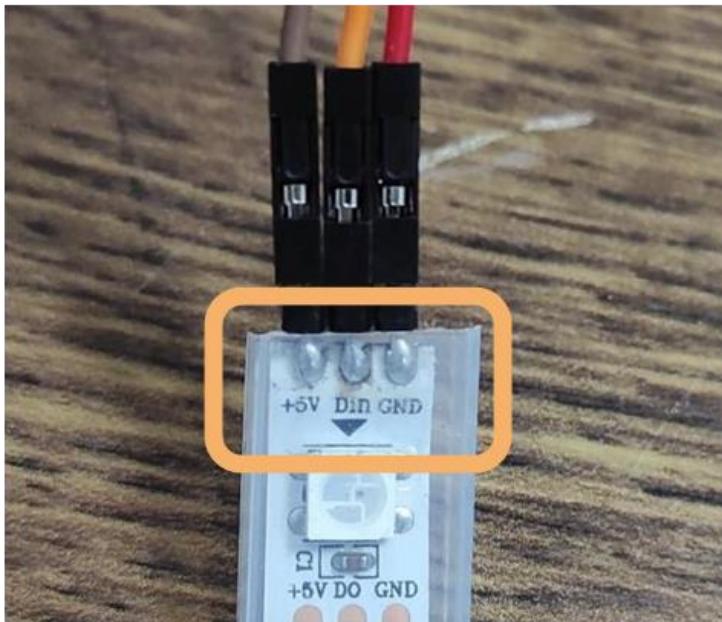
# #8 平衡大考驗



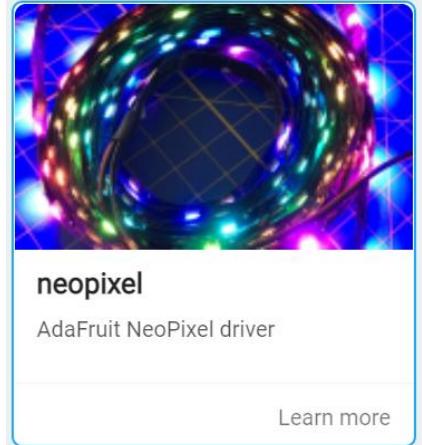
# #9 進階課程



3V Pin 1 GND

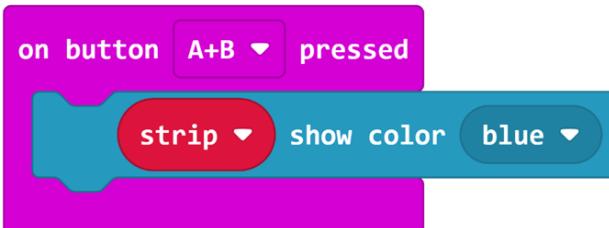
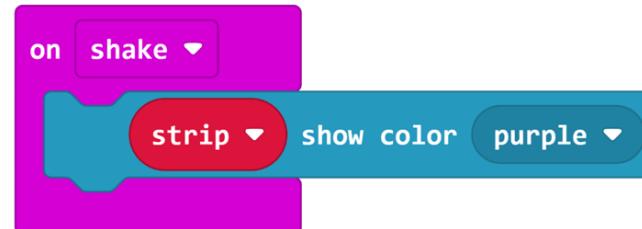


# #9 Extensions Neopixel

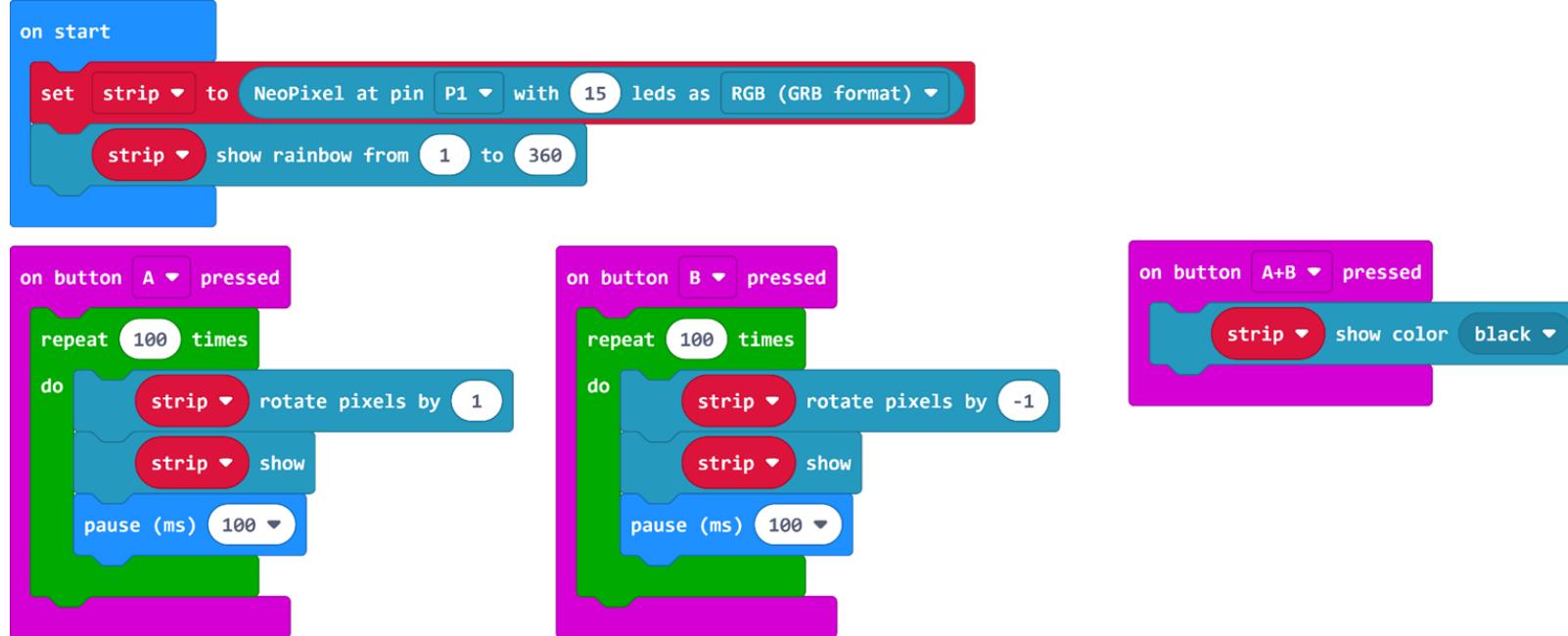


A screenshot of the Tinkercademy Scratch-like programming environment. On the left, there's a virtual micro:bit board with pins labeled A, B, 0, 1, 2, 3V, and GND. To the right is a library browser with categories like Basic, Input, Music, Led, Radio, Loops, Logic, Variables, Math, and Extensions. The Extensions category is highlighted with a red box. The main workspace shows the "Neopixel" extension selected, displaying several blocks for controlling a NeoPixel strip. One block is highlighted in red: "set strip to NeoPixel at pin P0 with 24 leds as RGB (GRB format)". Other visible blocks include "set range to strip range from 0 with 4 leds", "strip show rainbow from 1 to 360", "strip show color red", and "strip show bar graph of 0 up to 255".

# #9 Extensions Neopixel



# #9 Extensions Neopixel



※當按下A+B鍵因變數strip已被定義為黑色(=關閉燈泡)，因此再去按A鍵或B鍵是無法亮燈的。  
可以透過micro:bit背面的reset鍵重新啟動程式，再次體驗。

設計讓每個燈泡都依照彩虹的顏色順序顯示不同的顏色，當按下A鍵，燈泡會依照順序輪流變換顏色100次；按下B鍵則反方向變換顏色100次；按下A+B的按鍵則所有燈泡都熄滅(顯示黑色=關閉燈泡)。

# “寫” 程式？

:bit

Blocks

Python



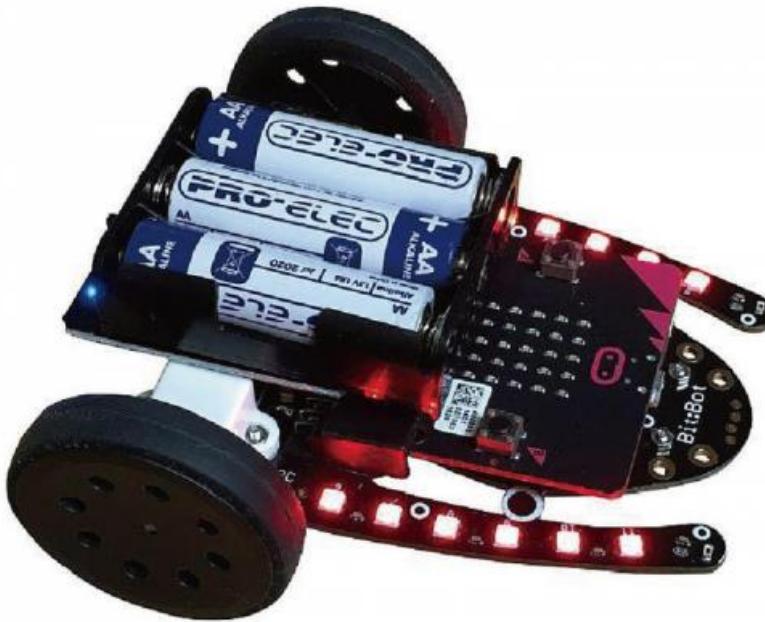
```
1 def on_received_number(receivedNumber):
2     global signal_level
3     signal_level = Math.map(radio.received_packet(RadioPacketProperty.SIGNAL_STRENGTH),
4                             -110,
5                             -55,
6                             0,
7                             100)
8 radio.on_received_number(on_received_number)
9
10 def on_button_pressed_a():
11     global count
12     if mode == 1:
13         music.start_melody(music.built_in_melody(Melodies.PUNCHLINE),
14                             MelodyOptions.ONCE)
15     count += 1
16 input.on_button_pressed(Button.A, on_button_pressed_a)
17
18 def mode2_acceleration():
19     if input.acceleration(Dimension.X) > 60:
20         basic.show_leds("""
21             . . .
22             . . . # .
23             . . # . #
24             . . . # .
25             . . .
26             """)
27     elif input.acceleration(Dimension.X) < -60:
28         basic.show_leds("""
29             . . .
```

# 程式範例

hex	功能
1__microbit-start_forever	開始 循環
2__microbit-press_A_B_AB	按鈕控制
3__microbit-move_move	LED 動畫
4__microbit-step_counter	計步器
5__microbit-voice_volume	聲音測量
6__microbit-mora	剪刀石頭布
7__microbit-melody	給愛麗絲
8__microbit-acceleration	平衡器
microbit-collaborative_learning_v11_TreasureChest	尋寶-寶藏
microbit-collaborative_learning_ver11	尋寶器

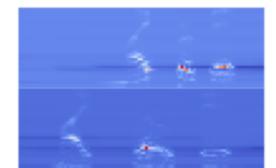
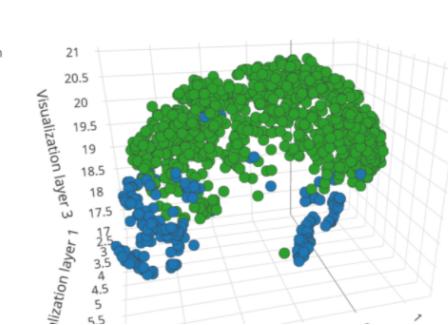
說說你想拿來設計什麼有趣的程式 ~

下次見~~



Within days of getting a device, Gordon Williams, lead developer of [Espruino](#) had the micro:bit supported in their online platform. This allowed JavaScript programs to run on the device, including Espruino's gesture recognition libraries that were originally designed for bangle.js and use Tensorflow Lite. Unlike the "gestures" you might be used to on the micro:bit, like "shake", this demo allows you to train a machine learning model to recognise any gestures you can collect data for - it takes recordings of the gestures being performed, and builds a model that can recognise them. This means you can have much more complex, subtle gestures, and even customise them for yourself or something you've attached the micro:bit to.

[Edge Impulse](#), working similarly fast, took a video recording of each member of the micro:bit team saying "micro:bit" three times (what better way to conclude the weekly team meeting?) and used the Edge Impulse cloud service to create a model that could recognise the word "micro:bit" being said. [You can read more about this demo here](#), but it clearly shows the possibility of training micro:bits to recognise unique sounds!



arm

Thank You

Danke

Gracias

謝謝

ありがとう

Asante

Merci

감사합니다

ধন্যবাদ

Kiitos

شکرًا

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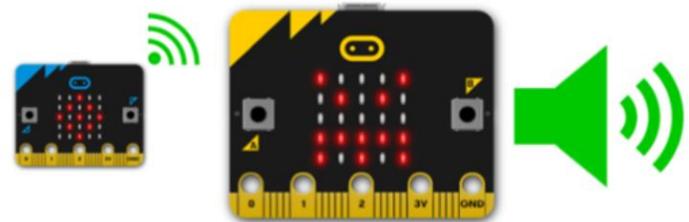
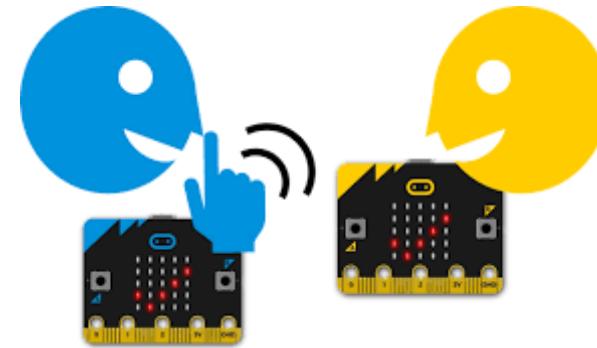
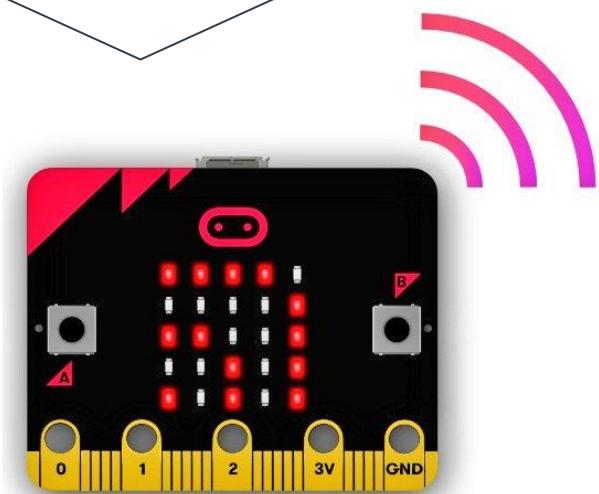
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# #8 Makecode\_廣播【Radio】x 尋寶大作戰

micro:bit的處理器內建低耗電藍牙模組，  
透過藍牙廣播傳遞無線訊號。

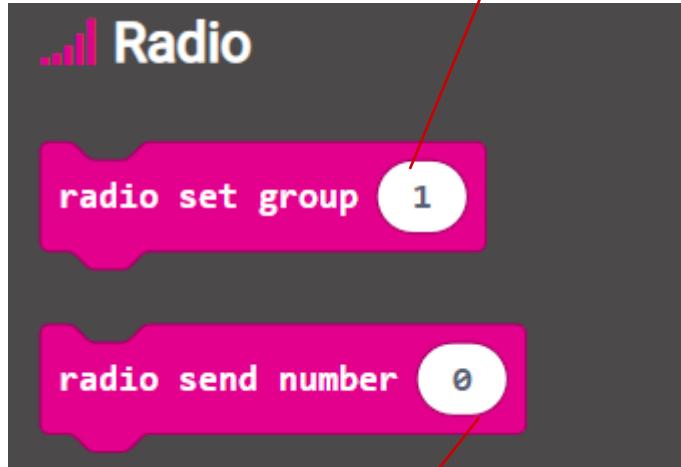
使用廣播功能可以讓多個micro:bit  
之間相互傳遞與接收訊息。

在無干擾、最理想的狀況下最遠達70公尺。  
可以透過廣播功能來製作遙控器、互動式遊戲等。

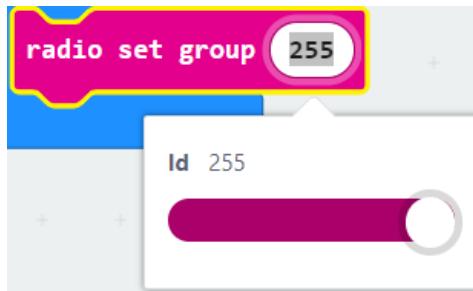


# Makecode\_廣播【Radio】x 尋寶大作戰

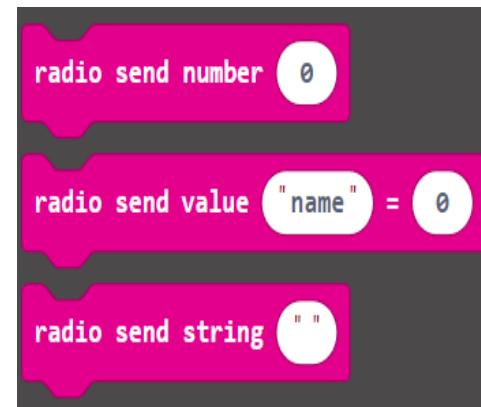
廣播群組Id設定範圍：0~255。



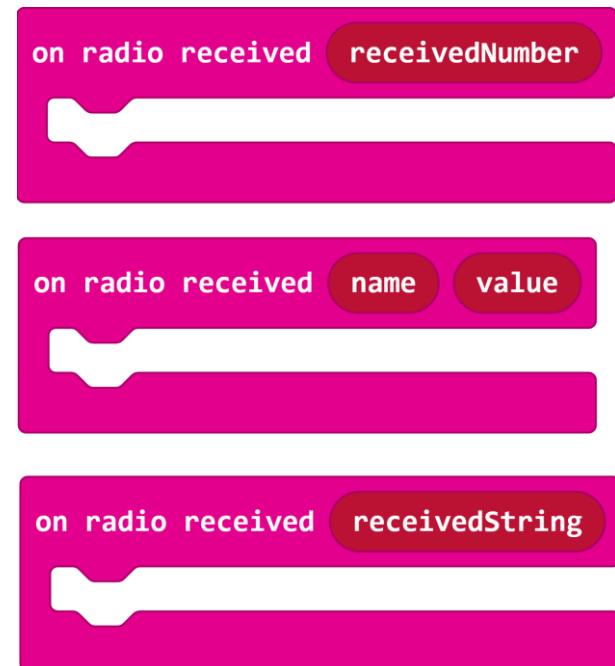
※透過廣播發送數字給在相同群組的micro:bit。  
廣播發送的數字會暫存在 `receivedNumber` 中。



※傳送端



※接收端



# 我們是一群很幸福的人



以程式教學跟孩子們一同互動。

活動日期：2021-11-30 Tue.

10:20am-4:00pm

活動地點：宜蘭三星鄉大洲國小 (宜蘭縣三星鄉上將路二段500號)



# 我們是一群很幸福的人



天下雜誌 希望閱讀

Arm 安謀國際科技公司

感謝 希望閱讀公益夥伴

0:37 / 1:00

A screenshot of a video frame. The video is titled '希望閱讀' (Hope Reading) from '天下雜誌'. It shows a group of people, including Arm volunteers in blue shirts, standing together holding books and a banner that says 'team arm'. The banner also features the Arm logo. The video player interface shows a progress bar at 0:37 / 1:00 and various control icons.



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