

Using the BBC micro:bit

Sending Radio Messages
(Fireflies Activity)

Who am I?

Anthony Lawrence

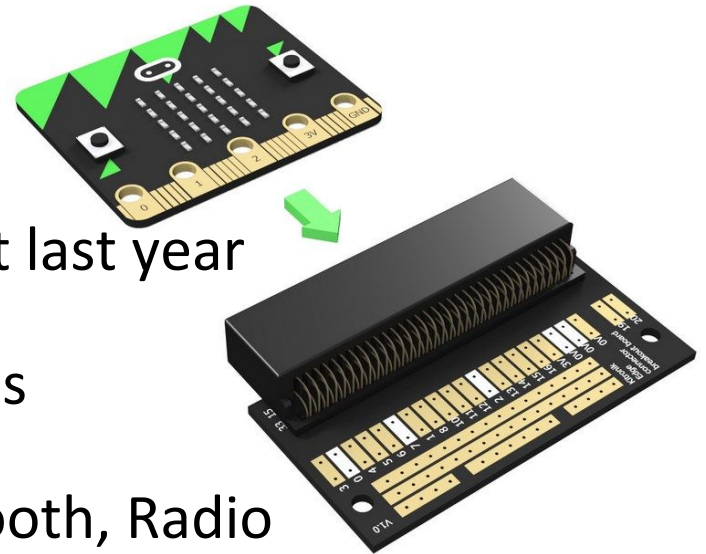
Teach of Computer Science @ Penair

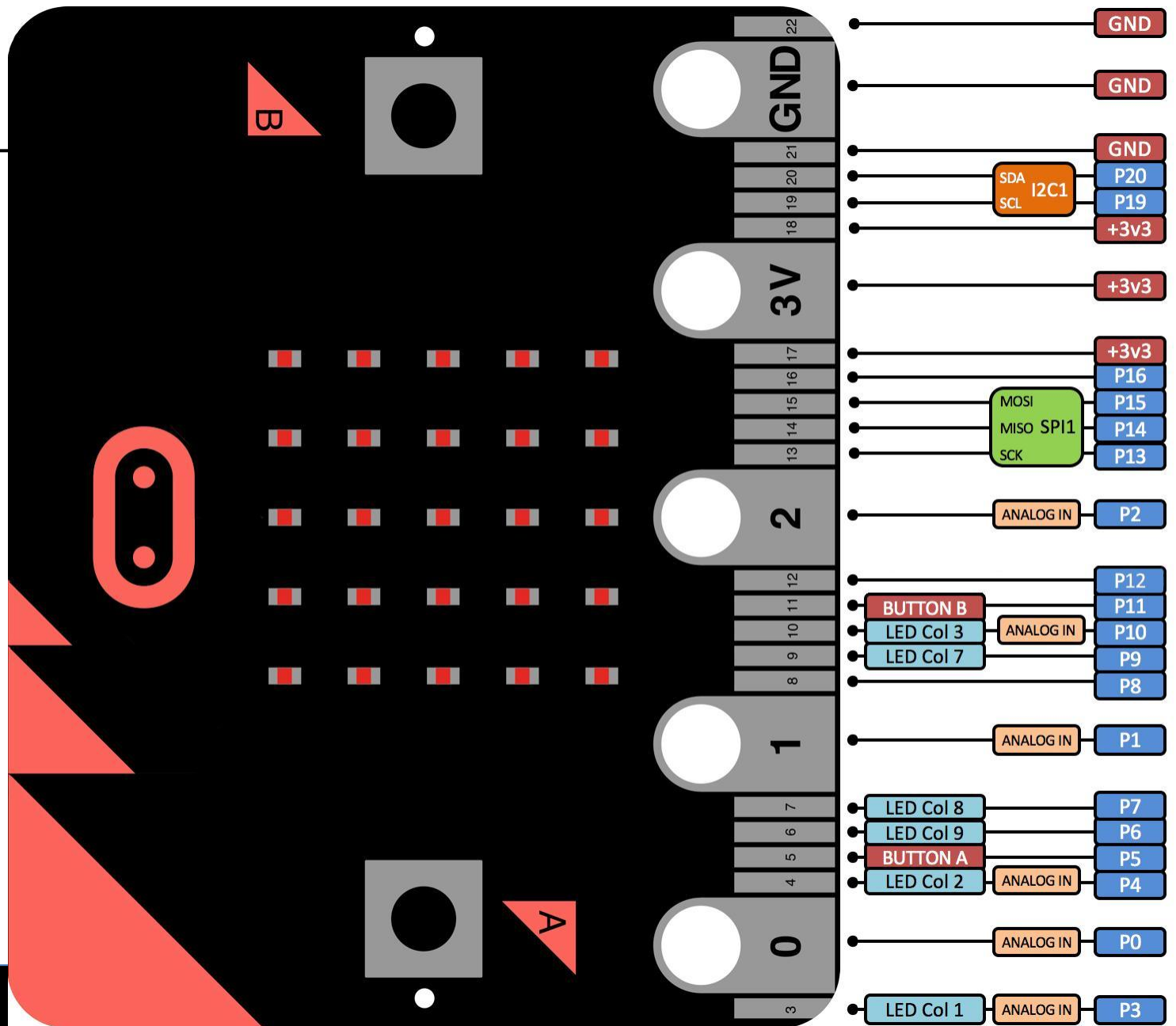
artisan@anthonylawrence.me.uk

@4DegreesWest

What is it?

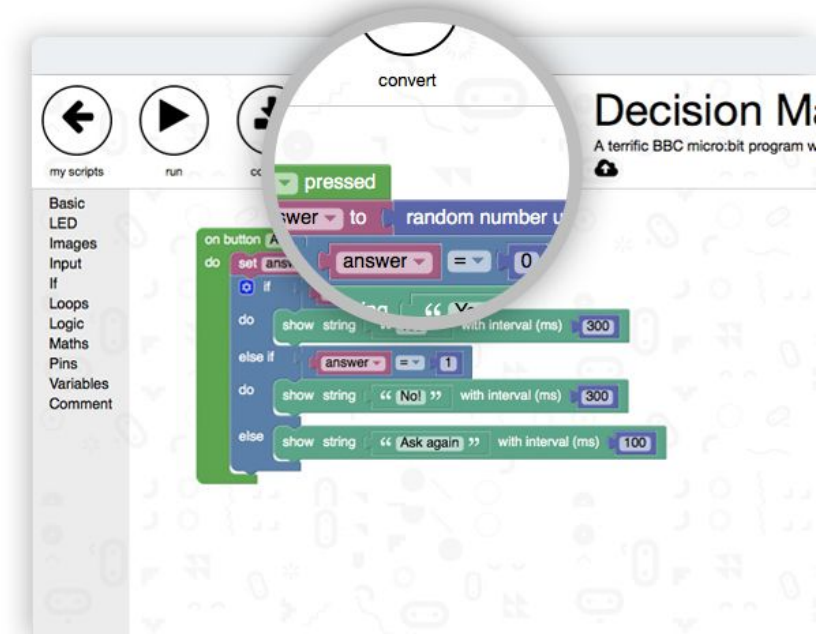
- Small, embedded system (4x5cm)
- Being provided to every year 7 student last year
- 25 red LEDs & 2 programmable buttons
- Accelerometer, magnetometer, Bluetooth, Radio
- Five I/O rings (can be broken out into 21 pins)





4 Environments

- Microbit.co.uk
 - Code Kingdoms Javascript
 - Microsoft Block Editor
 - Microsoft Touch Develop
- Python



A demo...



A Try out the challenges...

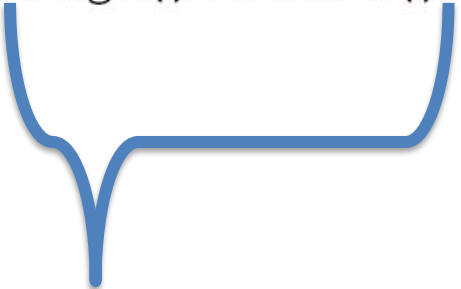
- A basic “Hello World”
- Displaying a countdown timer
- Fireflies

Dissecting Fireflies

```
1 import radio
2 import random
3 from microbit import display, Image, button_a, sleep
```


Dissecting Fireflies

```
5 flash = [Image().invert()*(i/9) for i in range(9, -1, -1)]
```



`Image().invert()`

Invert the pixels for the given base image (in this case, nothing). Inverting nothing, sets all pixels to “ON”.

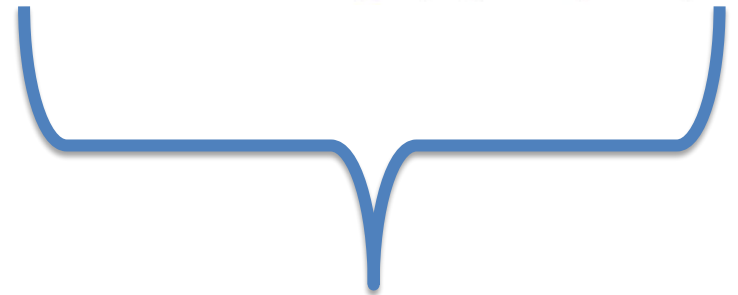


`Image().invert()*(i/9)`

Multiplying a Micro:Bit image by a number will modify the brightness of each pixel by that amount.

Dissecting Fireflies

```
5 flash = [Image().invert()*(i/9) for i in range(9, -1, -1)]
```



```
for i in range(9, -1, -1)
```

We then repeat this for every number between 9 and 0 (inclusive), adding each new image to the resulting list.

Dissecting Fireflies

```
7 radio.on()  
8 radio.config(channel=9)
```

Dissecting Fireflies

```
10 while True:
11     if button_a.was_pressed():
12         radio.send('flash')
```

Dissecting Fireflies

14

```
incoming = radio.receive()
```

Dissecting Fireflies

```
16  if incoming == 'flash':  
17      sleep(random.randint(50, 350))  
18      display.show(flash, delay=100, wait=False)  
19  
20  if random.randint(0, 9) == 0:  
21      sleep(500)  
22      radio.send('flash')|
```

Dissecting Fireflies

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