Using the enviro:bit in the classroom
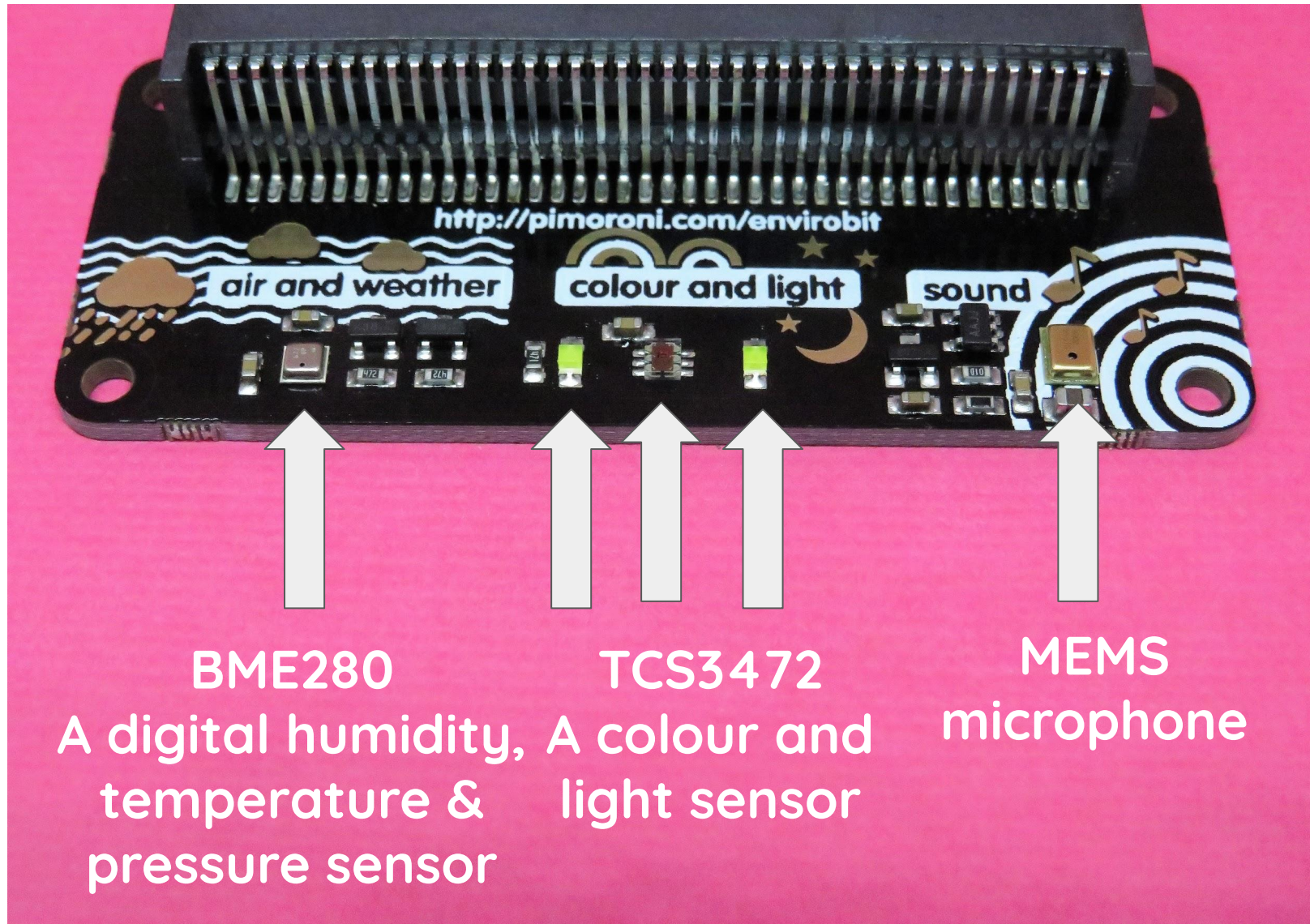

An overview

Using the code blocks

Projects

Curriculum links & applications

PIMORONI
education

What's an enviro:bit?

BME280
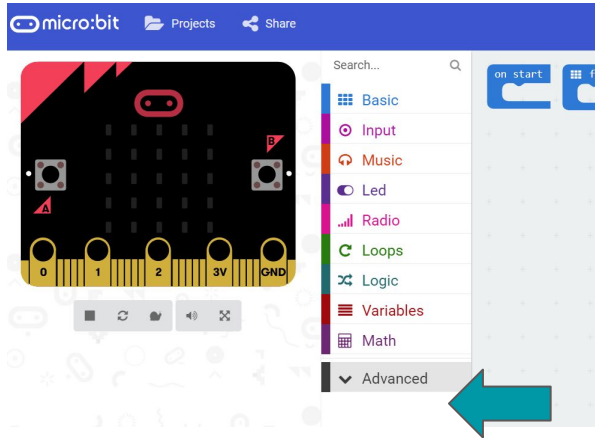A digital humidity, temperature & pressure sensor

TCS3472
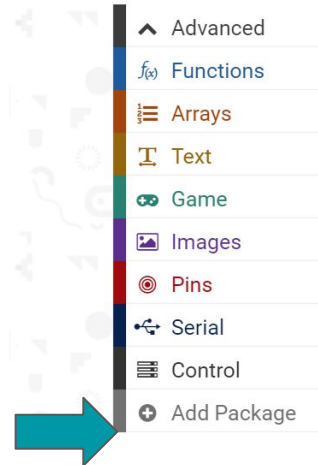A colour and light sensor

MEMS microphone

How to install the enviro:bit library
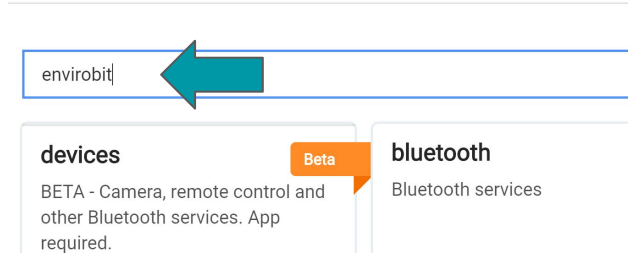
1. Go to MakeCode and click on the Advanced part of the menu.
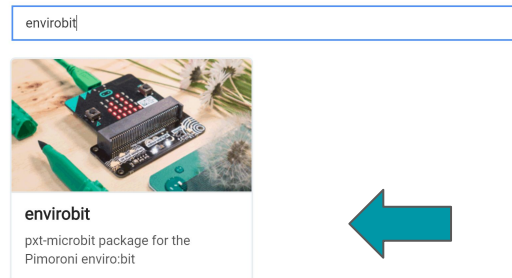
2. Choose "add package" from the menu.

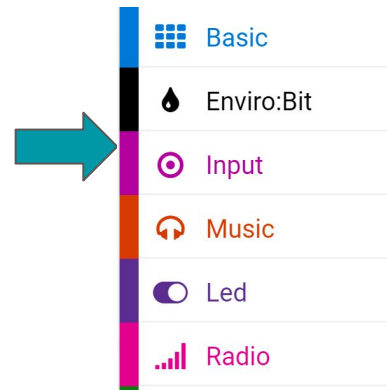3. In the pop-up that appears, type in the URL of your chosen package, or search keywords.

4. Pick your package from the results.
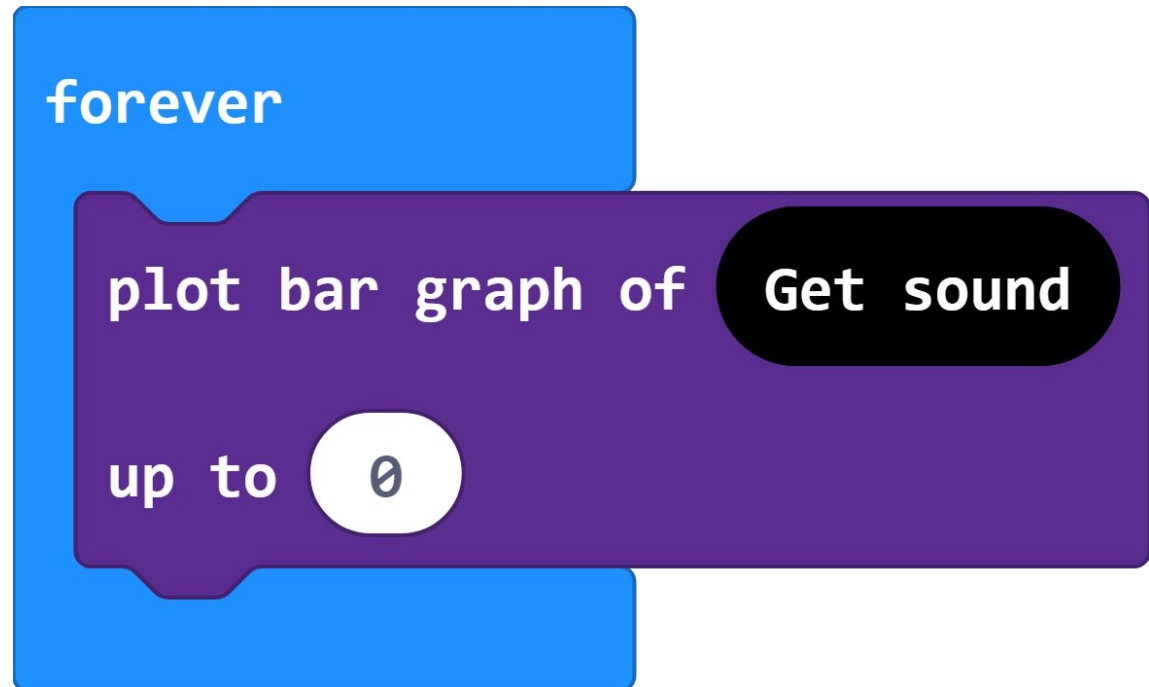
5. After a few seconds, you should see your new package in the menu.
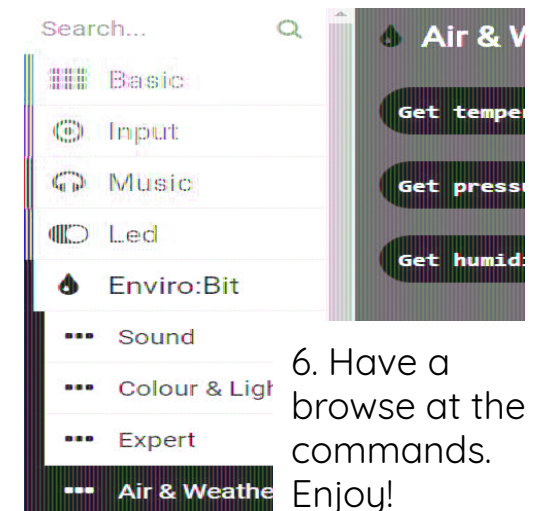
6. Have a browse at the commands. Enjoy!

Trying out the sound sensor

Basic

Input

Music

Led

Enviro:Bit

Radio

Loops

Logic

Variables

Math

```
forever
    plot bar graph of    Get sound
    up to    0
```
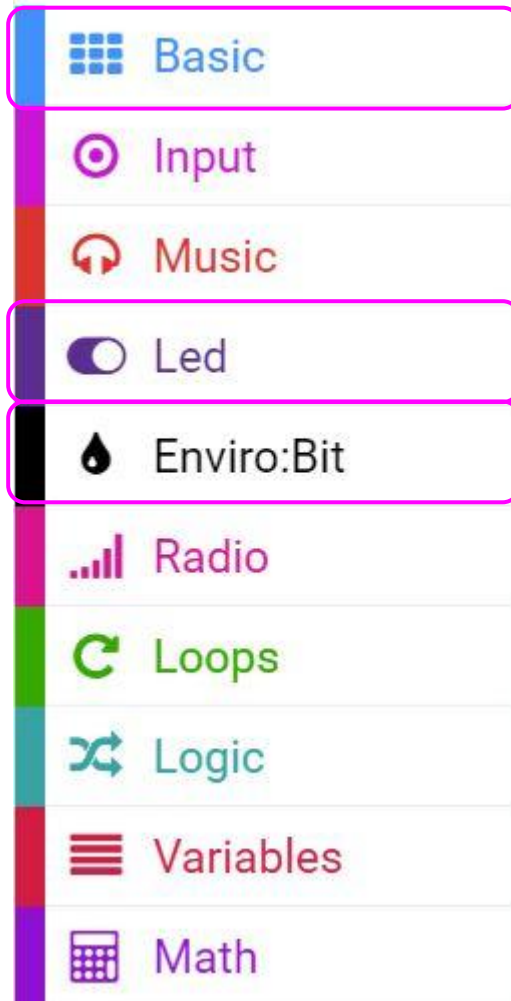
Limitations:
Auto-scaling means silence results in a full graph.
Tap to reset scale.
No smoothing

Clap on, clap off

Basic
Input
Music
Led
Enviro:Bit
Radio
Loops
Logic
Variables
Math

```
on start
  Set clap sensitivity t
  set  duck  to  0
```
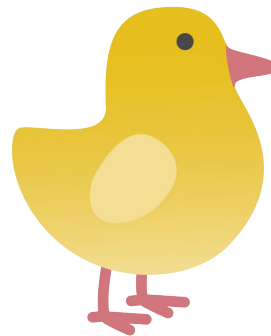
```
When I hear a clap
  if   duck  =  0
    change  duck  by  1
    show icon
  else
    change  duck  by  -1
    clear screen
```

Limitations:
Need to set sensitivity level to cope with your own background noise and clapping style

PIMORONI education

Using the envirobit in experiments

Categoric

Continuous

Interval

Resolution

Accurate (closer to known value)

Precision (consistency)

Random error

Systematic error

Zero error

Using the envirobit in experiments

Using continuous data to read categoric values

Colours from RGB values

Basic

Input

Music

Led

Enviro:Bit

Radio

Loops

Logic

Variables

Math
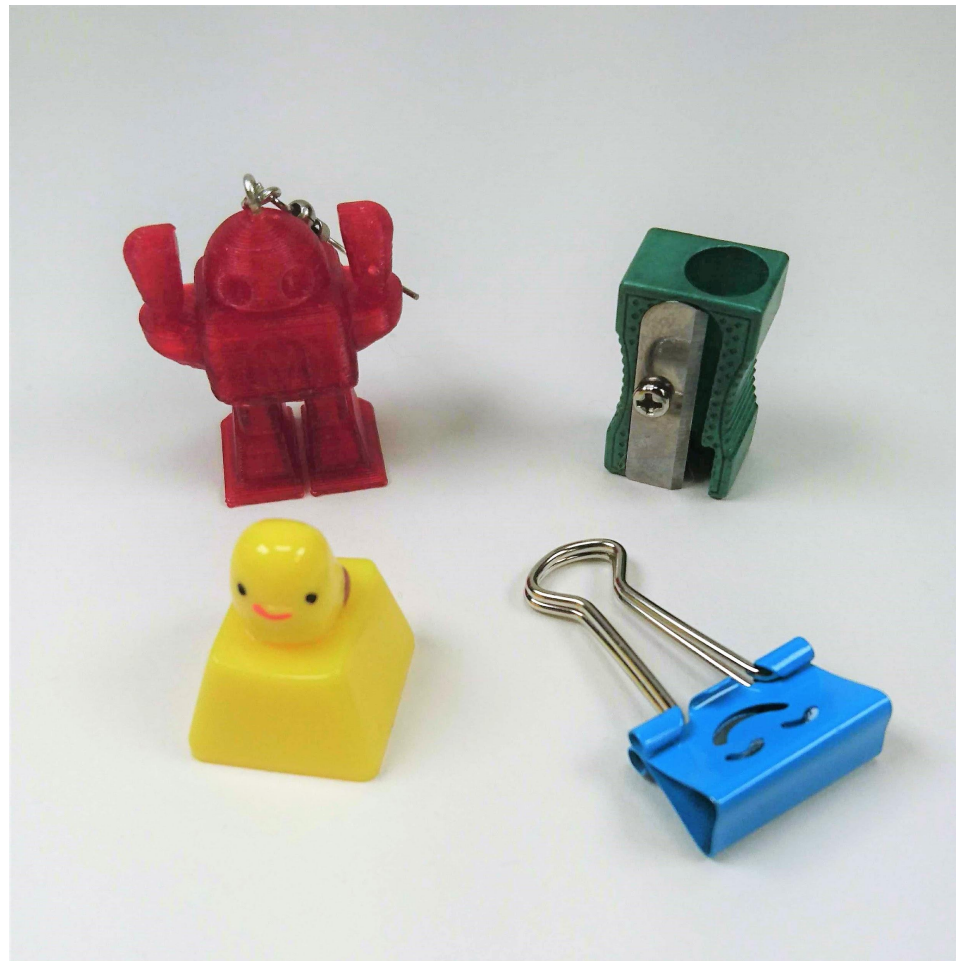
on button A pressed

clear screen

Set LEDs to On

pause (ms) 1000

show leds

show number Get red

show leds

show number Get green

show leds

show number Get blue

Set LEDs to Off

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Classroom activity - RGB colours

Task - use continuous RGB data to sort objects into categories.
Skills - colour recognition, greater than/less than mathematics, pattern matching, data recording
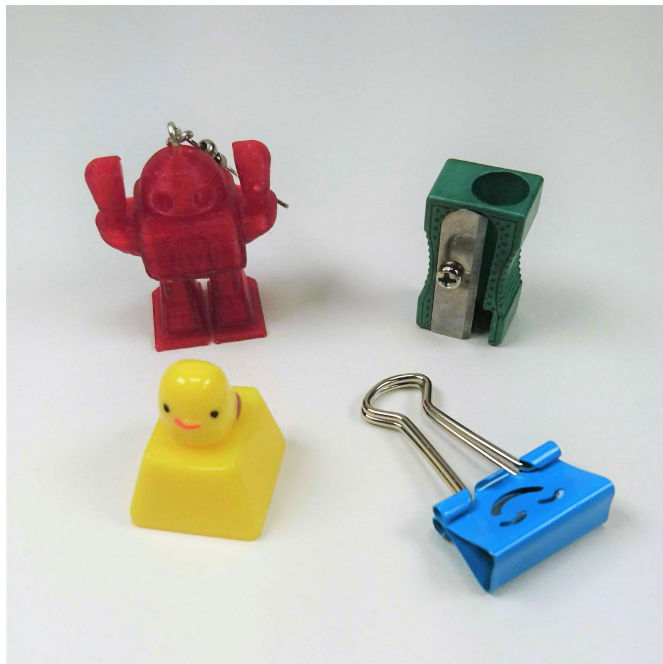
1. Record the RGB data of as many objects as you can find.
2. Note down the colour of each object (your opinion).
3. Using the RGB checker, how close is the reading to the colour you saw with your eyes?
4. Why do you think there are differences? (What might affect the readings?)

Datalogging

GCSE Science skills: AT 1 Use of appropriate apparatus to measure mass, time and temperature accurately.
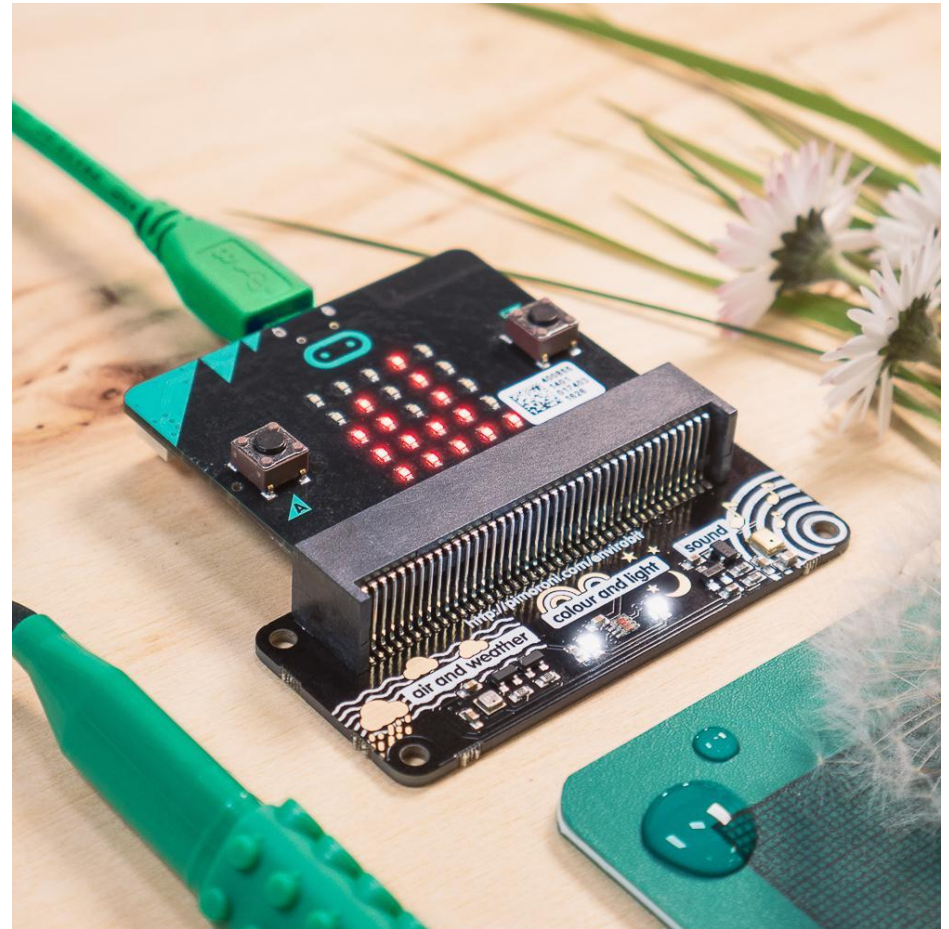
"I call this the noselogger"

Plant responses

Investigate the effect of light or gravity on the growth of newly germinated seedlings.

- set up three petri dishes with mustard seeds and allow them to germinate
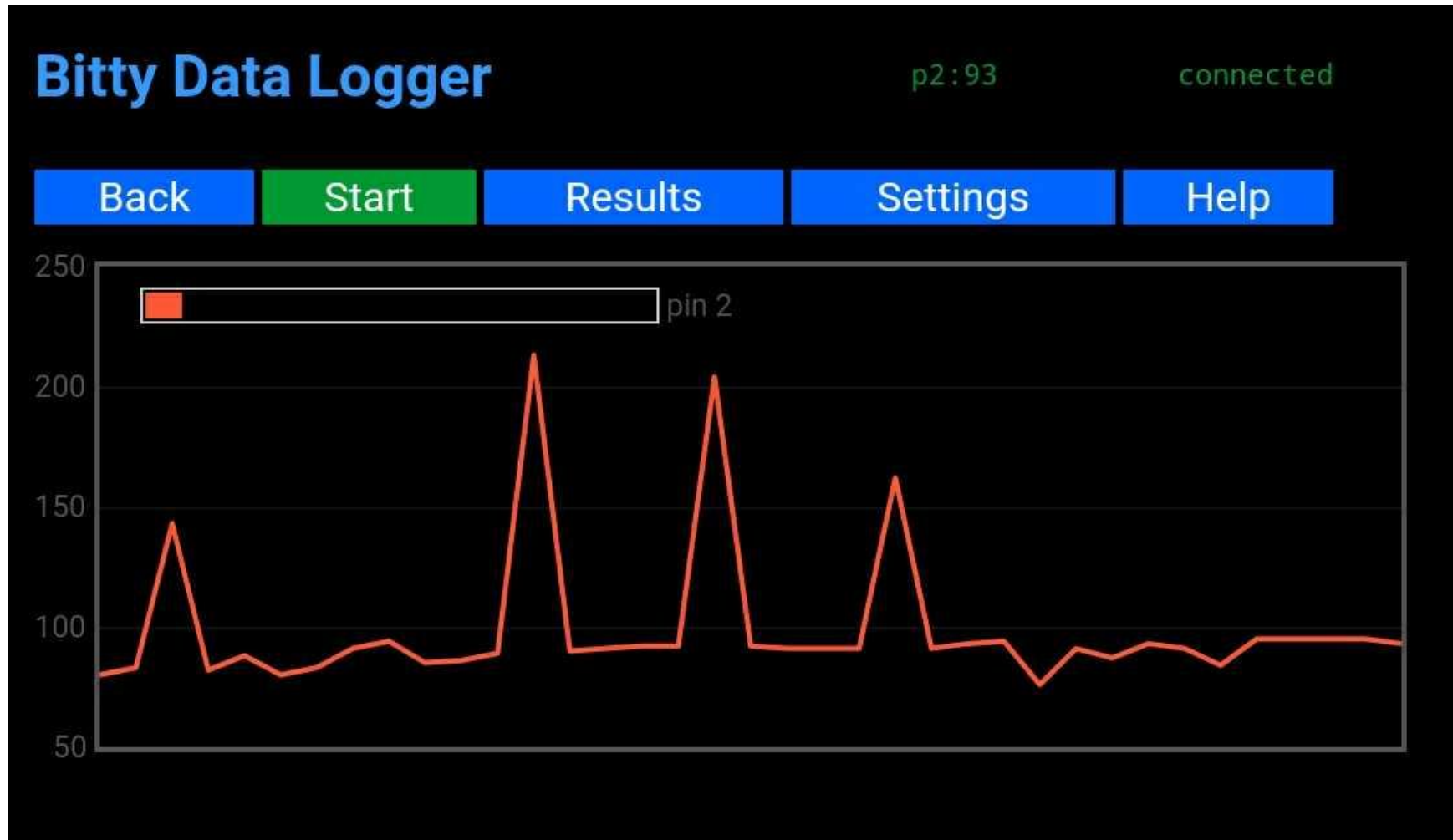- put each dish of seedlings in a different light intensity for the same period of time
- monitor the height of each seedling at each light intensity.

Apparatus
- some white mustard seeds
- three Petri dishes
- cotton wool
- a ruler
- water.

Method
1. Set up three petri dishes containing cotton wool soaked in equal amounts of water.
2. Put ten mustard seeds in each dish.
3. Put the dishes in a warm place. They must **not** be disturbed or moved.
4. Allow the mustard seeds to germinate.

   Water daily with equal amounts of water to each dish.
5. Each dish should have the same number of seedlings after the seeds have germinated. Remove excess seedlings from any dish that has too many.
6. Measure the height of each seedling in mm.

Ruler

Measuring height of white mustard shoots

Petri dish

Damp cotton wool
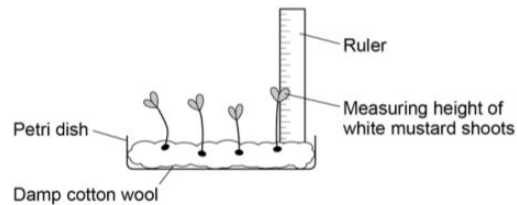
7. Move the petri dishes into position.
   - Put one on a windowsill in full sunlight.
   - Put the second one in partial light.
   - Put the third one in darkness.

8. Measure the height of each seedling every day, for at least five consecutive days.
9. Record the heights in a table like this one:

Day	Height of seedling in full sunlight in mm								
	1	2	3	4	5	6	7	8	Mean
1									
2									
3									
4									
5									

You will need a table each for:
- full sunlight
- partial light
- darkness.

### Analysis and conclusion
a. Calculate the mean height of the seedlings each day.
b. Plot a graph with:

- 'Mean height in mm' on the y-axis.
- 'Day' on the x-axis.

Your graph should include the data for full sunlight, partial light and darkness.

c. Write a conclusion to state and explain your results, you should include reference to hormones and their distribution in your written answer.

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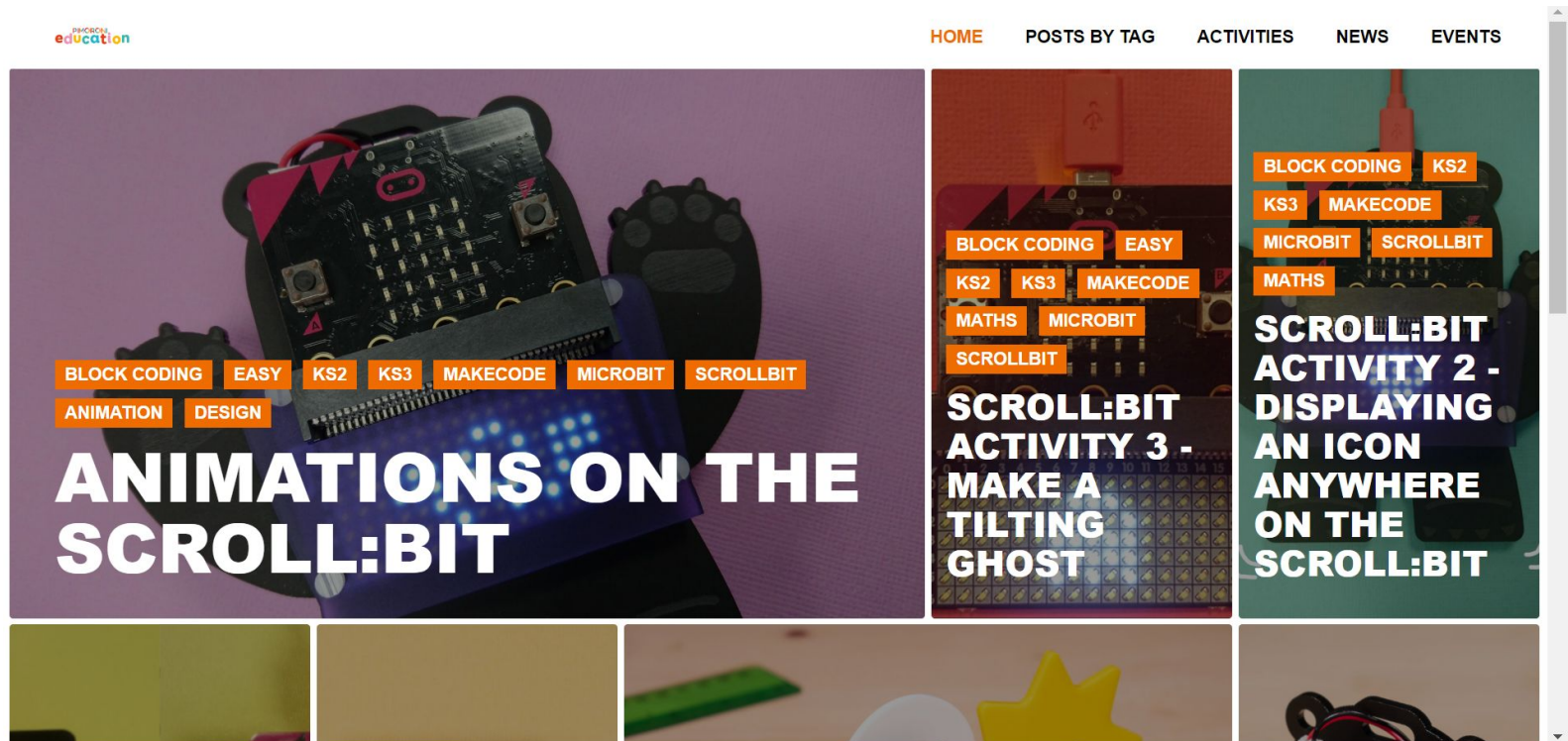
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Hackspaces & Code clubs

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- Custom education packages
- Product support via e-mail and phone

Create an education account 🎓

> 1. Create an account.

Shopping Cart

Here's the contents of your order. **Prices are now shown in GBP/£.**

	SKU	Product	Line Total	Quantity	
1.	PRE359	MINI.MU Glove Kit (includes micro:bit) £23.99/pc Backorder	£119.95	5	

	Items Total	£119.95
	Shipping will be calculated during checkout based on the weight and destination of your order.	

> 2. Put stuff in your basket.

Backorder Not enough local stock to cover this entire order. Expect your order to ship in 5 working days.

Special instructions?

Let us know about any special requirements for your order...

Need a quote?

If you need a quote for your finance department then you can generate a quote for printing.

> 3a. Get a quote and get your finance dept to raise a purchase order.

Ready to place your order?

Continue to payment and shipping options.

Place order

> 3b. Or just pay using a credit card or PayPal.

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Starter packs for schools - £300 / £450