



arm

Lesson 20

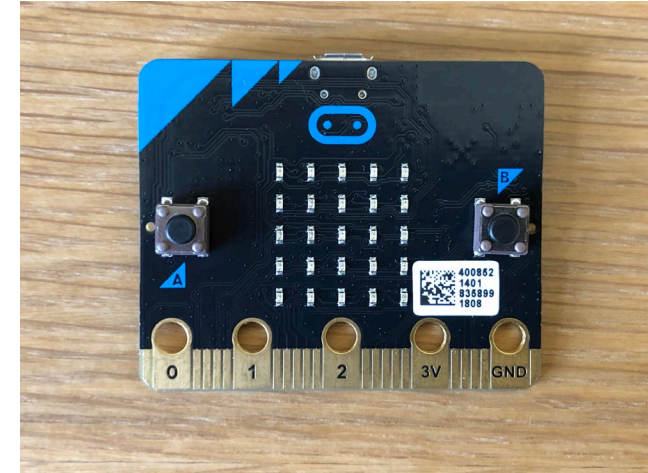
Using External Devices



arm School Program

Embedded Systems

- At the start of the course we discussed what **embedded systems** are
- Can anyone remember?



enviro:bit

- The **enviro:bit** is an amazing device that contains lots of different sensors
- There are three categories of sensors on the enviro:bit
 - Air and weather
 - Colour and light
 - Sound
- Today we are going to focus on the air and weather section
- There are three different sensors that make up air and weather: **humidity**, **pressure** and **temperature**

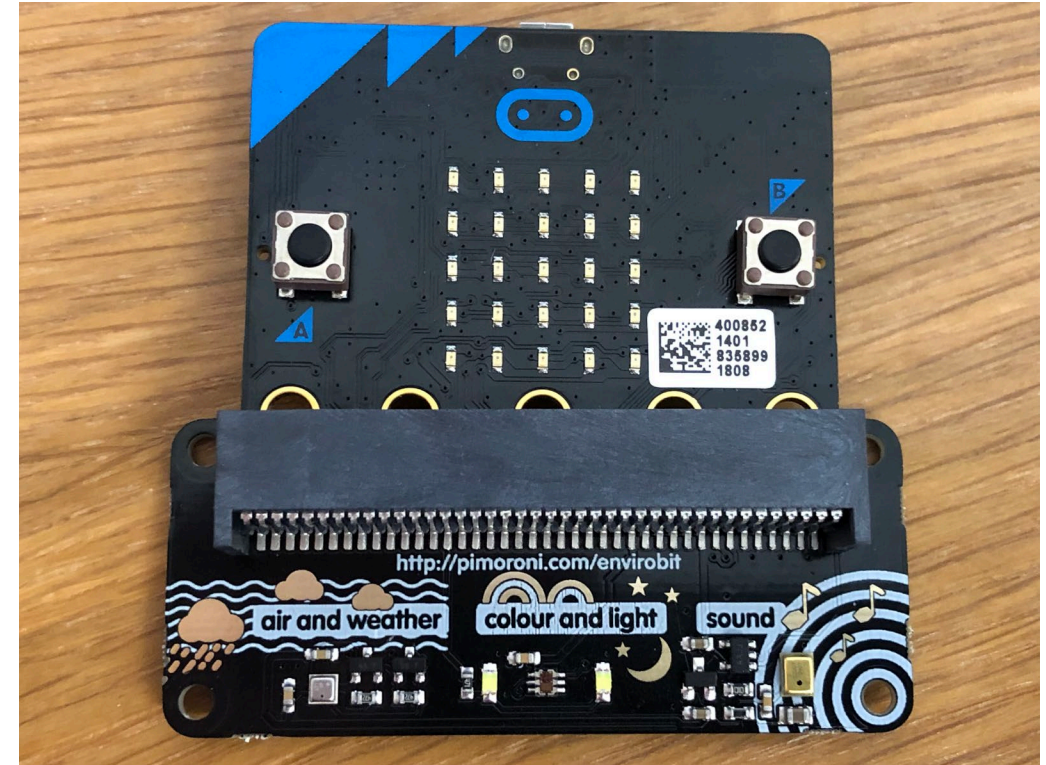


Software Libraries

- We are using an **external device** – the blocks necessary to program the enviro:bit are not on the MakeCode website
- To be able to program the enviro:bit we need to install its software **library**
- By installing the library we will then see the blocks of code needed to develop our own enviro:bit sensor applications

Assembling the System

- To make the complete system the micro:bit should be inserted into the enviro:bit
- The copper contacts at the base of the micro:bit allow the two devices to communicate



Coding the enviro:bit

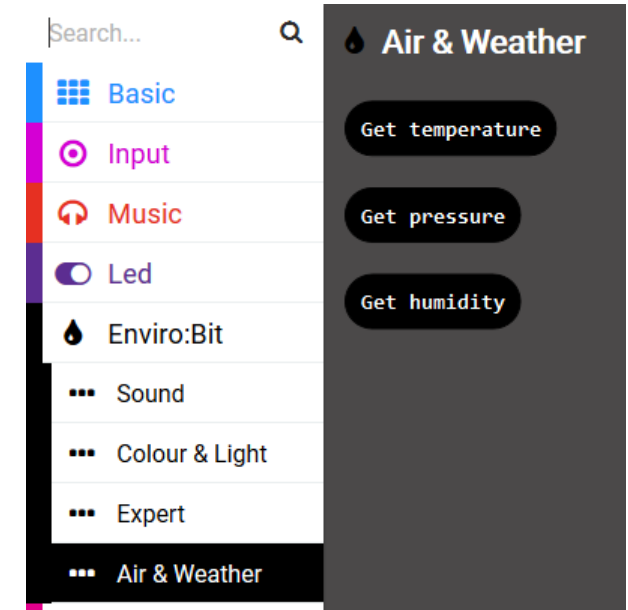
- The micro:bit program:
 - Takes a pressure reading when Button A is pressed
 - Takes a humidity reading when Button B is pressed

Pressure

- A rapid increase in pressure suggests an approaching thunderstorm or rain front

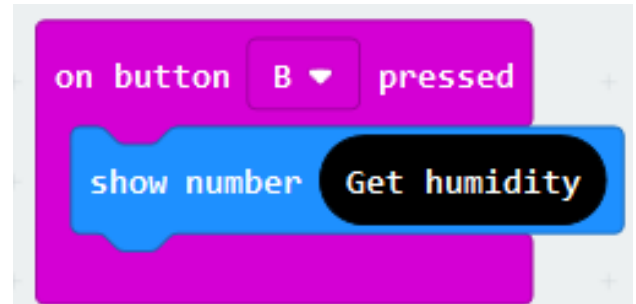
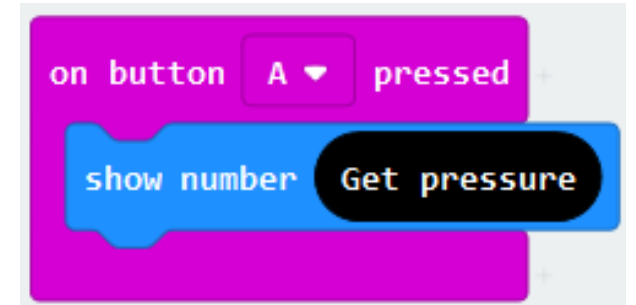
Humidity

- This measurement suggests how comfortable we find the air
- High humidity could suggest fog or dew, depending on the season



Displaying Pressure and Humidity

- The pressure and humidity readings are both numbers
- Using the *show number* block we can display the pressure and humidity
- You should enter the blocks of code below into MakeCode
- Can you expand the code so that a message is displayed so that it says 'Pressure is:' and then the pressure?
- You should do the same for humidity
- Can you also add in the units of measurement for pressure and humidity? You may wish to research the units of measurement on the internet



Stretch Task

- Can you add to your code so that the user can use a different control to display the temperature reading?

Thank You

Danke

Merci

谢谢

ありがとう

Gracias

Kiitos

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