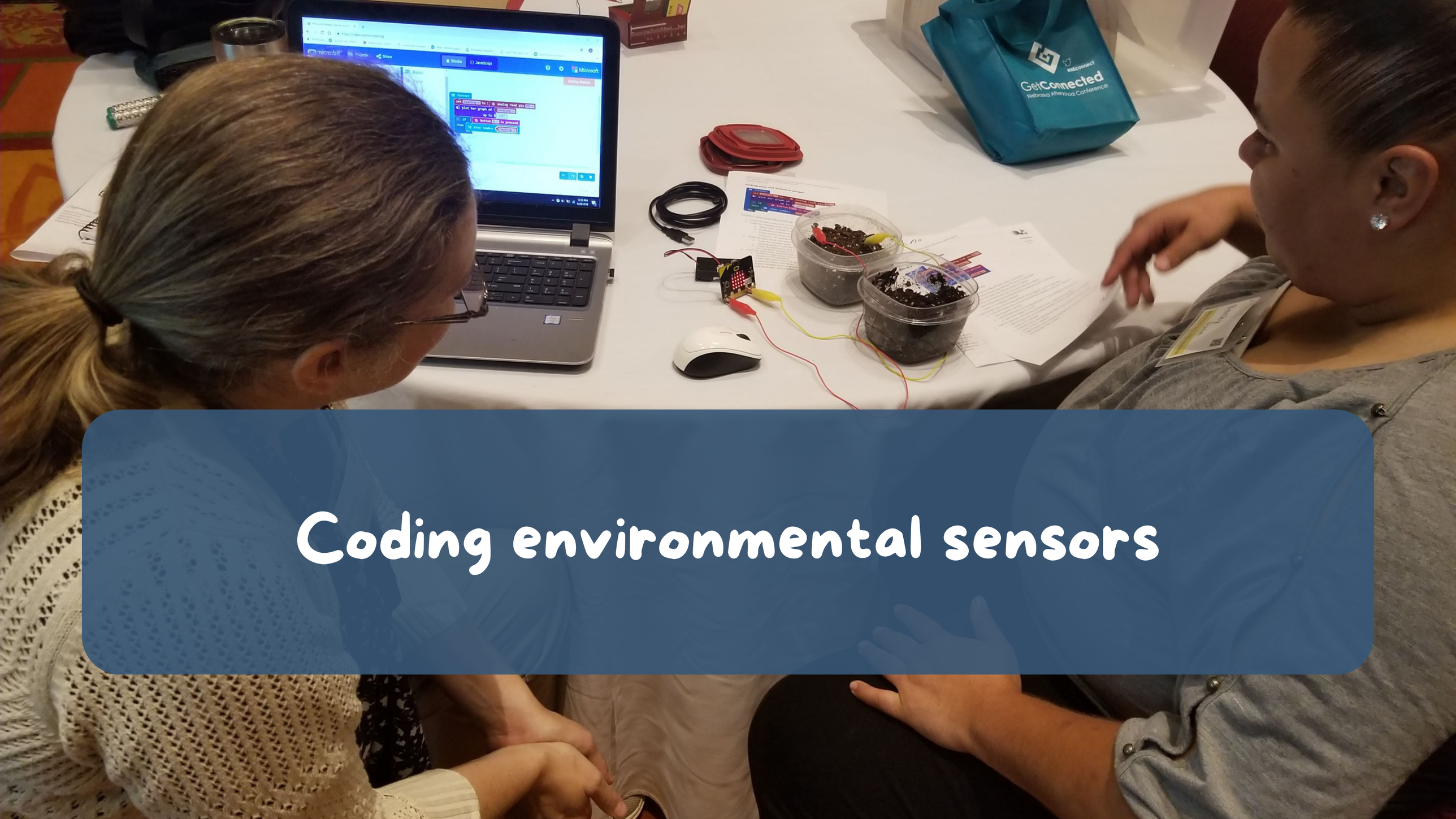
Garden TOOLS

PROFESSIONAL DEVELOPMENT SERIES

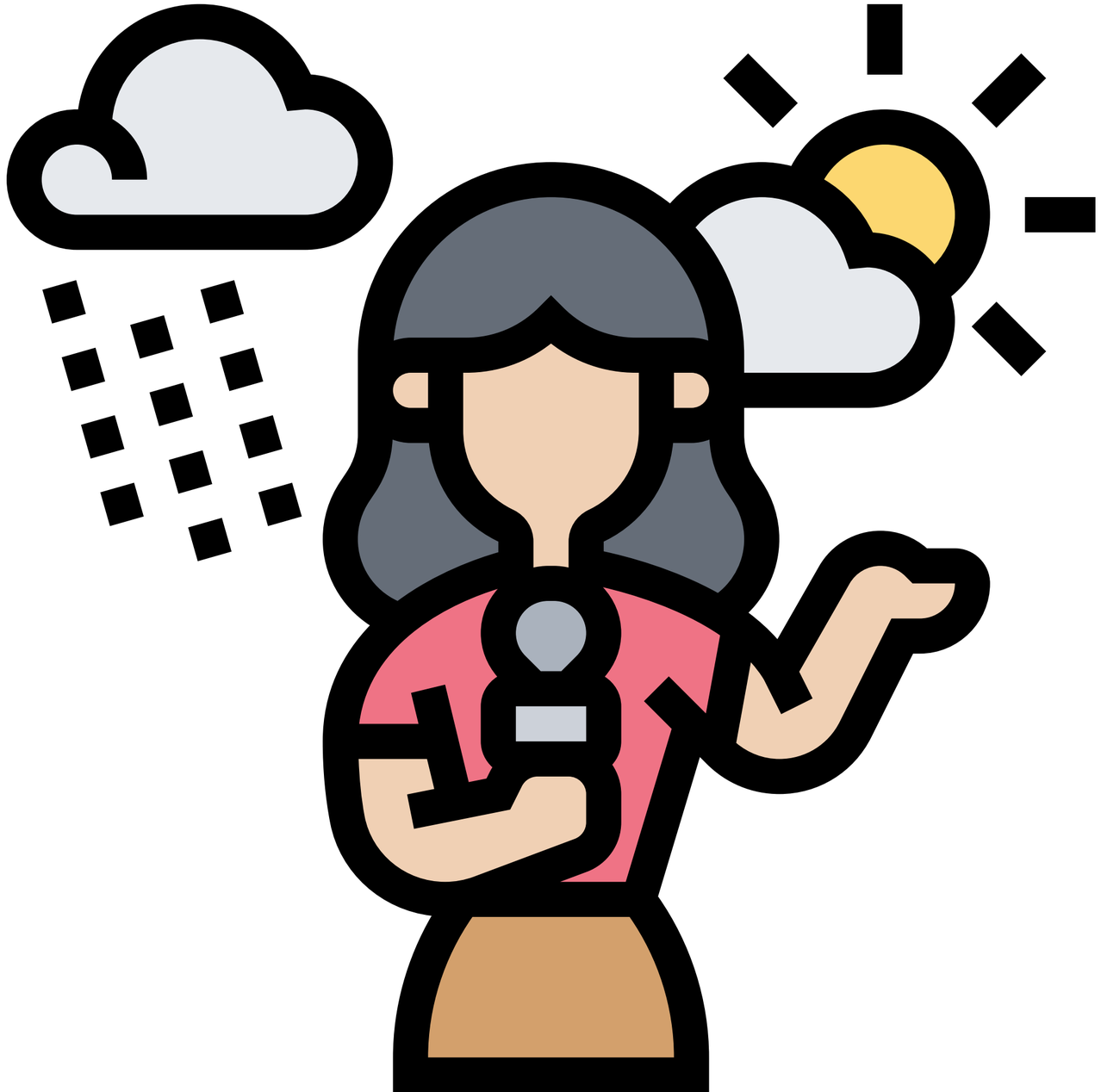


Coding environmental sensors

Notice and Wonder

One of our goals is to support exploration and curiosity.

Coding and using sensors is one way to do this in a garden setting.



I want you to think about the weather...

Without using any tools or technologies, how would you describe the weather outside today?

Imagine I give you a BBC micro:bit that measures one of the following:

LIGHT LEVEL

TEMPERATURE

SOIL MOISTURE

Go outside and explore

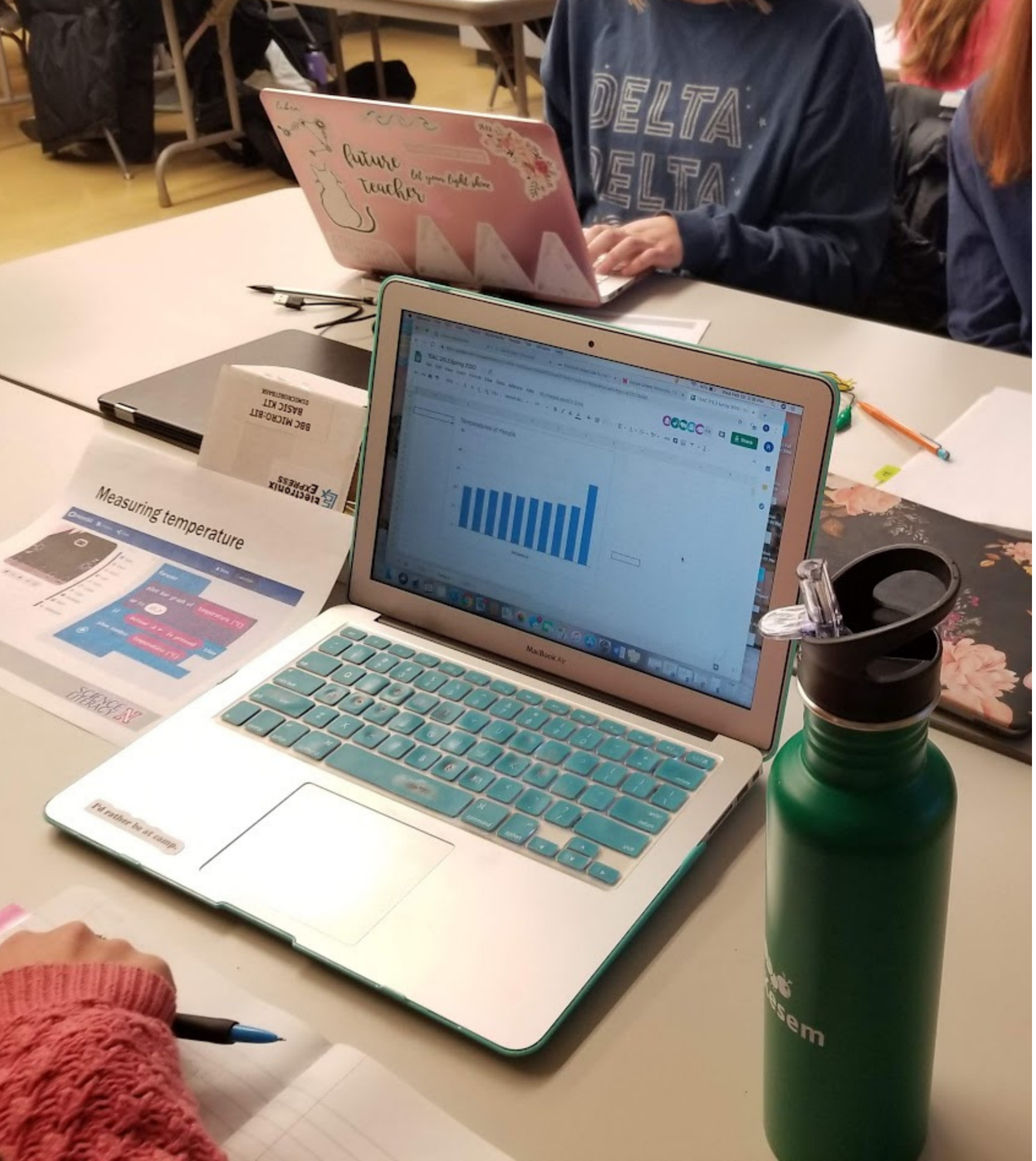
Take measurements for 5 minutes to answer the following questions:

1

Are conditions the same everywhere?

2

What are the most extreme conditions you can find?



Share and Compare

Imagine comparing your measurements with others.

How would YOU visualize the data? How would visualizing the data help you to look for patterns?

Now that you know why, let's talk about how...

I am going to walk you through the basics of coding each of the three environmental sensors.

The code looks and functions very much the same for each.

TEMPERATURE

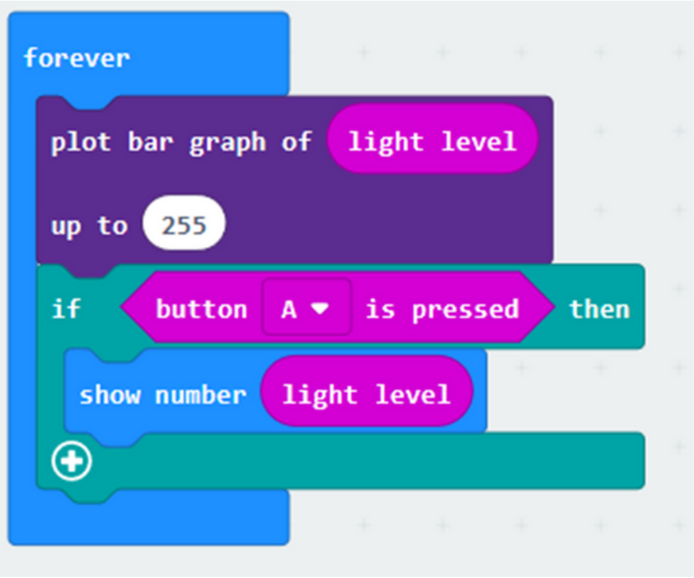
LIGHT LEVEL

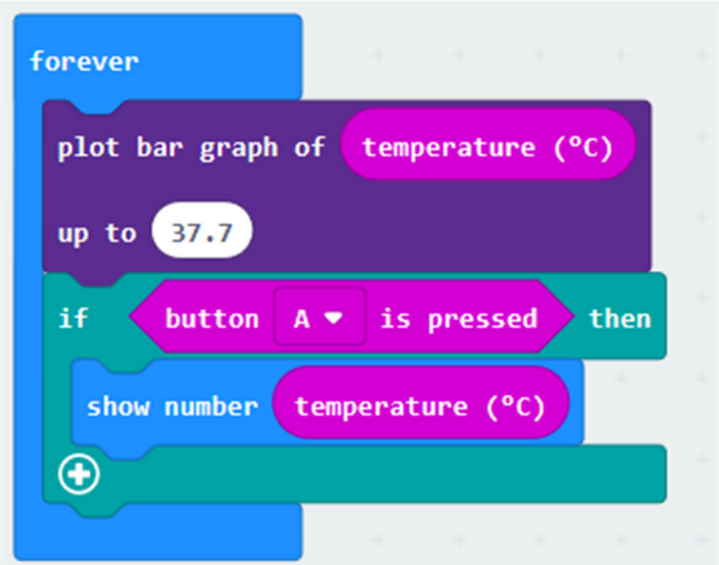
SOIL MOISTURE

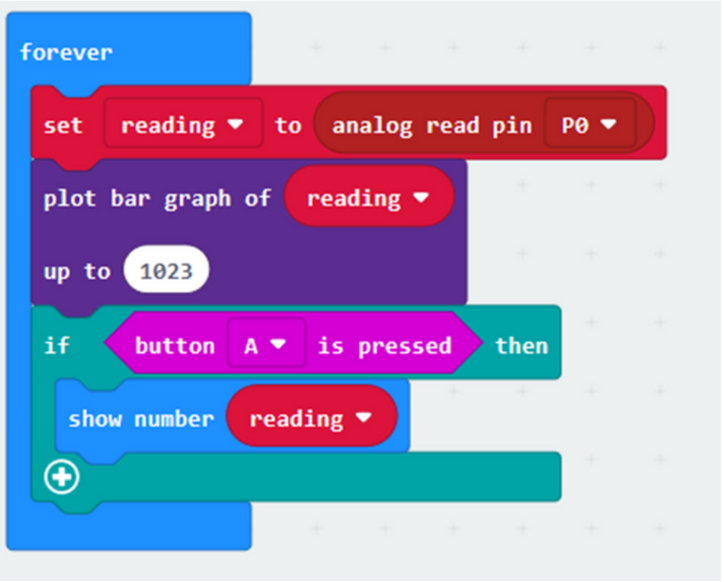
LIGHT LEVEL

TEMPERATURE

SOIL MOISTURE







What similarities do you notice?

In all cases, the code functions to do two things:

1. SHOW A GRAPH
2. SHOW A NUMBER WHEN THE "A" BUTTON IS PRESSED

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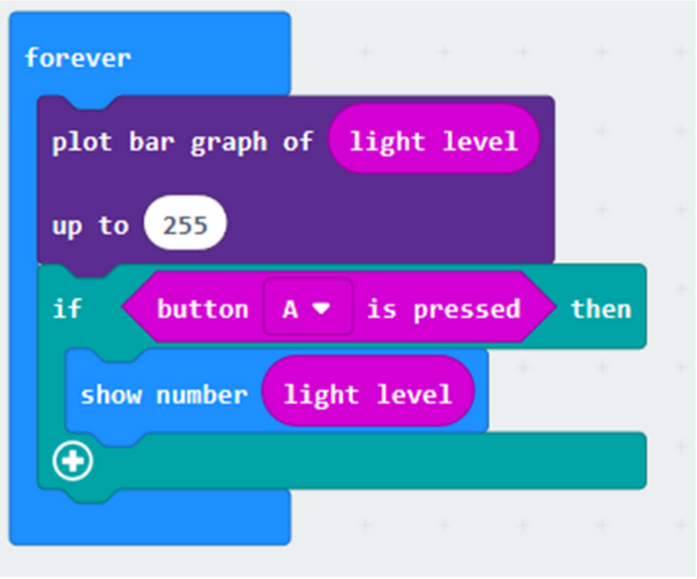
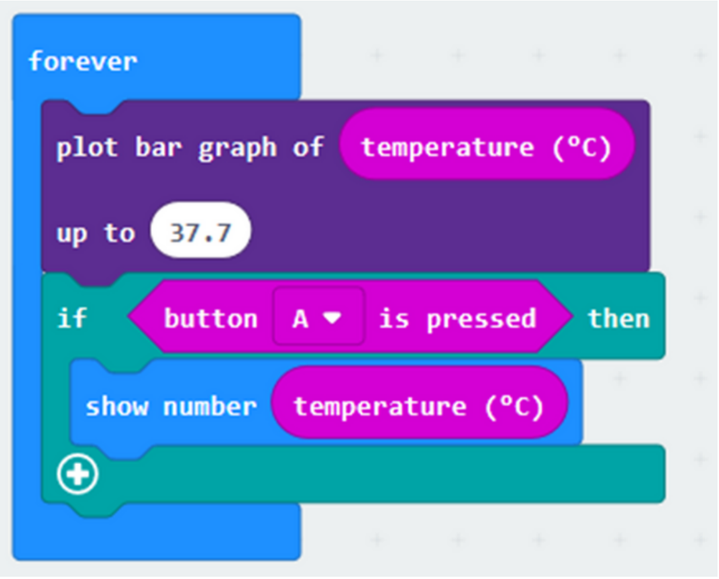
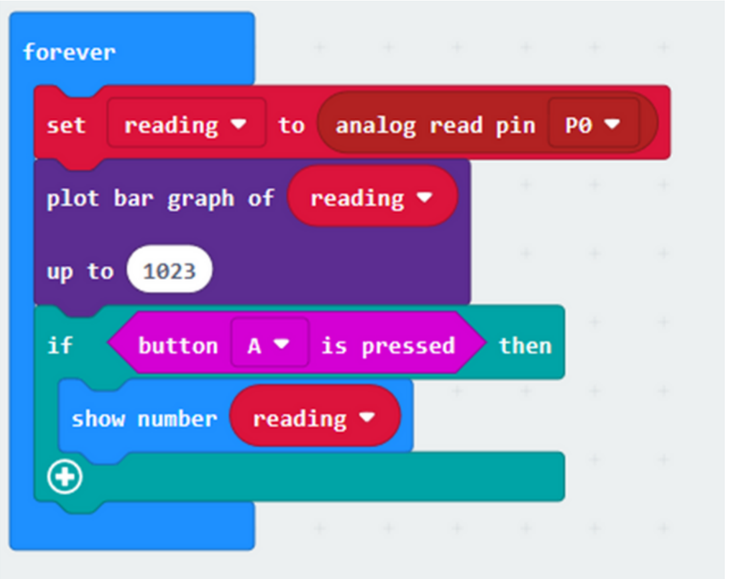
1 SHOW A GRAPH

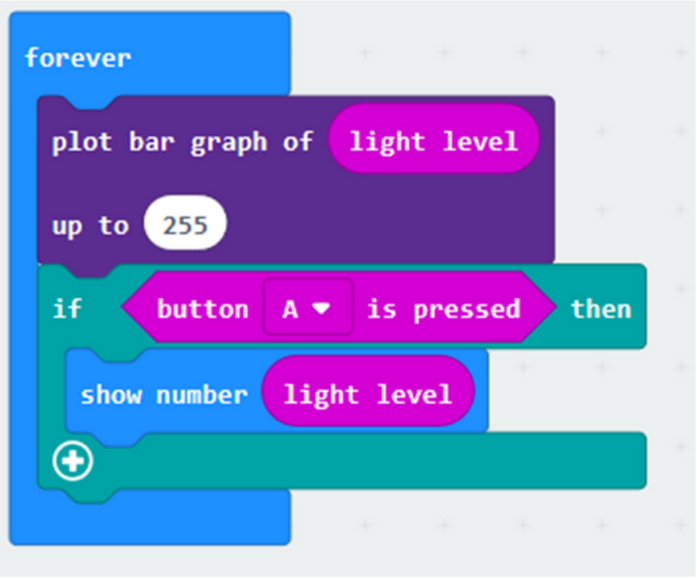


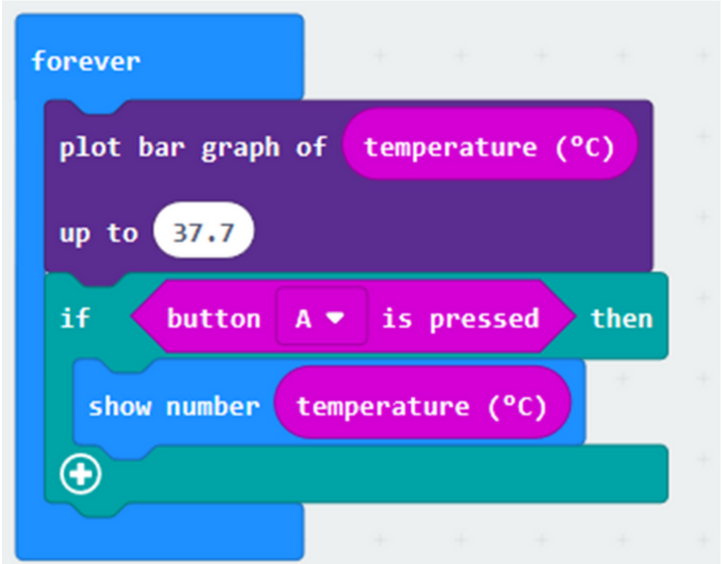


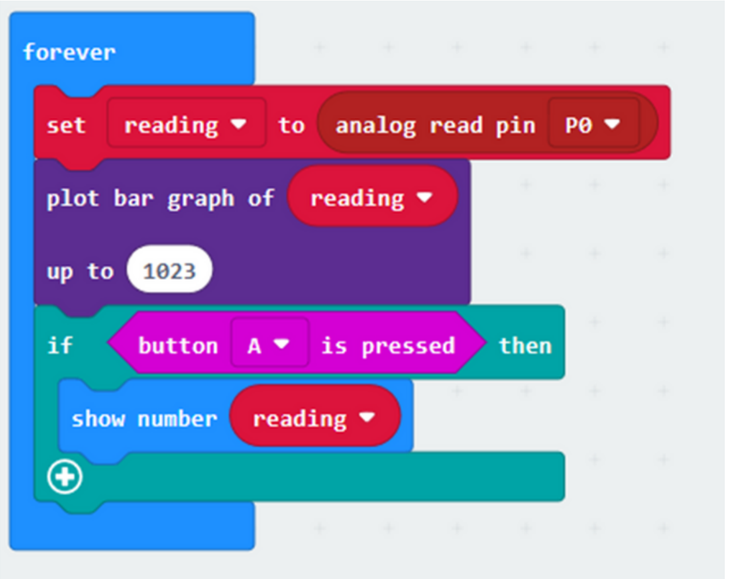


In all cases, the code functions to do <u>two</u> things:

2 SHOW A NUMBER WHEN THE "A" BUTTON IS PRESSED







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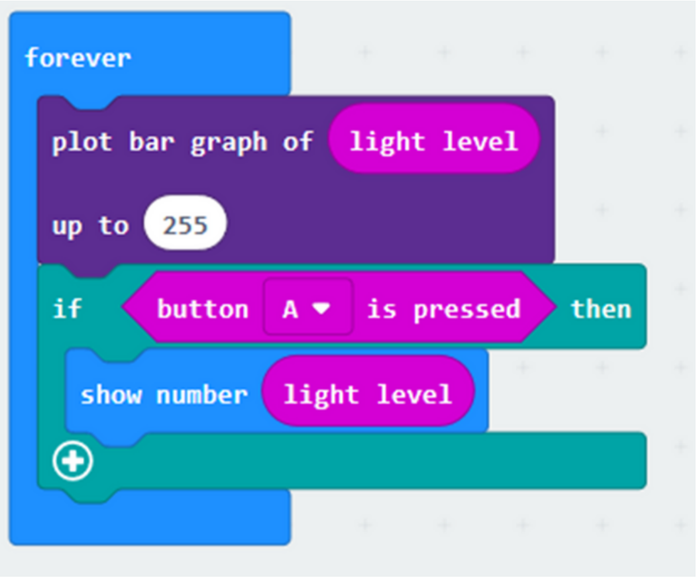
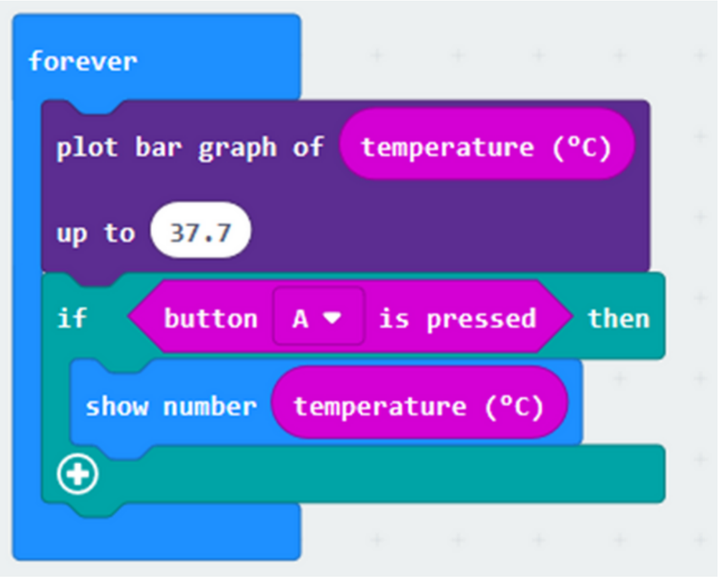
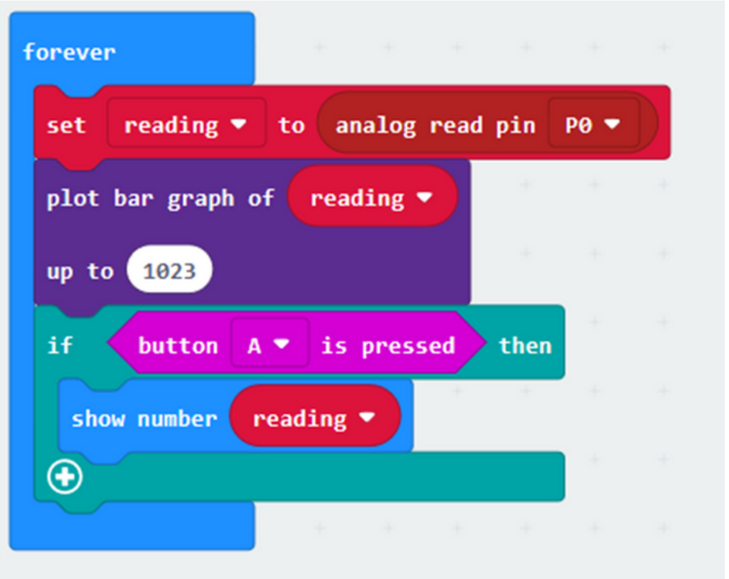
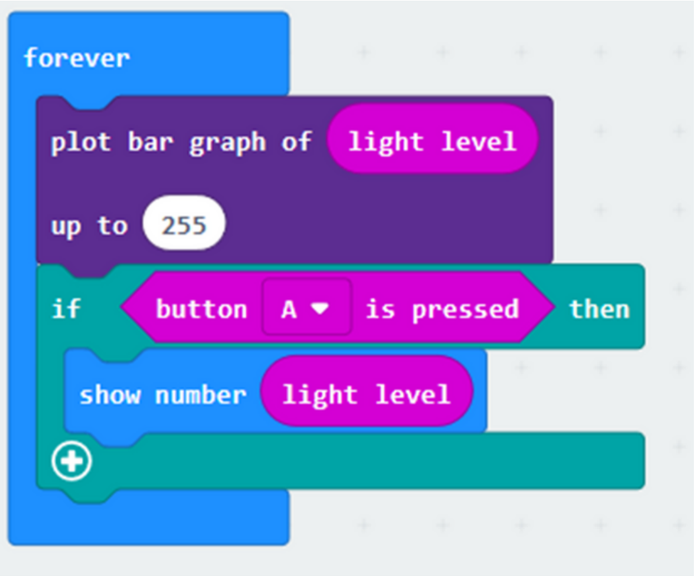
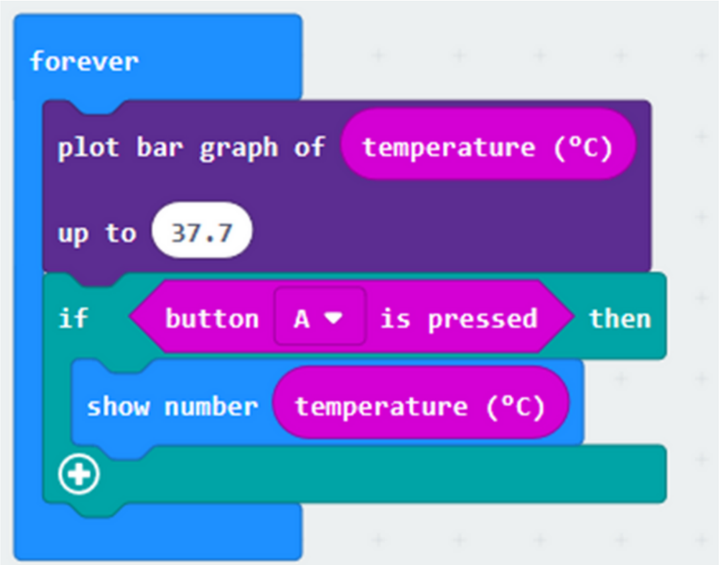
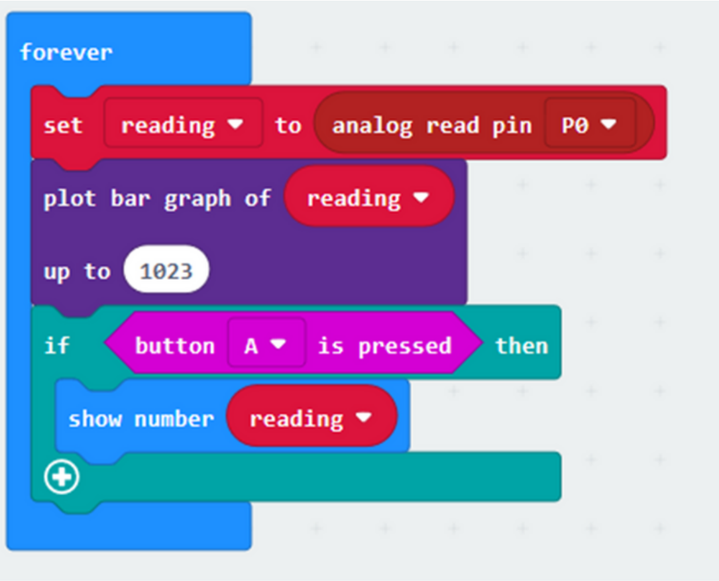






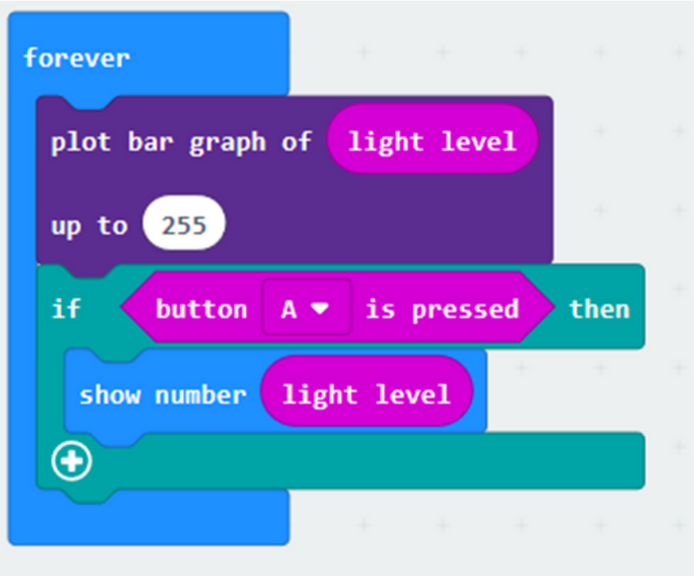


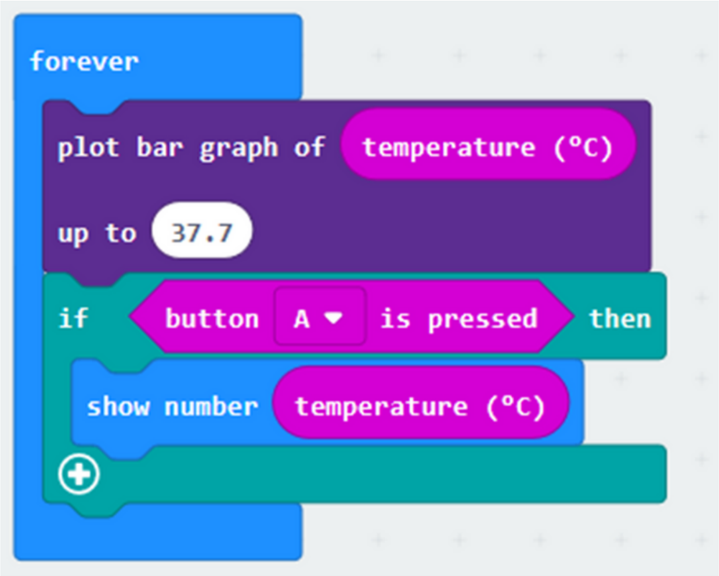


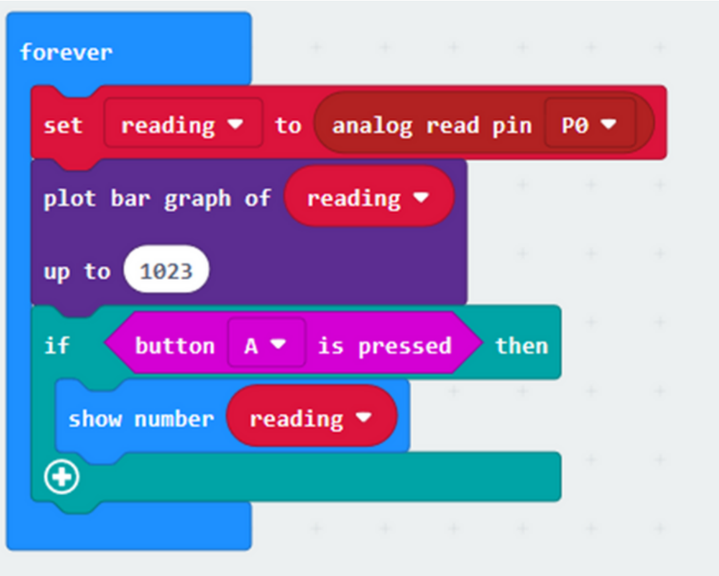


What is measured and how it is communicated depends on the details you include in the program.

A great example of abstraction!



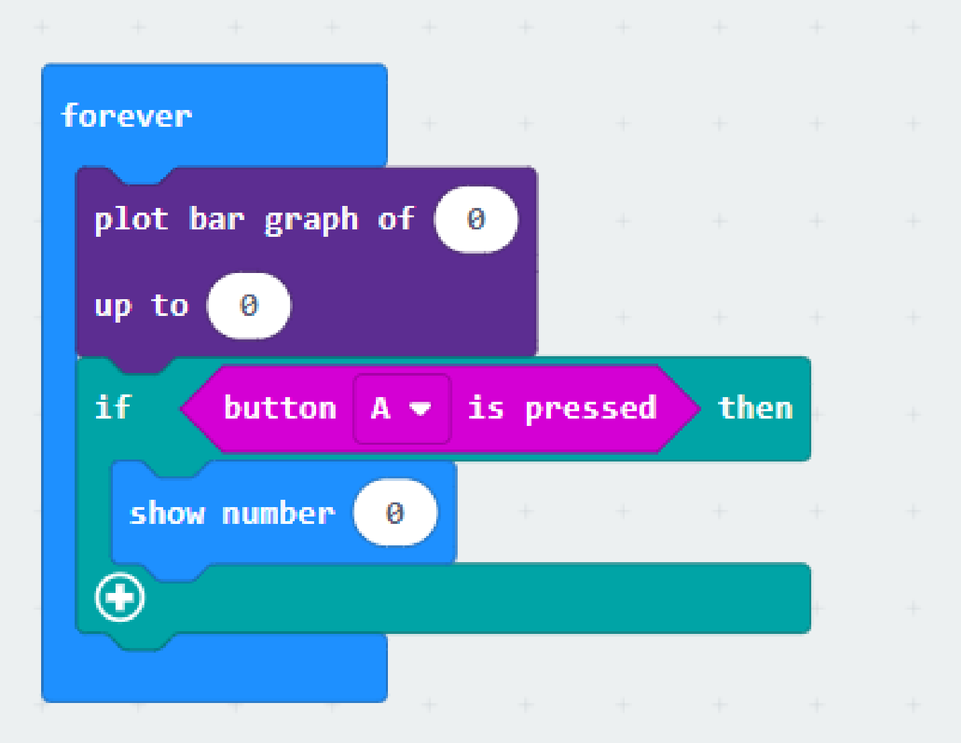




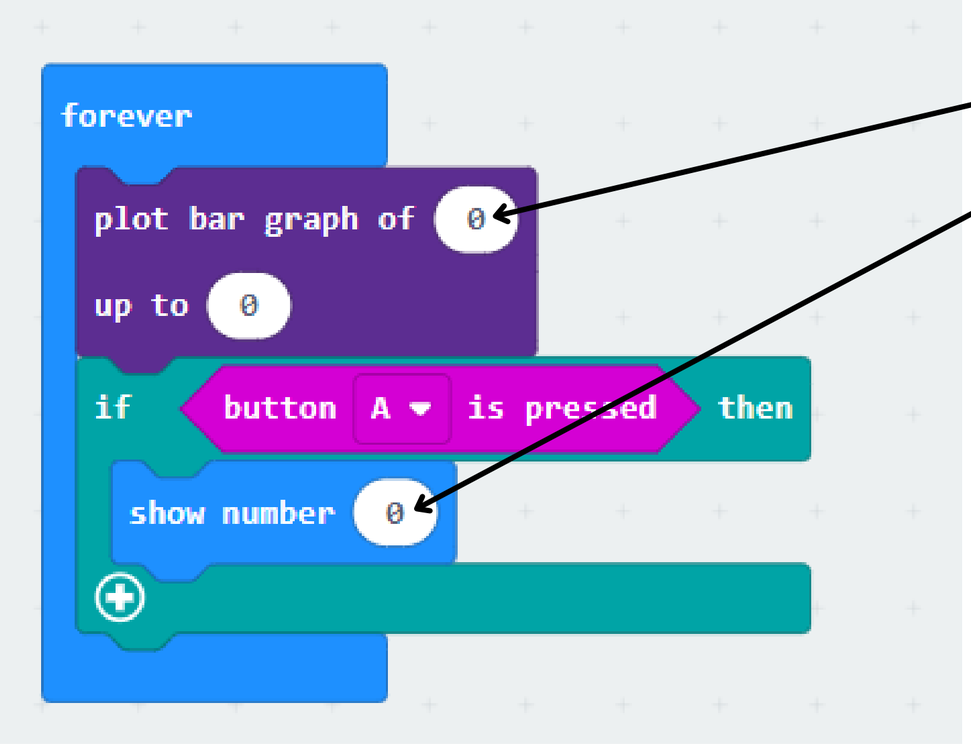
Take away all the details that are specific to a single program.

Leave everything else.

It looks a little something like this...



Now fill in the blanks with details...



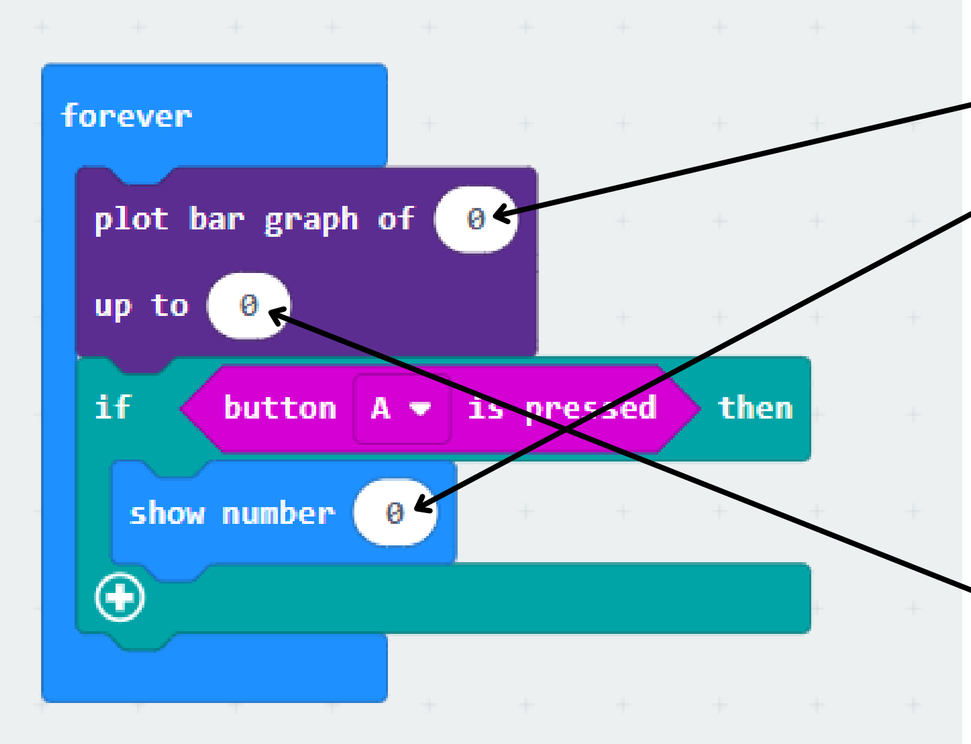
Choose your input

Light level

Temperature

Create a variable
(Soil moisture)

Now fill in the blanks with details...



Choose your input

Light level

Temperature

Create a variable (Soil moisture)

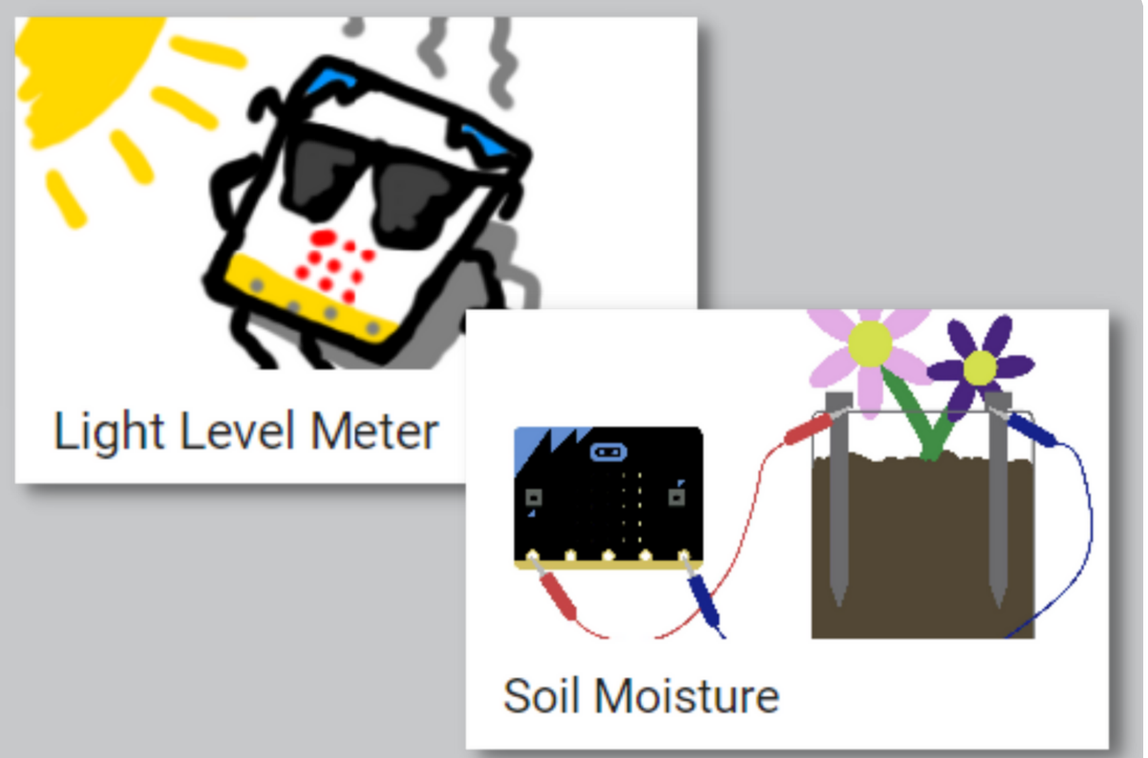
Type in the maximum number to graph

255

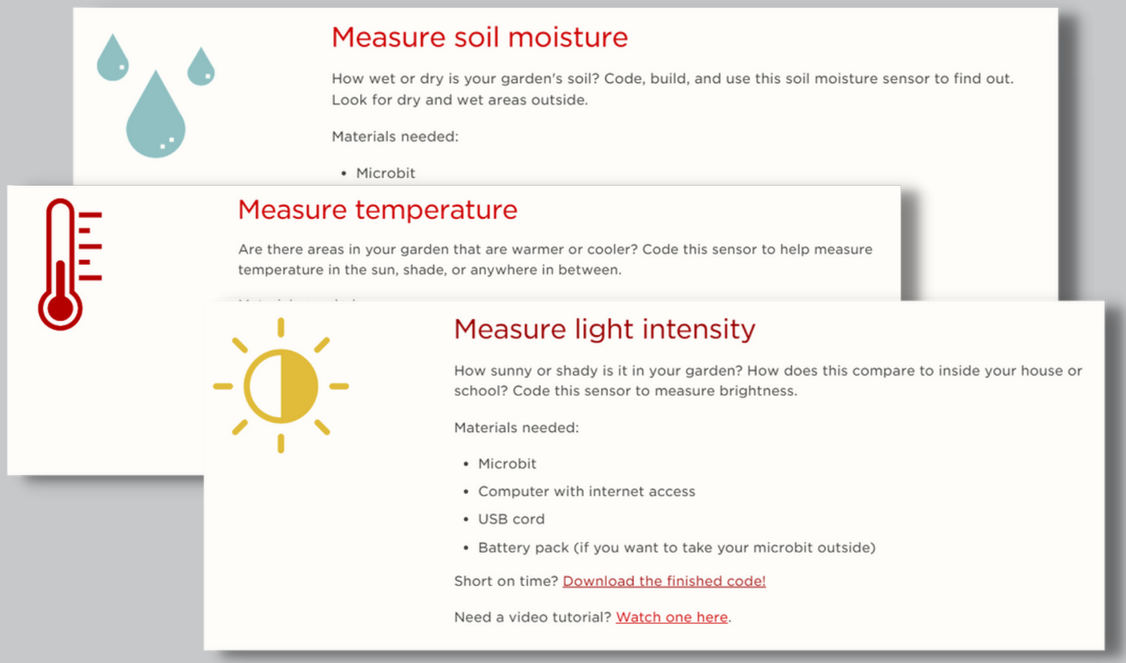
37.7

1023

Need help? You've got options!



- Use **tutorials on MakeCode** for light level and soil moisture sensing



- Check out our **how-to coding guides** on our website
  - Read the **written instructions with diagrams**
  - Watch the **video tutorials**
  - **Download the finished code** directly