Hello World

Using technology to connect students with outdoor growing spaces

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SCIENCE LITERACY
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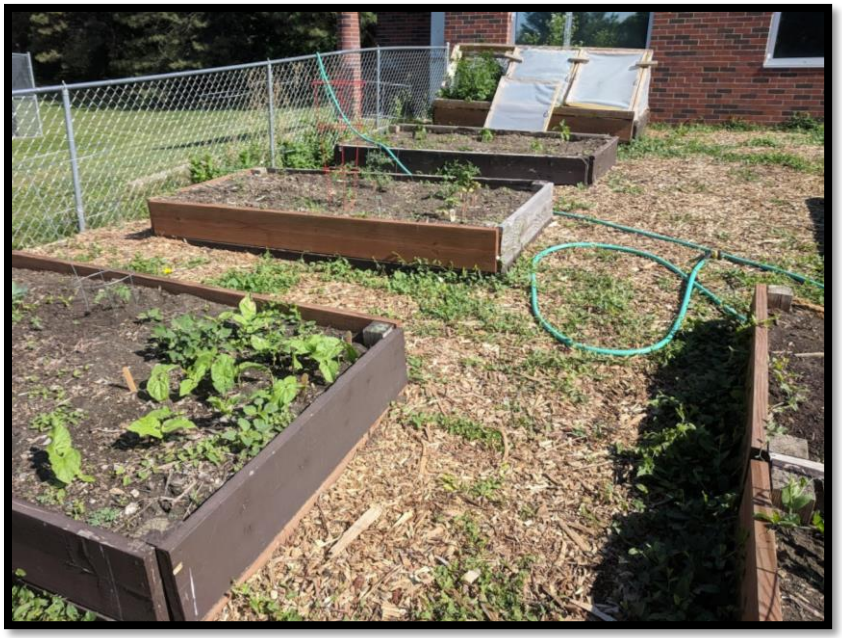
Getting to know you…

- Does your program have **access to a school garden**?
- What **challenges or benefits** do you feel come with students learning in the garden?



Decision-making in the garden

- Do **students play a role in making decisions** related to the garden?

Which crops should we plant and where?
When and how much should we water?

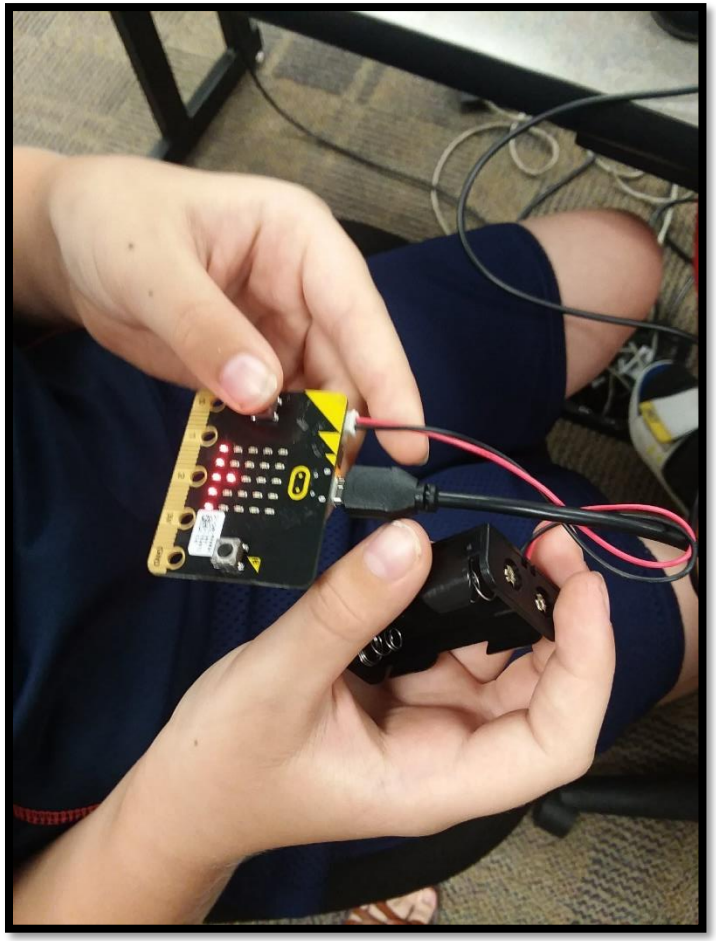
- What **challenges or benefits** come with students as decision makers?
- What **knowledge, skills, tools** or would be helpful in supporting student-driven decision-making?

Increasing Science Literacy

An enhanced capacity,
both at the individual and collective levels,
to make effective decisions
grounded in STEM-informed analyses
of complex, real-world challenges.

Why introduce technology in the garden?

- Transferable STEM knowledge and skills
- Relevant to students' lives and interests
- Generate and analyze data to make decisions
- Exposure to career connections

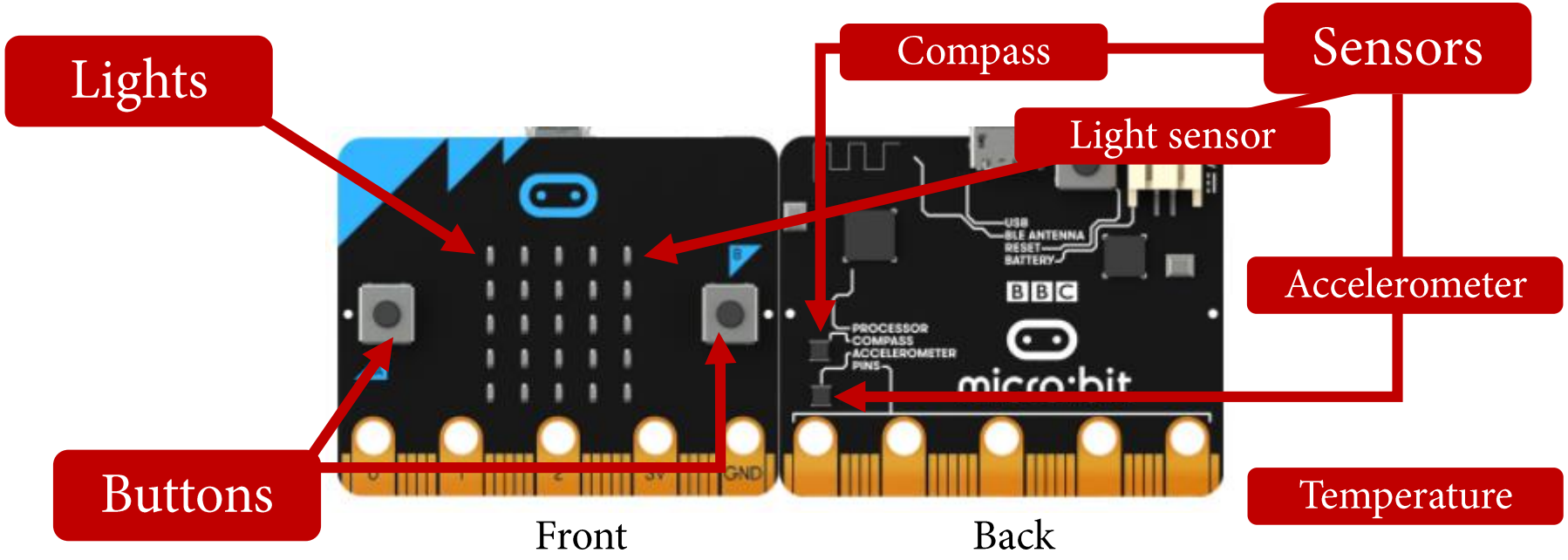


Our goals for today

- ❑ Introduce the micro:bit and its features
- ❑ Learn how to connect and program the micro:bit
- ❑ Practice drag-and-drop coding skills
- ❑ Apply coding skills to measure soil moisture

What is a micro:bit?

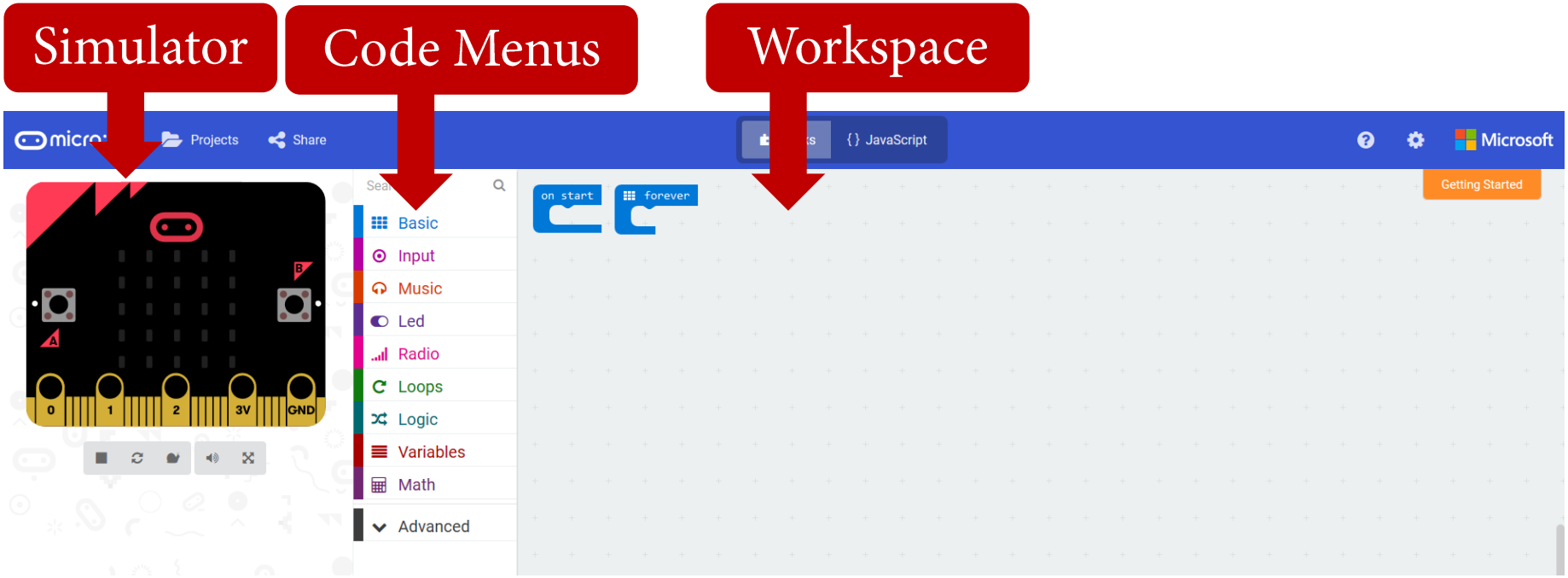
- A personal programmable device



http://microbit.org/guide/features/

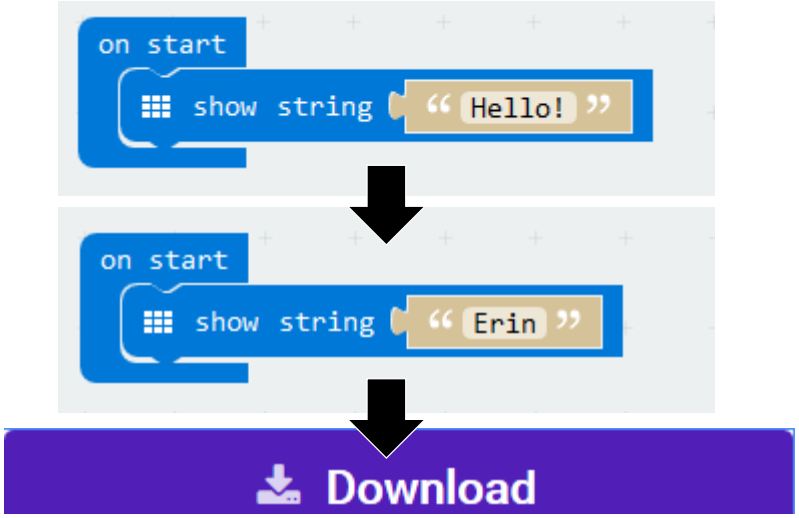
Programming your micro:bit

- Open a web browser (I recommend Firefox)
- Navigate to the code block editor, https://makecode.microbit.org/



Hello World!

- Follow tutorial directions
- Use drag-and-drop code blocks to create a program to show your name
- Download the program



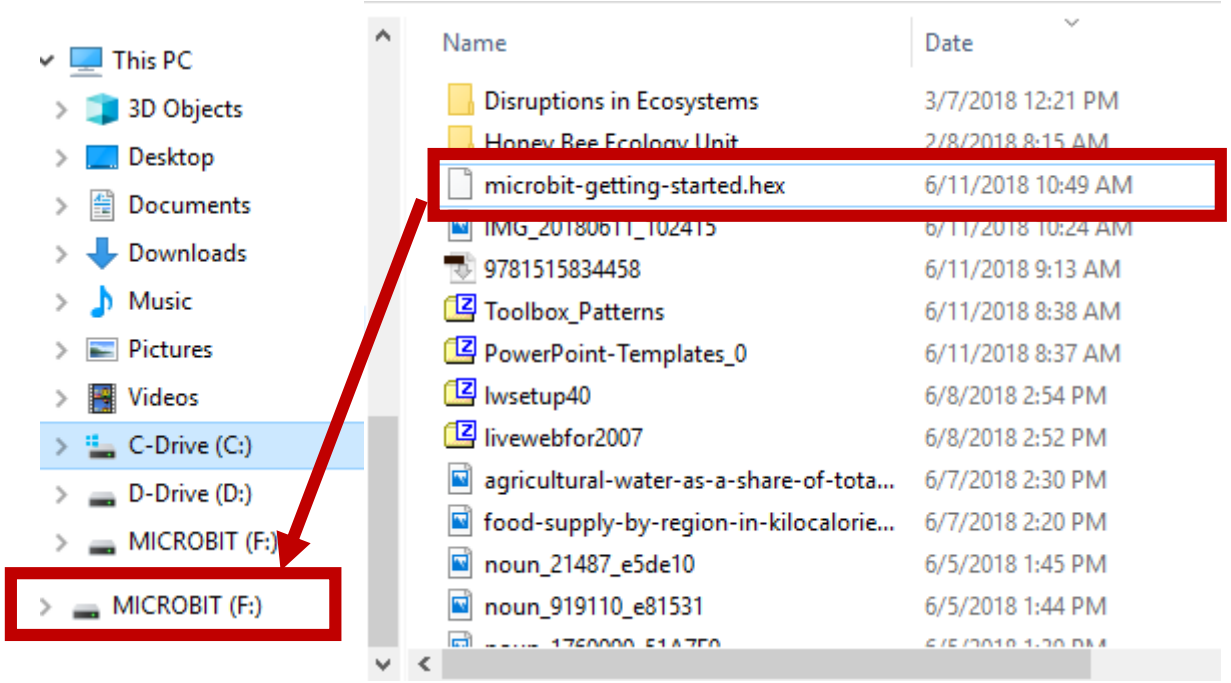
Connecting your micro:bit

- Using the USB cord, connect the board to your computer.

Front

Uploading a program

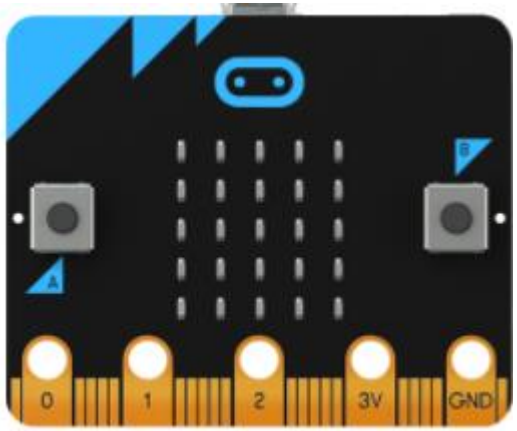
- Open Windows Explorer
- Find the MICROBIT device, drag program to device

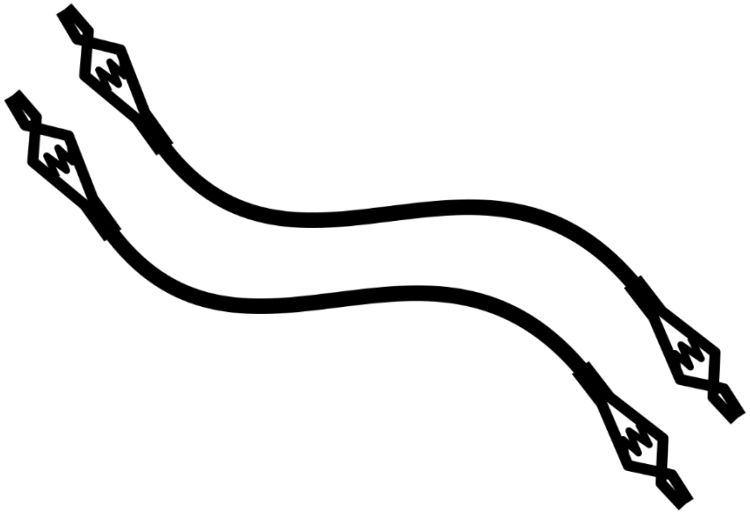


Making a soil moisture sensor

Materials

- 1 micro:bit
- 2 nails
- 2 alligator clips

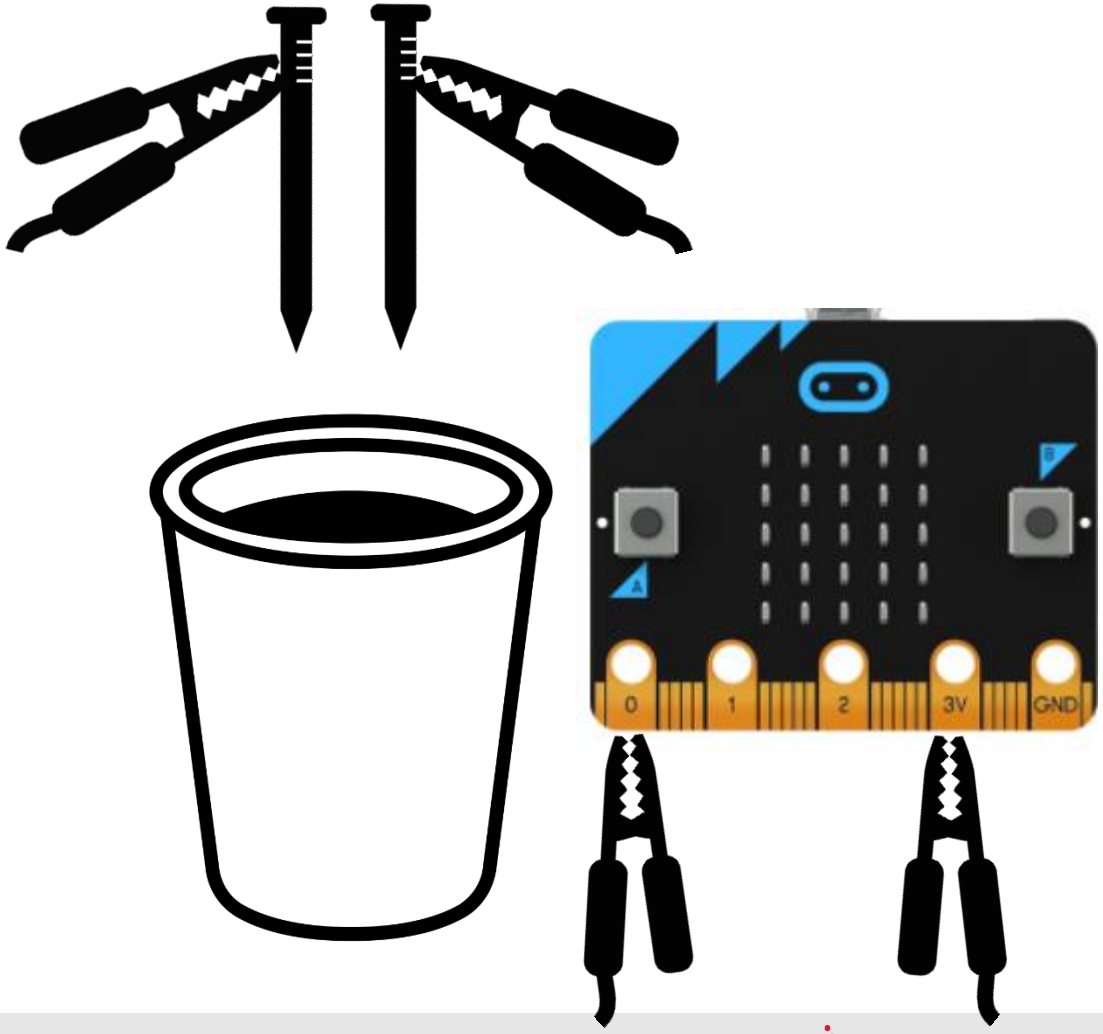




Making a soil moisture sensor

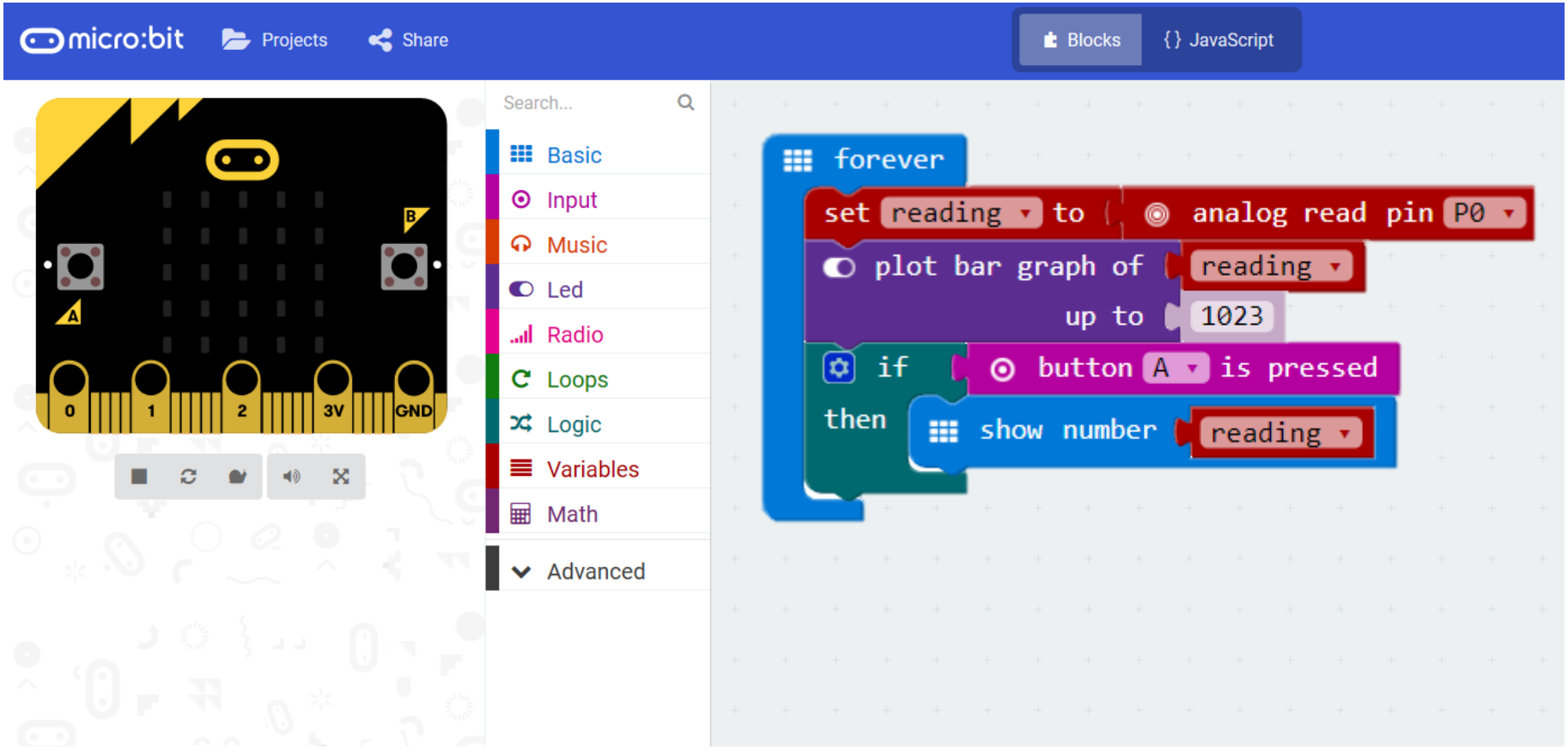
Steps

- Connect a nail to the **3V** pin with a croc clip
- Connect the other nail to the **P0** pin with a croc clip
- Insert nails into soil

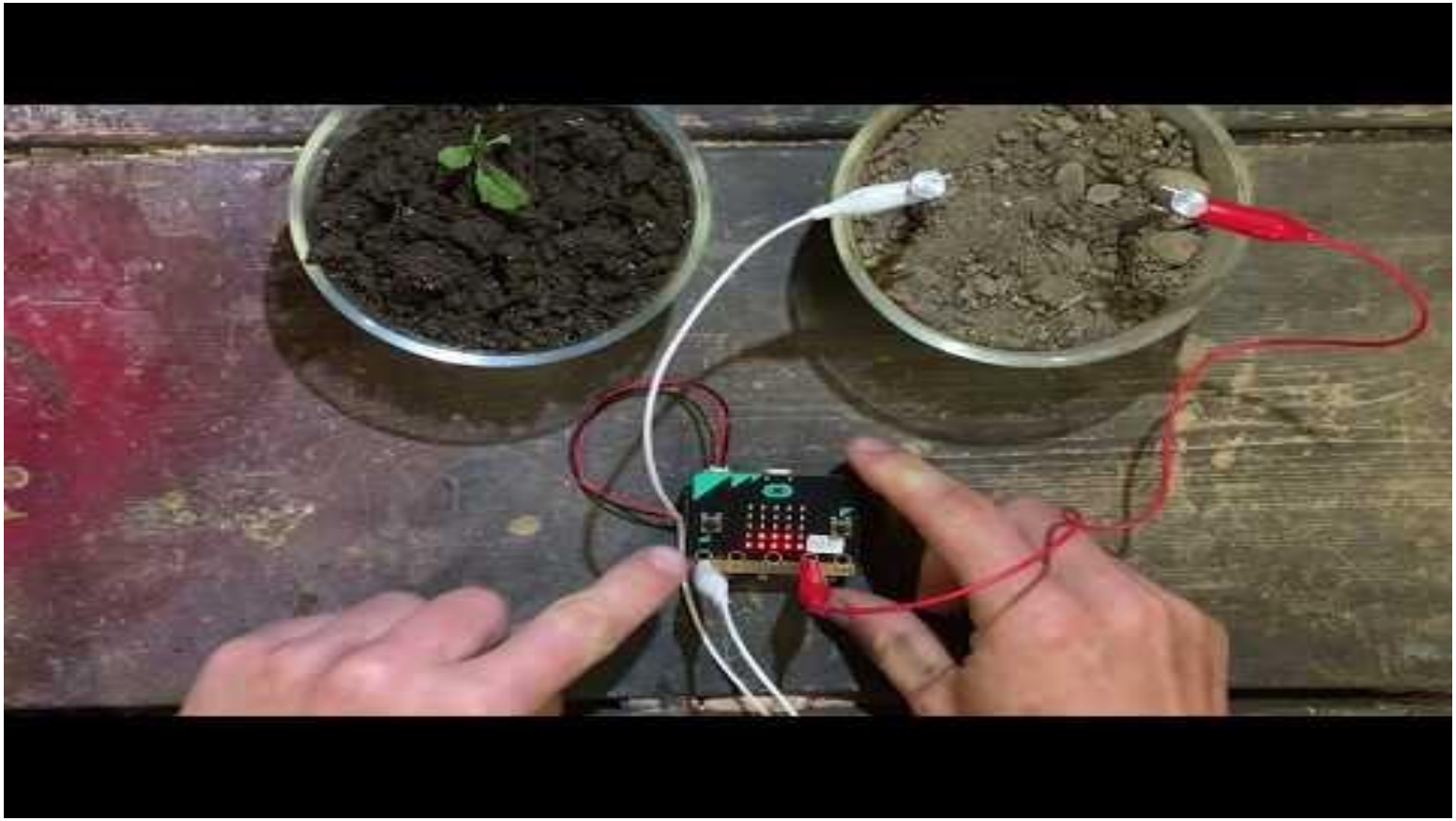


Coding the soil moisture sensor

- Navigate to https://makecode.microbit.org/



Testing your sensor



Discussion

- How might students explore the garden using sensors?
- What data can we gather using sensors?
- How can this data support better decision making in the garden?

Summer Pilot

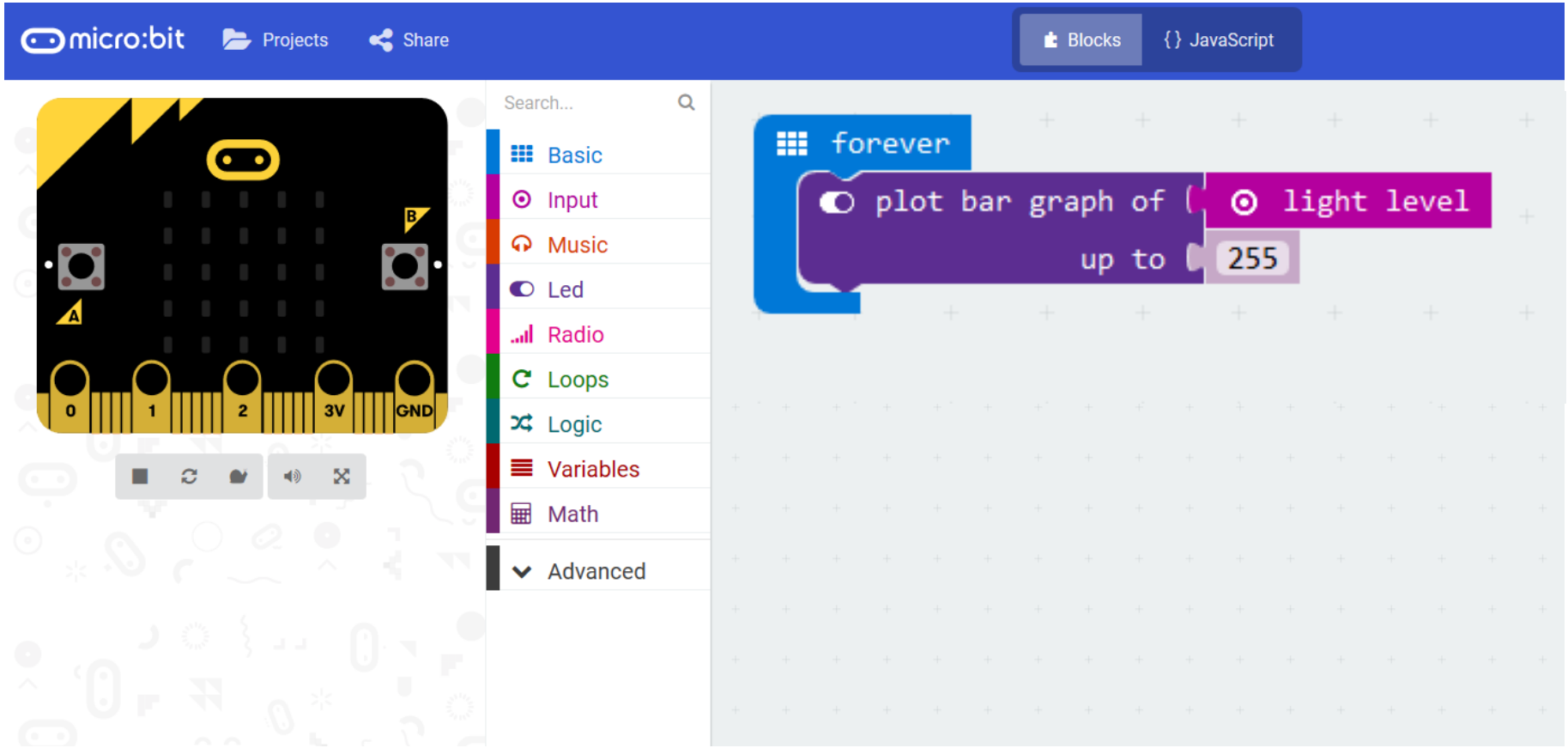
- Miranda Earnest
  - Senior Agronomy and Horticulture major
  - Science Literacy Initiative summer intern
  - Piloted materials at CLC sites in Central Nebraska over the summer
- Tips and Tricks
- Challenges

Student feedback

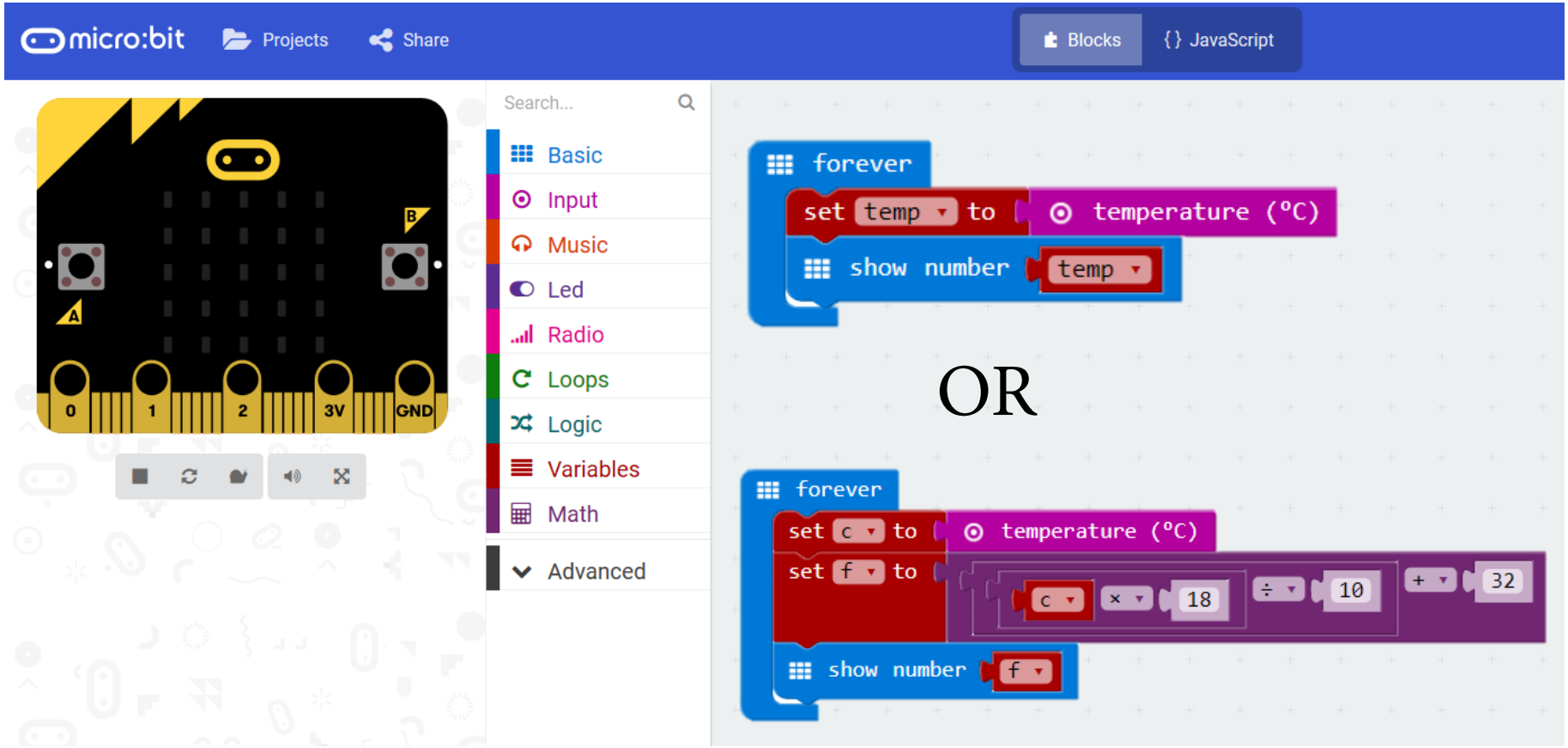
- I love it! **It made me feel really smart** when I coded the microbit. I loved when we tested the code! It was interesting.
- I like checking the soil and when **we went to the gardens** and put them in the soil and **got different results**
- It was fascinating how **we programmed the microchips to tell us how much moisture** was in the plants.

Questions?

Measuring light



Measuring temperature



Looking for more ways to use your micro:bit?

- Projects: http://microbit.org/ideas/
- Lessons: A 14-week introduction to computer science course, https://makecode.microbit.org/courses/csintro