

---

# Interdisciplinary Physical Computing Lessons Learned!



## Rashmi Pimprikar

ISTE Computer Science PLN Leadership Team  
Director of Curriculum, C-STEAM Futures  
&  
Program Director STEAM + Computer Science  
Lesley University STEAM Learning Lab, Graduate  
School of Education  
Email: [rashmi.pimprikar@lesley.edu](mailto:rashmi.pimprikar@lesley.edu)

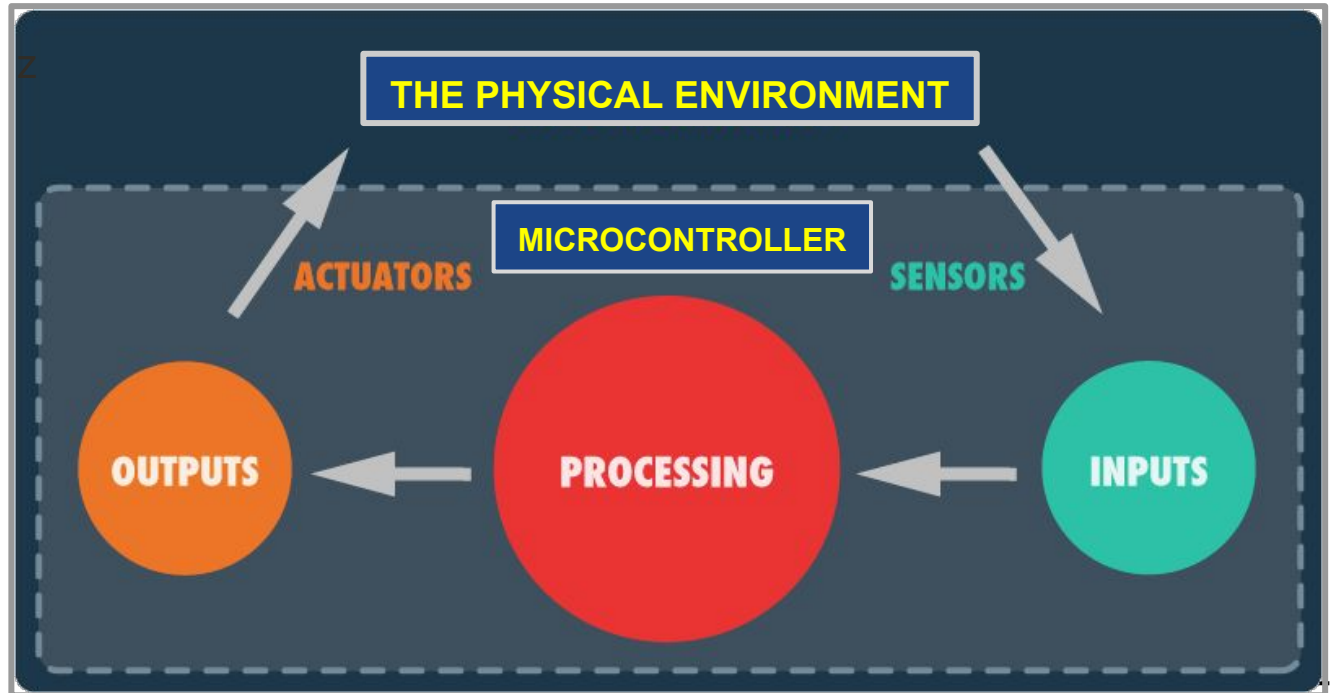
## Sue Cusack

Assistant Professor,  
Lesley University  
Graduate School of Education  
&  
Director  
Lesley STEAM Learning Lab  
Email: [scusack@lesley.edu](mailto:scusack@lesley.edu)

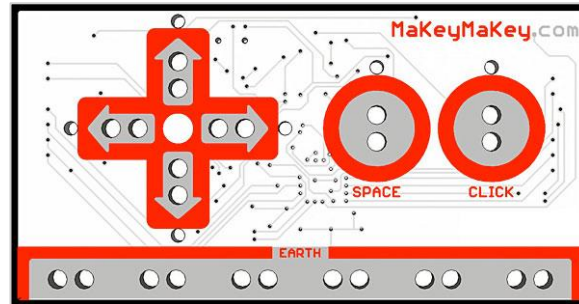
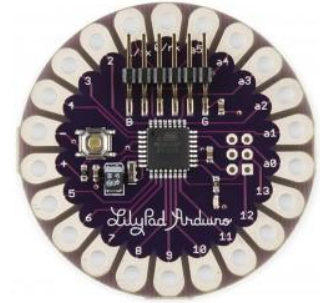
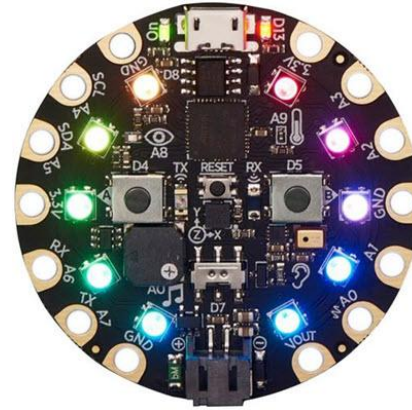
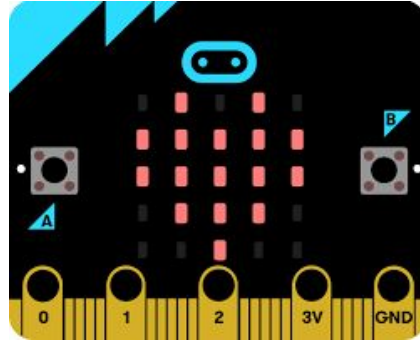
---

# What is Physical Computing?

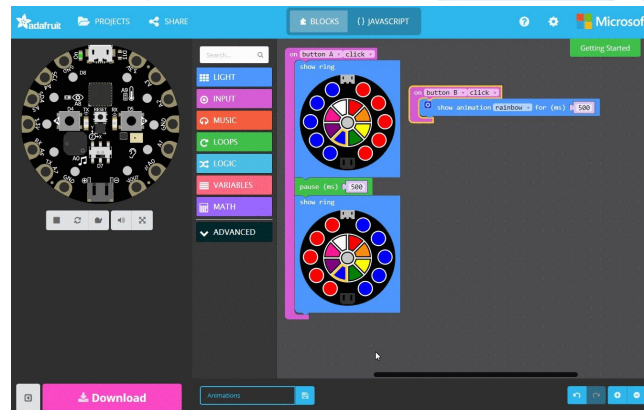
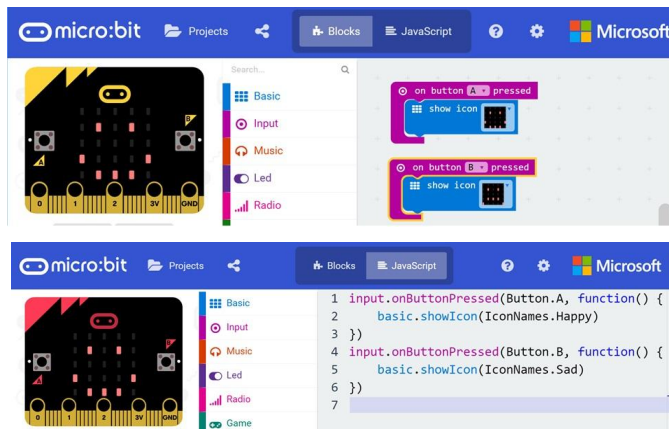
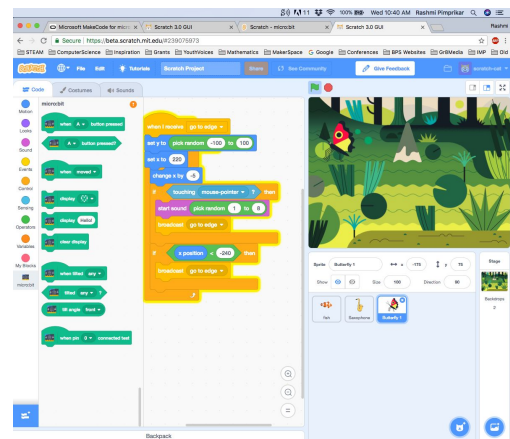
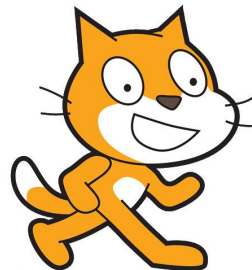
Physical Computing lies at the intersection of the physical and the digital



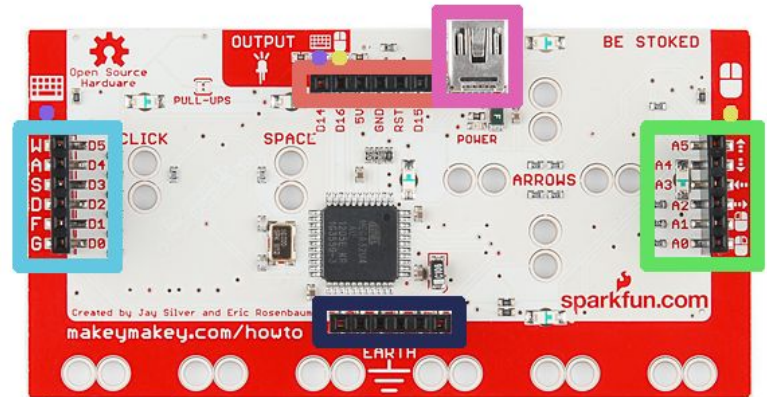
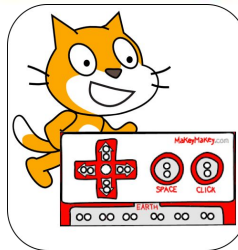
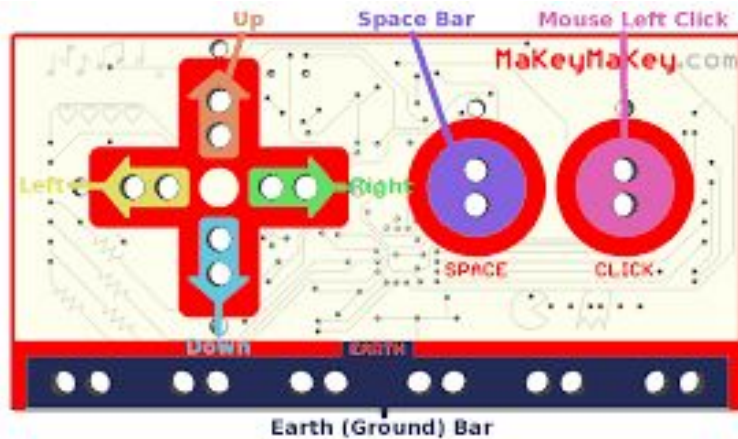
# Devices



# Environments



# Makey Makey and Scratch

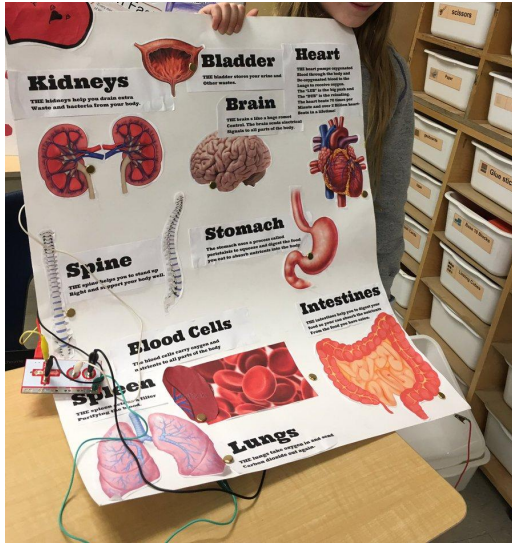


- USB Connector (Mini-B)
- Keyboard (W, A, S, D, F, G)
- Mouse (Up, Down, Left, Right, Left Click, Right Click)
- Keyboard LEDs
- Mouse LEDs
- Earth (Ground)
- Output/Expansion Header (D14, D16, 5V, GND, Reset, D15)

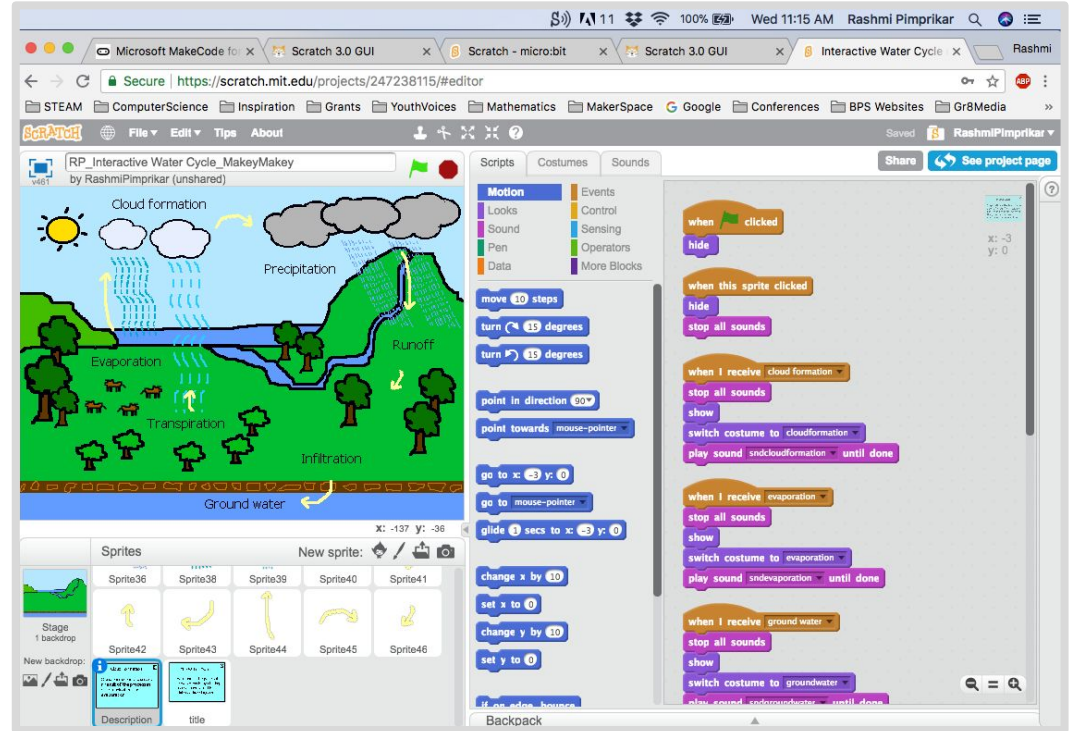
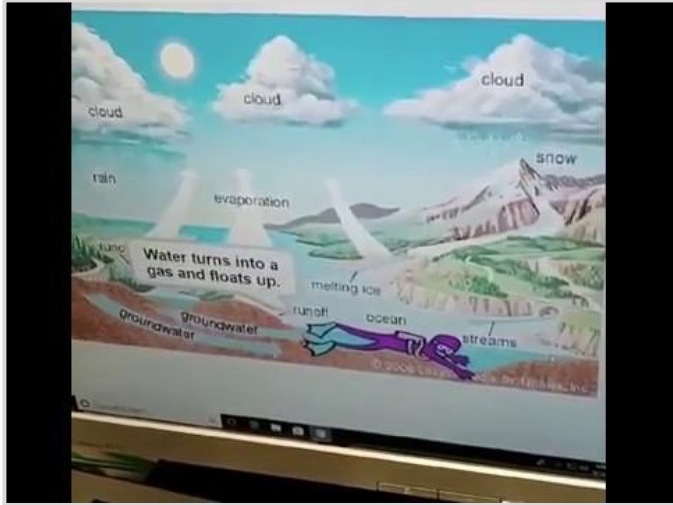


---

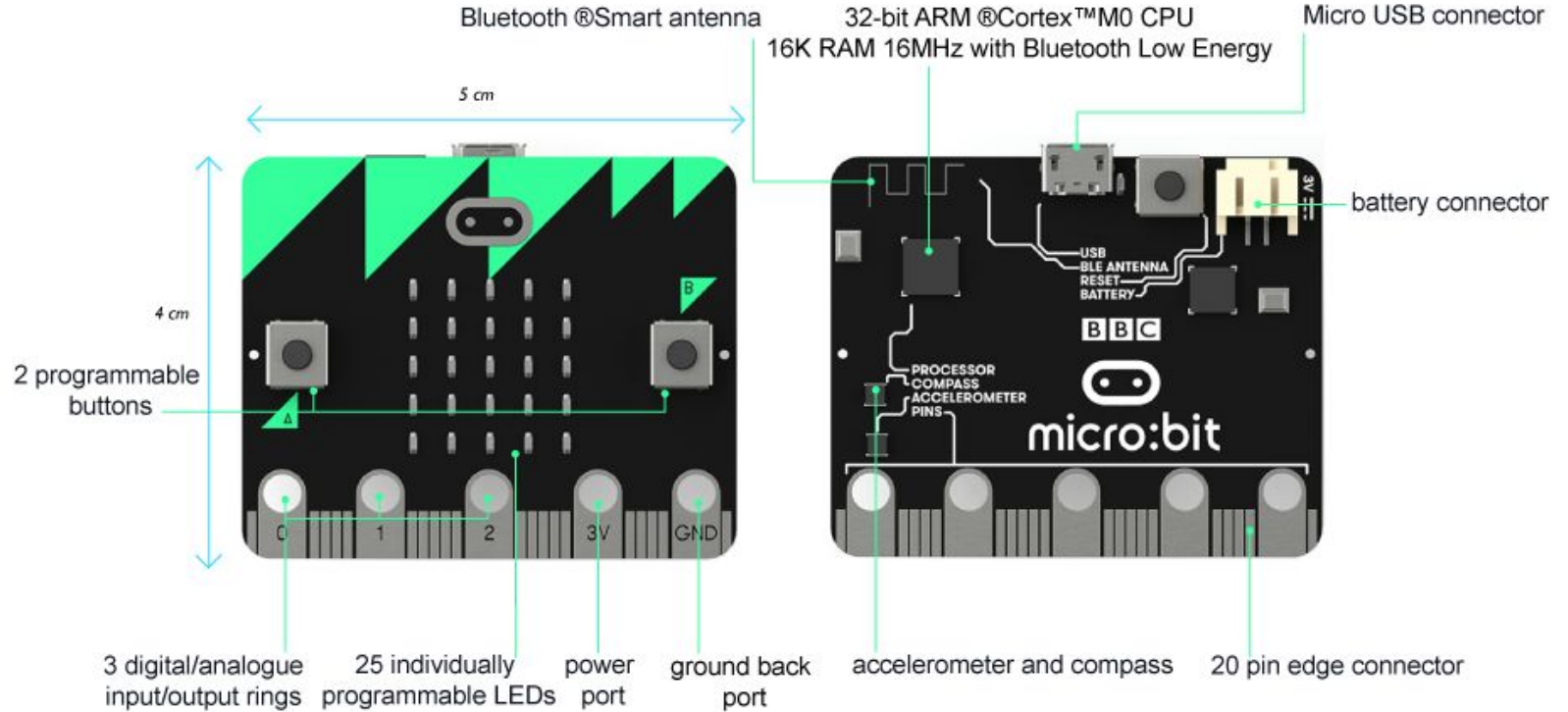
# Interdisciplinary Projects



# Makey Makey Water Cycle



# Microbit



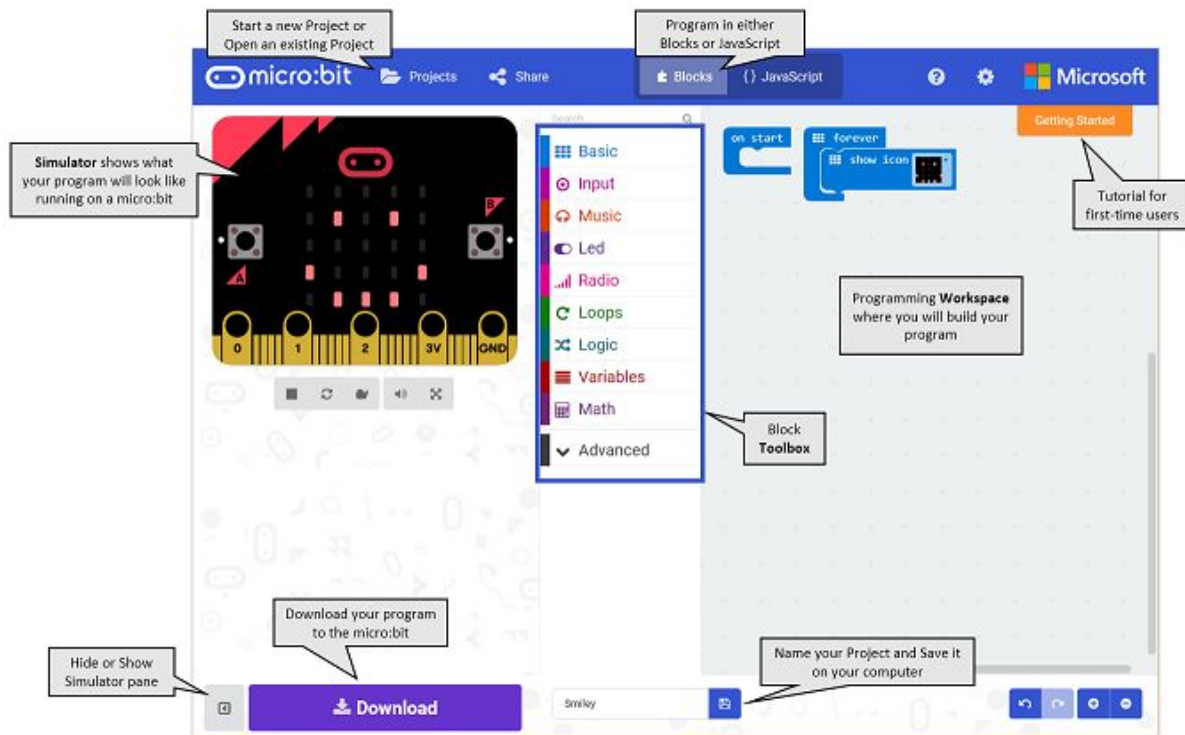
FRONT

BACK



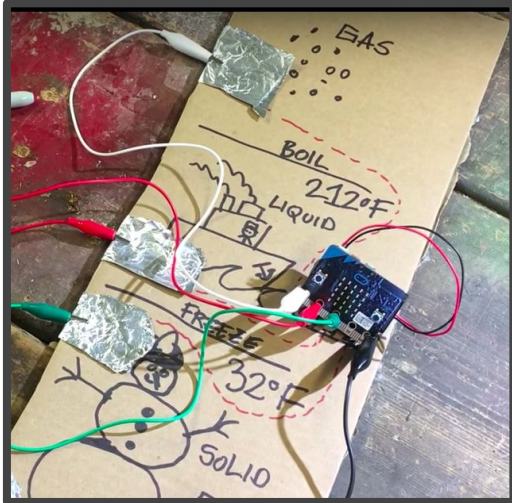
# Microbit + MakeCode

<https://makecode.microbit.org/>

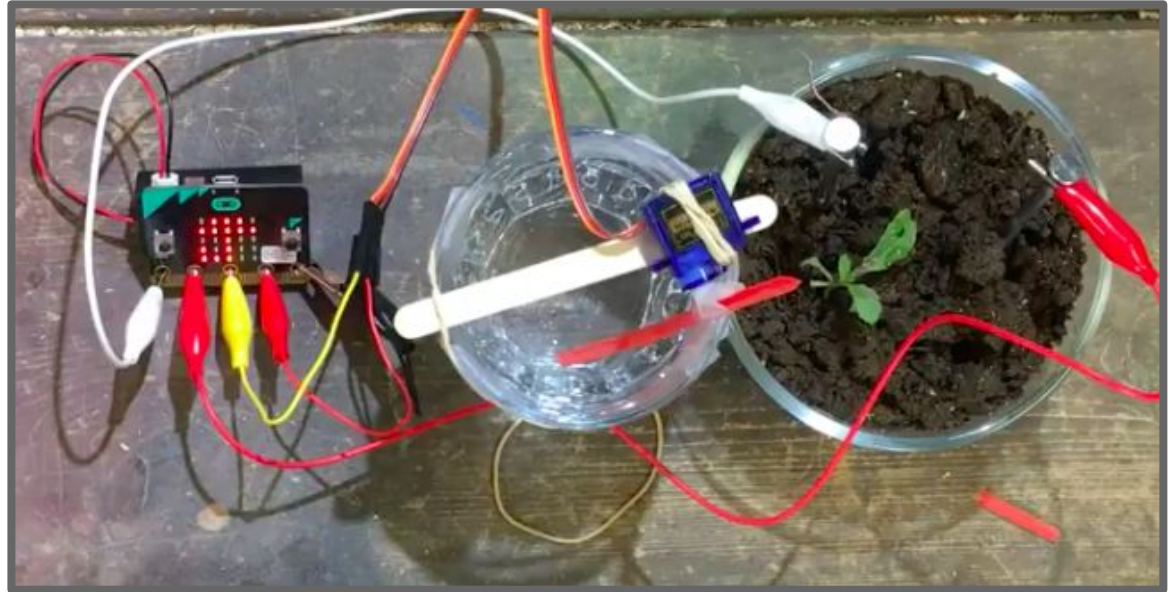


---

# Interdisciplinary Projects



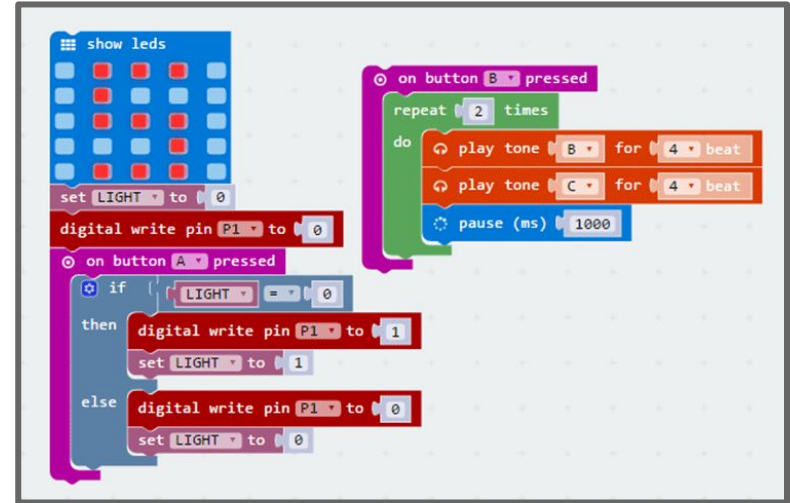
States of Matter



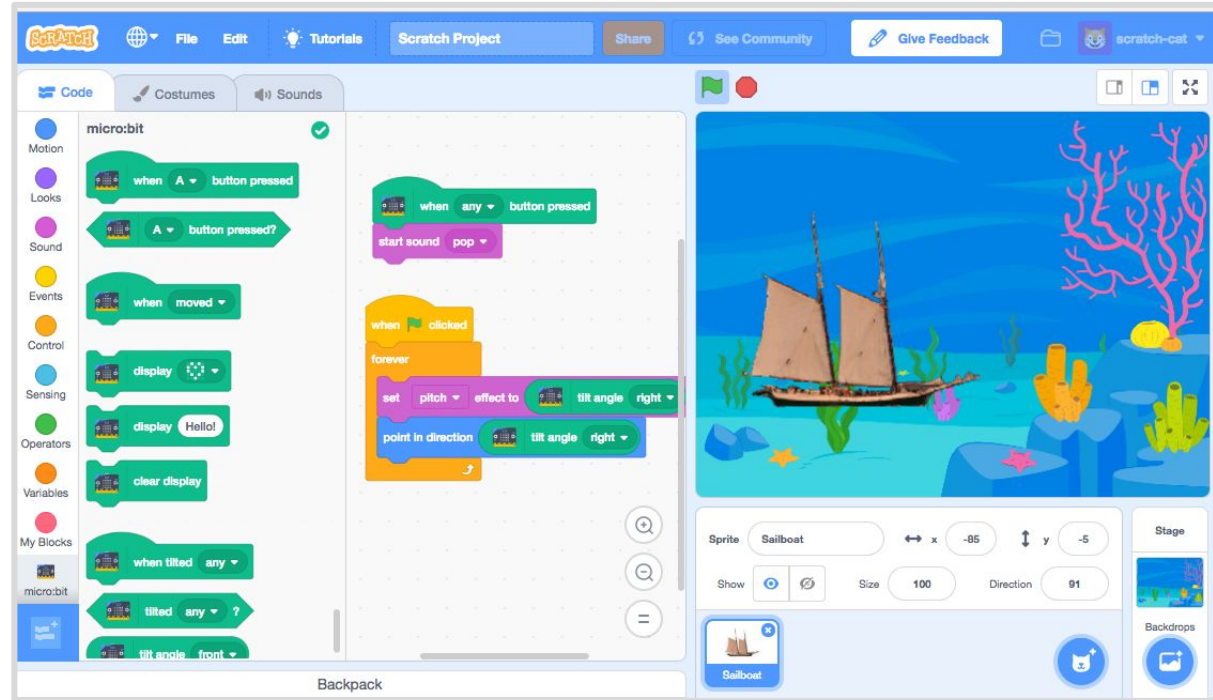
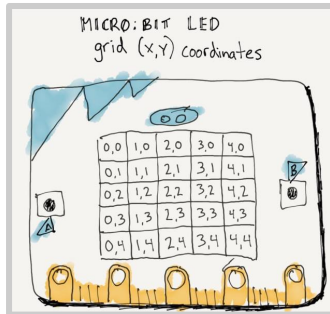
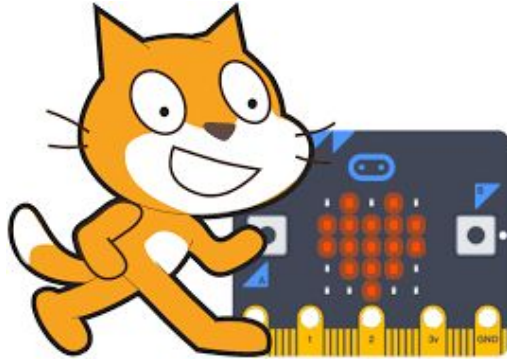
Automatic Plant Watering System

---

# A Lego Micro Bit Project



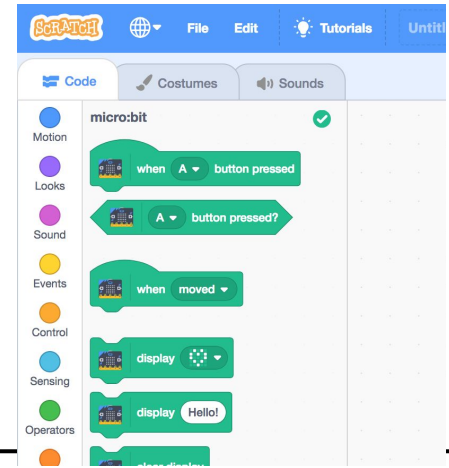
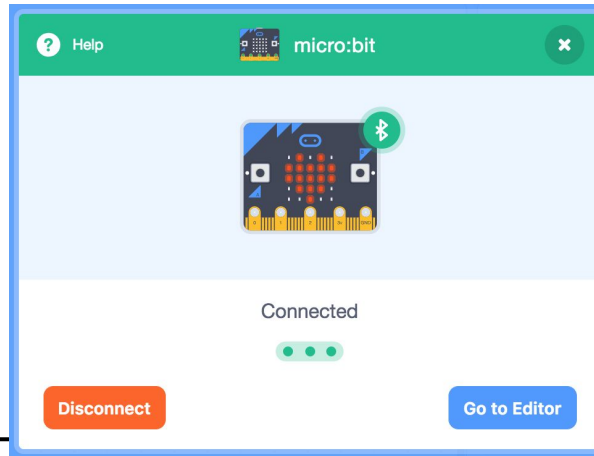
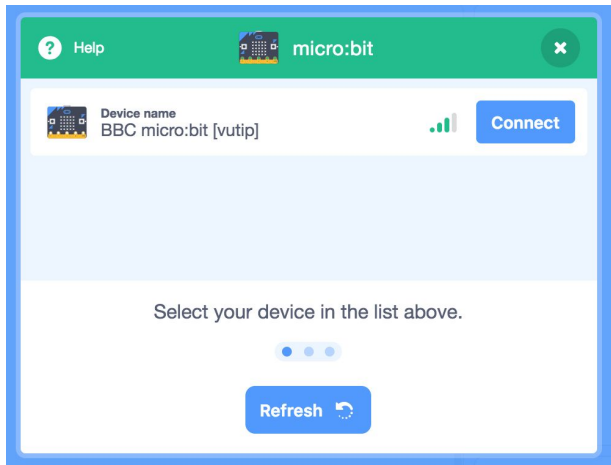
# Micro Bit & Scratch 3.0



# Scratch 3.0 Download

Note: Scratch Link only supports Mac OS X 10.13+ and Windows 10+, *not* Chrome OS - coming at a later date

1. Download and install “Scratch Link”: <https://scratch.mit.edu/microbit>
2. Find the application Scratch Link on your computer, click on it to make it run.  
Make sure you see the icon for it in your toolbar.
3. Then in Scratch 3.0 (<https://beta.scratch.mit.edu>):





---

# Installing Micro Bit

## Getting Started

### Install Scratch micro:bit HEX

1



Connect a micro:bit to your computer with a USB cable

2



Download the Scratch micro:bit  
HEX file [📄](#)

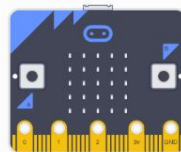
3



Drag and drop the HEX file onto  
your micro:bit

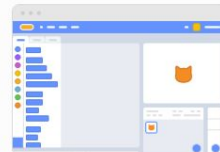
## Connecting micro:bit to Scratch

1



Power your micro:bit with USB or  
a battery pack.

2



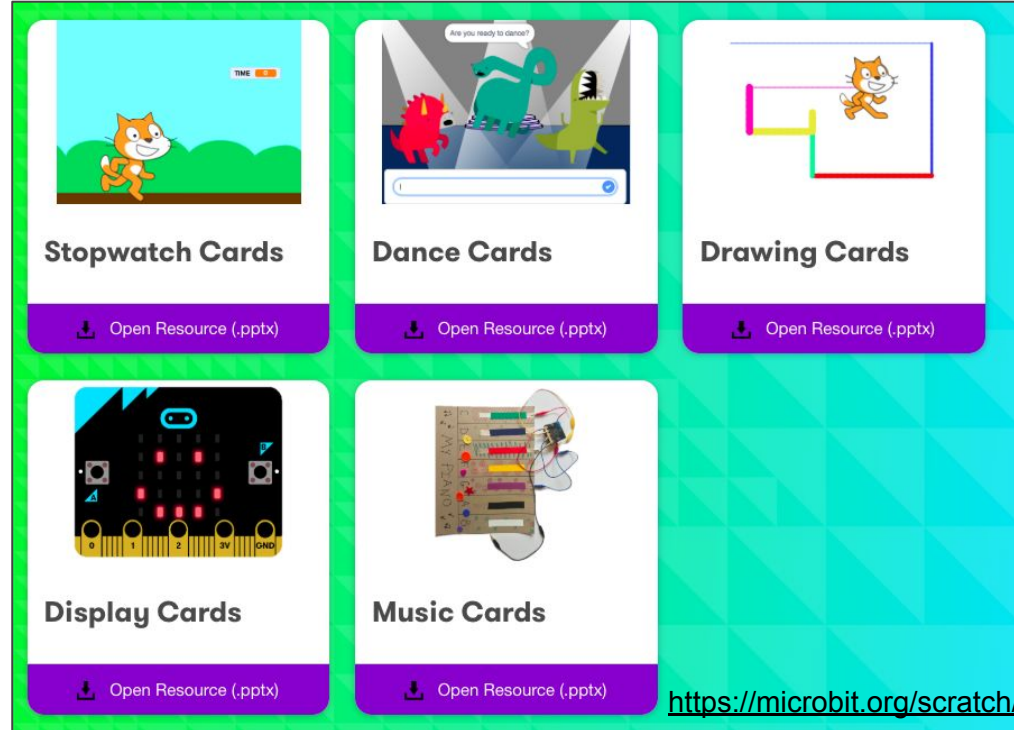
Use the [Scratch 3.0](#) editor.

3

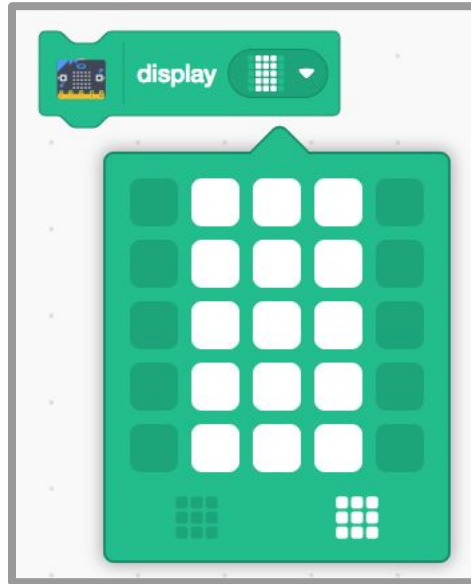


Add the micro:bit extension.

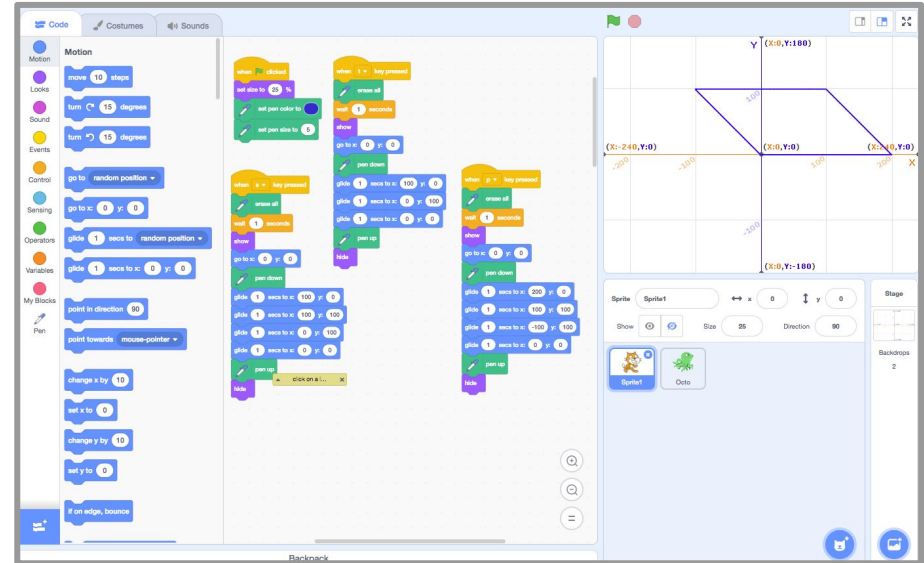
# Scratch Cards for Micro Bits



# Multidisciplinary Projects

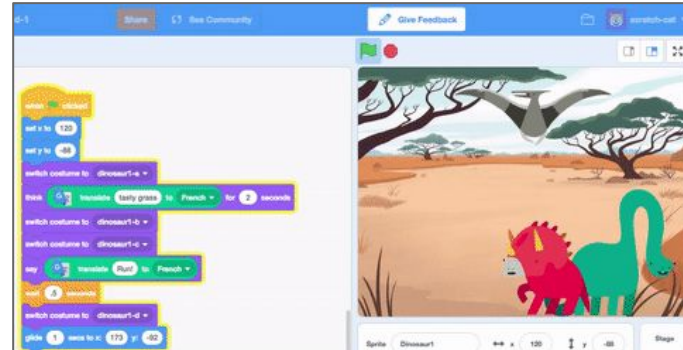
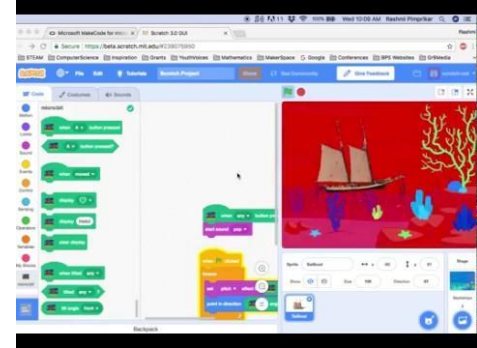
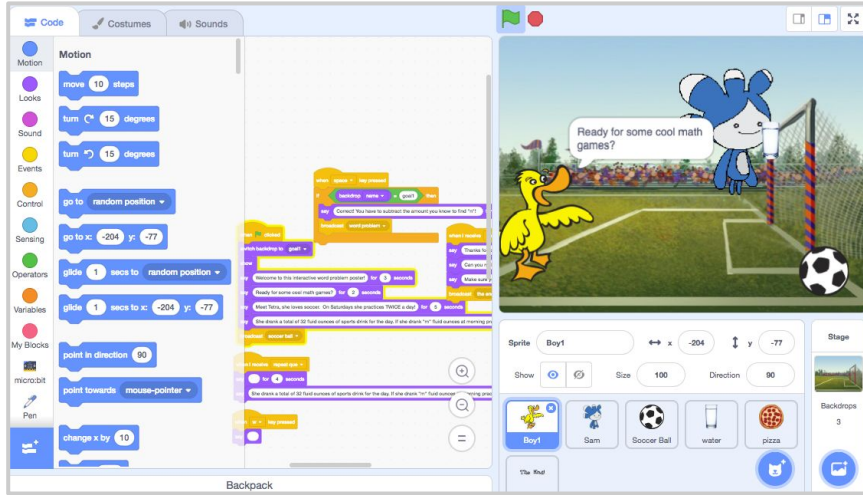


How could you use the display to represent  $\frac{3}{5}$  fraction in multiple, creative ways?



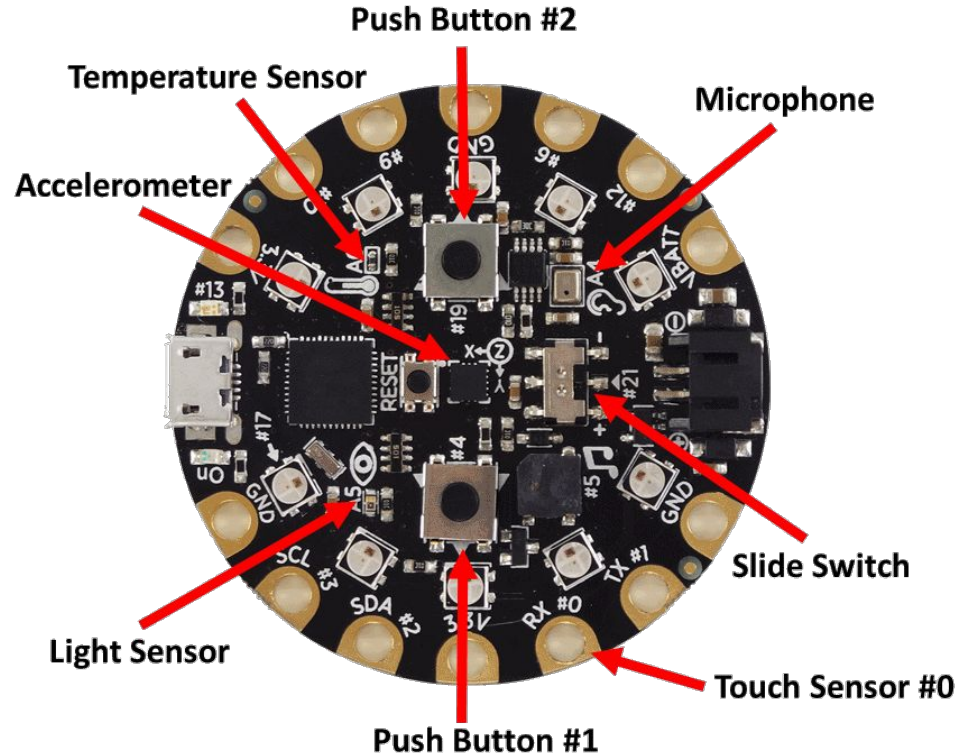
How could you use the microbit to display different mathematical shapes? For eg. A Parallelogram, A Square and Triangle

# Multidisciplinary Projects



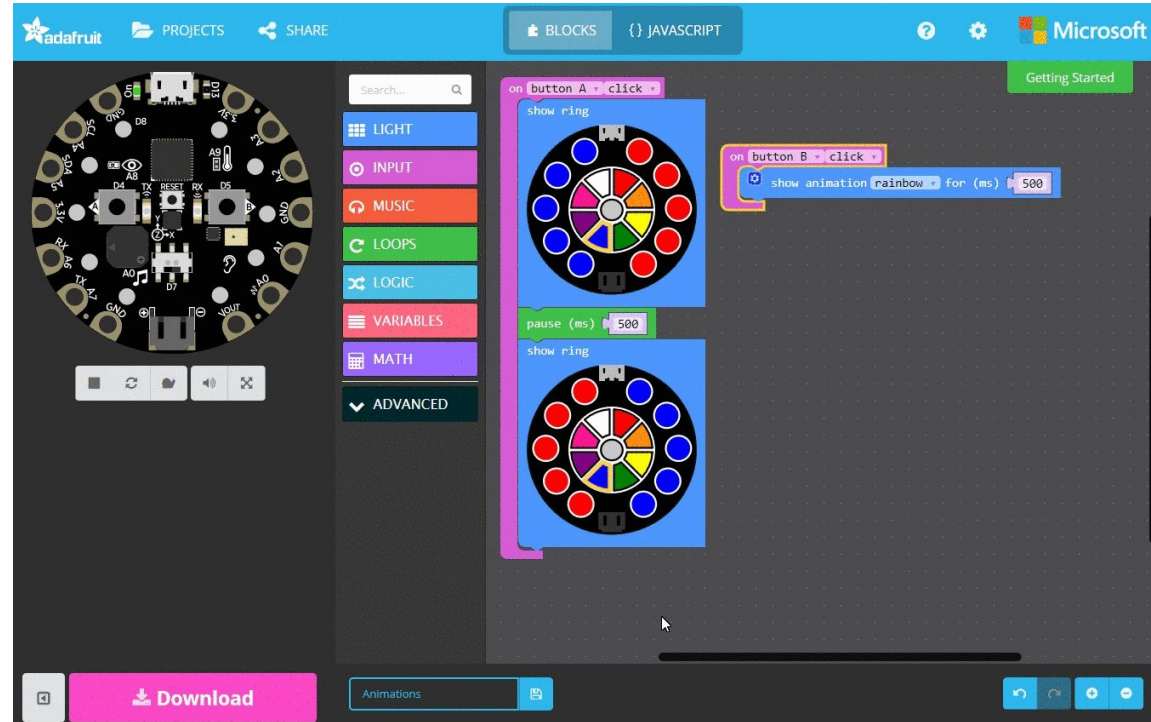
---

# Circuit Playground Express





# Circuit Playground Express



---

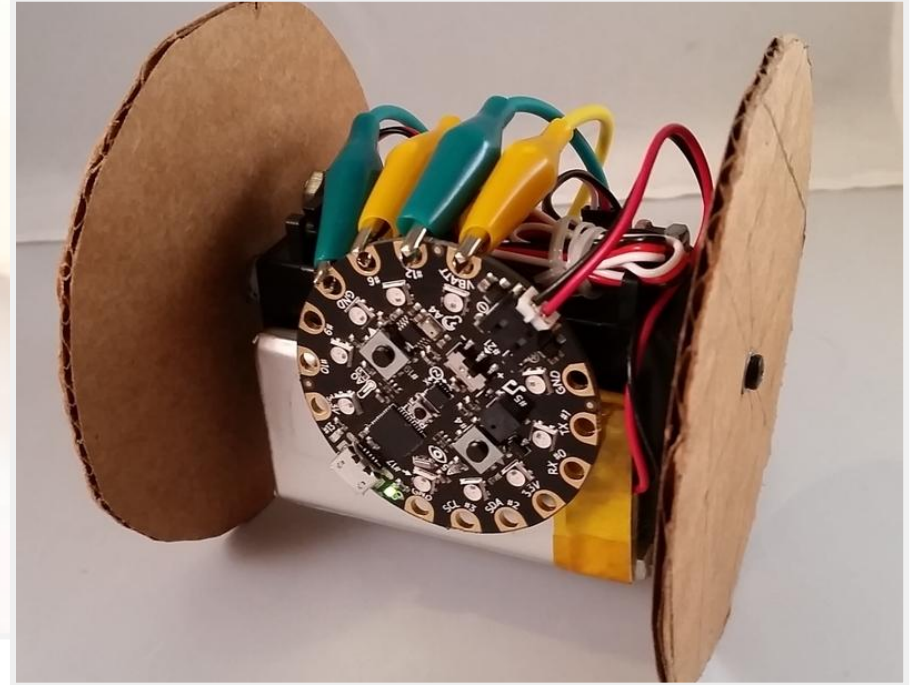
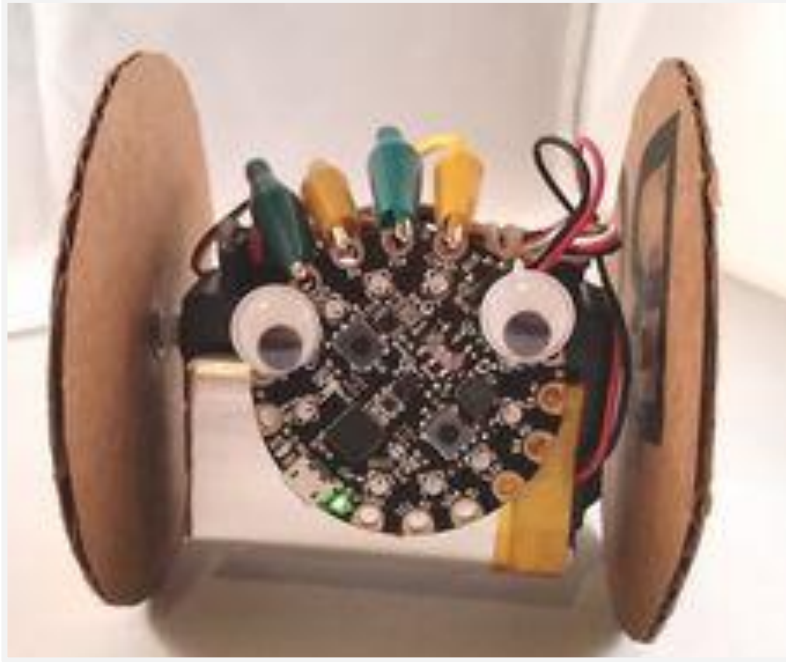
# Multidisciplinary Projects



---

# Extend - Sound - Controlled Robot

---



---

**Q/A**

