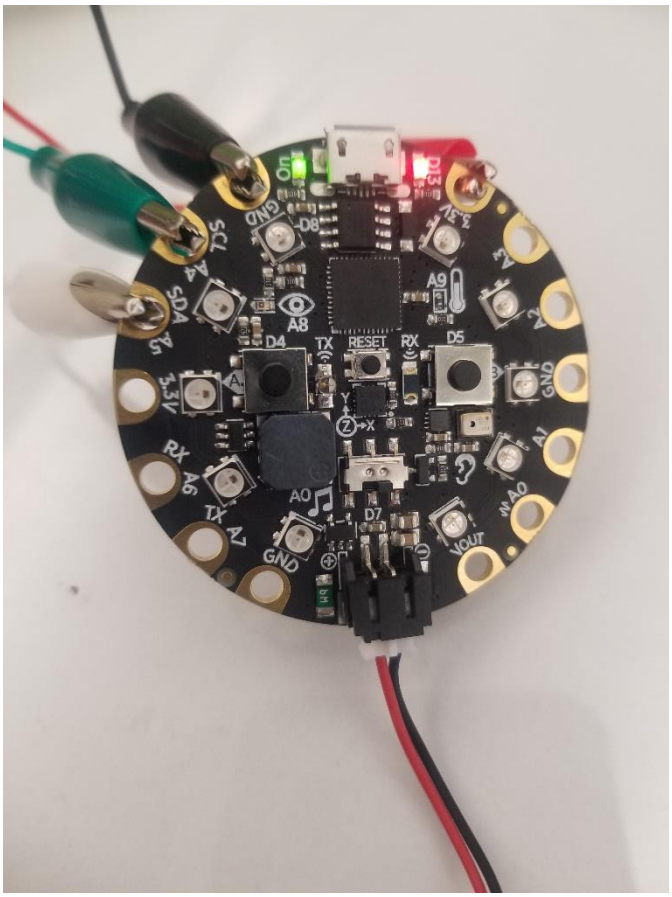
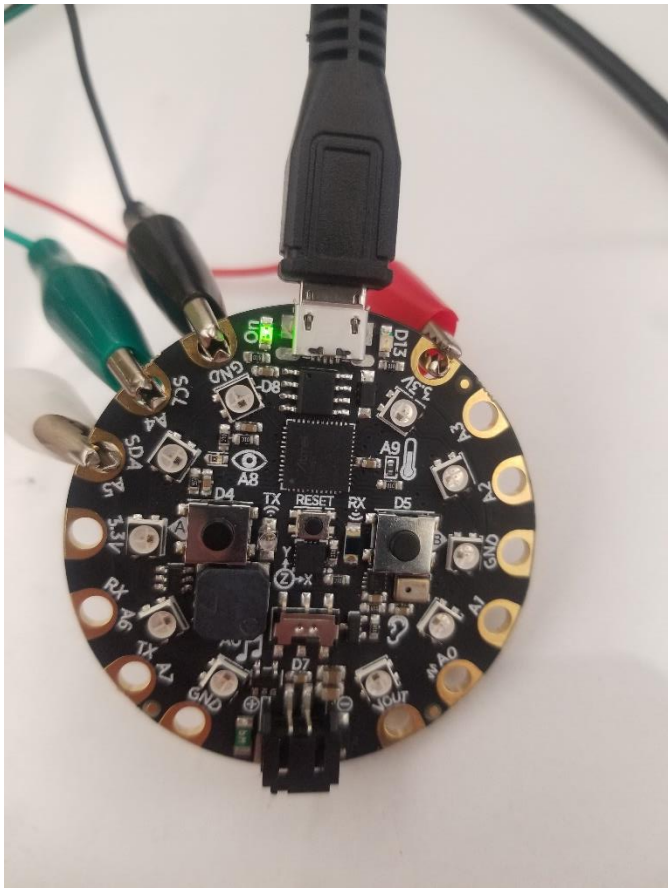
# Soil Moisture and Temperature Sensor

## How to use:

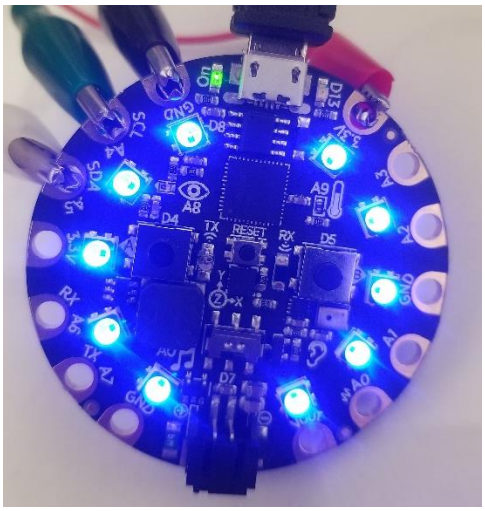
Once the system is connected it will cycle Blue LEDs to confirm it is working and connected properly.  If not, then check connections.  Place sensor into the soil.  Make sure the small red LED is blinking.  If so, press A/Left button for a visual representation of the soil temperature, or press B/Right button for a visual representation of the soil moisture.

1: Connect JST Power, or the USB power, to the Circuit Playground Express (CPE).

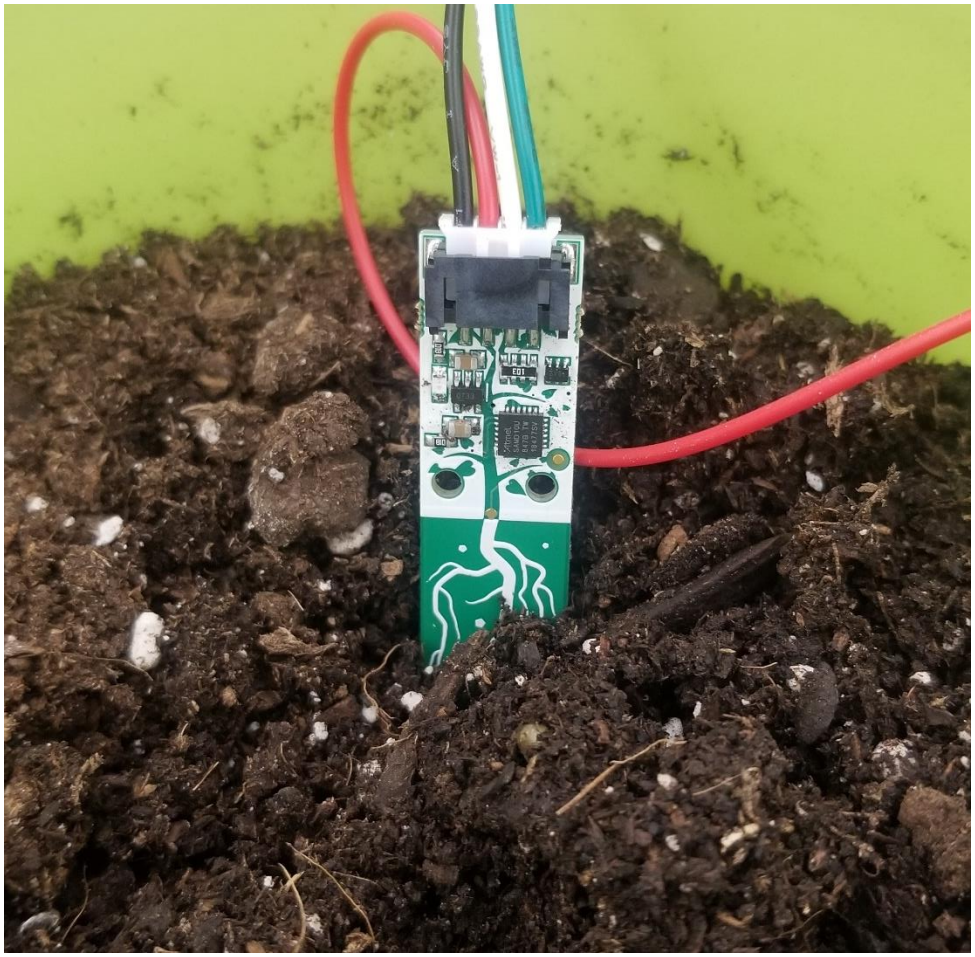




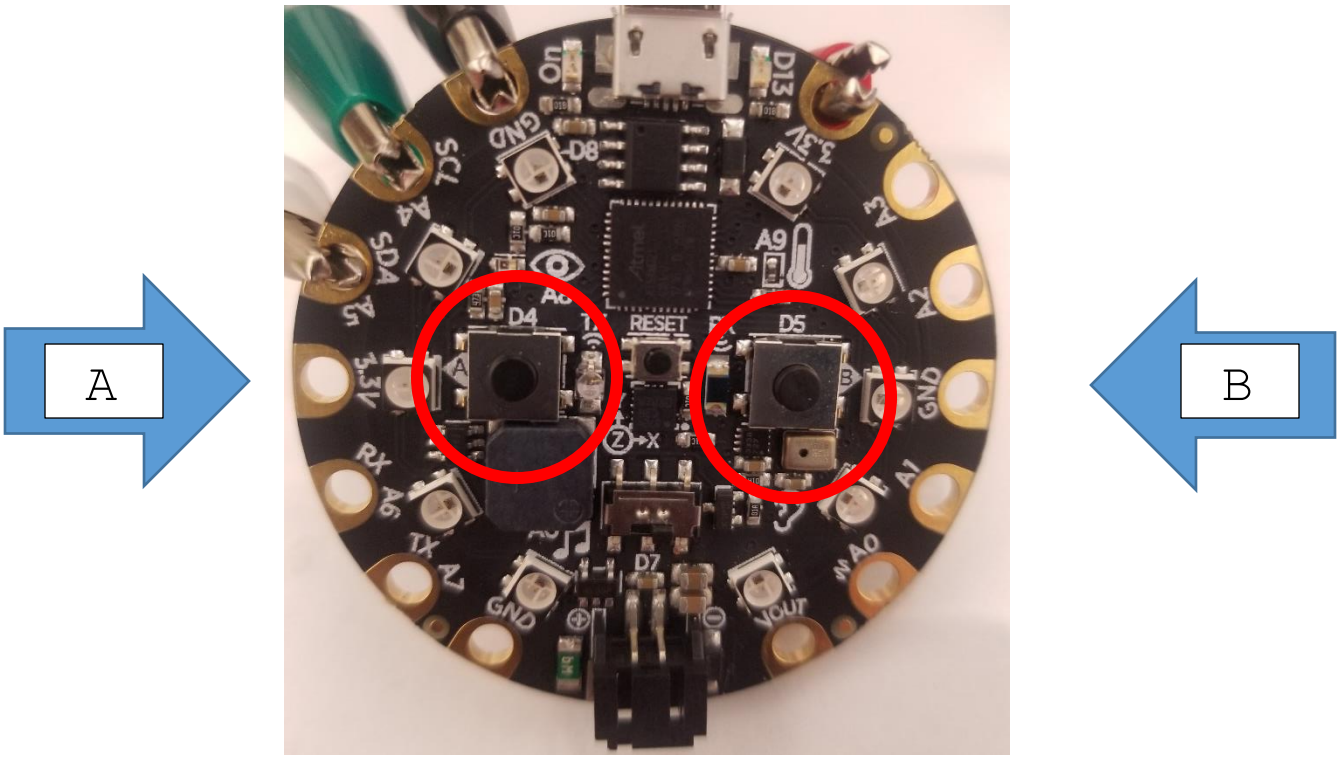
2: CPE will cycle through Blue LEDs if the sensor is set up correctly.



3: Place the soil sensor into the soil



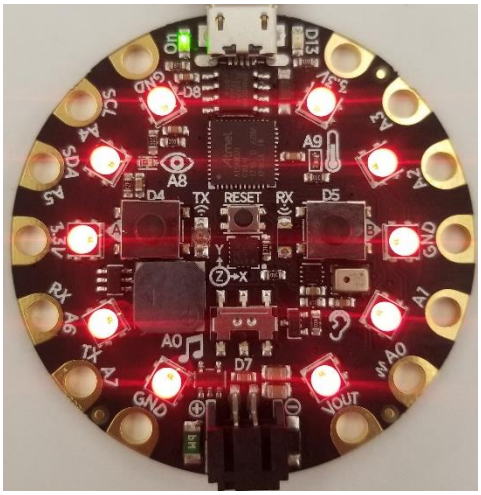
4: Press the A/Left Button for a visual representation of the soil temperature or the B/Right Button for a visual representation of the soil moisture.



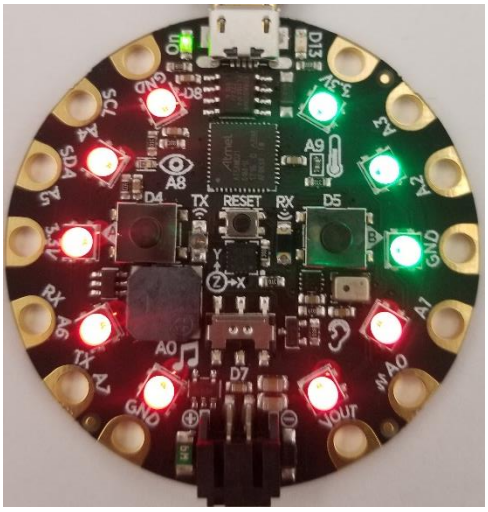
5: What does the visualization meant?

## Soil Moisture

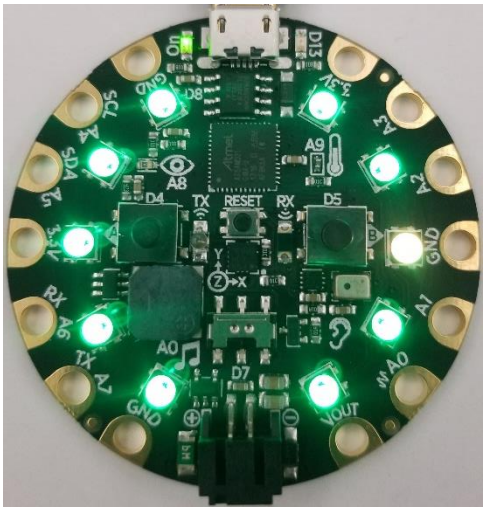
If the LEDs light up all red, the soil is extremely dry.



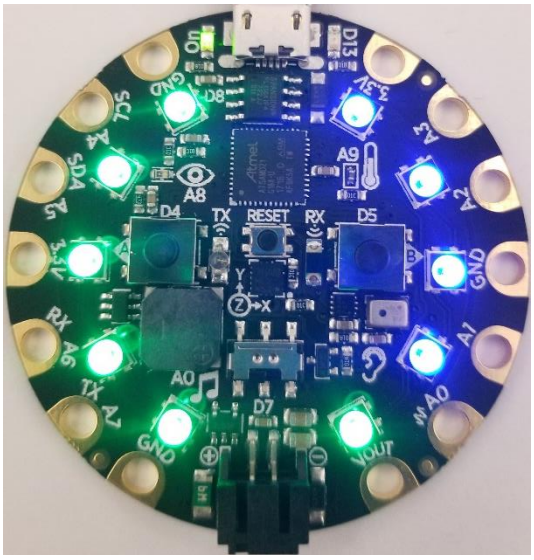

If the LEDs light up red to green, the soil is between moist and optimal moisture. The green LEDs move clockwise from very dry to optimal moisture.



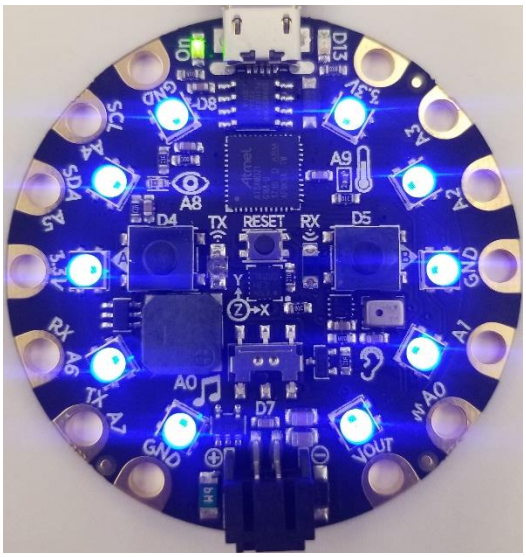

If the LEDs light up green and a yellow, the soil is in the optimal moisture range.



If the LEDs light up green to blue, the soil is between optimal moisture and too wet. The blue LEDs move clockwise from optimal moisture to extremely/too wet.

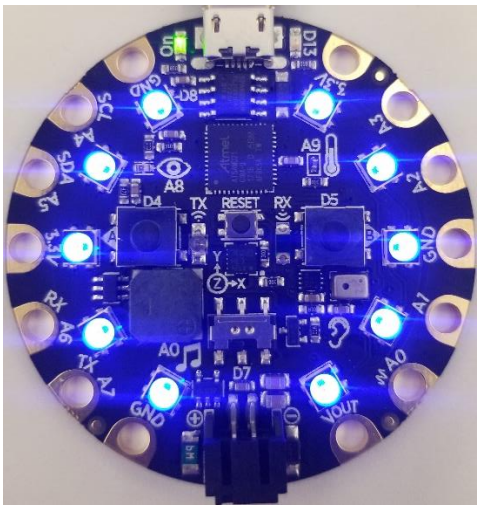



If the LEDs light up all Blue, the soil is too wet.

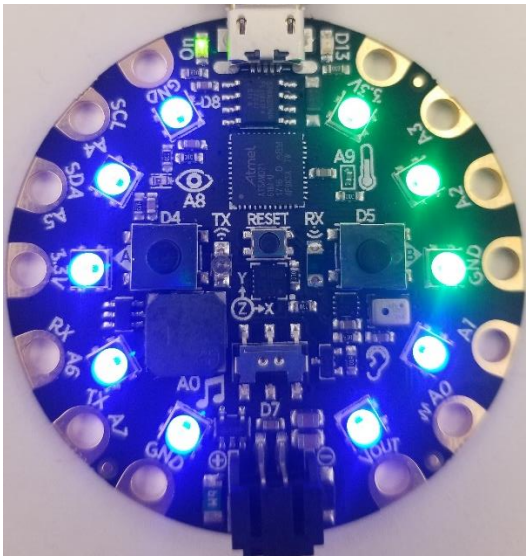



## Soil Temperature

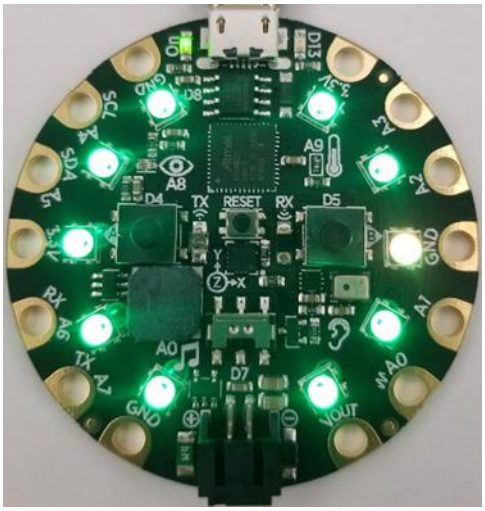
If the LEDs light up all Blue, the soil is too cold.



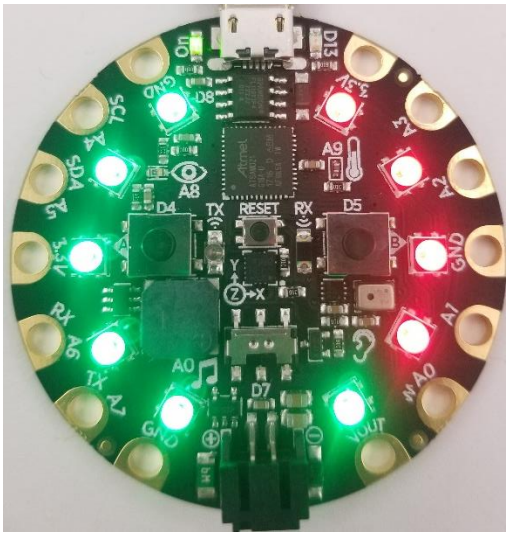
If the LEDs light up blue to green, the soil is between too cold to optimal temperature. The green LEDs move clockwise from too cold to optimal range.



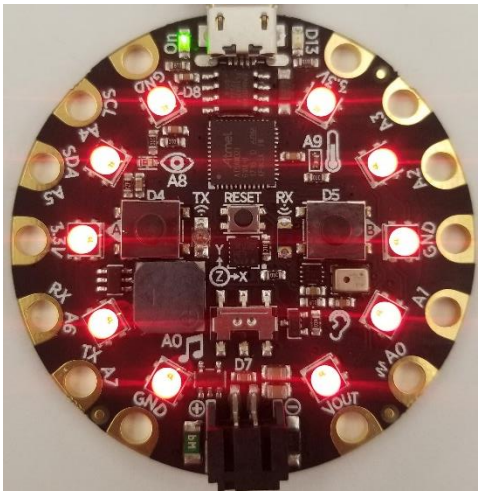

If the LEDs light up green, the soil is in the optimal temperature range



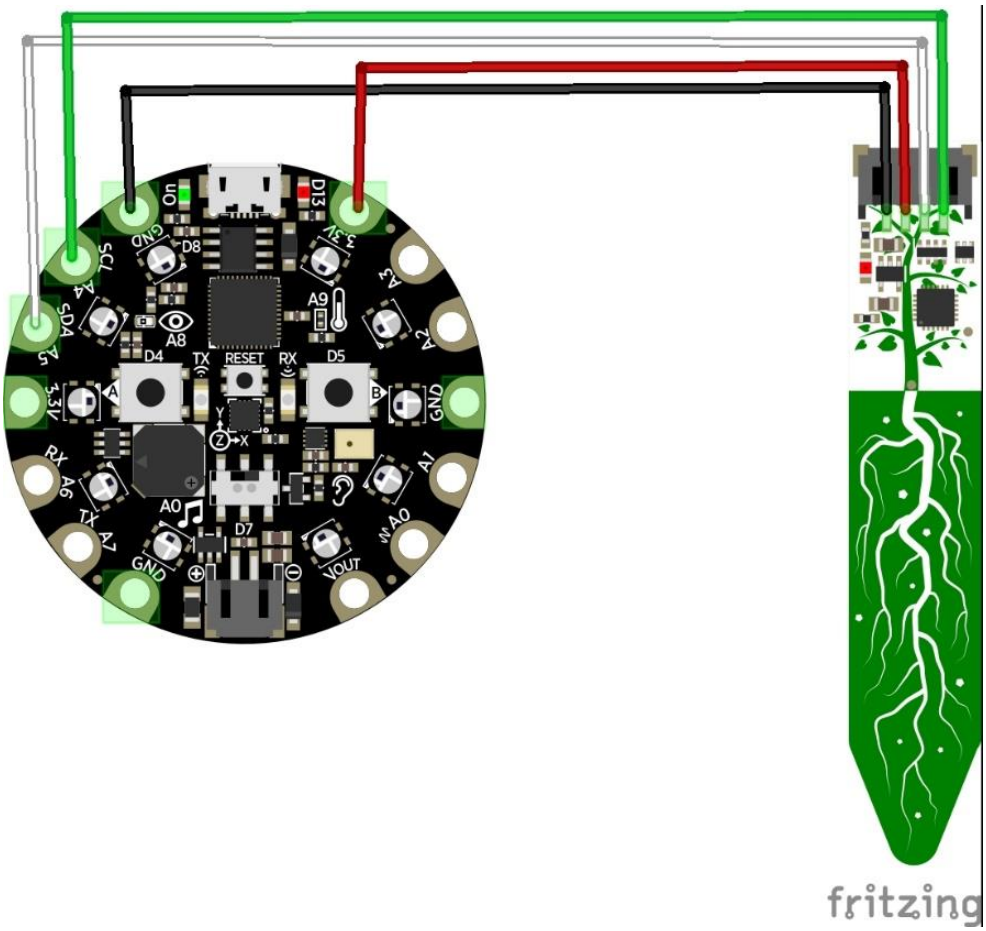

If the LEDs light up green to red, the soil is between optimal temperature range to too hot. The red LEDs move clockwise from optimal temperature range to too hot.



If the LEDs light up all red, the soil is too hot.




## Build:




## Code:

While the Circuit Playground Express can use code in Circuit Python, Microsoft Make Code, or Arduino, I'm using Arduino as the code can easily be reused for a Circuit Playground Classic, or a Circuit Playground Bluefruit BLE.

Code is located at: https://github.com/lordjim2001/MFSN2020-01/blob/master/soilsensor_exampleCPE.ino