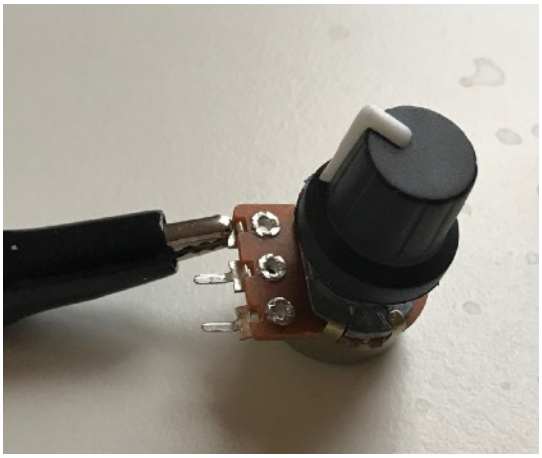
Electronics for Artworks, Session 2 Instructions
Paul Mirel, MICA Engineer in Residence 20201101

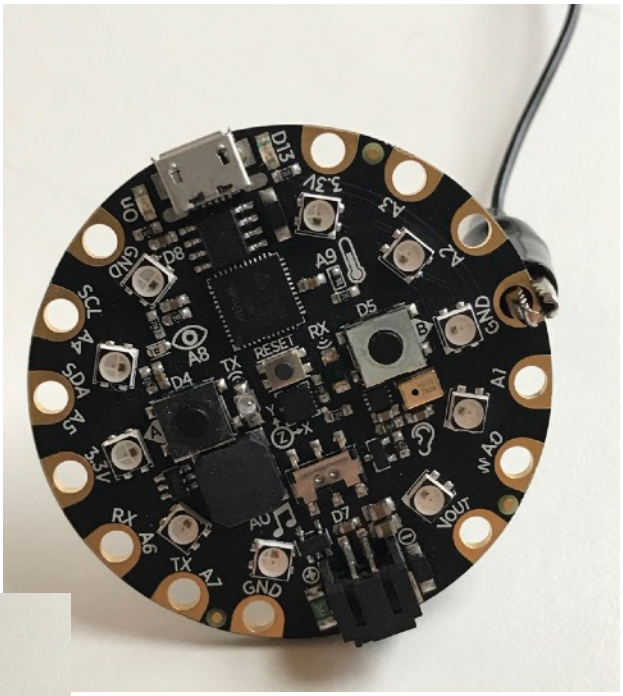
1. Connect the angle sensor, following the steps below. This type of angle sensor is called a potentiometer, because it allows us to set ("meter out") a voltage (also known as "potential") to a specific value. That is how we will use it.

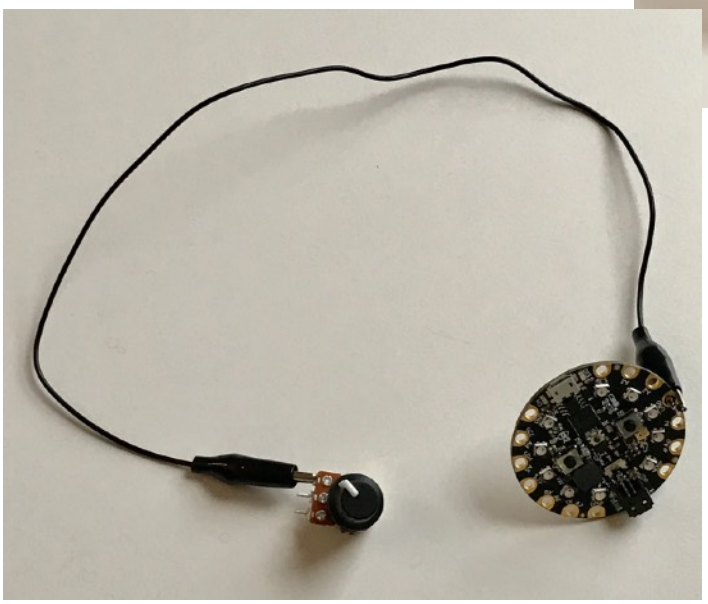
A. Disconnect the Circuit Playground Express from your computer, and turn off or disconnect the battery pack, if you have connected it. Always remove power before making connections, to avoid damaging the Circuit Playground or your computer.

B. Always make the "electrical ground" connection first, using a black wire if you have one available. We use black wires for ground connections. The color coding is for us; the electrons don't care what color the wire jacket is:

i. Connect the terminal on one side of the angle sensor to the black alligator lead.
ii. Connect the GND terminal on the Circuit Playground to the other end of the black alligator lead.

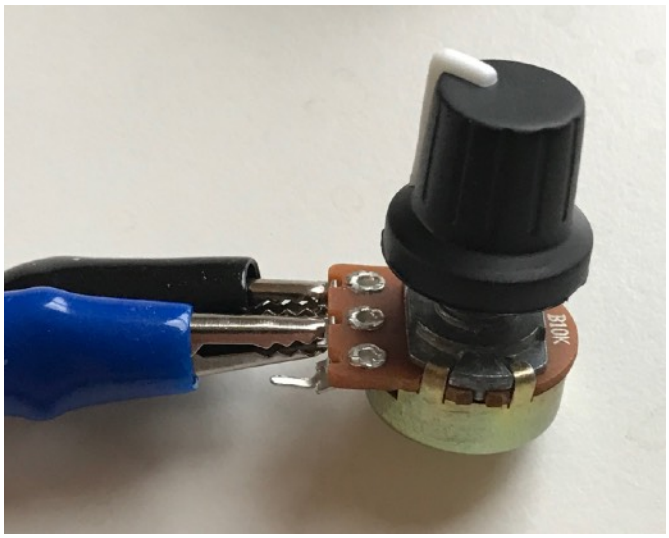


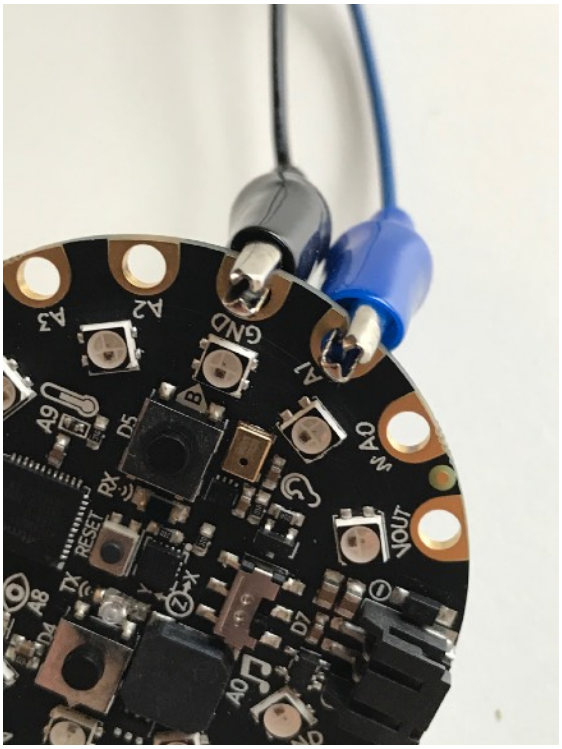




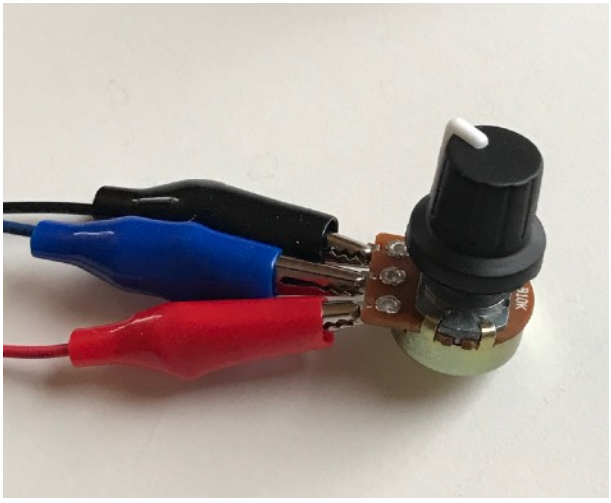
C. Make the signal connections (only one, in this case) next. Use any color wire except black (ground) or red (power).

i. Connect the alligator lead to the middle terminal of the angle sensor.
ii. Connect the other end of the alligator lead to the A1 terminal on the Circuit Playground.

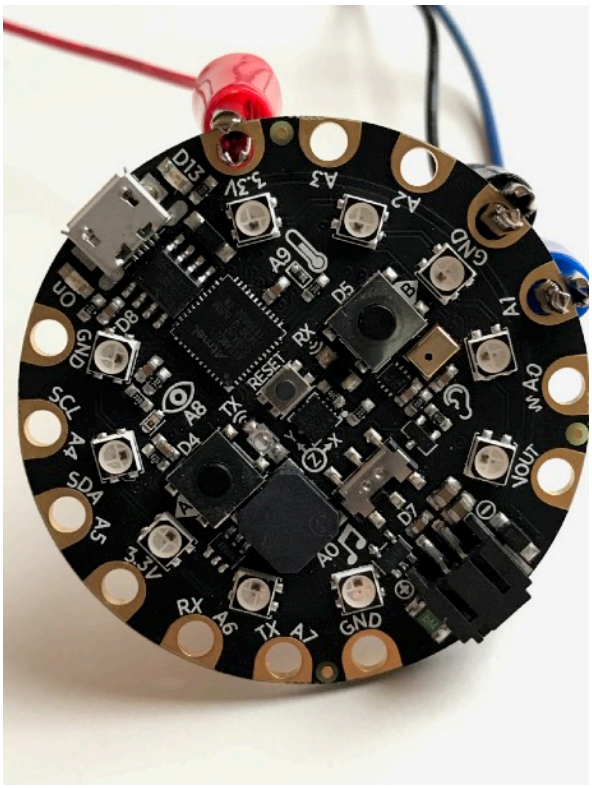


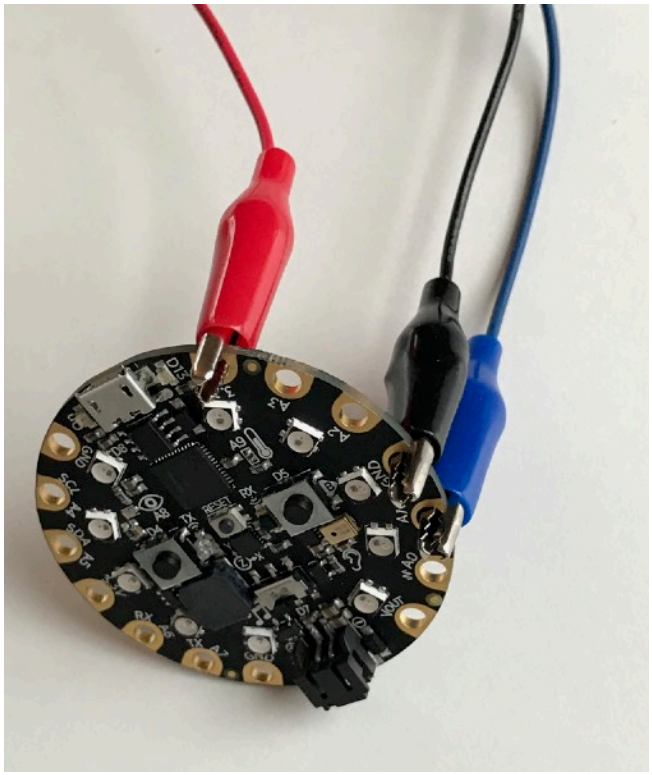


D. i. Connect the red alligator lead (power) to the remaining terminal of the angle sensor. Make sure that the black lead and the red lead are on opposite ends of the terminal set. If they are next to each other, you can make some awful smelling smoke and damage the angle sensor.

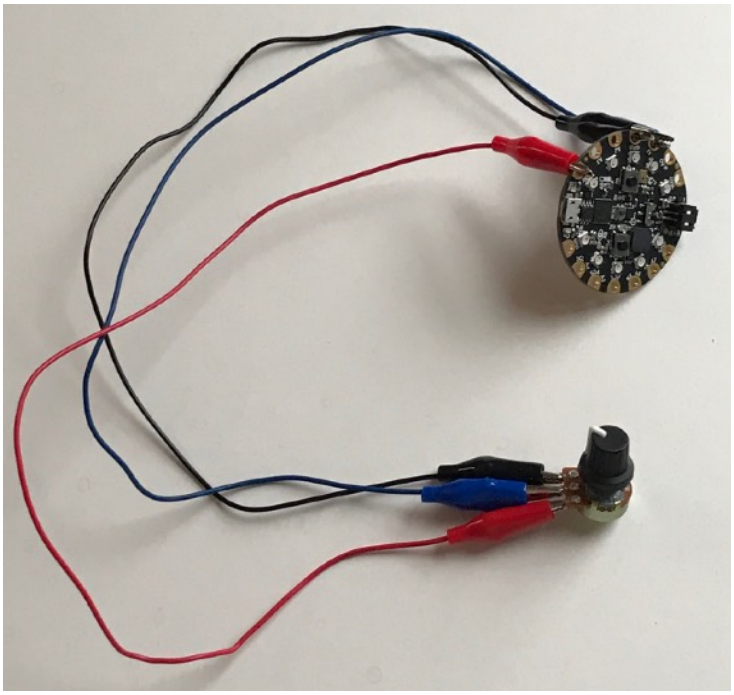


D. ii. Connect the other end of the red lead to the 3.3V terminal on the Circuit Playground.





Success. You have properly connected the angle sensor to the Circuit Playground.



2. Load the code to read out the angle sensor:

    2-read-angle-sensor-on-A1

3. Turn on an indicator when the angle crosses a threshold value:

    3-angle-sense-threshold

4. Use the angle sensor reading to set the brightness.

    4-angle-to-brightness

5. Use the angle sensor reading to set the hue.

    5-angle-to-hue

6. copy the lib folder from today's download to the Circuit Playground. This version of the lib folder has libraries in it to allow data remapping, and to read the laser rangefinder sensor.

7. Wire the laser rangefinder sensor. (TBD PHOTOS)

8. Read the laser rangefinder sensor.

    8-read-the-rangefinder

9. Remap the laser rangefinder data to set the hue.

    9-range-to-hue

    Simpleio library map_range documentation:
    https://circuitpython.readthedocs.io/projects/simpleio/en/latest/api.html#simpleio.map_range

10. Example code: read the onboard thermometer.

    10-read-thermometer

11. Example code: read the onboard light sensor.

    11-read-light-sensor

12. Reference: Using the plotter in Mu:

    https://codewith.mu/en/tutorials/1.0/plotter