Objectives:

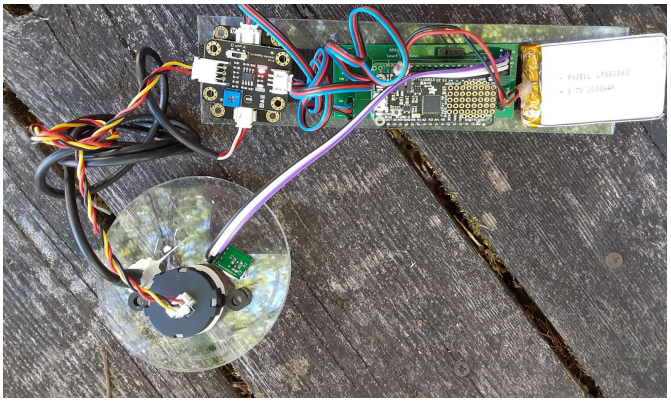
To test pressure/temperature and TDS sensors for basic functionality and set-up SmartRock for future calibrations in a 5 gallon bucket.

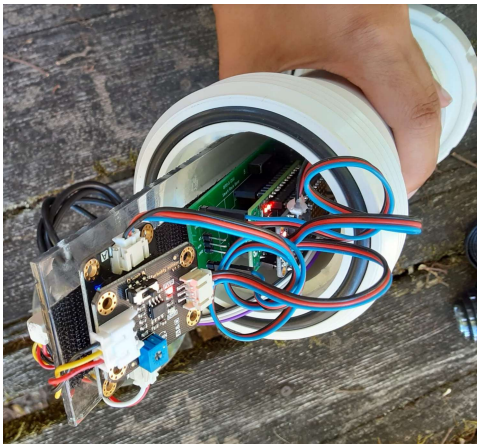
Supplies Needed:

- Fully assembled SmartRock with charged battery and SD card
- Weights
- U bolt and j hooks
- 5 gallon bucket
- Table salt
- Ice
- Ruler
- Thermometer
- 30 mL cup

Procedure:

1. Set SmartRock into operation mode (turn switch to mode A), plug in battery, *make sure pressure and TDS sensors are plugged into Hydro Board*, slide electronics into SmartRock case





2. Insert weights on either side of rail

3. Screw on end caps

   Note: Hand tightening is sufficient. A waterproof seal is formed when you look at the O-ring and see it pressed flat against the acrylic plate.

4. Occasionally, the system can freeze up during manual handling of wires. Check the lights (sensor boards and hypnos board should light up for several seconds and then turn off) to ensure nothing disconnected during assembly and that SmartRock is still taking samples
5. Attach u-bolt and j-hooks to SmartRock and hang on side of bucket with sensors facing down, tighten down u-bolt nuts by hand
6. Leave for half an hour to take atmospheric pressure samples. Do not fill with water until these samples are taken!

7. Fill bucket with 13cm of water so that water is roughly level with sensor plate, leave for 1 hour to allow data to be taken

8. Take and record temperature measurement with thermometer
   Note: The thermometer units are in degrees Fahrenheit, but SmartRock records in degrees Celsius!
   (32°**F** − 32) × 5/9 = 0°**C**

9. Add more water to bring the TOTAL water level to 18cm: SmartRock end is submerged by roughly 5 centimeters

10. Take and record temperature measurement with thermometer
11. Leave for 1 hour to allow data to be taken

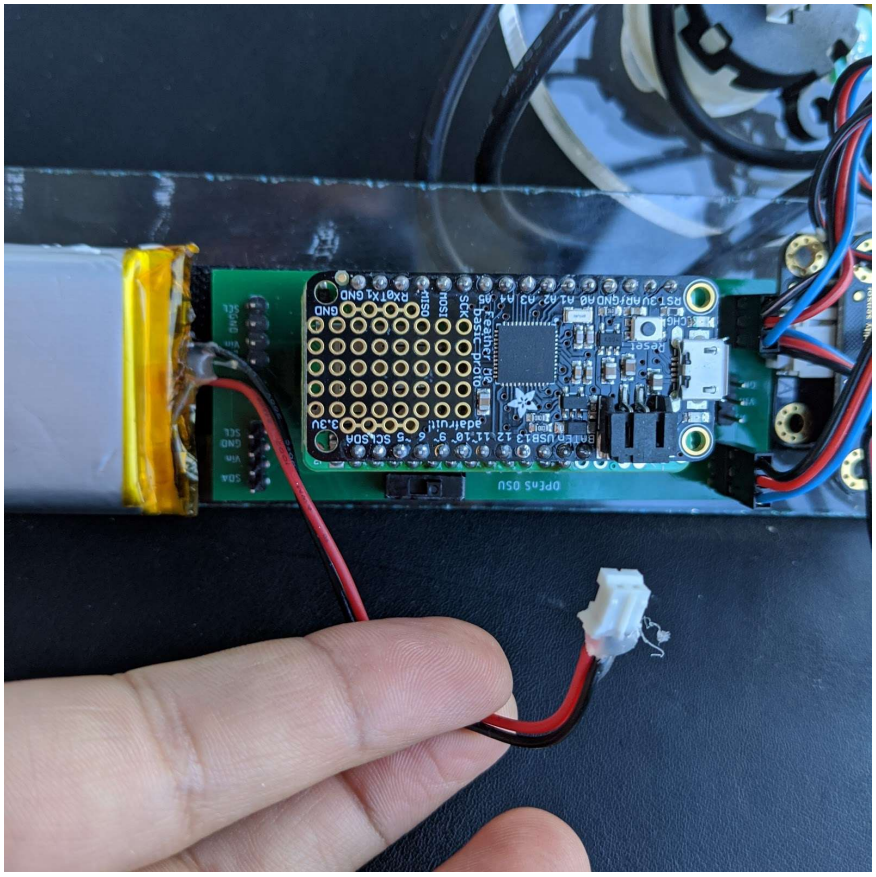
12. Add enough **ice** to raise level of water by 5 more centimeters to a total of 23cm.

13. Add 30mL of table salt to bucket of water

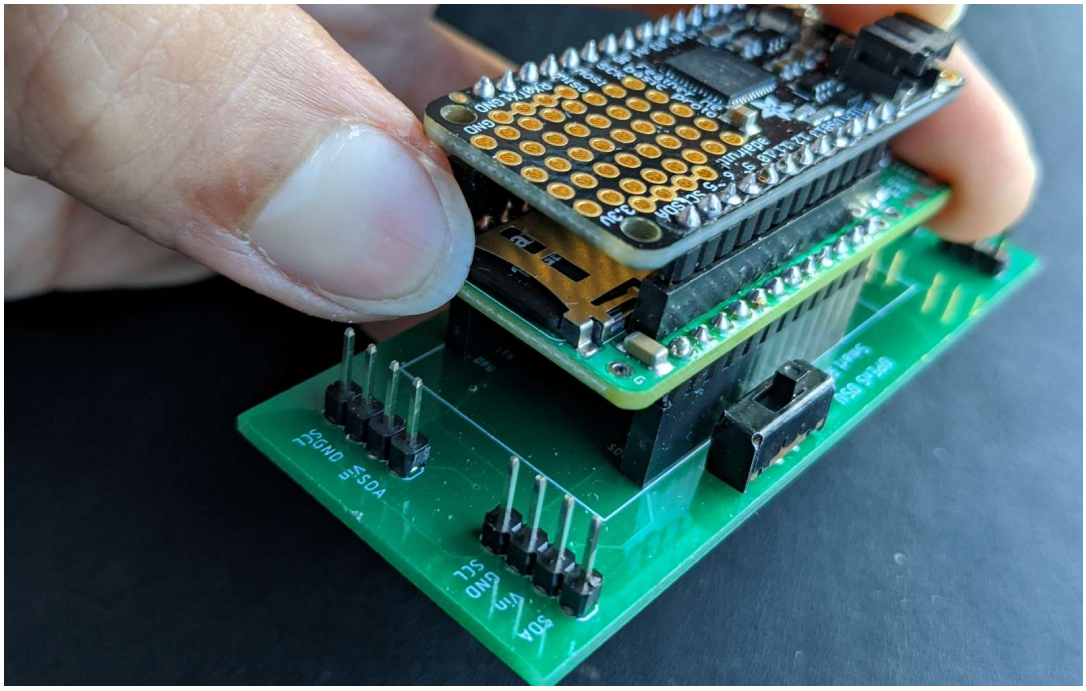
14. Stir. Take and record temperature with thermometer

15. Leave for several hours and allow ice to melt completely
16. Take and record temperature with thermometer upon retrieval
17. Remove Smart Rock from bucket and dry with paper towels
18. Unscrew end cap and remove acrylic slide from enclosure

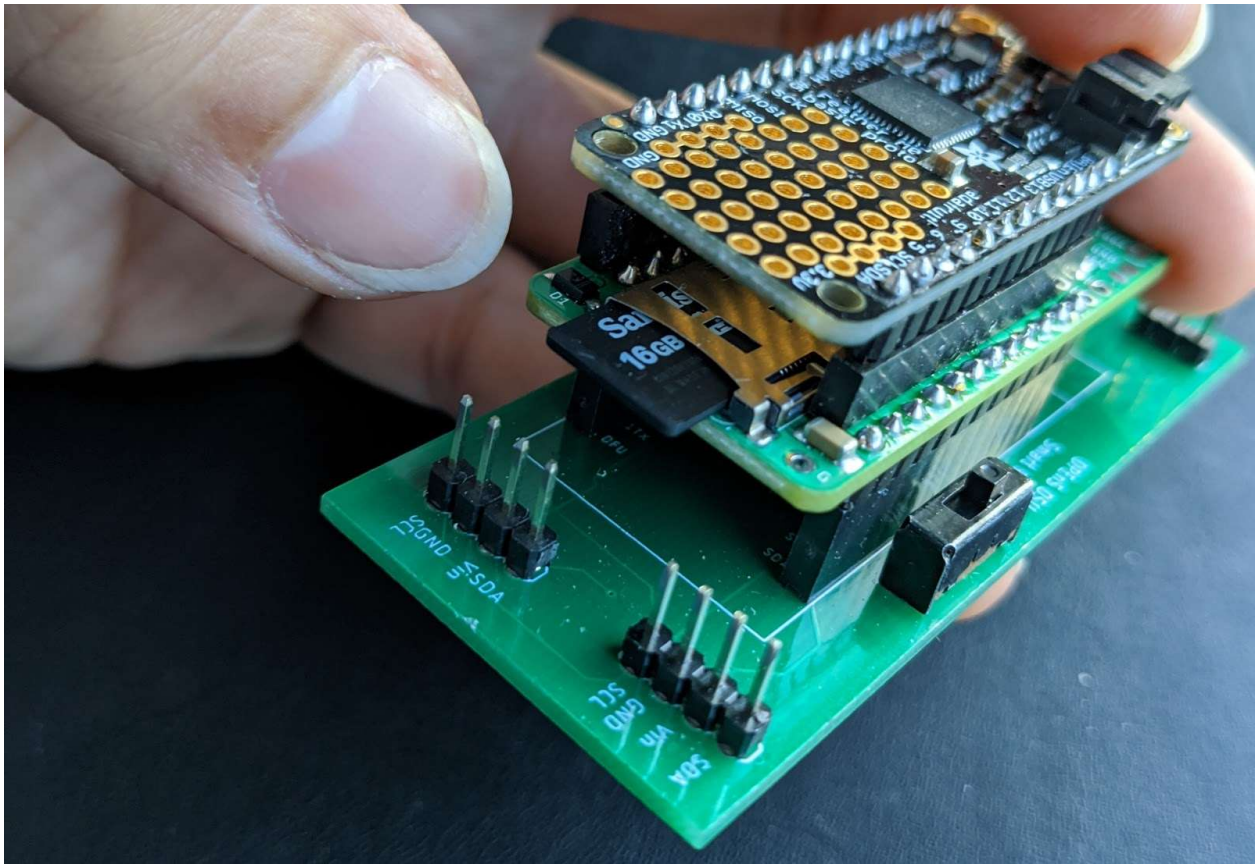
19. Remove power from Smart Rock



20. Remove SD card from Hypnos board: press the SD card until an audible click



SD card should eject itself, now safe to remove from Hypnos board



21. Insert SD card into adapter and then computer
22. Open csv file and check for fluctuations in TDS during this test, it should increase when the salt was added and decrease as the ice melts
23. Save csv file for temperature and pressure validation on day 3

Results and troubleshooting:

- If lights on SmartRock stay on instead of turning off several seconds after the battery is plugged in: Check pressure/temperature sensor cables are correctly plugged in and didn't unplug when closing the case. The code for the device will get stuck if cables are not all plugged in.