Sampling Rate vs Power Consumption (M6)

Purpose:

- Understand how power consumption changes as I used different sampling rates to collect my x-axis accelerometer values.

Experiment Design:

We would need the following materials to measure the power. I used a breadboard, resistor, power source for the Arduino, and a voltmeter.

Method:

- I decided to create a series circuit with my breadboard, I had a voltage source as well (8V), where I could control how much power I was giving my series circuit. The voltage I found my Arduino used is 5.8V (I measured this with my voltmeter). With this the current we have is (8-5.8)V/4 = 0.55.
- I then picked a random resistor, and I chose 4 ohms for this. Through this I could find my current as well
- I was then able to test my Arduino code out and see how the power was changing with sample rates.

Results

- When I added a delay of 100 between each sample, my arduino's voltage was 5.9, and with a delay of 2000 it went to 6V.
- So, the power consumption with… (I took the average of the voltages I got across a few tests)
  - delay(100):
    - V/R = (8-5.9)V/4 ohms = 0.525 A
    - P = 5.9V * 0.525A = **3.0975 W**
  - delay(2000):
    - V/R = (8-6)V/4 ohms = 0.5A
    - P = 6 * 0.5A = **3.0 W**
- The sampling rate increased by 1.69%, and the power increased by 3.25%