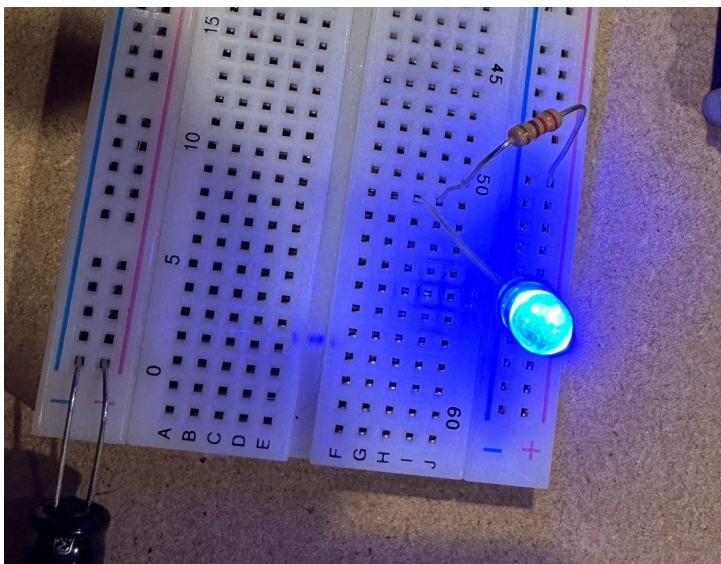


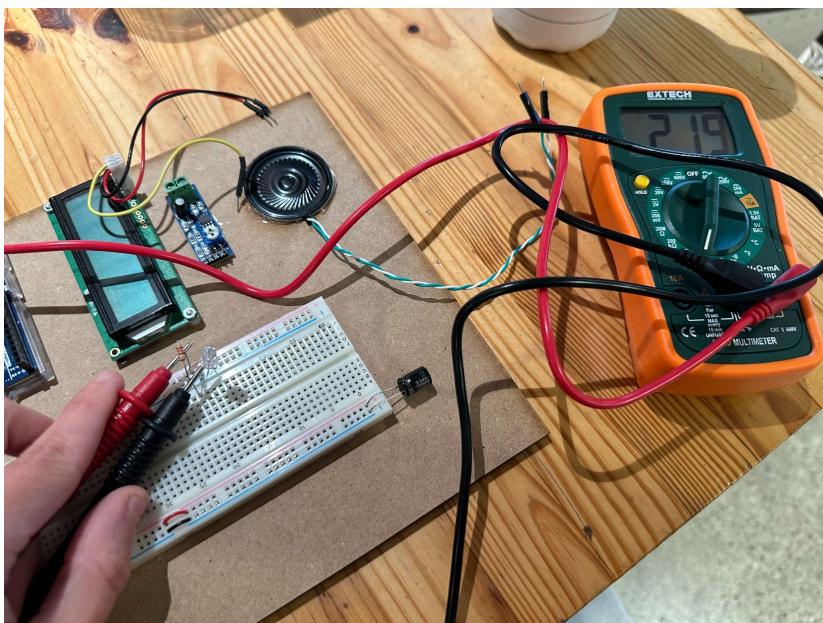
Molly Jones  
PAT 551 Interactive Media Design 1  
Breadboards, Circuits, Multimeter  
9/14/2023

PART 1:  
<https://photos.app.goo.gl/kmorsYViRJT13Uen8>

PART 2:  
A)

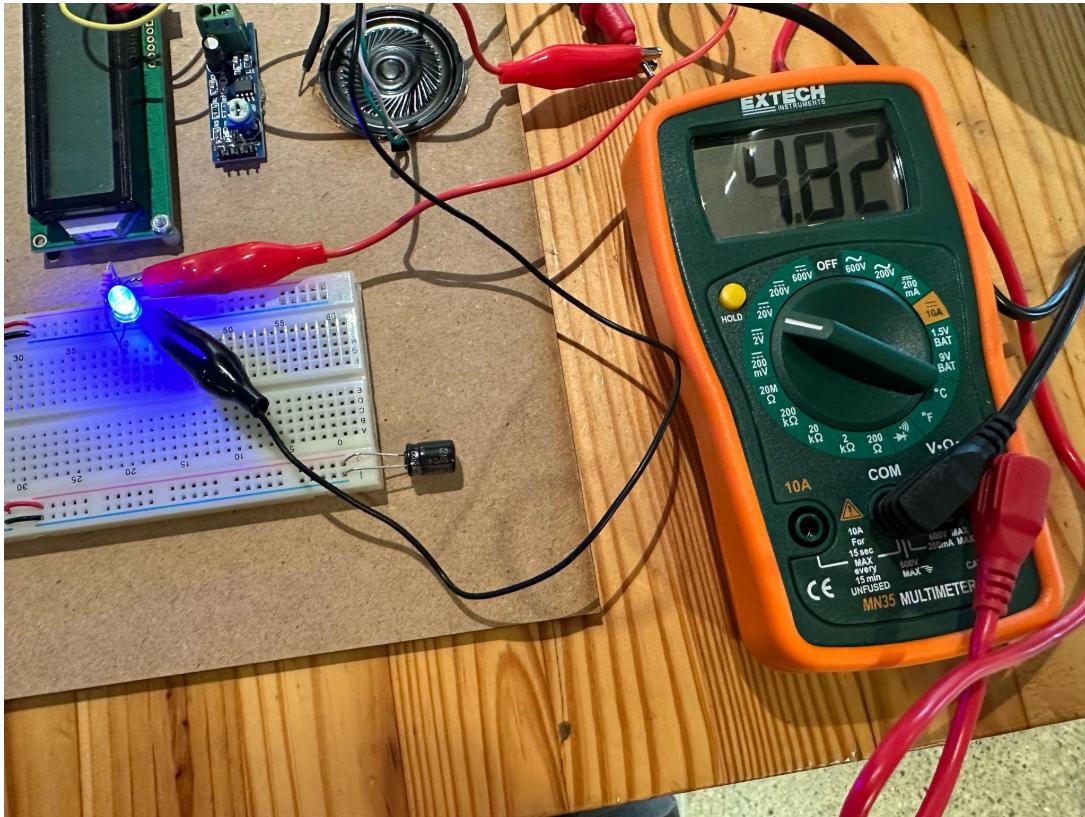


B)  $219 \Omega$

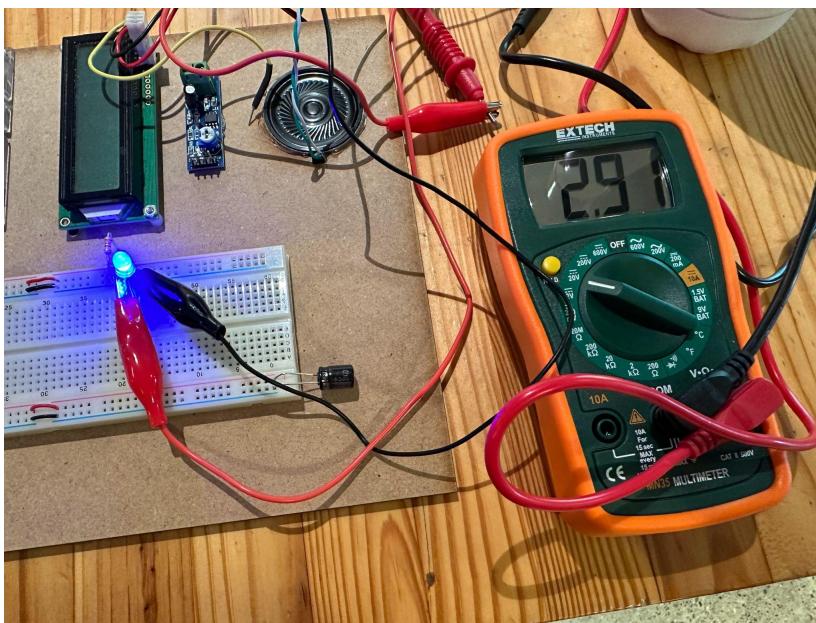


C) The resistance of  $219\ \Omega$  is within the rated resistance of  $220 \pm 5\ \Omega$

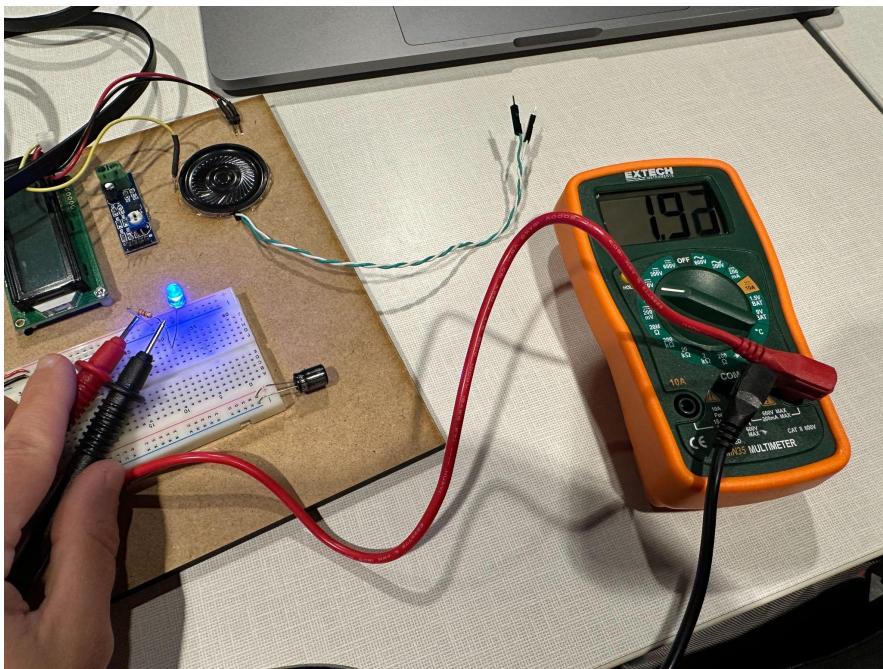
D) 4.82 V



E) 2.91 V

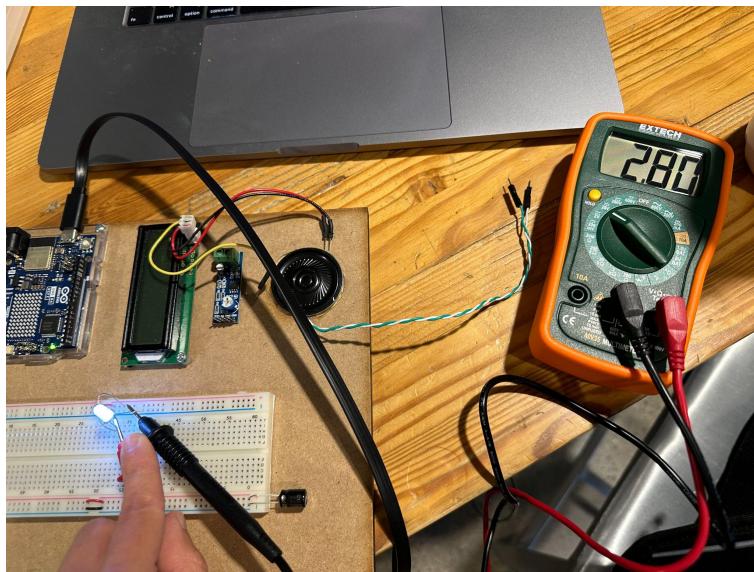
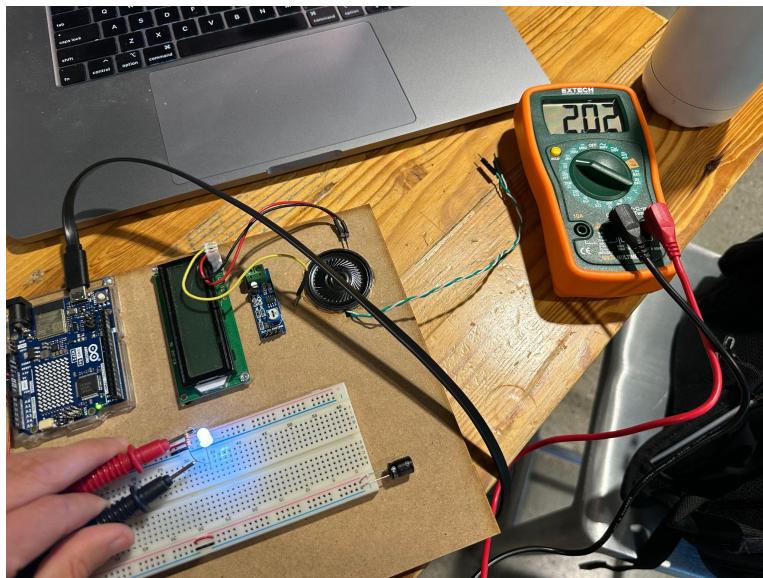


F) 1.92 V



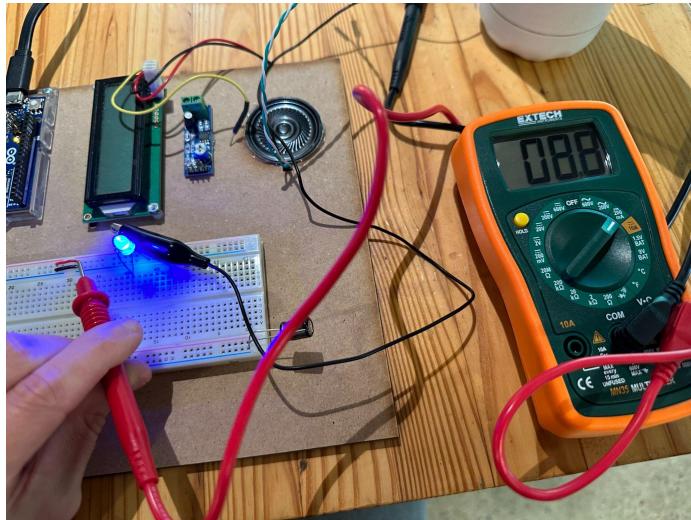
G) The sum of the individual voltages across each component of the circuit equals the voltage across the whole circuit.

H) resistor: 2.02 V white LED: 2.8 V

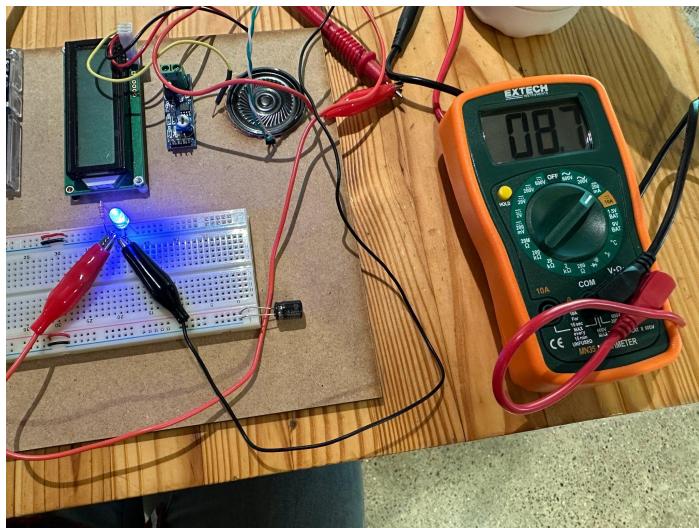


The voltage across the white LED is slightly lower than the voltage across the blue LED, and the voltage across the resistor is slightly higher. When I checked an amber LED, the voltage across it was 1.98 V. The voltage drop is highest for blue, slightly less for white, and significantly less for amber. Each color of LED is made of different materials, so it should have a different voltage drop. I'd expect the voltage drop to be higher for higher frequencies of light (purple/blue/etc). I wasn't sure what to expect with the white LED, since white is the sum of all other colors.

I) 8.8 mA



J) 8.7 mA



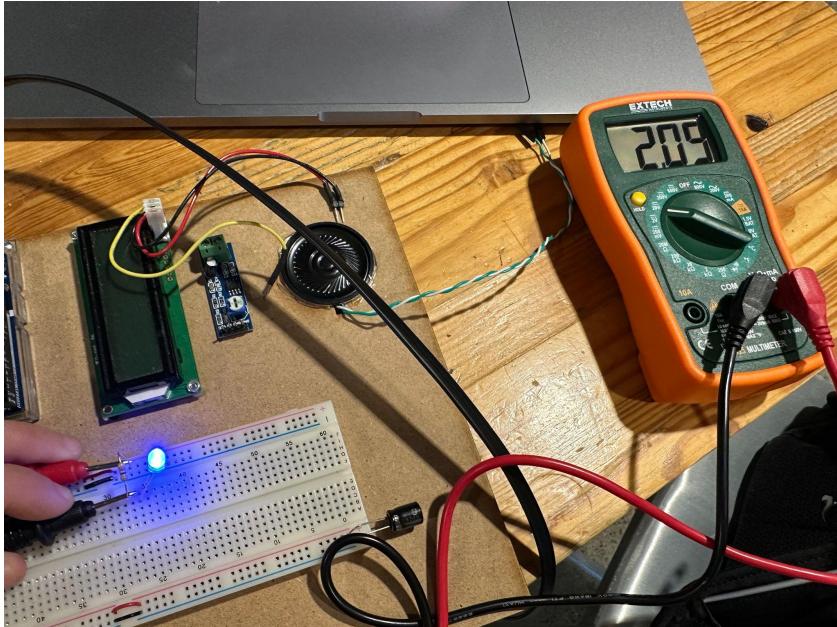
K)  $I = V / R \rightarrow$

$$I = (4.82 - 2.91) / (219 + \text{supposedly } 0 \text{ from LED}) \rightarrow$$

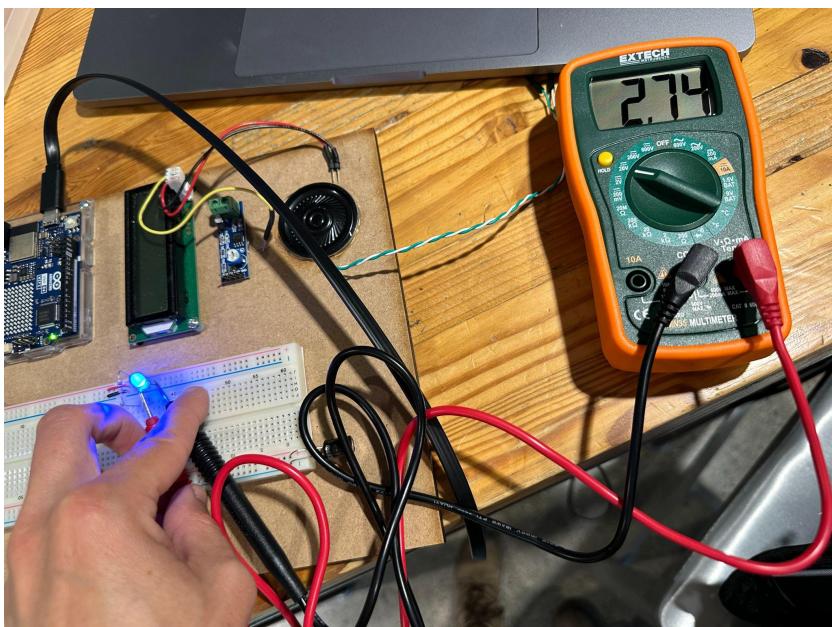
$$I = 8.7 \text{ mA}$$

L) With a  $470\ \Omega$  resistor:

**2.09 V across resistor (vs. 1.92 V)**

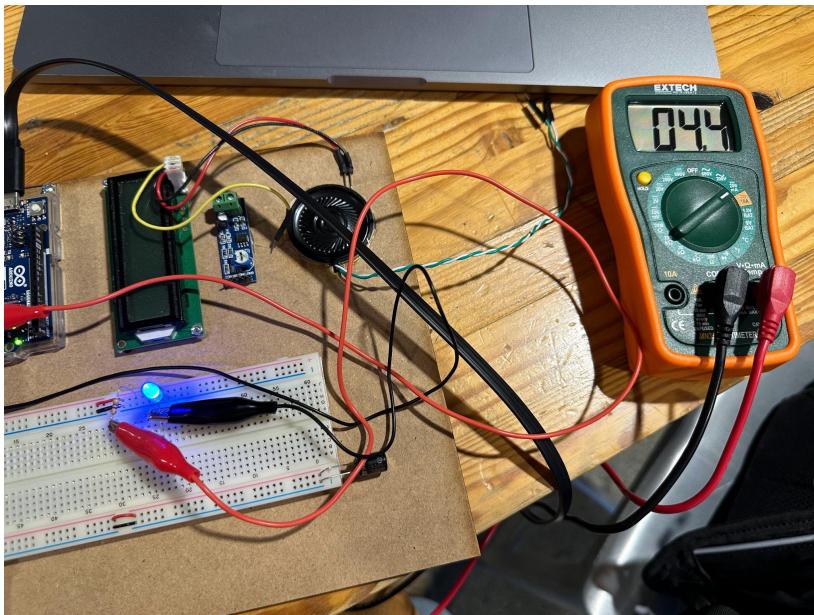
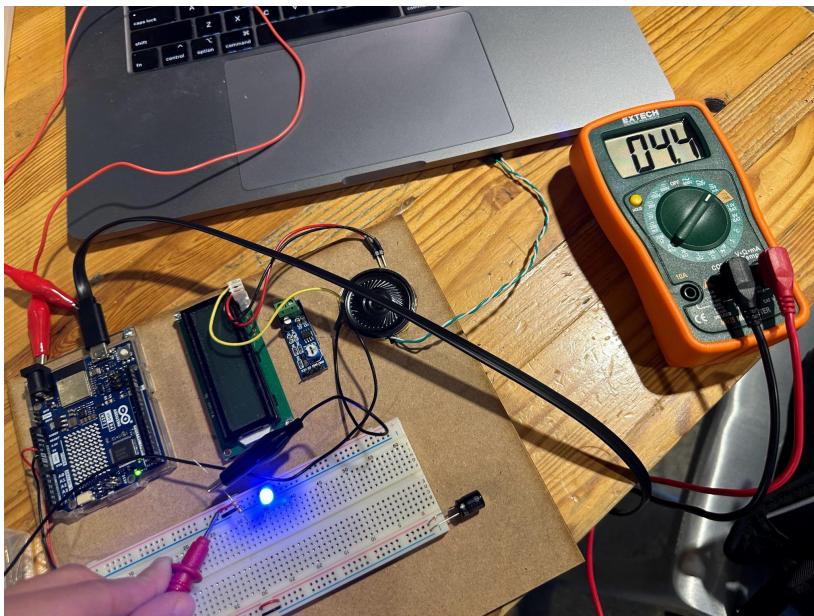


**2.74 V across LED (vs. 2.91 V)**



With a  $470\ \Omega$  resistor, the voltage across the resistor is slightly higher and the voltage across the LED is slightly lower. I wouldn't expect the voltage across the LED to vary, because I thought an LED should have the same voltage drop regardless of the resistor?

M) 4.4 mA through resistor and LED



Higher resistance for the same voltage drop should mean lower current:

$$I = V / R \rightarrow$$
$$I = (4.82 - 2.74) / 470 \rightarrow$$
$$4.4 \text{ mA}$$

N) The blue is a little dimmer with the  $470\ \Omega$  resistor. The brightness of an LED is determined by the current, so lower current should correspond to a dimmer LED.