Chapter 4 Lab Report

Objective:

From this lab, we will learn how to measure resistance, voltage, current, and power measurements using a light bulb. We will also apply Ohm's law to calculate the power and the resistance using data from the meter.

Procedure/Data:

We used a 3W light bulb, 2 multimeters, a power supply, and some wire to complete the following lab.

To start the lab, we connected an Ohmmeter to a light bulb as shown in *figure 1*. Next, we measured the resistance of the cold bulb using three different settings on the meter, and created a chart, as shown in Chart 1.

Next, we added a power supply to the light bulb and measured it with a voltmeter, as shown in *figure 2*. We set our voltage source to 14 volts and measured the voltage shown by the voltmeter, and it read 14 volts.

Next we arranged the light bulb, voltage source, and ammeter as shown in *figure 3*. We attached a voltmeter across the bulb to monitor the voltage. When the power supply was set to 14 volts, we determined that there was 227 milliamps.

Next we created the table shown in Table 2 using data from previous experiments. Using ohms law, we used the equation R = V/I to determine the calculated resistance. Then we created another table, as shown in Table 3, using the power formula: P = I * V.
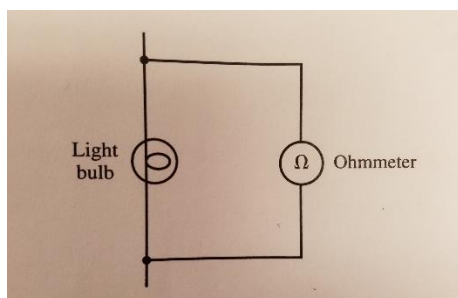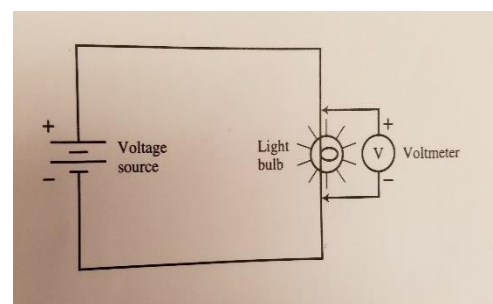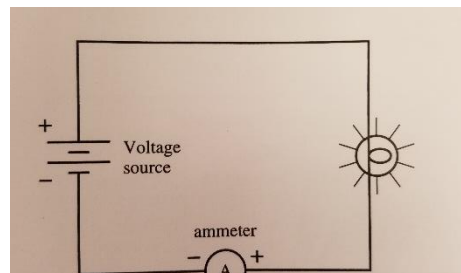

Figure 1

Figure 2

Figure 3

Table 1			
R X 1	R X 10	R X 100	Average
4.1Ω	.003kΩ	.003kΩ	3.37Ω

Table 2			
Resistance Measured	Voltage Measured	Current Measured	Calculated Resistance
3.37Ω	14V	227mA	61.67Ω

Table 3			
Voltage Measured	Current Measured	Calculated Power	Rated Power
14V	227mA	3.178W	3W

Discussion:

We did not have many problems with this lab other than finding the watt rating for the bulb. By reading the microscopic text on the bulb, we were finally able to figure it out.

Conclusion:

When the bulb is lit, the resistance is increased greatly. When the bulb is dull, it still acts as a resistor, but it is very weak. Using ohms law, it is possible to determine many ways to calculate power and resistance, such as $P = I * V$, and $R = V/I$.