WPI | Department of Physics

Worksheet for Lab 2: I-V Characteristics

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Section: B22

Partner:
Date: 11/14/2022

Use this sheet to enter and submit your answers to the questions asked in the gray boxes on the Lab Instructions document. When you have completed this worksheet, save this file as a .pdf and upload the pdf to the canvas assignment associated with this lab. If you have any trouble converting to a pdf, please ask you Lab Instructor or Lab Assistant.

Remember to use complete sentences and that these text boxes will increase in size as you add more content.

Based on the data that you took today, write and answer the questions in the following sections. Remember that even though you will have the same data as your partner, the writing in these sections should be done individually.

## 1: Insert your circuit diagram for an LED in test below

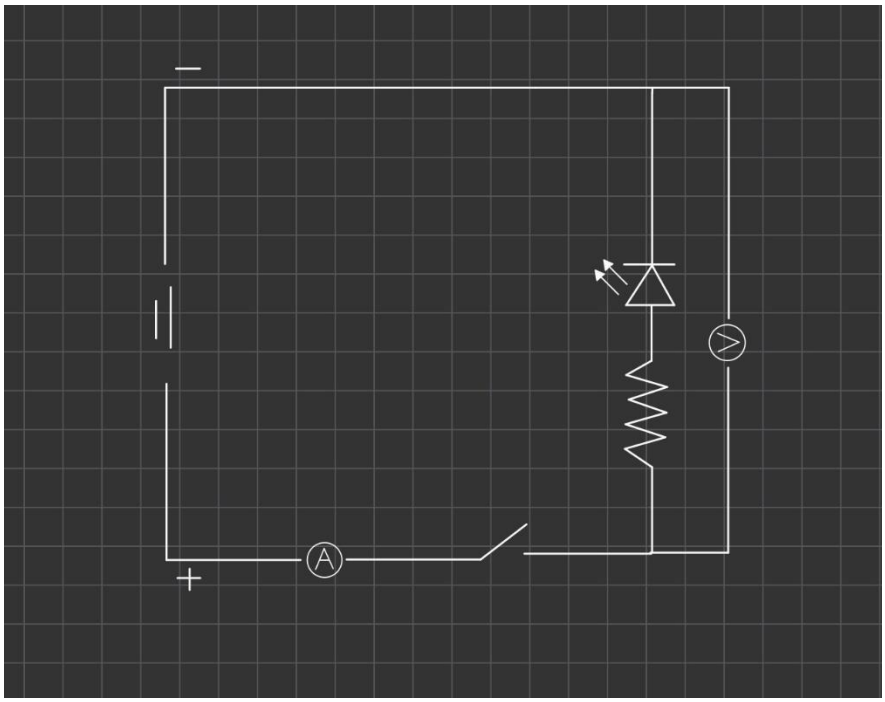


Figure: 1

## 2: Lab Modus Operandi

For this lab, we were expected to collect two set of data – one for LED and one for resistor. In the beginning stages of the lab, we were expected to assemble the following circuit as shown in Figure: 1 to perform the experiment which involves a switch, a power source, an ammeter to know the amount of current flowing through, an LED which indicates whether the current flows through it or not, a resistor and a voltmeter connected in parallel to find the amount of voltage passing through.

## 3: Data Analysis

The graph for the light bulb test does have a constant slope (resistance). The graph for the resistor Figure 2 and Figure 3 test have a constant slope or smooth curve which indicate that the current is directly proportional to the voltage and inversely proportional to resistance.

## 4: Results

Overall, the experiment was successful in proving Ohm's law while demonstrating how changing the voltage may affect the amount of current flowing circuit.

## 5: Conclusion

Ohm's law states that the voltage is directly proportional to the current, and the data indicates that the greater the voltage, the higher the current. Therefore, if there is no resistance or if the resistance is constant, the current will always increase as the voltage rises. Every trial I conducted proved the law, as can be shown by dividing the voltage by the current to obtain the resistance.

## Graphs

Include your graph for your **lightbulb, 10 ohm resistor, and LED below**. These graphs should have the uncertainty, linear trendlines, and proper figure captions.

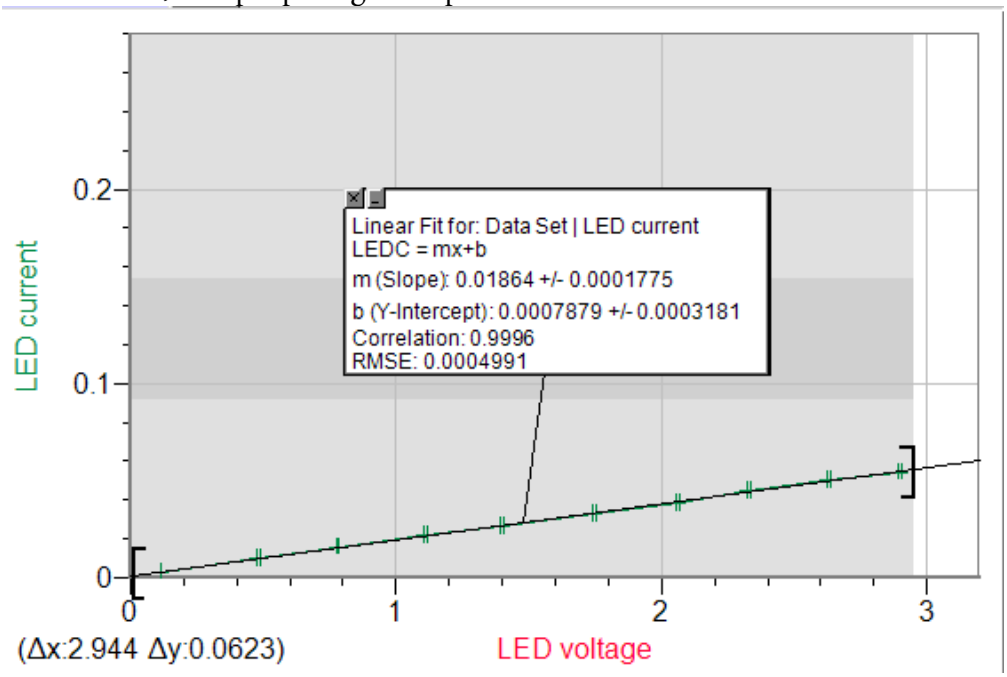


Figure: 2

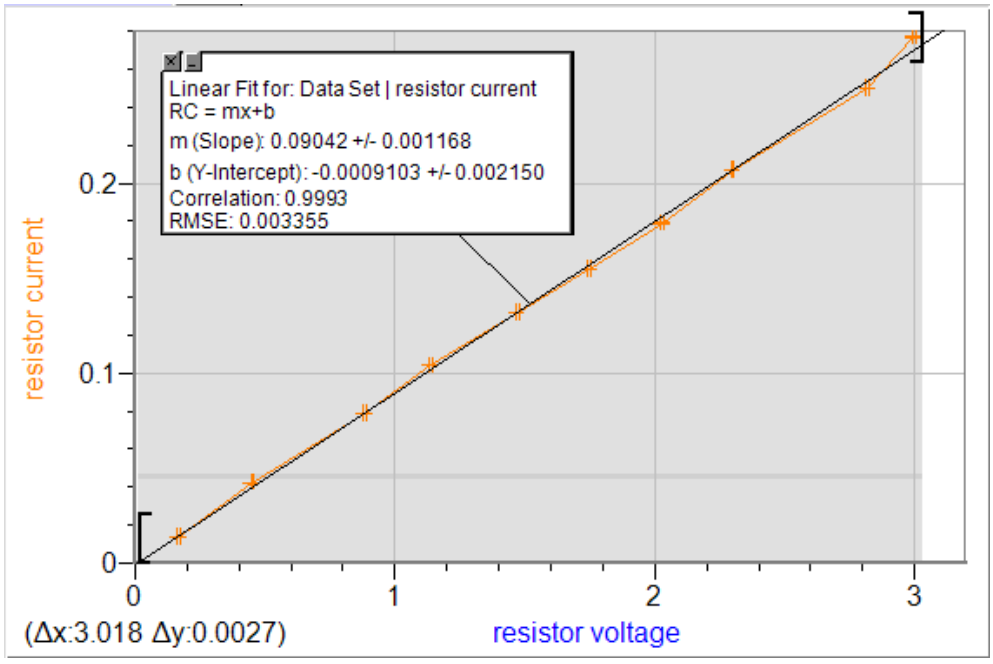


Figure: 3

**Tables**

| Voltage (V) | Voltage Uncertainty (V) | Current (A) | Current Uncertainty (A) |
|---|---|---|---|
| 3 | .00651 | .277 | .0000681 |
| .169 | .00472 | .0135 | .0000831 |
| .451 | .00491 | .0424 | .0000821 |
| .885 | .00615 | .0790 | .0000976 |
| 1.14 | .00577 | .104 | .0000766 |
| 1.47 | .00664 | .132 | .0000785 |
| 1.75 | .00635 | .155 | .0000633 |
| 2.03 | .00643 | .179 | .0000813 |
| 2.3 | .00585 | .207 | .0000726 |
| 2.82 | .0060 | .25 | .0000990 |

| Voltage (V) | Voltage Uncertainty (V) | Current (A) | Current Uncertainty (A) |
|---|---|---|---|
| .114 | .00255 | .00254 | .0000709 |
| .482 | .00424 | .00986 | .0000644 |
| .781 | .00467 | .0159 | .0000670 |
| 1.11 | .00543 | .0217 | .0000703 |
| 1.40 | .00606 | .0268 | .0000678 |
| 1.75 | .00664 | .0329 | .0000675 |
| 2.06 | .00582 | .0386 | .0000515 |
| 2.33 | .00641 | .0448 | .0000588 |
| 2.63 | .00650 | .0504 | .0000612 |
| 2.90 | .00634 | .0544 | .0000575 |