

Physics: Lab 34.1
Watts Your Power?

Name _____ Hour _____

Lab Partners _____

Purpose:

- Construct a simple circuit.
- Calculate current and power in a simple circuit.

Equipment:

- Power supply
- Lamps

- Multimeter and test probes
- Connecting wires



Calculations for Theoretical Power Consumed:

- Use the power supply voltage value of 3V and the given resistance values of the two bulbs to calculate a **theoretical** amount of power used by each bulb when it is connected to the power supply.

Bulb #1

Bulb #2

Procedures:

- Attach one test probe to the red V Ω port and one test probe to the black COM port of the multimeter.
- The multimeter can be set to measure DC **Volts** by turning the dial to V.
- The multimeter can be set to measure DC **current** (amps) by turning the dial to A. **The test probe in the red V Ω port should also be moved to the red 10A port. When you move the probe, you also need to turn the dial to A.**
- Set the power supply to 3V.
- Connect Bulb #1 to the power supply with the proper wires.
- Use the multimeter to measure the voltage and the current moving through the bulb. Record these values in the data table.
- Repeat these steps for Bulb #2.

Data Table:

Bulb #1 Voltage _____ Current _____

Bulb #2 Voltage _____ Current _____

- Use your data table measurements to calculate an **experimental** value for the power used by each bulb.

Bulb #1

Bulb #2

5. Calculate the percentage difference between your experimental and theoretical values for the power used by the bulbs with the equation $\frac{P_{theoretical} - P_{experimental}}{P_{theoretical}}$.

Bulb #1

Bulb #2

4. Draw and label a diagram of your circuit. Include one lamp, the power supply, and the ammeter (show the ammeter as though you were measuring amps.).

Summary Questions:

1. How do the measured voltage values compare with the 3V setting of the power supply? Why might there be a difference?
2. What do you think would happen to the brightness of the bulbs if you used both bulbs in the circuit at the same time?
3. Compare the measurements of the two bulbs when connected to the circuit. Which bulb has the higher amount of charge flowing through it when connected to the circuit?
4. Which bulb has the higher amount of energy per charge when connected to the circuit? Explain your answer.
5. Suppose the first bulb was attached to a power supply with 1V instead of 3V. How would this affect the . . . current through the lamp? . . . resistance of the lamp? . . . power used by the lamp? Explain your answers.

