LAB A - LEDS

Instructions. The goal of this Lab is to get you used to working with the breadboard. Use the Lab Report instructions from Lesson C to complete the tasks below. Be sure to take pictures of your circuits and attach them to the back of your report.

Exercises.

Problem 1. Your first task will be to light up an LED on the breadboard. Follow the steps below and include all answers in your report:

(1) Begin by drawing a detailed circuit diagram.

(2) Try wiring the LED directly to the voltage source. What happens? Why does this happen?

(3) Experiment with different resistor values, and then use them to light up the LED.

(4) Calculate the current that should flow through the LED based on the resistors you chose in (3)

(5) Confirm these values using the ammeter.

(6) Measure the voltage drop across LED using the resistance values you chose above.

Problem 2. In this experiment, you will make series connections.

(1) Connect two LEDs in series and light them up.

(2) Measure the resistance of each LED, and then the total resistance across both LEDs. Confirm that the total resistance is the sum of the individual resistances.

(3) Calculate the current you expect to flow through each LED.

(4) Use the ammeter to measure the current through each resistor. Confirm that you have made a series connection.

(5) Measure the voltage drop across each LED and then the voltage drop across both LEDs. Confirm Kirchoff's Voltage Law holds in the circuit.

(6) Connect five LEDs in series (just for fun!)

Problem 3. In this experiment, you will make parallel connections.

(1) Connect two LEDs in parallel.

(2) Measure the voltage drop across each LED and confirm that you have made a parallel connection.

(3) Measure the current passing through each LED, and confirm Kirchoff's current law at the nontrivial node.

(4) Measure the resistance across each LED.

(5) Connect five LEDs in parallel (just for fun!)

Problem 4. Application Question: Suppose you wanted to light up a bunch of string lights for Christmas. Based on what you learned in this lab, how would you do it?