

Lab #0
Due Tu. 10/16

Please prepare a lab report which records your circuit schematic, hand analysis, circuit measurements, and a picture of your working circuit.

1. Parts List

Verify you have all of the parts listed on page 3 of the PK-101 manual.

2. Kit Introduction

Read the **Introduction to Basic Components** section of the manual. Be sure to understand how a breadboard is organized and connected internally. And practice wire stripping so that you can insert wires into the breadboard.

Your life will be considerably easier if you keep pins of parts straight and wires neatly routed on the breadboard. It is much easier to debug a circuit when wires are not crossing everywhere.

Read the first five sections BASIC CONCEPTS AND TEST EQUIPMENT to learn how to use the digital multimeter.

- Always connect the black lead to the **COM** port of the multimeter.
- To measure voltage or resistance, connect the red probe to the port marked **VΩmA** and measure in parallel.
- To measure current, connect the red probe to the port marked **10ADC**, break the circuit, and place the multimeter in series.

3. Experiment #1: The Light Bulb

Notice the LED is a light emitting diode. An LED is a diode that emits light based on current.

- (a) What is the expected voltage across the LED when it is on?
- (b) Draw the circuit schematic and calculate the current through the 10 kΩ resistor.
- (c) Repeat the calculation for each of the resistors you try.

Be sure to remember that the anode (positive polarity terminal) is the longer pin on the LED while the cathode (negative polarity terminal) is the shorter pin.

4. Resistors

Read **More About Resistors** to understand how to determine the resistor value using the color codes. Online reference can be found in Lessons In Electric Circuits – Volume V.

5. Experiment #2: The Brightness Control

In this experiment, you do not need to do a hand calculation of current. Measure the current, and voltage across the 1 kΩ resistor to determine the variable resistance. Use the multimeter to measure this resistance. (You will need to remove the variable resistor from the circuit to do this).