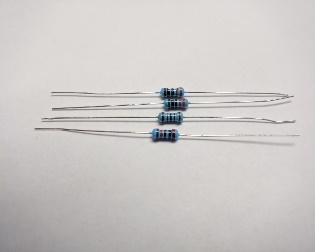
**iCREAT I: Module 3 - LAB 1:**

**Using a Multimeter**

horizontal line

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**Multimeter                     Coin Battery           Battery                    Resistor**

**Objective:** Measure a coin battery, a 9 V battery and a resistor using a multimeter**.**

**Background / Scenario**

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| --- |
| Working on this lab will make you comfortable using a multimeter tool to measure electrical/electronic components  **Note**: The multimeter is a sensitive piece of electronic test equipment. Do not drop it or handle it carelessly. Be careful not to accidentally nick or cut the red or black wires or leads, called probes. Because it is possible to check high voltages, take extra care to avoid electrical shock. |

**Required Resources:**

* Multimeter
* Coin battery and 9 Volt battery
* Resistor

**Part 1: Setup the Multimeter**

**Step 1:**

1. Insert the red and black leads into the jacks on the meter. The black probe should go in the COM jack and the red probe should go in the + (plus) jack.  The (+) jack is typically located on the right of the meter and includes V in the label.
2. Turn on the multimeter.  Some require you to press an **On** button and in others you will have to turn the dial.

**Part 2: Measure the voltage of a coin battery**

**Step 1:**

1. Switch or turn the multimeter to the DC voltage measurement.  Typically, you will have to turn the dial to the left to the section that is labeled V.  Be sure that the scale is set to the appropriate number.
2. Place the battery on the table. Touch the tip of the red (positive) probe to the positive (+) side of a battery. Touch the tip of the black (negative) probe to the other side of the battery.
3. What is shown on the display? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   Is it what you expected to see? (Why or why not)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   **Note**: If the multimeter does not display a number close to the battery voltage, check the multimeter setting to ensure it is set to measure voltage, or replace the battery with a known good battery. If the number is negative, reverse the probes.
4. Disconnect the multimeter from the battery

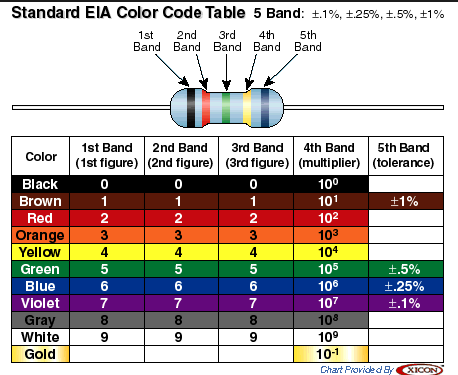
**Part 2.1: Measure the voltage of a 9V battery**

**Step 1:**

1. Place the battery on the table. Touch the tip of the red (positive) probe to the positive (+) side of a battery. Touch the tip of the black (negative) probe to the other end of the battery.
2. What is shown on the display? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   Is it what you expected to see? (Why or why not)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
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   **Note**: If the multimeter does not display a number close to the battery voltage, check the multimeter setting to ensure it is set to measure voltage, or replace the battery with a known good battery. If the number is negative, reverse the probes.
3. Disconnect the multimeter from the battery

**Part 3: Measure a Resistor**

**Step 1:**

1. You selected two randomly sized resistors.  To estimate the size, try to read the color code based on the chart below.  
   
2. What should the meter show for resistor 1?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   What should the meter show for resistor 2?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 2:**

1. Switch or turn the multimeter to the Ohm measurement.  Typically you will have to turn the dial to the left to the section that is labeled Ω.  Be sure that the scale is set to the appropriate number.  Refer to the estimated resistor size in Step 1 to figure out the scale setting.
2. Place resistor 1 on the table. Touch the tip of one probe to one leg of the resistor. Touch the tip of the other probe to the other side of the resistor.
3. What is shown on the display? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   Is it what you expected to see? (Why or why not)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   **Note**: If the multimeter does not display a number close to the expected resistor value, check the multimeter setting, or replace the battery with a known good battery.
4. Place resistor 2 on the table. Touch the tip of one probe to one leg of the resistor. Touch the tip of the other probe to the other side of the resistor.
5. What is shown on the display? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
   Is it what you expected to see? (Why or why not)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
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*References: Some materials for this lab were based on the labs in the CISCO Networking Academy*