



PASADENA
CITY COLLEGE

Introduction to Electronic Test Equipment

Professor Tom Thoen



Electronic test equipment

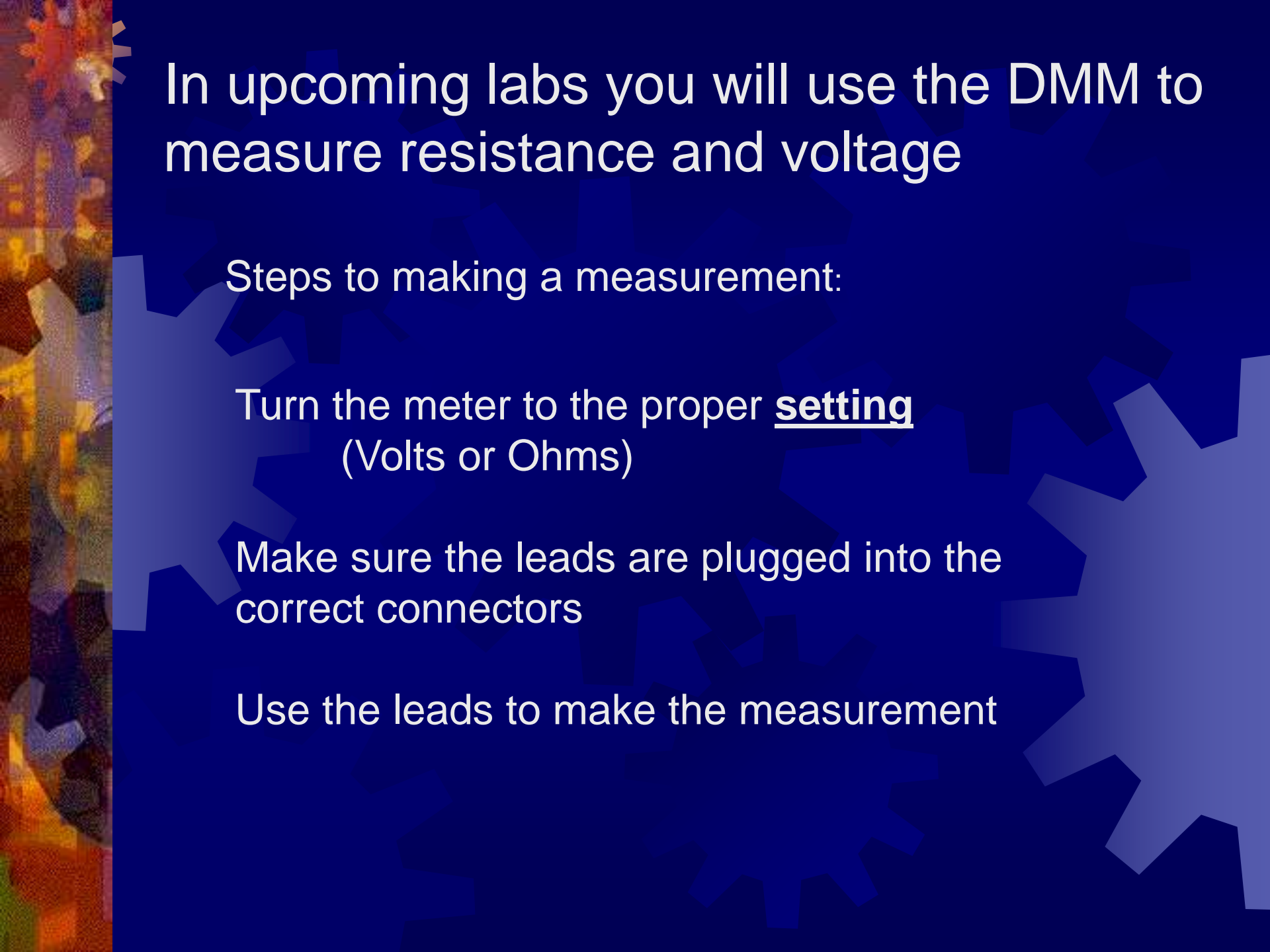
- ✦ Electronic Technicians and designers use specialized test equipment in the lab.
- ✦ The two most common are DMMs and Power Supplies.

DMM stands for Digital Multi-Meter.

DMM's can be used to measure:

- Voltage (V)
- Current (mA)
- Resistance (Ω)
- and “Continuity”
(a low resistance connection)





In upcoming labs you will use the DMM to measure resistance and voltage

Steps to making a measurement:

Turn the meter to the proper **setting**
(Volts or Ohms)

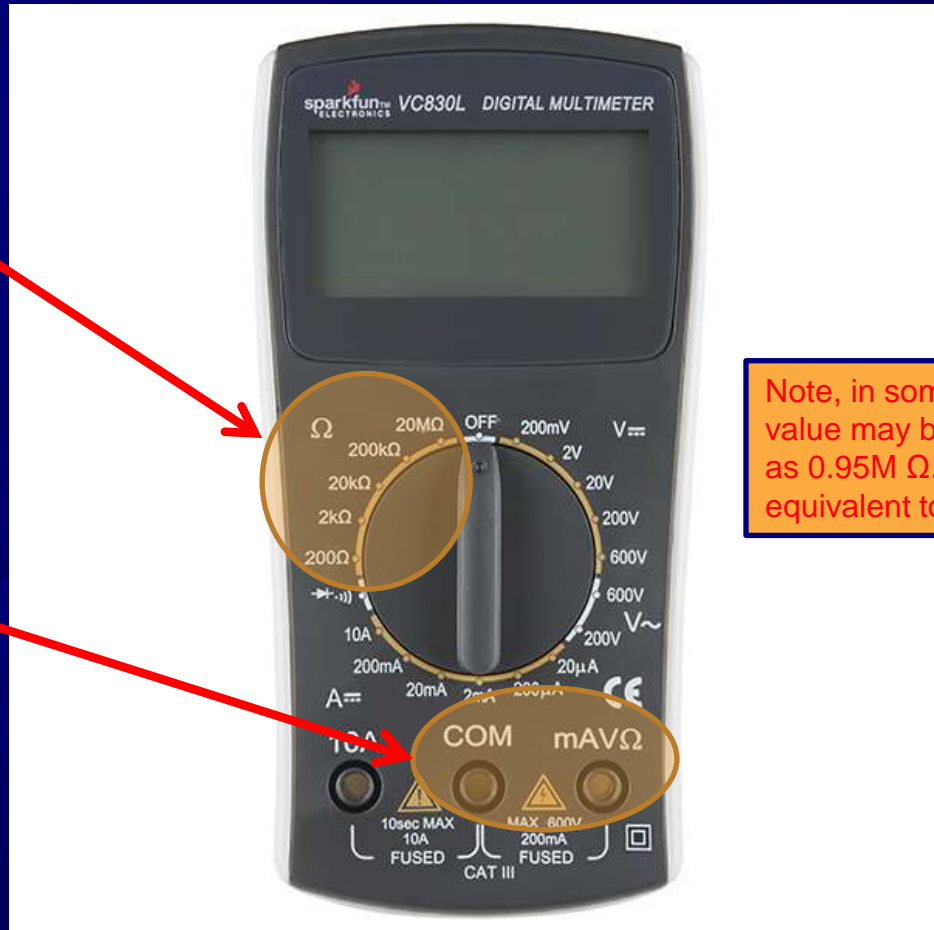
Make sure the leads are plugged into the correct connectors

Use the leads to make the measurement

If we are measuring resistance, we switch the meter to the resistance setting (Ω).

Choose the proper setting, in this case Ohms (Ω)

We plug the probes into the COM and mAV Ω jacks

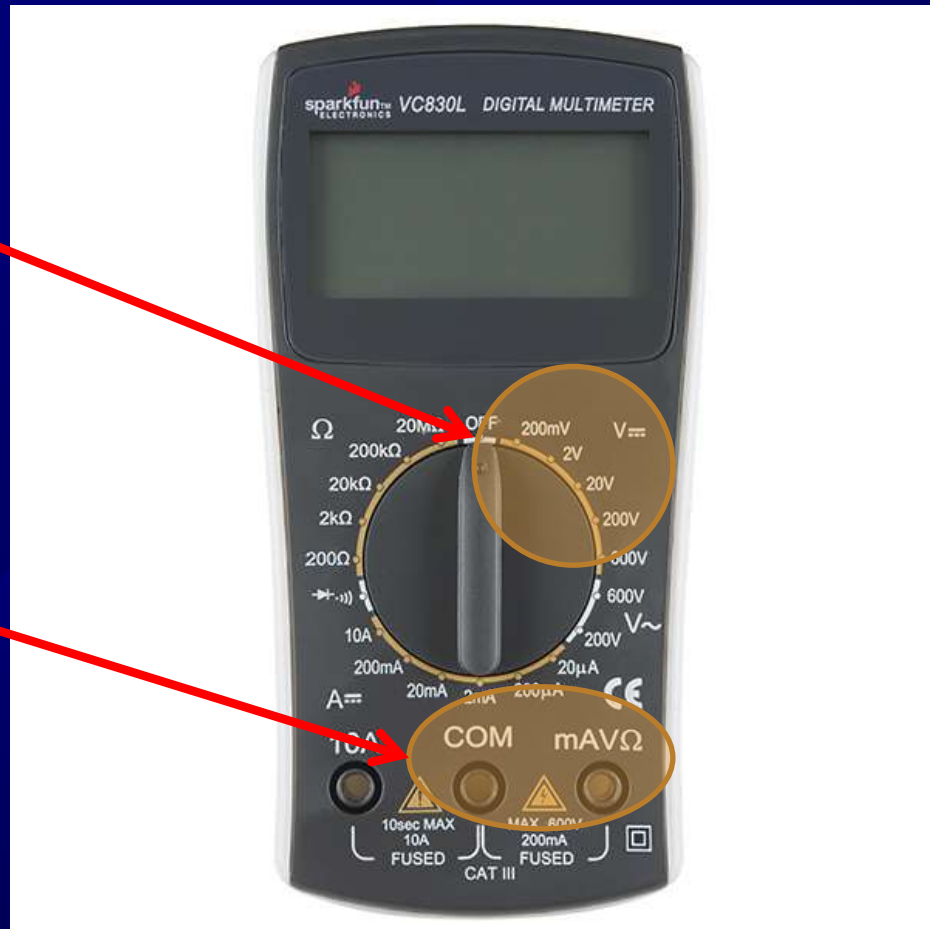


Note, in some cases a value may be displayed as 0.95M Ω . This is equivalent to 950K Ω

If we are measuring D.C. voltage, we switch the meter to the voltage setting ($\overline{\overline{V}}$).

Choose the proper setting, in this case Volts (V)

We plug the probes into the COM and mAV Ω jacks



If we are measuring low D.C. current, we switch the meter to the mA setting.

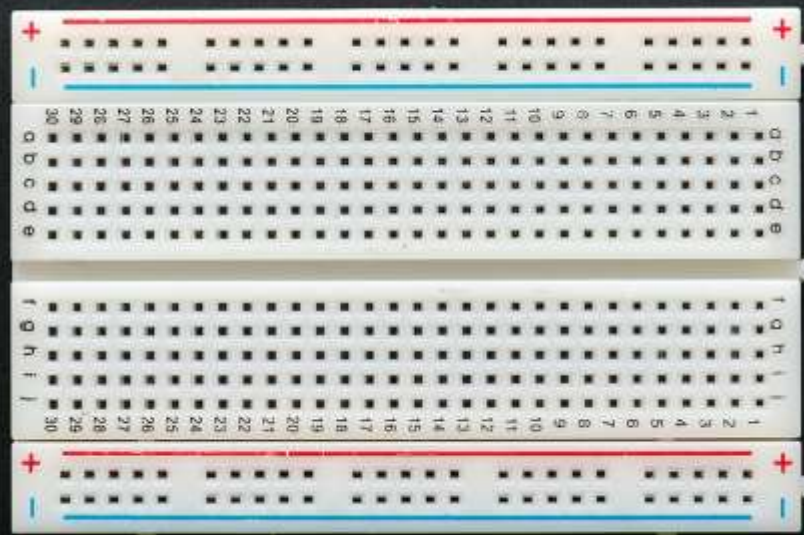
Choose the proper setting, in this case mA

We plug the probes into the COM and mA/V/Ω jacks

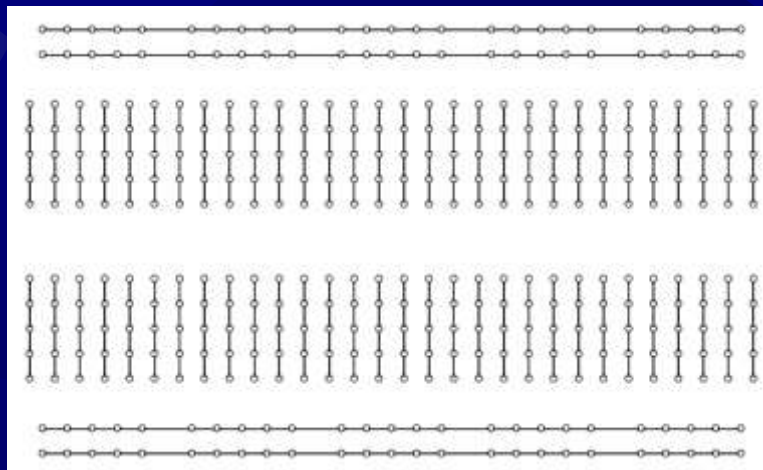
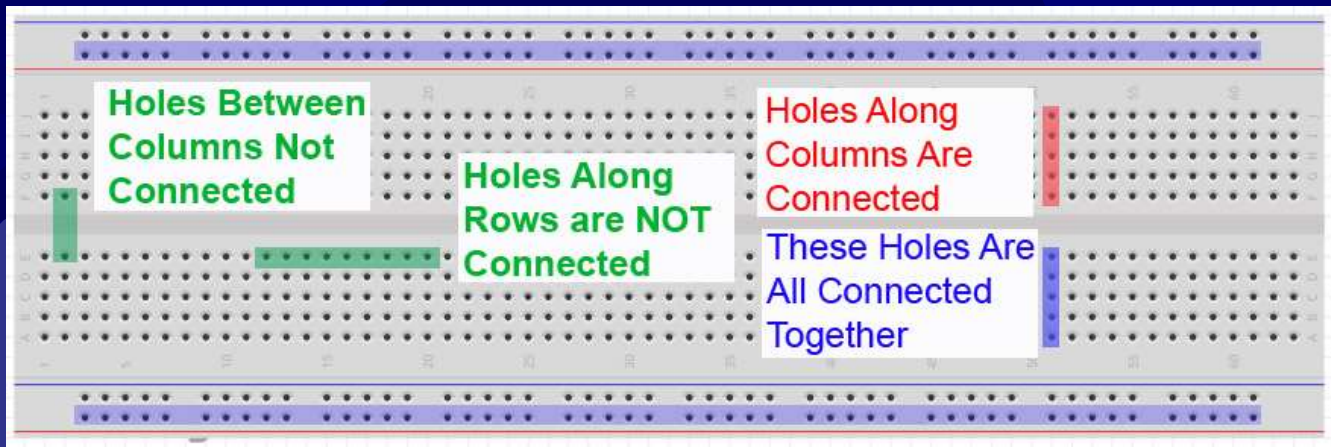


Prototyping Equipment

- ✦ A breadboard is used to test a circuit without soldering wires.



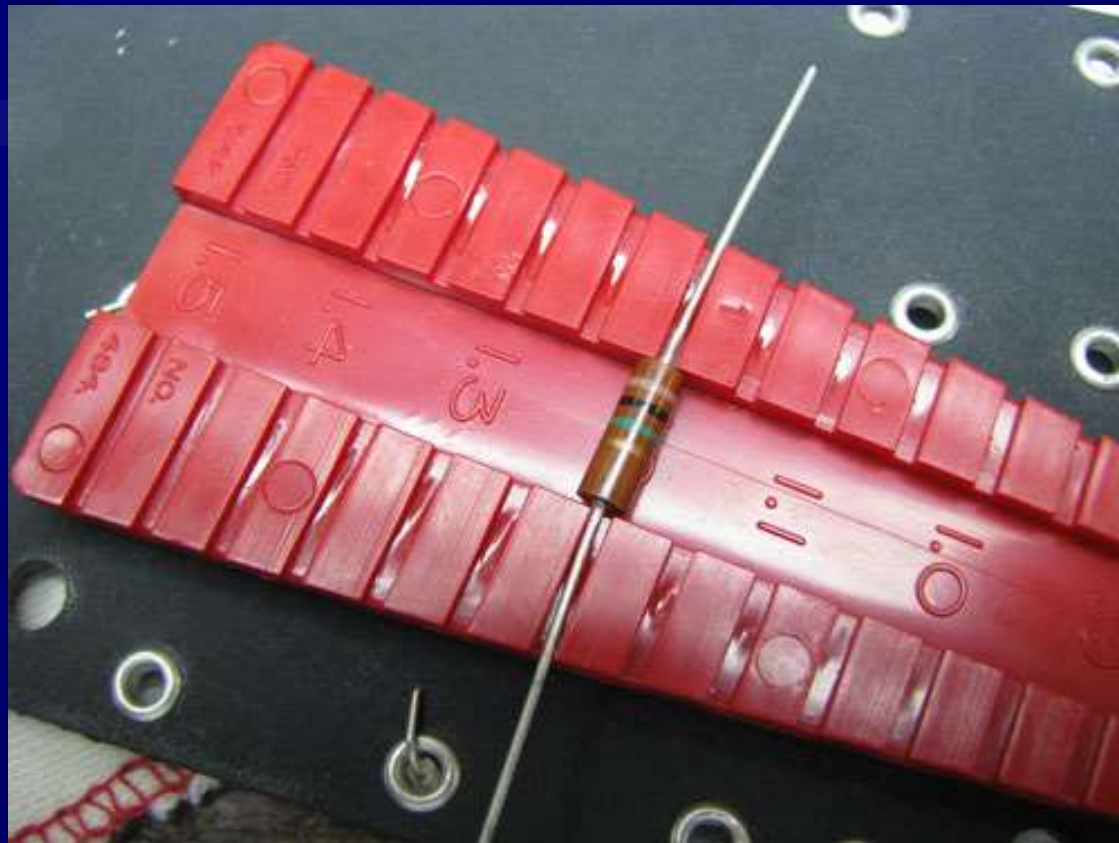
How do breadboards work?



What's inside?
Springs to hold the wires, and strips of metal making connections underneath.

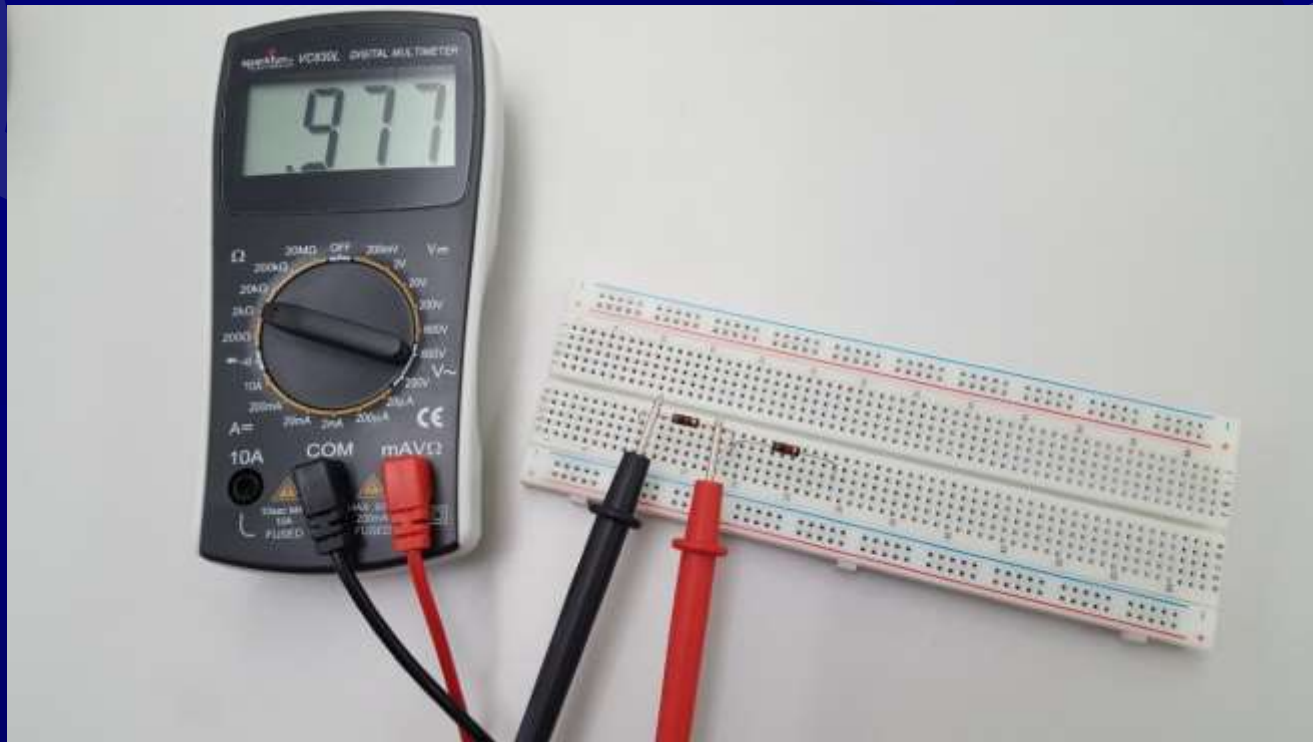
<https://www.youtube.com/watch?v=6WReFkfrUIk>

Before inserting resistors in the breadboard, Use the Lead forming tool to create a 90 degree angle.



How to measure resistors

- ☀ Measure across the resistor – no power connected!

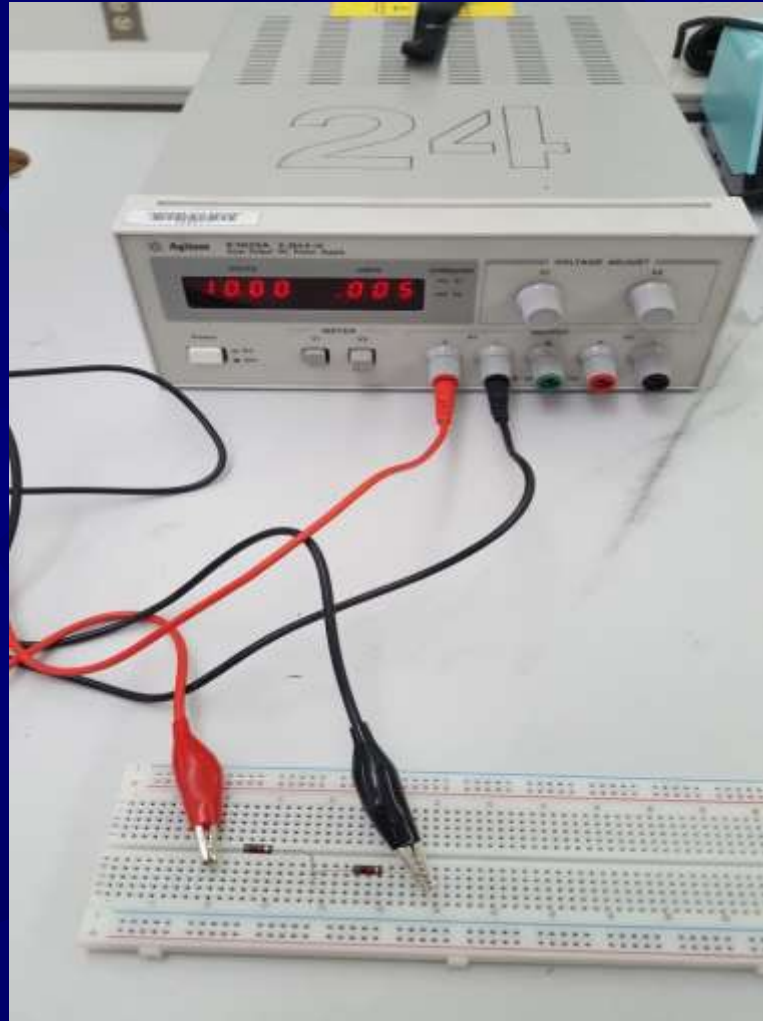


Power Supplies

Used to provide adjustable voltages for lab experiments



Powering a circuit



Reading the voltage of each resistor with the DMM

