

Using a DMM with Breadboards –Current measurements

{ ELTN 130
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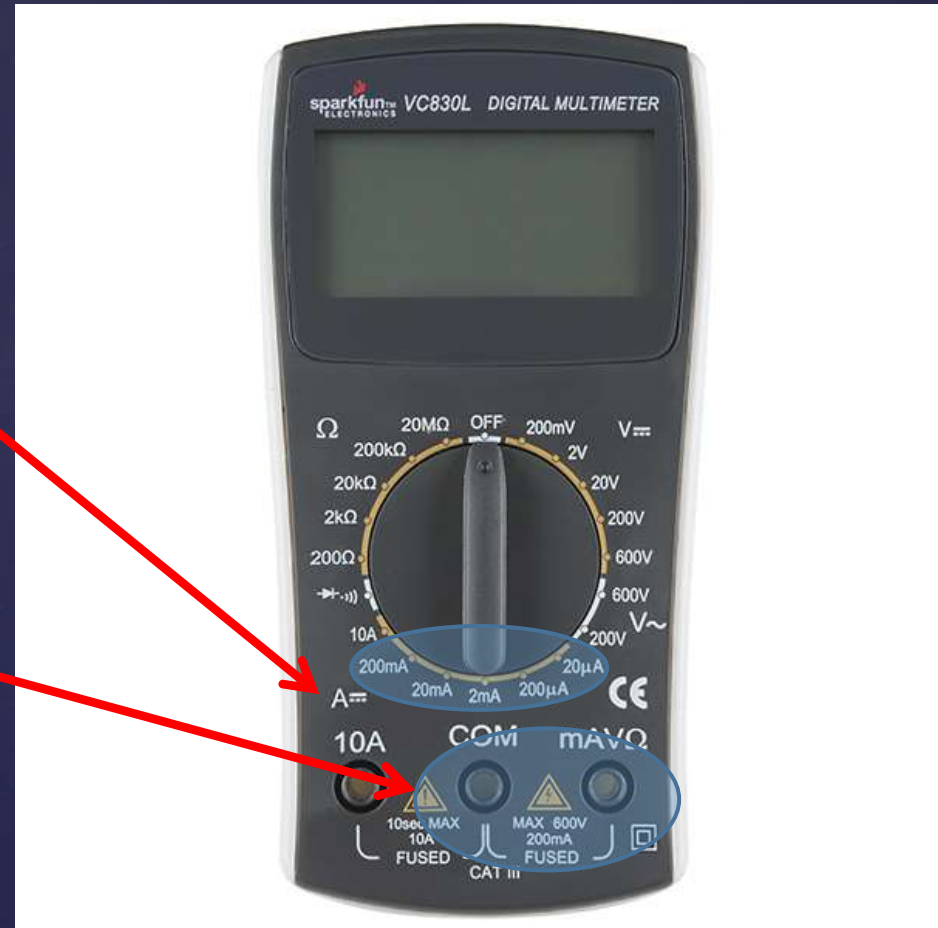
In order to make measurements with the DMM, we need to do four things BEFORE making the measurement:

1. Understand WHAT we are trying to measure!
2. Turn the meter to the proper setting (I)
3. Set the meter to the proper range (20mA, 200mA, etc.) – *starting with a higher range and working down is a good idea for voltage and current...*
4. Switch the leads to measure higher current, if necessary

If we are measuring LOW current, we set the meter to the current setting (A).

Next, choose a range just above the range we are trying to measure. NOTE: The measurement will be displayed in the units selected:

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



If we are measuring HIGH current, we set the meter to the current setting (A).

Next, choose the 10A setting. NOTE: The measurement will be displayed in AMPS

We plug the probes into the COM and 10A jacks.



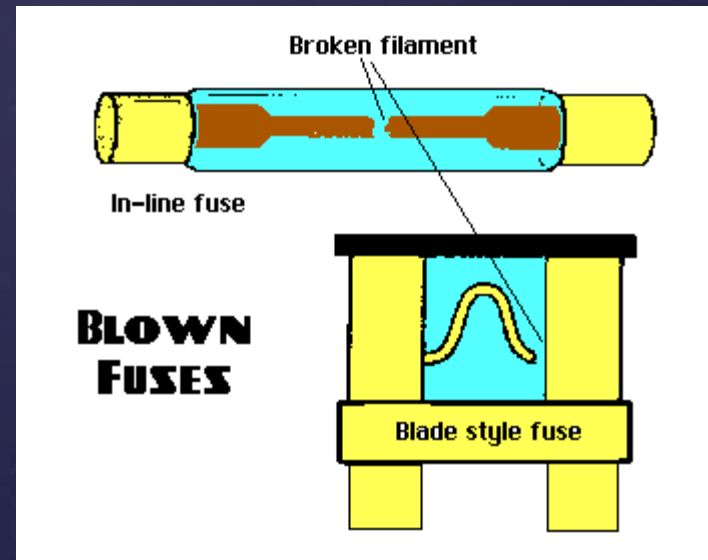
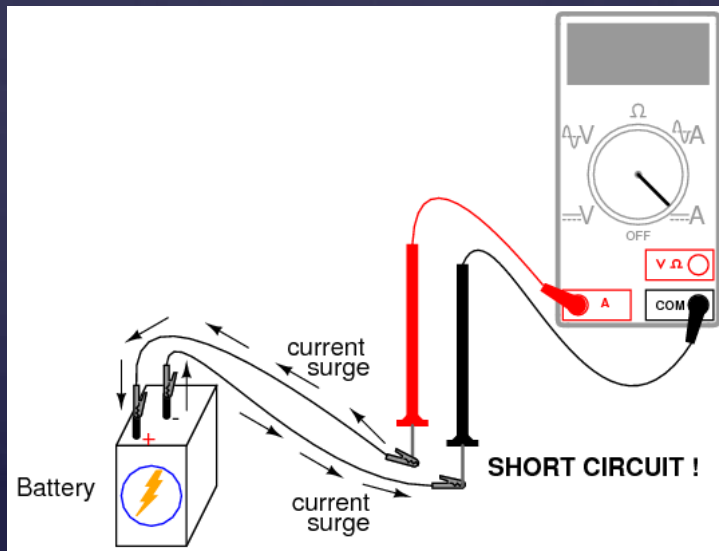
Background Videos...

<https://www.youtube.com/watch?v=P660hTqkGiY>

<https://www.youtube.com/watch?v=bF3OyQ3HwfU>
(start at 3:32)

So why does the fuse blow??

If we try to make a current measurement **ACROSS** a voltage source, we create a short circuit. This is because the meter looks like a zero ohm resistor to the circuit. When too much current flows through the meter, it melts the metal in the fuse to protect the circuitry.

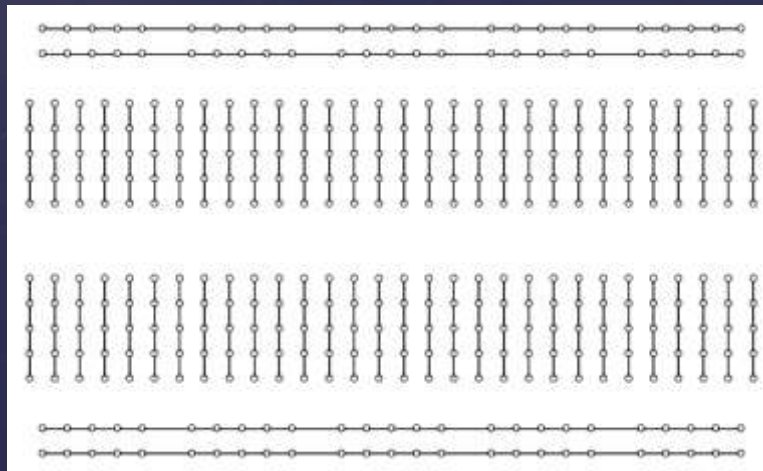
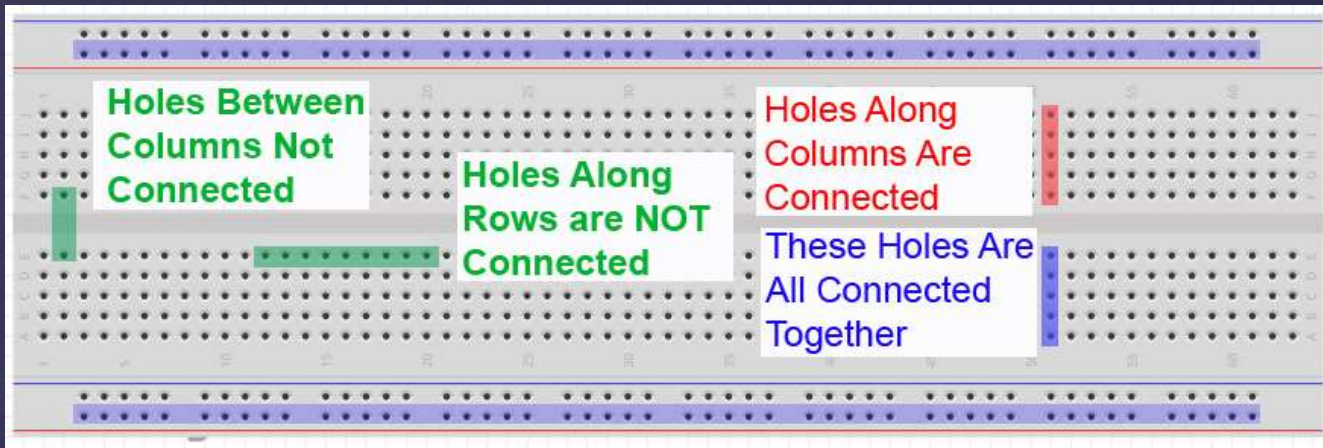


What's the proper way to measure current?

Current measurements basics:

<http://www.allaboutcircuits.com/textbook/experiments/chpt-2/ammeter-usage/>

How do breadboards work?



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

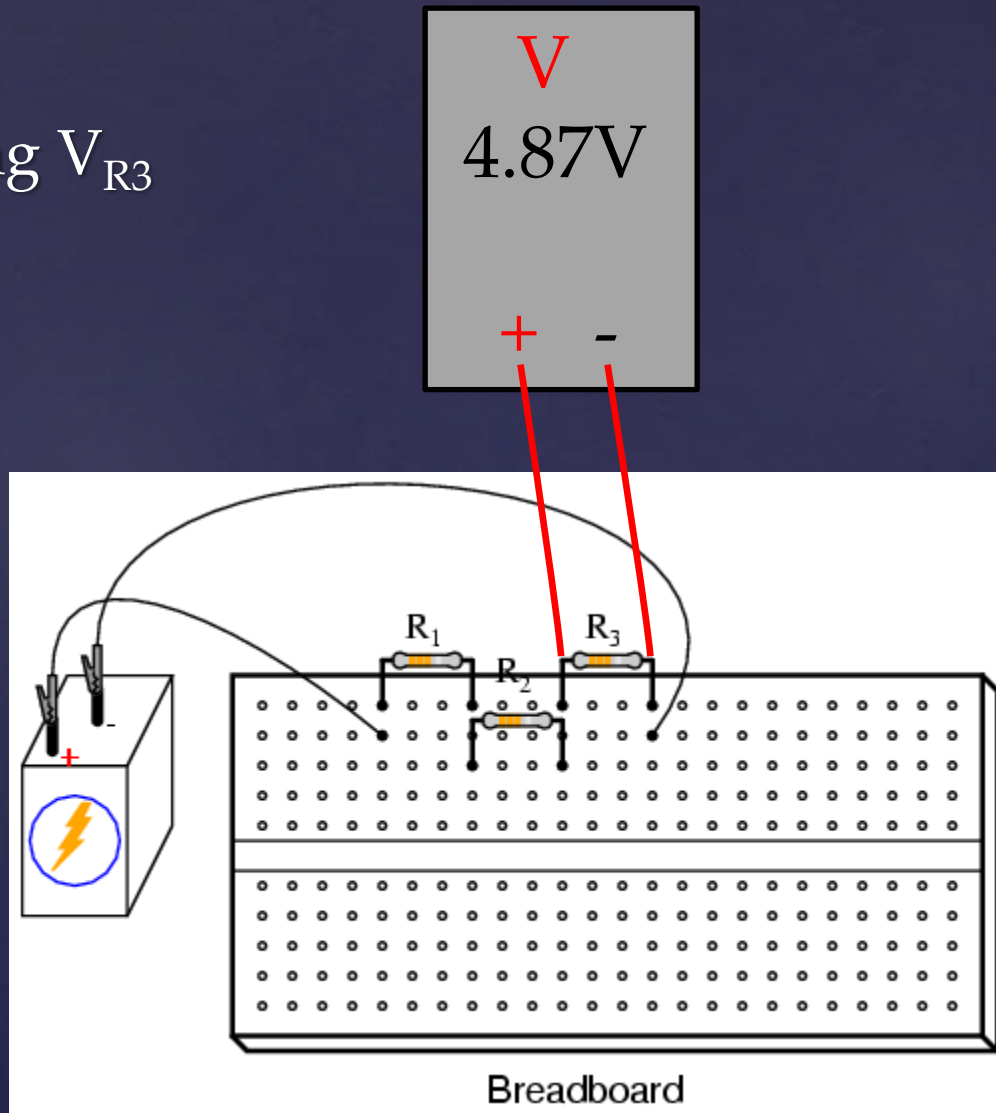
www.toptechboy.com

www.cmuems.com

How to measure voltage on a breadboard:

Voltage:

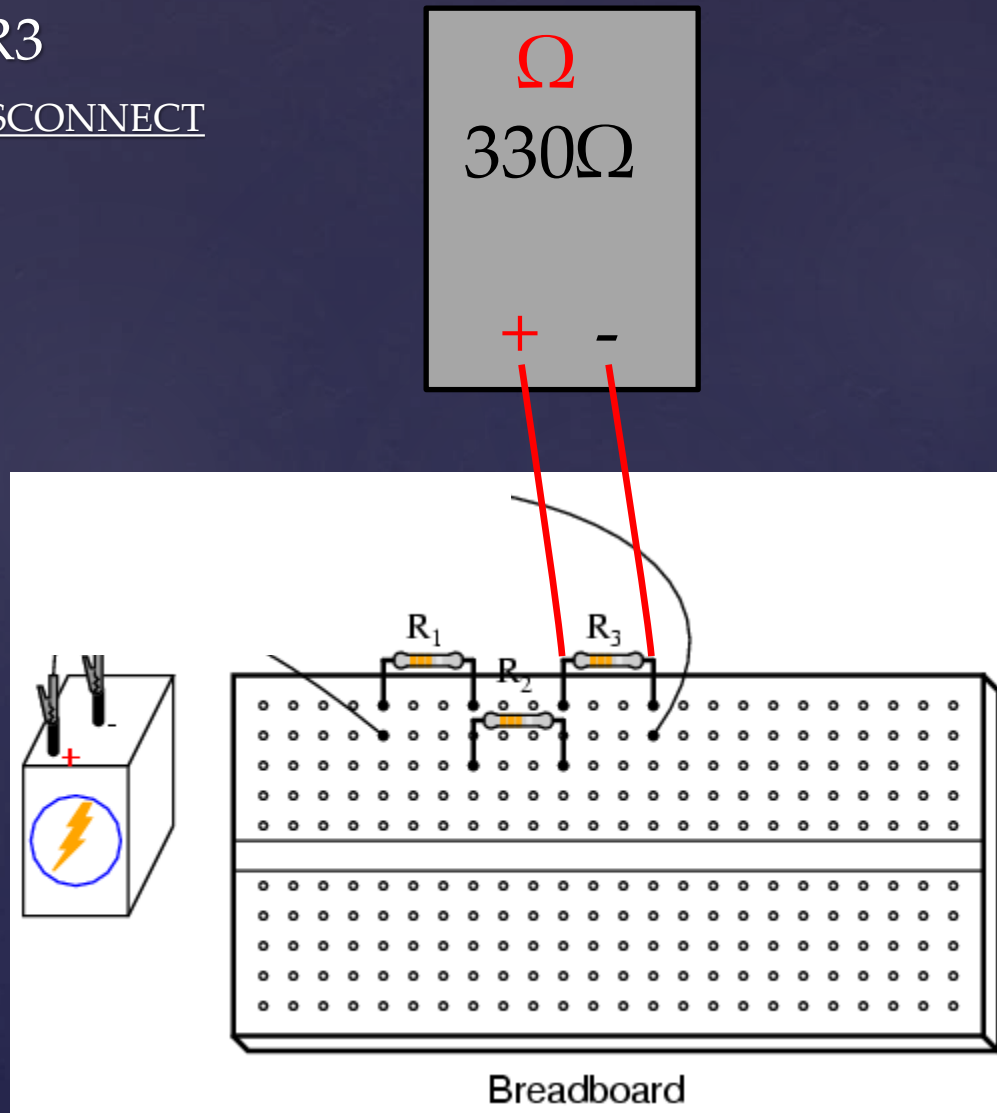
Measuring V_{R_3}



How to measure resistance on a breadboard:

Measuring R3

NOTE: MUST DISCONNECT
BATTERY!



How to measure current on a breadboard:

Measuring Is

NOTE: MUST INSERT METER IN THE CIRCUIT!!
NEVER ACROSS VOLTAGE!!!

