



STEAM CLOWN™ PRODUCTIONS

MILTI METERS



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CAN I GET A COPY OF THESE SLIDES? YES, PROBABLY...

Look Here – SVCTE Mechatronics Engineering Blog: <https://svctemechatronics.blogspot.com/>

Or, most presentation lecture slides can be found indexed on www.steamclown.org and maybe blogged about here on [Jim The STEAM Clown's Blog](#), where you can search for the presentation title. While you are there, sign up for email updates



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WHAT IS A DIGITAL MULTI METER?



<https://dam-assets.fluke.com/s3fs-public/flukeig/articles/images-generals-web-cards/web-cards/training/6004286-card-back-dmm-history-715x360.jpg>



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WHAT IS A DIGITAL MULTI METER?

- A digital multimeter (DMM) is a test tool used to measure two or more electrical values—principally voltage (volts), current (amps) and resistance (ohms). It is a standard diagnostic tool for technicians in the electrical/electronic industries.



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DIGITAL MULTIMETERS COMBINE THE TESTING CAPABILITIES FOR VOLTS, AMPS, RESISTANCE

- Display is where the measurement readouts can be viewed.
- Buttons to select various functions
- Dial (or rotary switch) to select primary measurement values (volts, amps, ohms)
- Input jacks to connect the test leads



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THE BEST MULTIMETER TUTORIAL (HD)



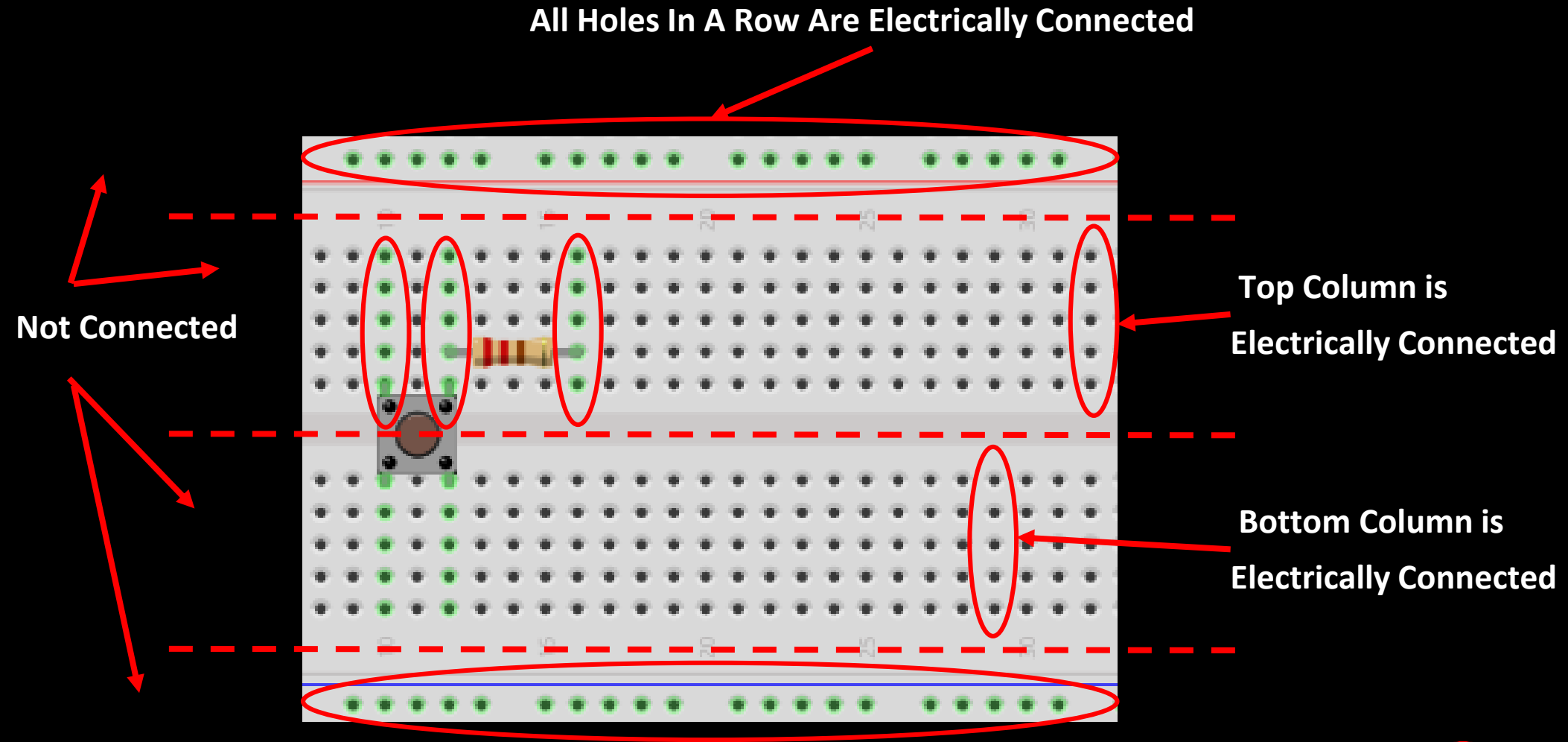
<https://www.youtube.com/watch?v=bF3OyQ3HwfU>



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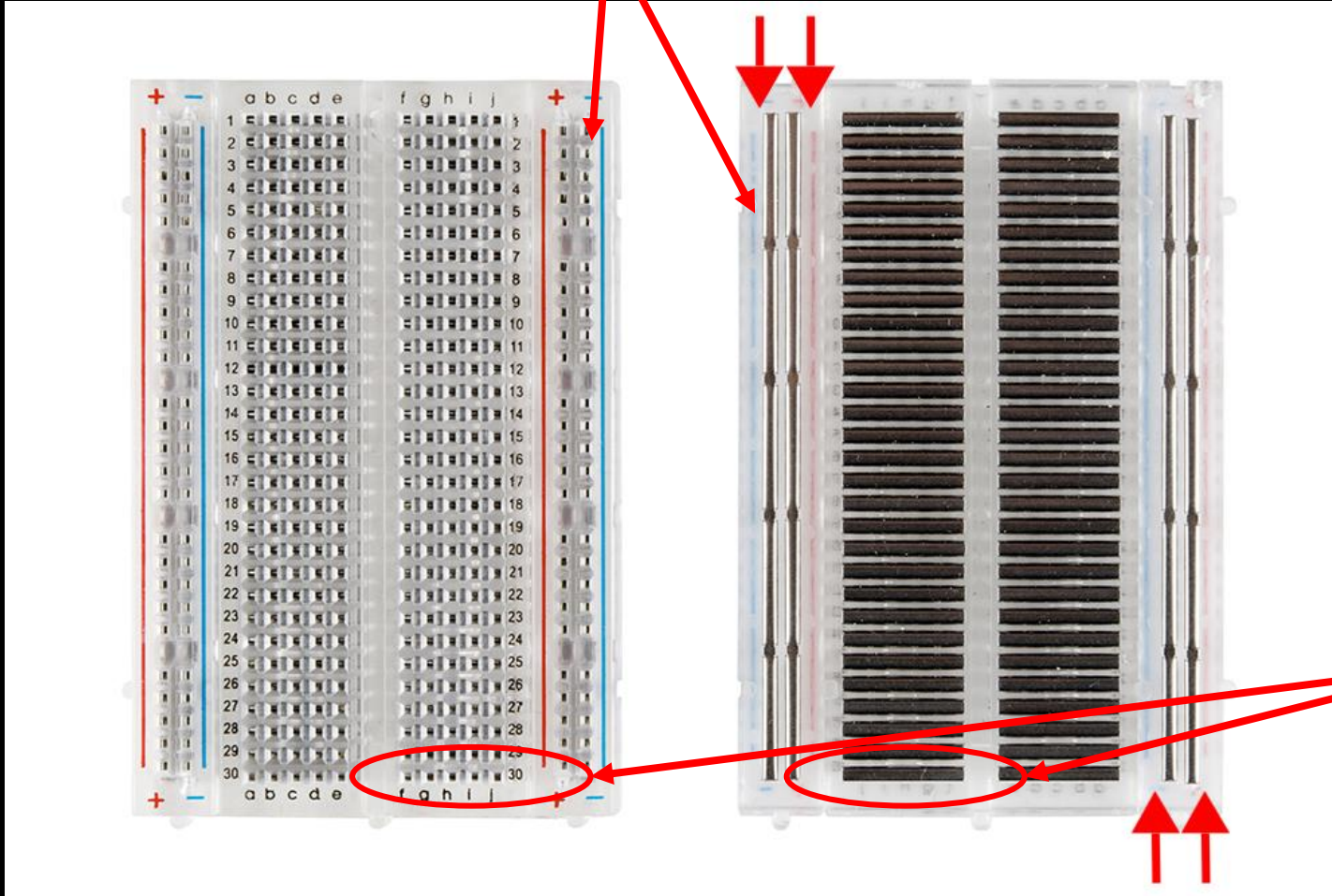
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REVIEW - HOW DOES THE BREADBOARD WORK?

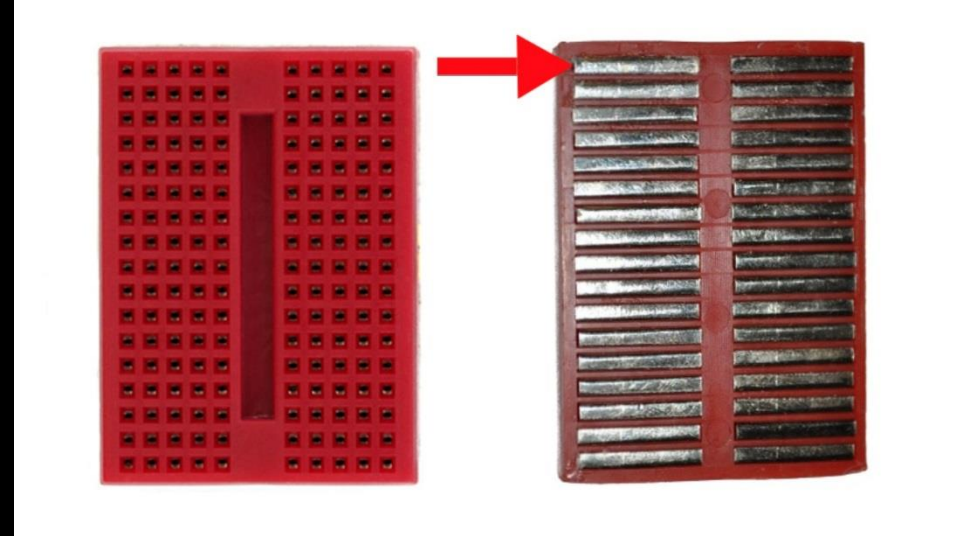


REVIEW - HOW DOES THE BREADBOARD WORK?

All Holes In A column Are Electrically Connected



<https://cdn.sparkfun.com/assets/3/d/f/a/9/518c0b34ce395fea62000002.jpg>



<https://cdn.sparkfun.com/assets/e/7/7/e/c/5175c500ce395f5a49000004.jpg>

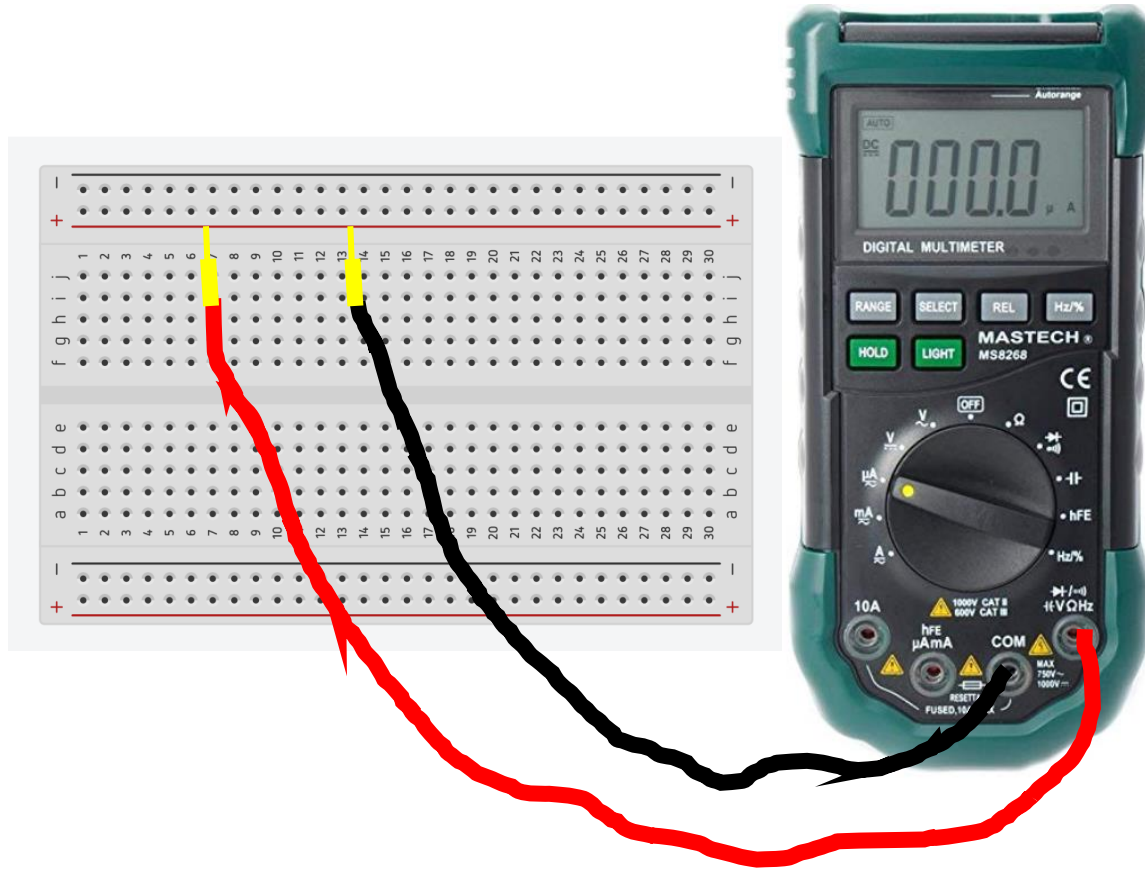
Row Electrically Connected



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LAB SETUP FOR MEASURING CONTINUITY



Diode / Audio



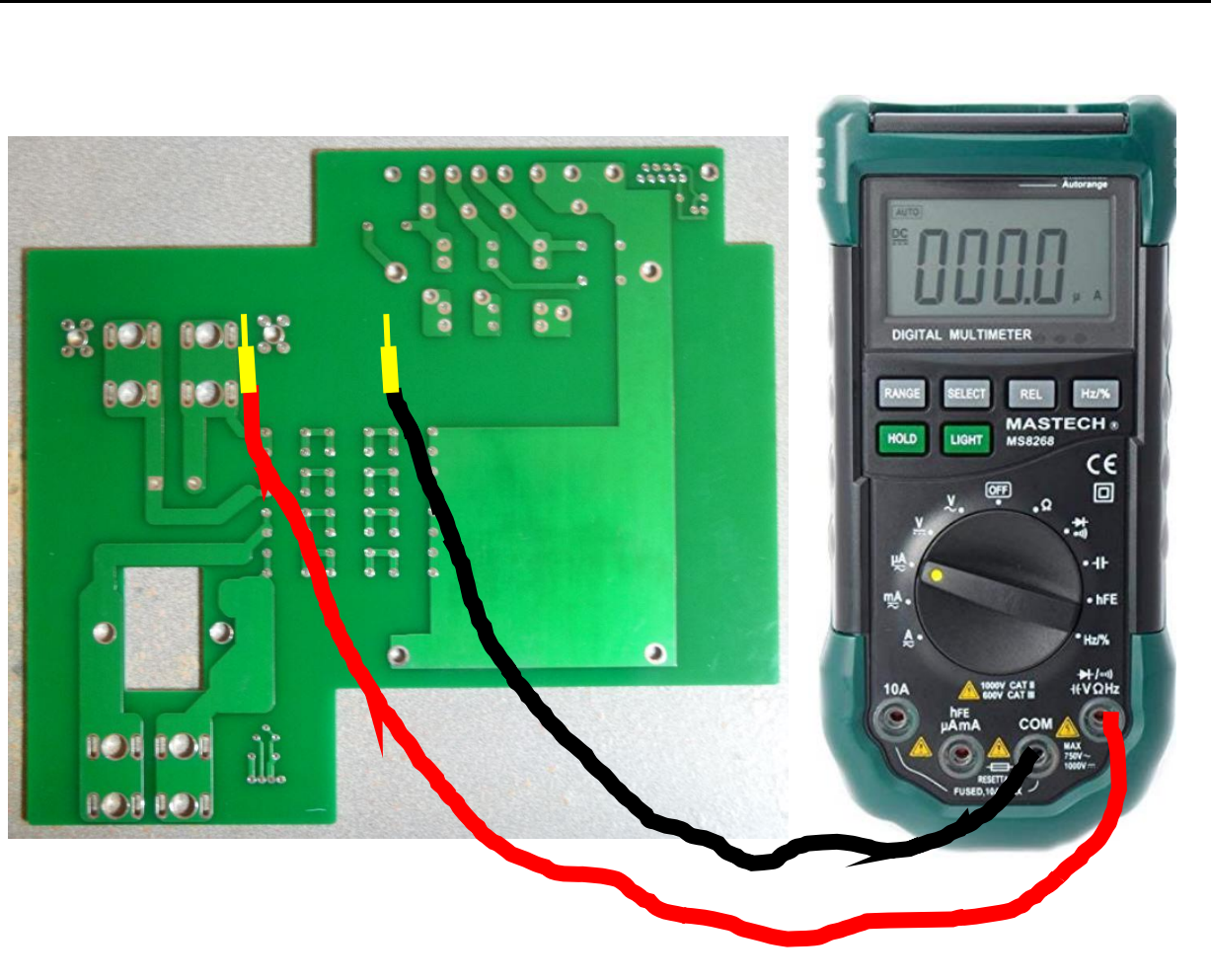
Probe the Breadboard to prove you understand the connections



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LAB SETUP FOR MEASURING CONTINUITY



Diode / Audio



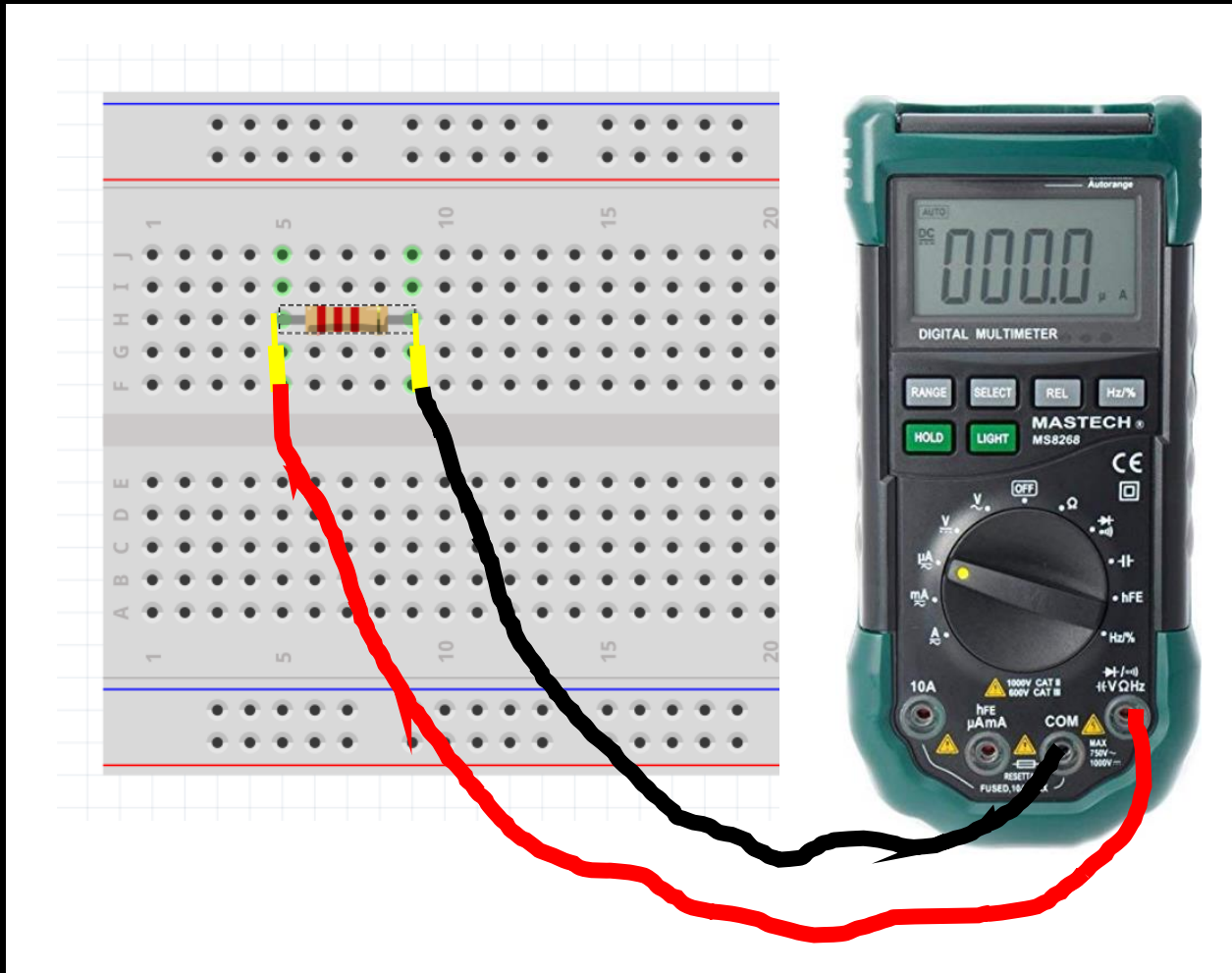
Probe the PCB and find points that are connected



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LAB SETUP FOR MEASURING Ω (ohms)



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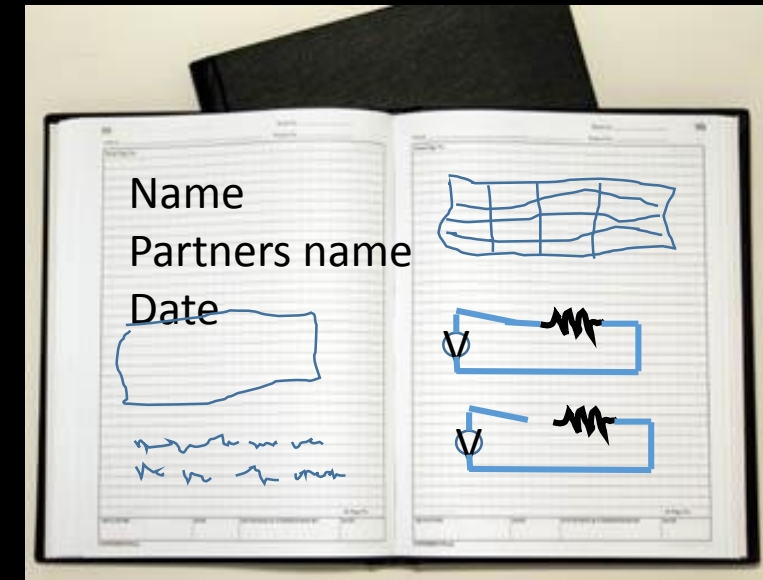
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HOW TO DOCUMENT THIS LAB

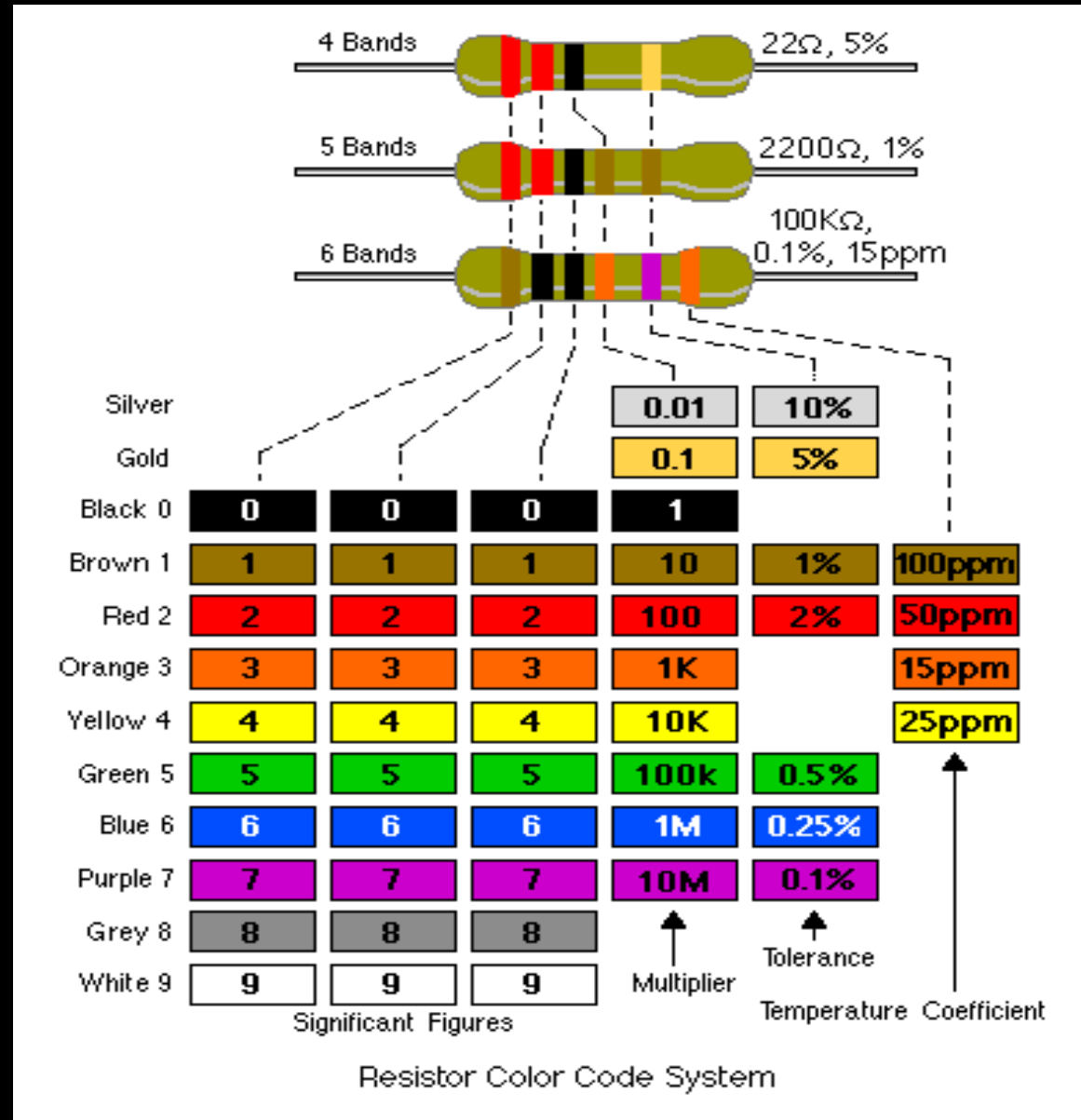
- On the next blank page
 - Draw a Tables for each set of Resistors
 - Measure the voltage... it may not be exactly 5 volts
 - Measured Volts _____

Resistor #	Resister Value	Measured Ω	Measured Volts	Calculated I	Measured I
Resistor #1					
Resistor #2					
Resistor #3					

- Draw a representation of the Circuit you have built
- Experiment... Build some different Circuits... Series, parallel... Draw them, then build them, then test them...



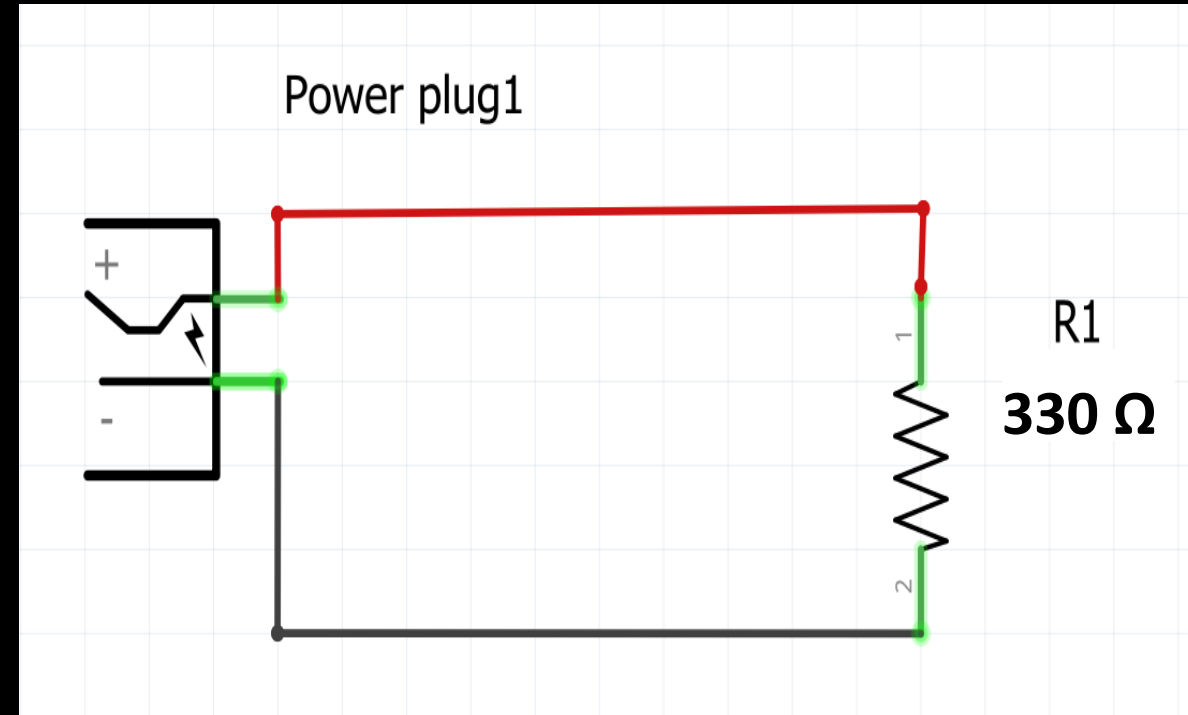
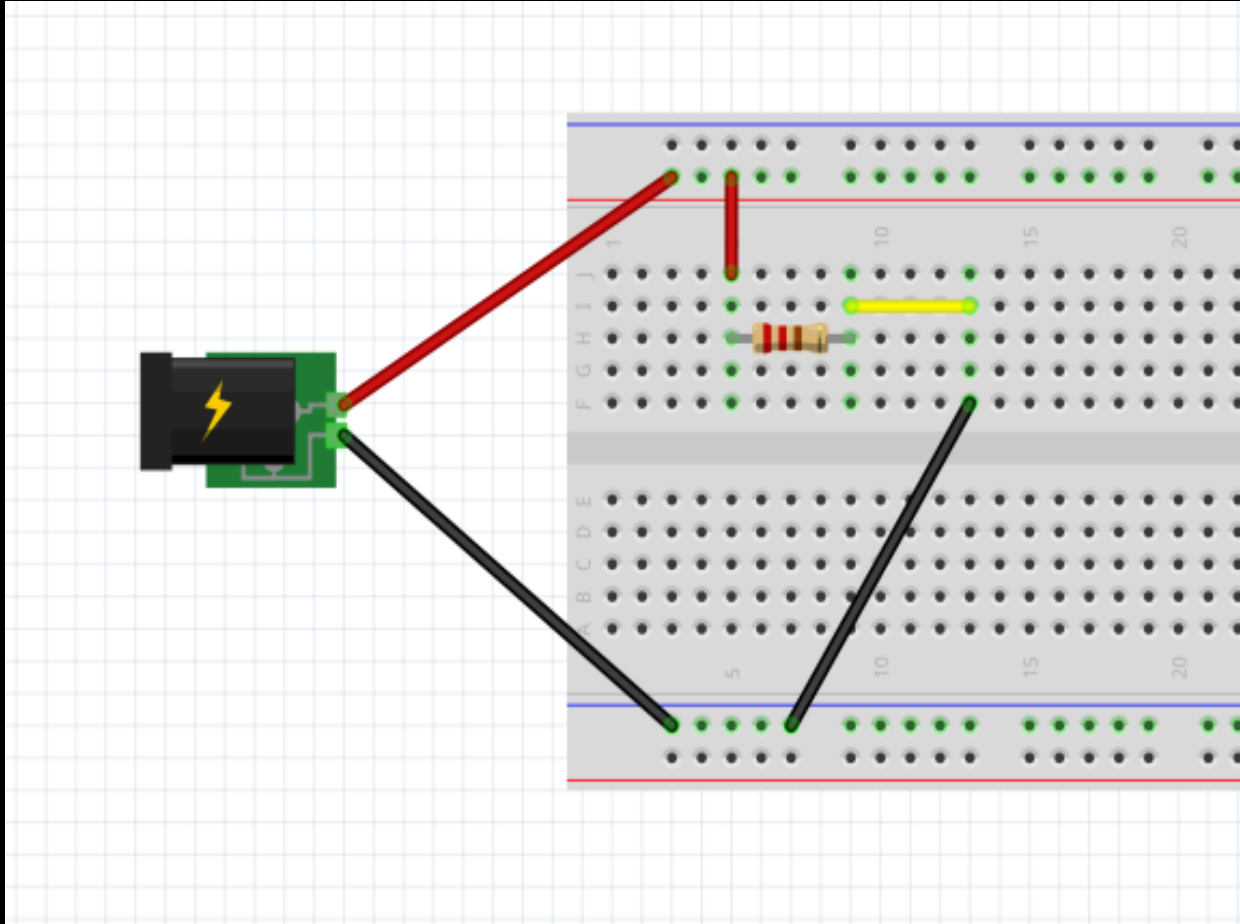
RESISTOR COLOR CHART



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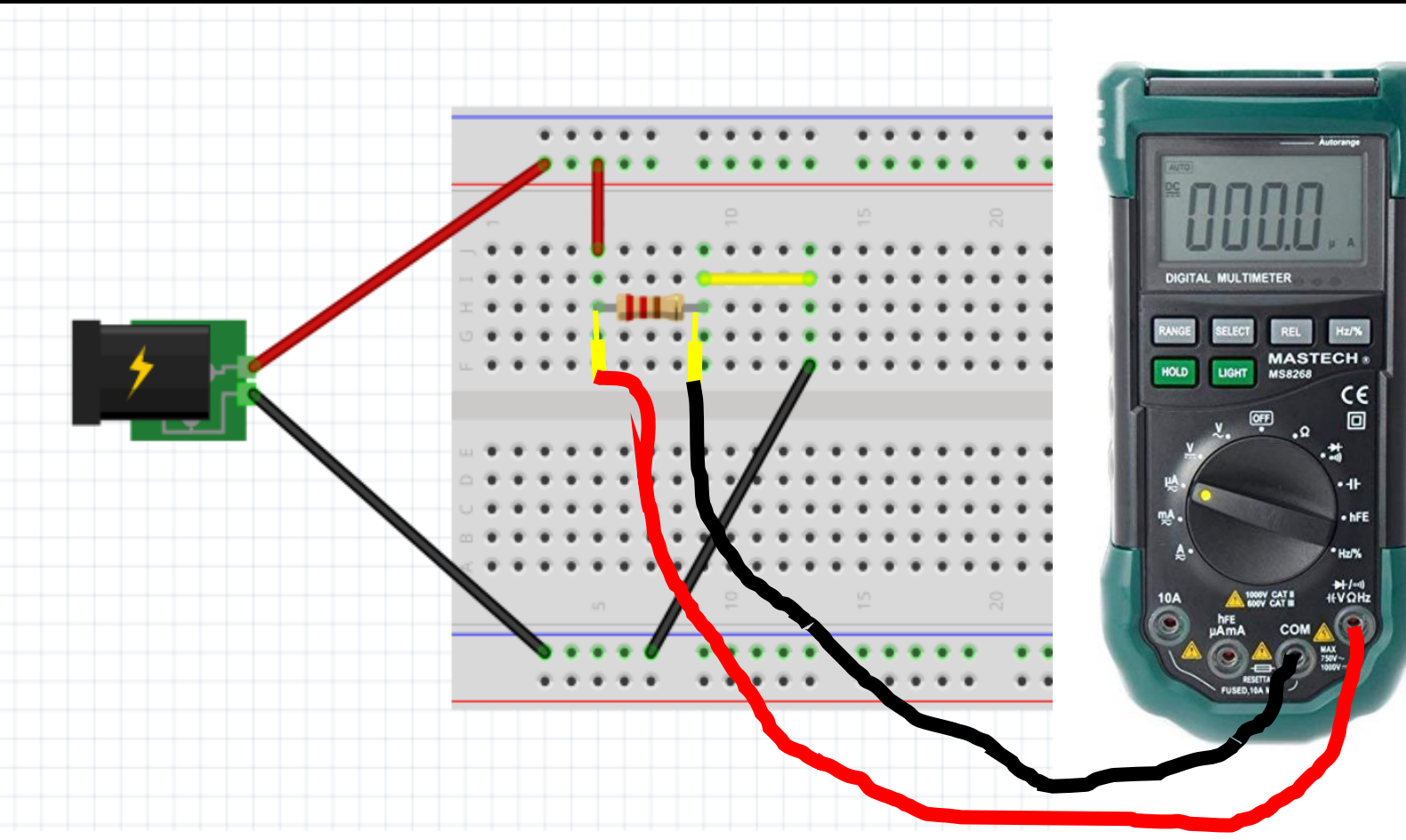
CIRCUIT SETUP FOR MEASURING VOLTS & AMPS



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LAB SETUP FOR MEASURING VOLTAGE



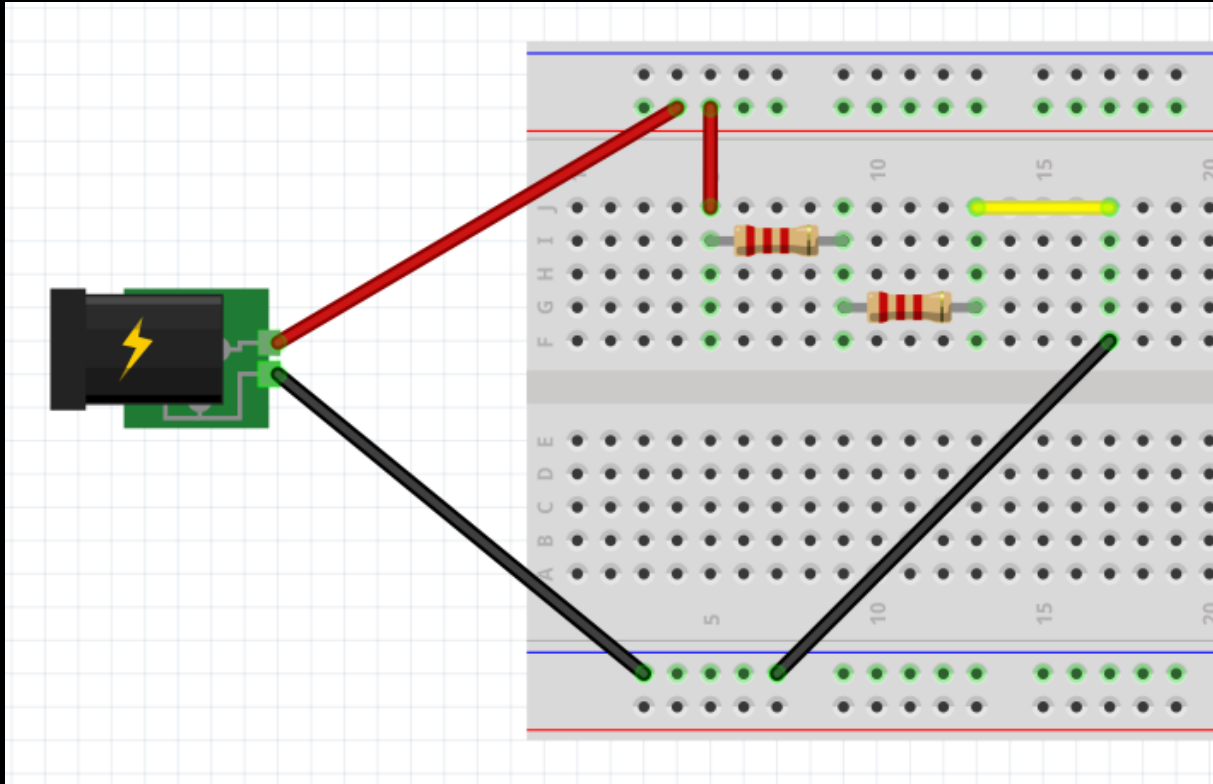
1. Set the DMM to DCV (to measure Voltage)
2. Test and verify the value of the Voltage over the resistor
 - Record this in a table in your lab book



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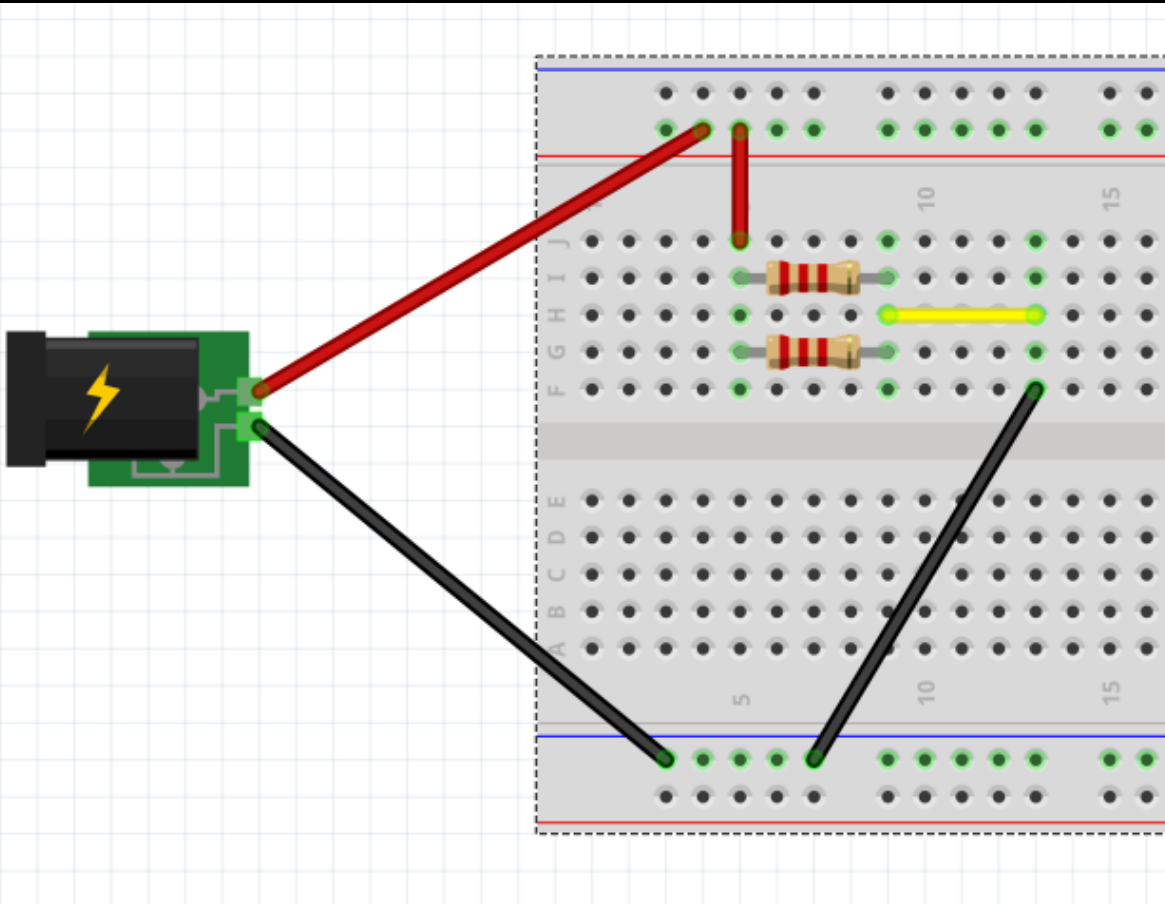
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TRY A SERIES CIRCUIT



- Measure the voltage on both resistors
- Is the voltage the same on both?
- What is the Current measurement?
- What if you had different Resistor values?

TRY A PARALLEL CIRCUIT



- Measure the voltage on both resistors
- Is the voltage the same on both?
- What is the Current measurement?
- What if you had different Resistor values?



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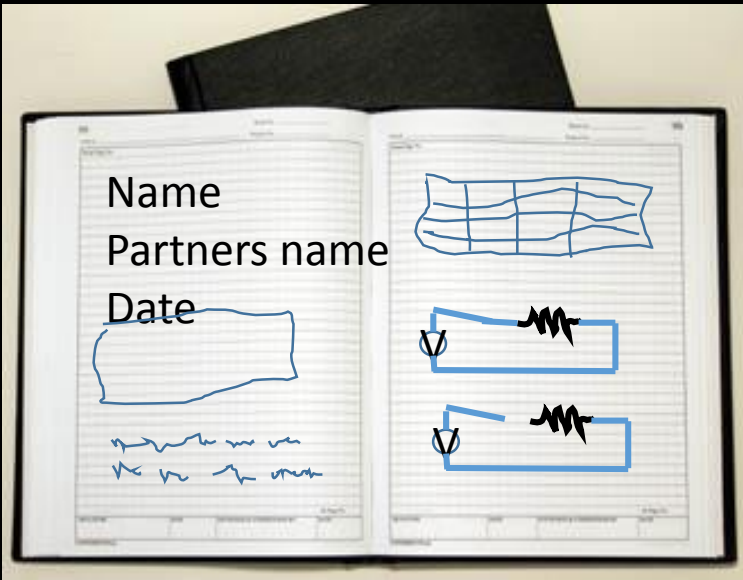
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HOW TO DOCUMENT THIS LAB

- On the next blank page
 - Draw a Tables for each set of Resistors
 - Measure the voltage... it may not be exactly 5 volts
 - Measured Volts _____

Resistor #	Resister Value	Measured Ω	Measured Volts	Calculated I	Measured I
Resistor #1					
Resistor #2					
Resistor #3					

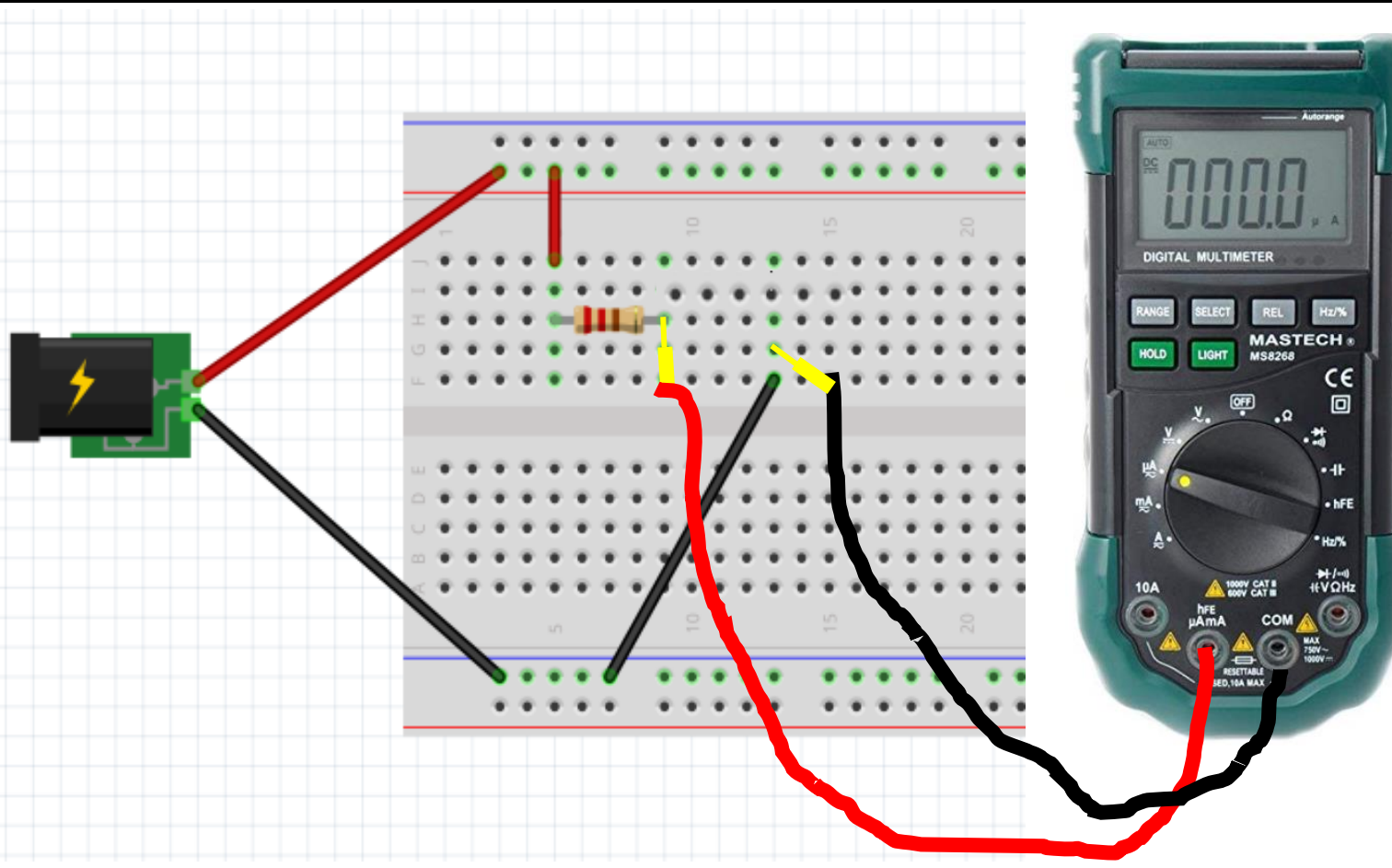
- Draw a representation of the Circuit you have built
- Experiment... Build some different Circuits... Series, parallel... Draw them, then build them, then test them...



Measure Current

LAB SETUP FOR MEASURING CURRENT

1. Set the DMM to mA (to measure Current)
2. Test and verify the value of the Current through the resistor
 - Record this in a table in your lab book



mA for DC Amps



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FLUKE ONLINE CLASS

- <https://www.fluke.com/en-us/learn/online-courses/digital-multimeter-basics-online-course>
- Sign Up For This Class. Complete The Class By The End Of Monday Aug 20



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REFERENCE SLIDES



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APPENDIX B: ATTRIBUTION FOR SOURCES USED

- Fluke - <https://www.fluke.com/en-us/learn/best-practices/measurement-basics/electricity/what-is-a-digital-multimeter>
- Amazon - <https://www.amazon.com/Mastech-MS8268-Digital-Manual-Multimeter/dp/B000JQ4O2U>



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