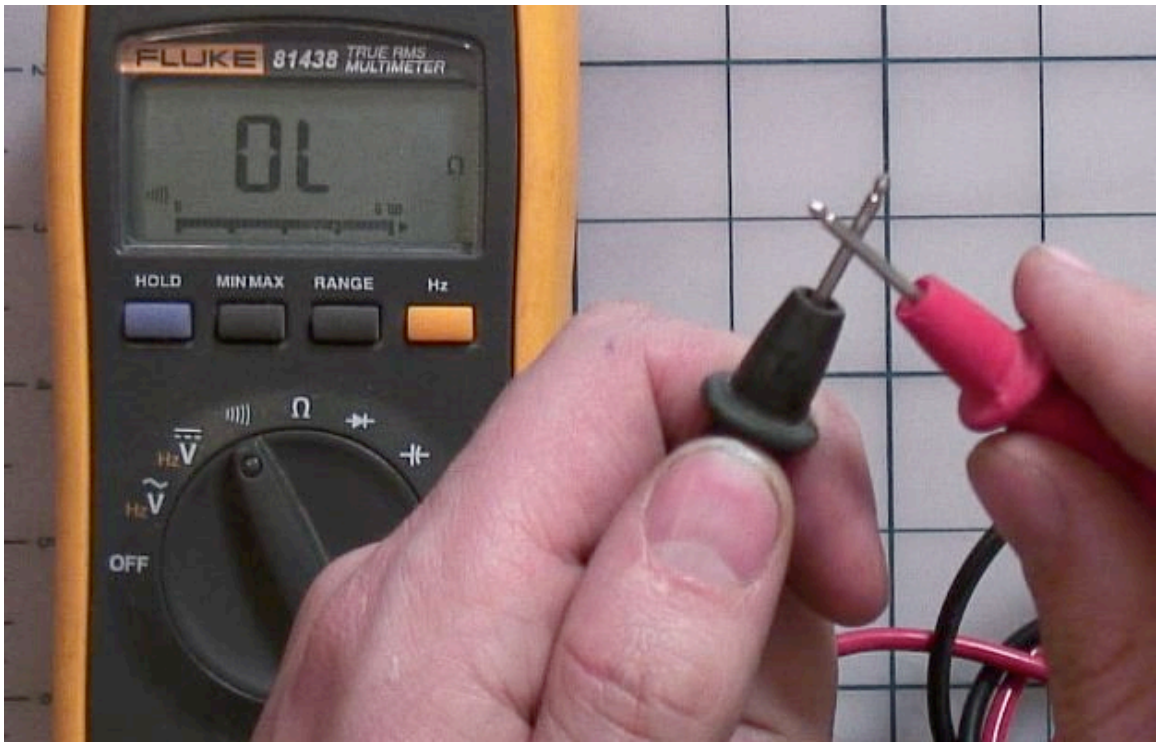
Make: technology on your time

Weekend Projects

How to Test Continuity, Measure Resistance, and Measure Voltage with a Multimeter.

Multimeters are the electrical engineer's swiss army knife. In this tutorial, you'll learn how to check for continuity, measure resistance and measure voltage. These measurements are really handy to have in your bag of tricks if you are messing around with electronics.

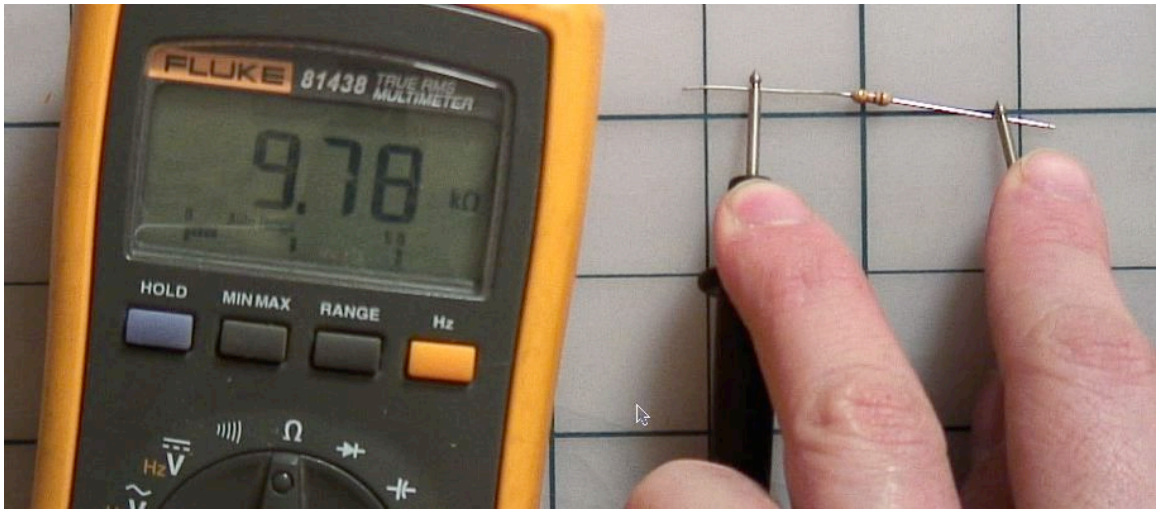
Testing Continuity



Continuity tells you if two spots on a circuit are connected. This is handy when you want to explore a circuitboard, test connections, or make sure your soldering joints are all effective.

This is probably the easiest thing to do with your multi-meter. Just turn it to the continuity setting which looks like a little speaker. Test it by touching the probes together and you should hear a beep. That's the same beep that you'll hear if you test two connections that are connected!

Measure Resistance



Set your multimeter to the Ohm symbol. You may have multiple settings on your multimeter for different ranges of resistance. You can play with these until you find the right setting.

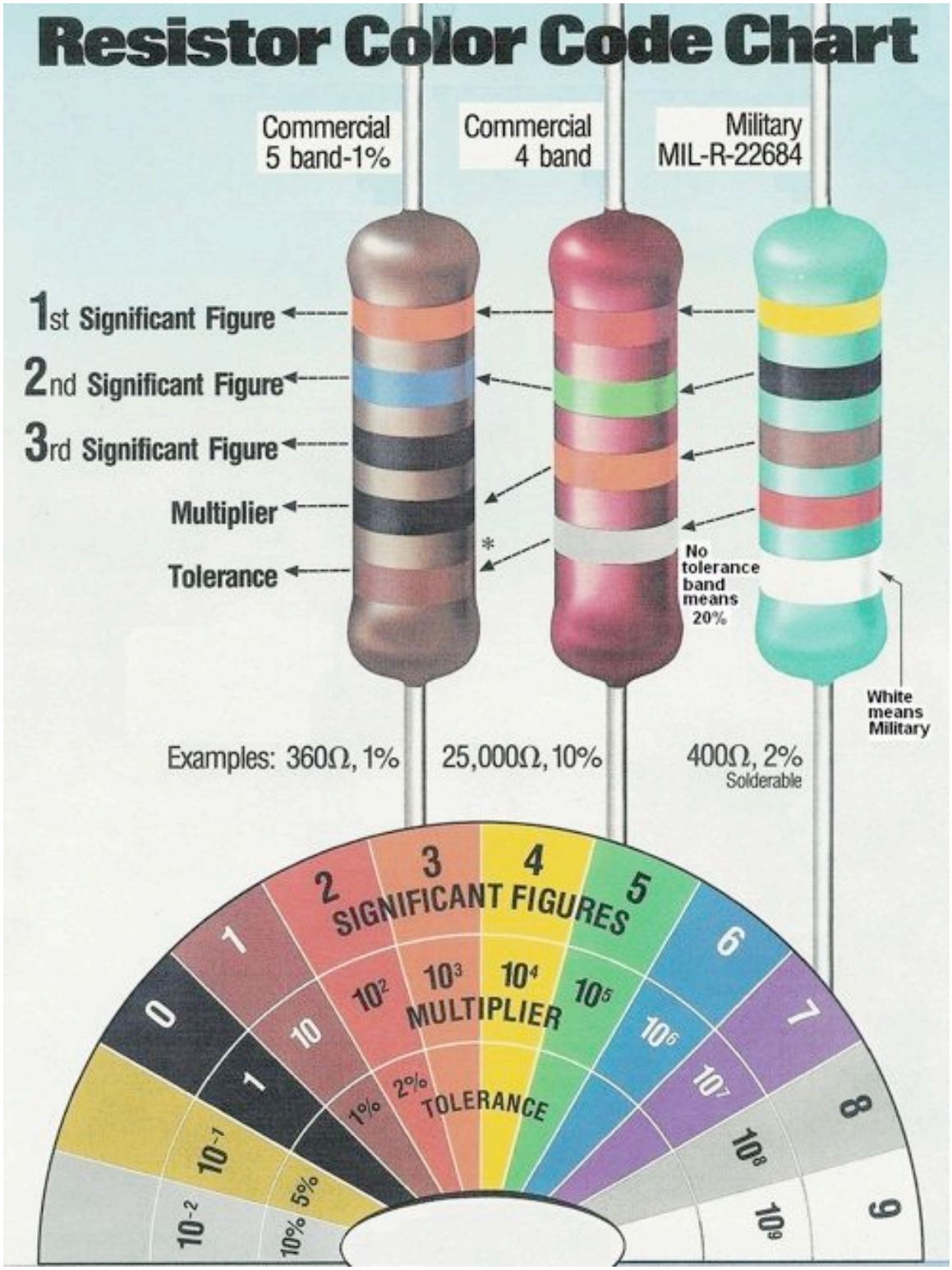
Then just hook the probes up to the end of the resistors and it will measure it. Of course you can always read the resistor by decoding the color bars, but resistors are not exactly accurate. They have a 2-5% tolerance that means it can be a good thing to test them if you need to be accurate.

The colors on a resistor are a secret code that you can decode to find out the approximate value of the resistor. If you're online, you can go check the resistulator at

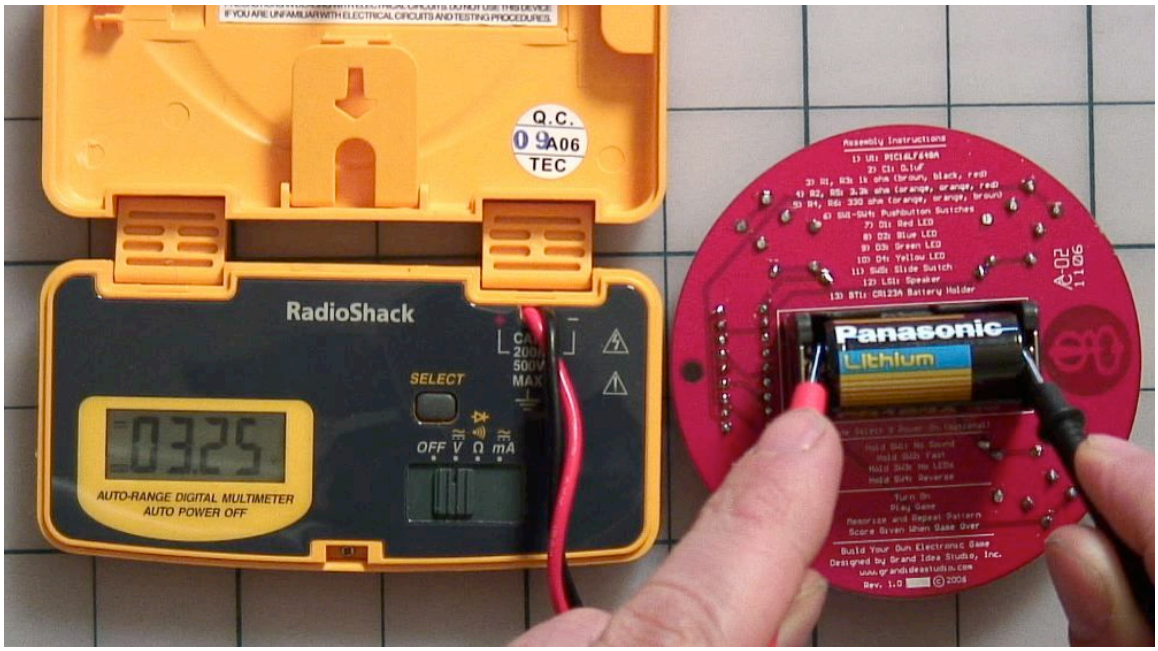
http://www.zambetti.com/projects/resistulator/

Or you can check with a color chart. Here's a color chart I found online a while ago, but can't find the original url. If you know who drew this up, let me know so I can credit them!

Resistor Color Code Chart



Measuring Voltage



You can use your multimeter as a voltmeter by setting it to a voltage setting and then putting the probes to two points where one has a positive charge and one a negative. If you have them mixed up, it will show a negative charge, which is fine.

You can see I'm using a little teeny multi-meter in this picture. It's not as accurate as the other multi-meter, but it's tiny and great for traveling.

There are lots of other things you can do with your multimeter like measuring amperage, testing diodes, and some even can test the temperature! Here are some links so you can go learn more!

Tangent Tutorial: 29 minute video - Link
Mechatronics Tutorial - Link
National Instruments Tutorial - Link
Choosing a Multimeter (includes info on analogue multimeters) - Link

If you make a tutorial on how to do something with your multimeter, document it and drop me a note at bre@makezine.com.

Now go out there and measure stuff and have a great weekend!

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