

Thank you for your purchase of an eLearnTronics Electronics Learning Board. These instructions are meant to guide you through the soldering process and teach you a bit about the different components in your board.

If you prefer videos instructions, you can visit [www.eLearnTronics.com/instructions](http://www.eLearnTronics.com/instructions) to view these instructions via video.

Also, don't forget to view your FREE video lesson that dives deeper into what Resistors are, and how resistance works!

If you have any questions at all, please reach out by emailing [questions@elearntronics.com](mailto:questions@elearntronics.com)

And as always, happy soldering!

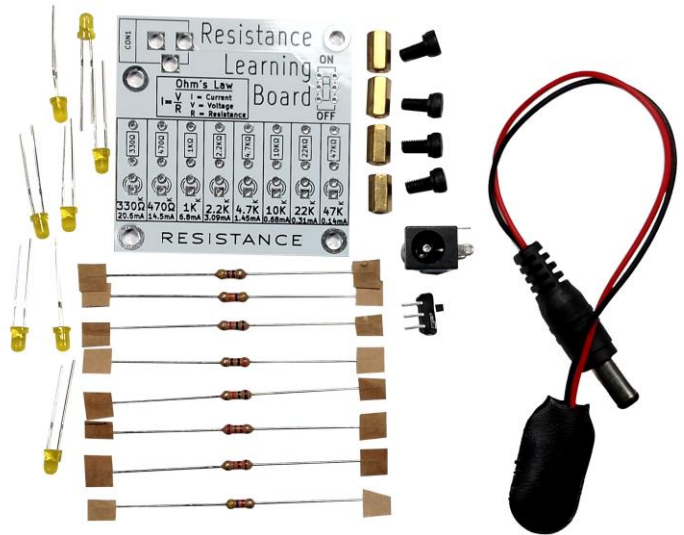
-Paul Recchia  
Creator, eLearnTronics



For FREE Video Instructions, visit  
[www.eLearnTronics.com/instructions](http://www.eLearnTronics.com/instructions)

## Contents

- 1 x Circuit Board
- 1 x Barrel Jack Connector
- 1 x 9v to Barrel Jack Adapter
- 4 x Brass Hex Standoffs
- 4 x m3 Machine Screws
- 8 x 3mm LED
- 1 x DPDT Switch
- 1 x 330Ω Resistor
- 1 x 470Ω Resistor
- 1 x 1K Resistor
- 1 x 2.2K Resistor
- 1 x 4.7K Resistor
- 1 x 10K Resistor
- 1 x 22K Resistor
- 1 x 47K Resistor



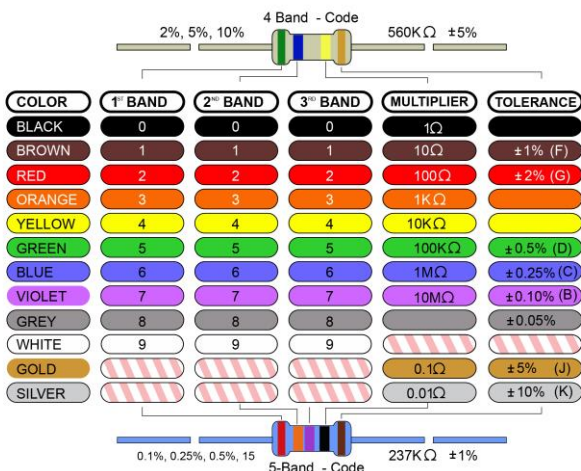
## How to Determine a Resistor Value

You should see a color value on your resistor. Those correspond to the chart on the left.

Identify the first color on the left. (The gold or silver band will go on the right)

Take the first 2 values (or 3, if there are 5 bands), and combine them. Then multiply by the value for the second to last band.









If you don't want to work out the values, there's a cheat sheet on the next page



Example: 

Orange (3) Orange (3) Brown(10x)  
33 x 10 = 330Ω

## Resistor Cheat Sheet

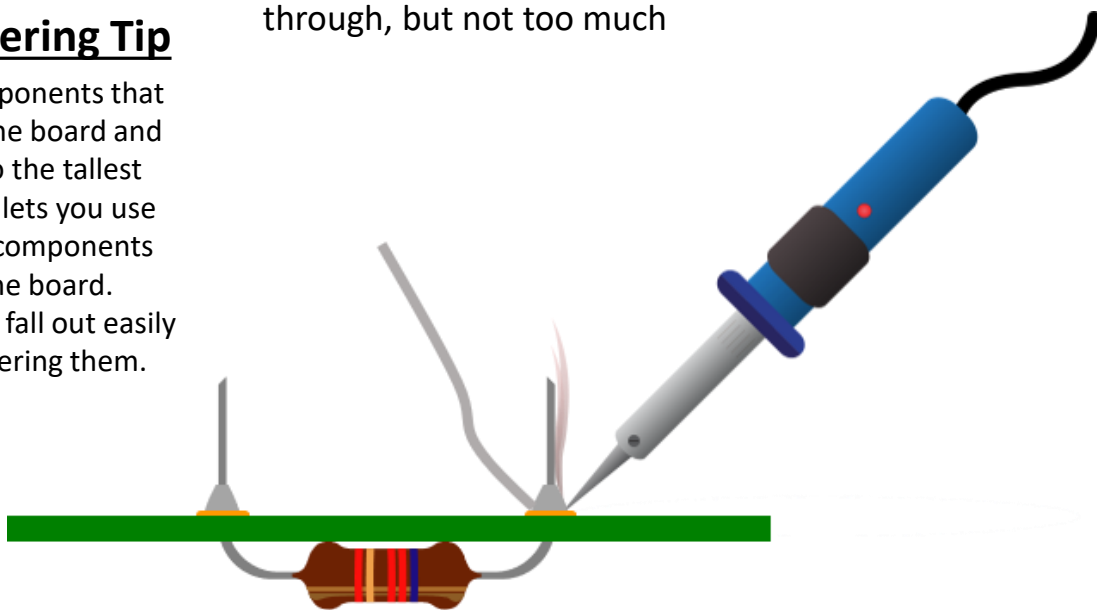
	330Ω
	470Ω
	1K
	2.2K
	4.7K
	10K
	22K
	47K

## Quick Soldering Tip

Start with the components that sit the closest to the board and work your way to the tallest components. This lets you use the table to hold components snug against the board. Otherwise they can fall out easily when you're soldering them.

## Soldering Process

1. Place leads through holes on the board
2. Turn board over, using table to hold part in place
3. Touch soldering iron to the copper pad and lead
4. Touch the solder to the other side of the lead. Don't touch the solder to the iron itself. Let the pad heat up, then let that melt the solder
5. When the joint is filled, remove the soldering iron
6. Repeat for all the
7. The joint should look like a little volcano
8. Now, pick up the board. Carefully push the component against the board (DO NOT TOUCH THE METAL)
9. On the back side, re-melt the solder and push the component snug to the board. Repeat for all components on the board.
10. Now, solder the additional lead(s) for each component. You should now have each component snug against the board, with good solder joints
11. Snip off the excess lead. You want a little bit sticking through, but not too much

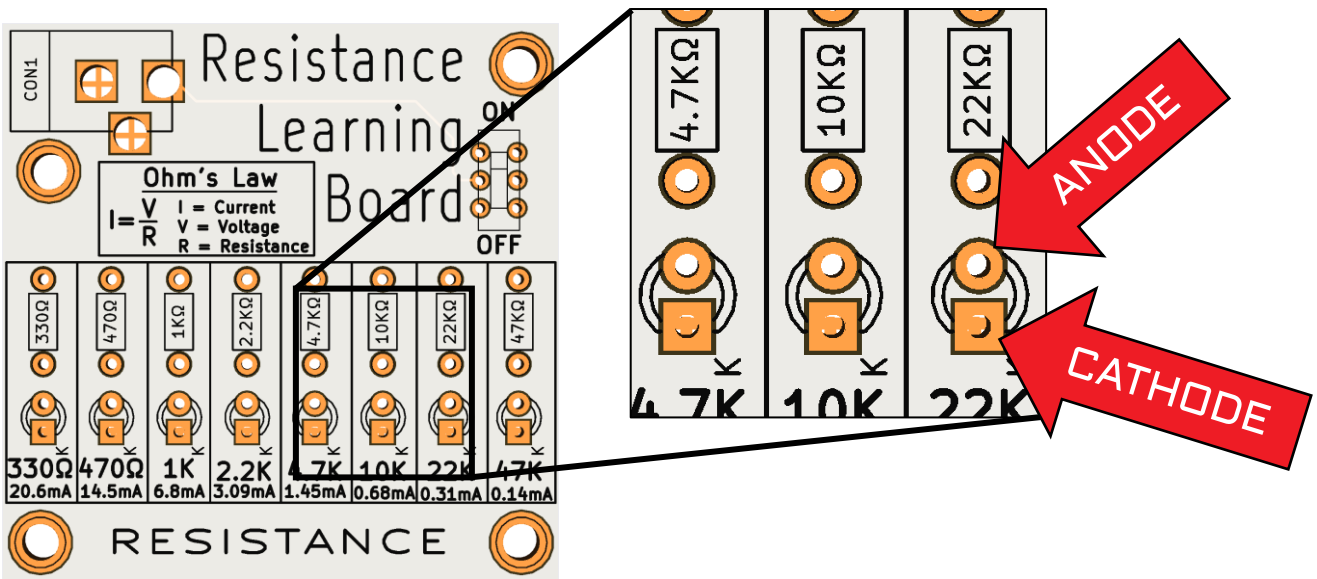
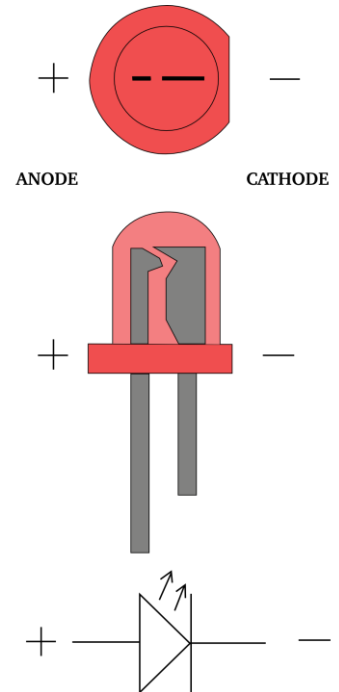


## Introducing LED's

LED's have 2 ends to them, an Anode, and a Cathode. Electricity can only flow from the Anode to the Cathode. Diode's block current from going in certain directions, and if you hook up an LED backwards, it will never light up.

So how do you identify the two? Well, there's a few ways.

1. The Anode (+) will have the longer lead
2. The Cathode (-) will have a flat side on the LED Bulb, which is helpful if you've already snipped your leads
3. If you look at the circuit board, there will be a flat side in the silk screen. That is where the Cathode goes
4. If the image is too small (like with the 3mm LED's on the Resistance Board), you can also identify the Cathode with a K



## Soldering the Resistance Learning Board

**WARNING:** Soldering Iron's get **EXTREMELY** hot, and you can get a serious burn just by touching the soldering iron or anything else it touches. Metal conducts heat very well, and even touching the circuit board in the right place can give you a mild burn. Touching the soldering iron or leads directly can give you a more serious burn. Be careful, and always think before you solder.

With that out of the way, let's get to the fun stuff.

1. First, solder each resistor to the board. Identify each resistor value and place the resistor in the corresponding slot on the board. If you place them in the wrong order, the lights will be all sorts of funky brightnesses! Solder the resistors in place.
2. Now for the next tallest item. The LED's. Place each of the 8 LED's in place. Make sure the Anodes and Cathodes are in the correct place! When each of the LED's are pushed through the board, the leads should all be facing the same direction. Solder the LEDs in Place.
3. Now, you'll solder the DPDT switch (DPDT stand for Double-Pole-Double-Throw) in place. It doesn't matter which direction you place it in.
4. Finally, solder in the Barrel Jack Connector. This will take a lot of solder, and be careful, it's easy to burn yourself!
5. Now, place the Screws through each hole in the corner, and screw a Hex Stand-off to the screw. This will hold the board up off your table, and keep the leads from scratching it up
6. Finally, connect a 9v battery to the battery connector, plug it in, and turn on the switch! If you've done things correctly, the LED's should decrease in brightness as the resistance goes up!

