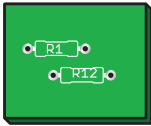
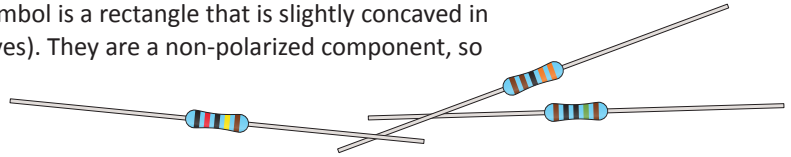


Board Symbols and their Corresponding Components



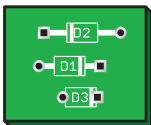
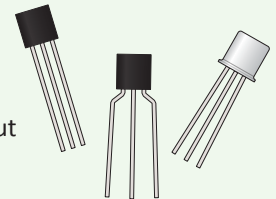
Resistors

Resistors are signified with an 'R.' Their symbol is a rectangle that is slightly concaved in the center (much like the Resistors themselves). They are a non-polarized component, so they can be soldered in either direction!



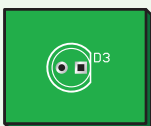
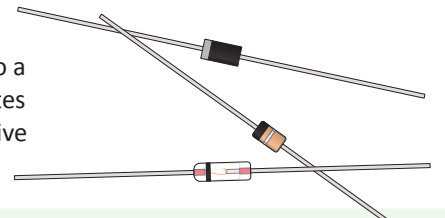
Transistors

Transistors are marked with a 'Q' and the symbol can have some slight variations. They are in the shape of a 'D' and all have three holes within them (either in a straight line or a triangle). A majority of Transistors share this 'D' shape with one flat side. In these cases; simply match up the shapes! Some Transistors (ie. Germanium) do not have this flat side, but will have a 'tab' that will represent which direction faces toward the flat end of the graphic.



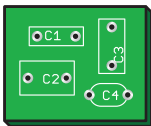
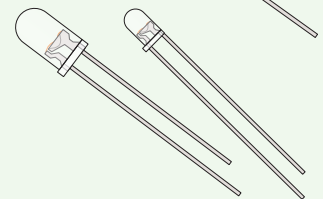
Diodes

Diodes are labeled 'D.' Their symbol is a visual representation of an actual diode (a rectangle with a stripe on one end). The white stripe corresponds to a stripe that can be either black, silver, or blue on the actual Diode. This denotes the negative side. The board will also have a square solder pad on the negative end. Make sure to pay attention and solder these in in the right direction!



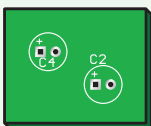
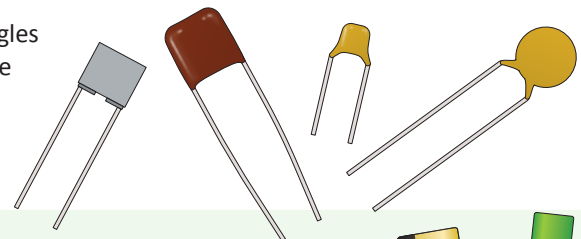
LEDs

LEDs (Light Emitting Diodes) are also labeled 'D,' but their symbol is very different. They are polarized, and can have up to three signifiers of their negative side: a shorter leg, a flat section on the 'lip' of the bulb, or if you look inside the bulb one of the metal pieces inside will be bigger. On the board, the negative side is the flat side of the circle which will also have a square solder pad.



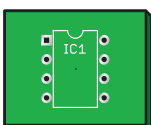
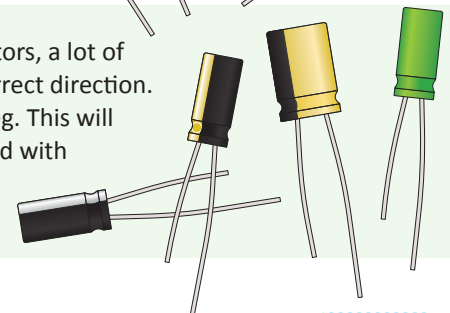
Capacitors

Capacitors are marked with a 'C,' and are illustrated as rectangles (or sometimes "pill" shapes). The size will vary depending on the amount of room needed for each given capacitor, but that is all. They are a non-polarized component, so you can stick them in there however you want!



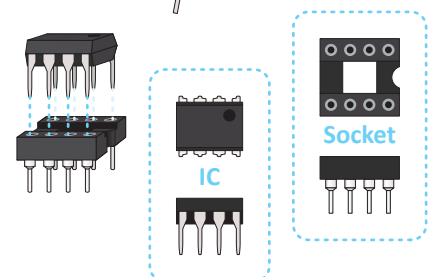
Electrolytic Capacitors

Electrolytic Capacitors are also marked with a 'C.' Unlike the other Capacitors, a lot of the time the Electrolytic ones are polarized, and need to be put in in the correct direction. A polarized Capacitor will have a stripe running up the side with the short leg. This will indicate which side is negative. On the board the positive side will be marked with a '+' and will have a square solder pad. [Note that Capacitors are opposite of the other components in that the square pad signifies a positive!]

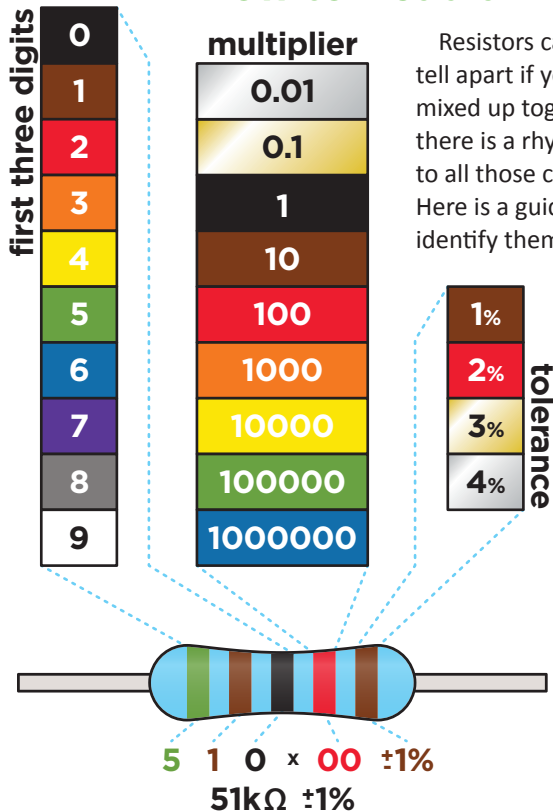


ICs/Sockets

ICs can be either labeled as 'IC' or 'U.' Sometimes ICs will not be soldered directly to the board (thought they can be). In some instances a companion component called a "Socket" will get soldered in, and then is used as a 'plug' for the IC to plug into. The symbol has an indent on one side (as does the actual Socket), so it is pretty straight forward how to align them. The IC itself has a little circle inset into one corner on the top side (with the writing). This circle goes toward the end of the Socket and Board Symbol that share the indent. There is also one square solder pad that accompanies this symbol. This corresponds directly to the corner of the IC that has that circle marking.

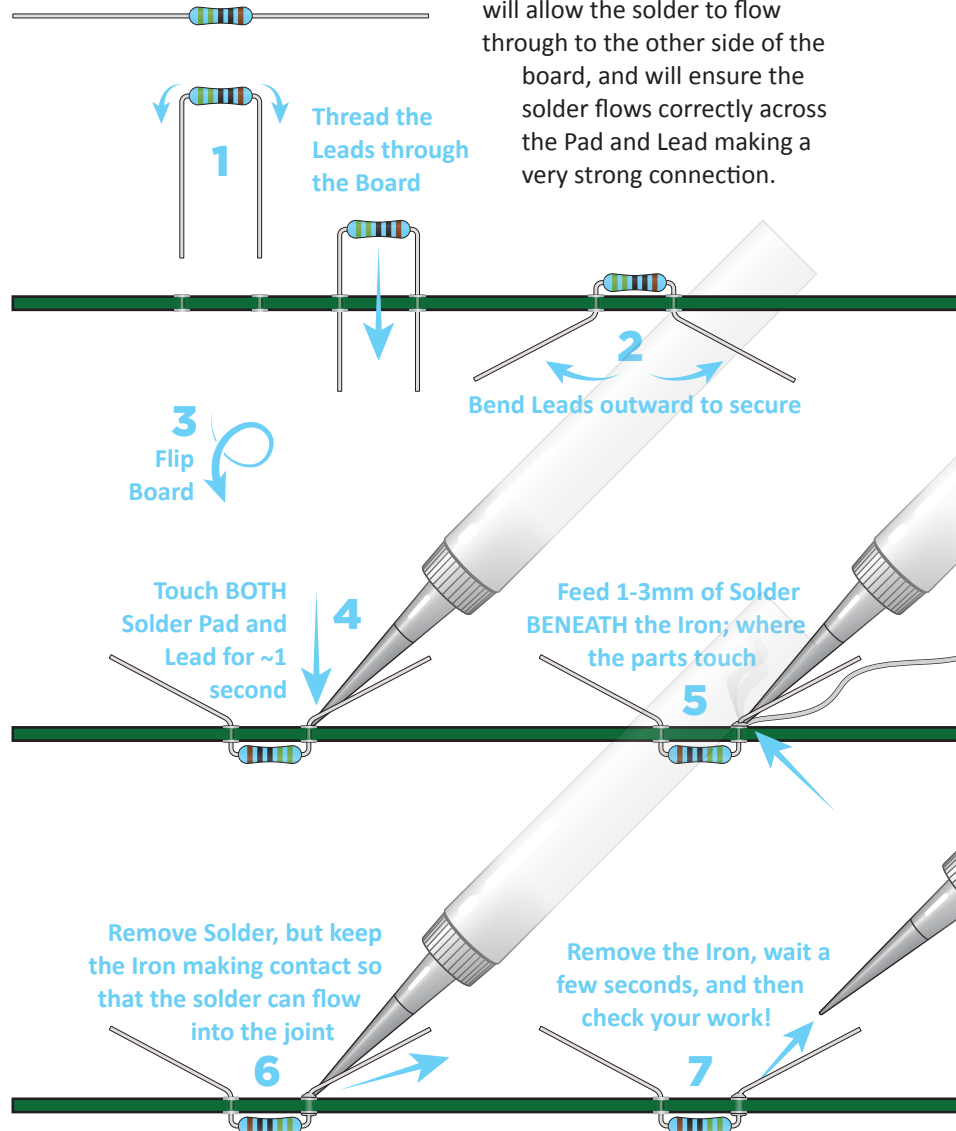


How to Read a Resistor

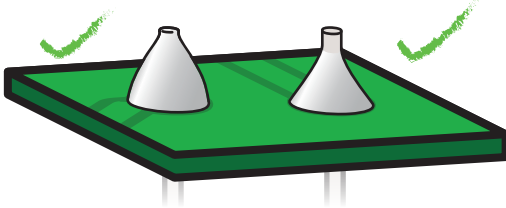


Good Soldering Practices

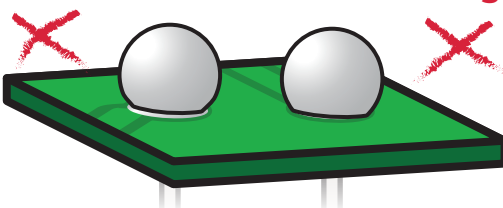
Soldering can be a little tricky, but we've got some basic tips to get you soldering like the pros! First step is to thread the Component's legs (Leads) into the Board where they are designated. Turn the board over as it is better to solder your components in from the opposite side of the board. From there place the tip of the soldering iron where it is touching both the Soldering Pad and the Lead so that both parts heat up and will accept the Solder. After about 1 second feed the Solder underneath the Soldering Iron where the two parts touch. [Note: Do not melt the Solder directly onto the Iron!] When the solder melts, feed in about 1-3mm of the solder wire depending on the size of the Pad. Remove the Solder Wire, but leave the iron touching the Pad for about 1 additional second. This will allow the solder to flow through to the other side of the board, and will ensure the solder flows correctly across the Pad and Lead making a very strong connection.



Good Solder Joints



Too Much Solder / Insufficient Solder Pad Heating



Way Too Much Solder

