Make: technology on your time

Weekend Projects

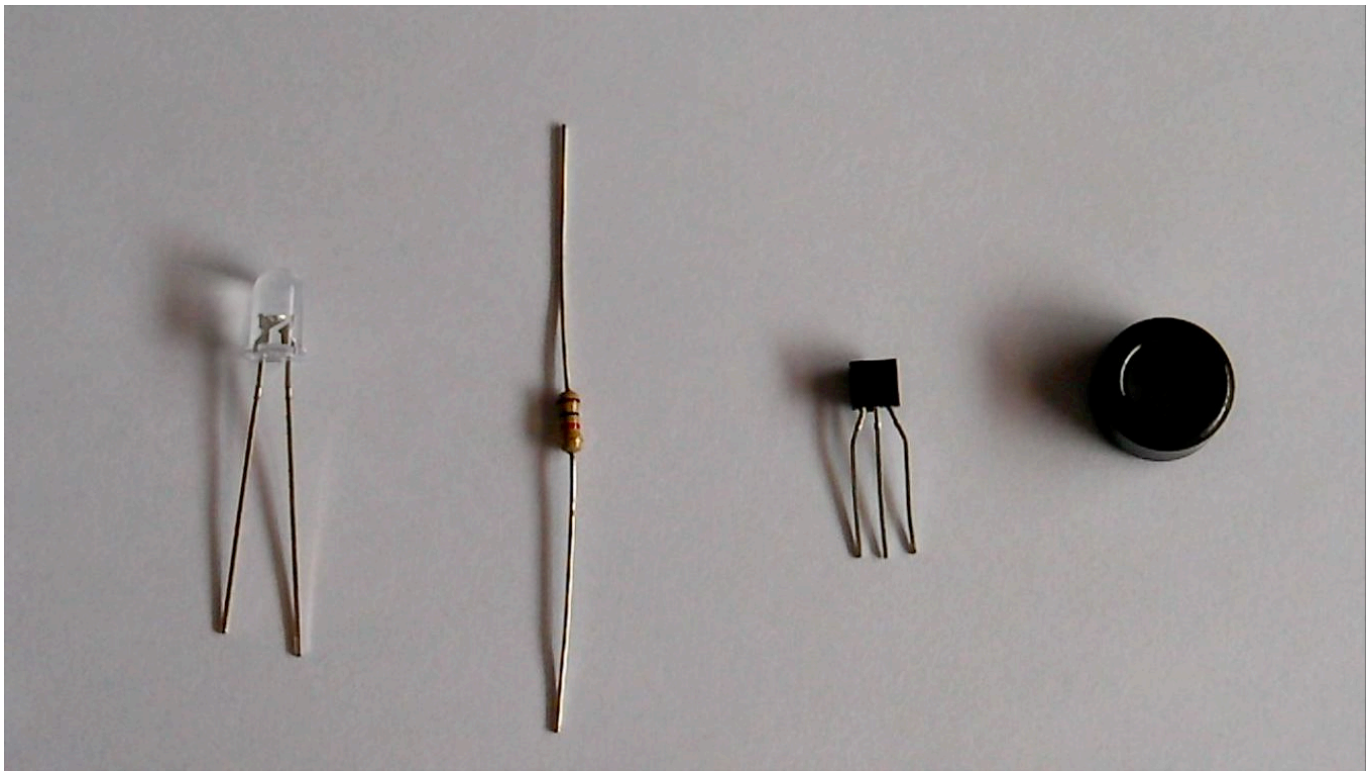
Make A Joule Thief

This weekend, make a super little circuit called the Joule Thief! It's called that because it robs every little bit of electricity out of a battery, even batteries that other gadgets have pronounced dead! When a 1.5 volt battery has been used up it's normally useless by the time you can measure 1 volt on a multimeter. The Joule thief doesn't care about that, it's going to take whatever juice is in that battery, and jack it up to 3 volts with this circuit. You solder all the parts together, no circuit board needed!

So now when you have dead batteries you can give them purpose once again by hooking them up to the joule thief and squeezing all their power out of them!

Before Maker Faire Austin got started, Windell Oskay of evilmadscientist.com and I put together a few of these to show you how to make this clever little bit of electronic engineering. We were inspired to by Big Clive who posted this at:

http://www.emanator.demon.co.uk/bigclive/joule.htm

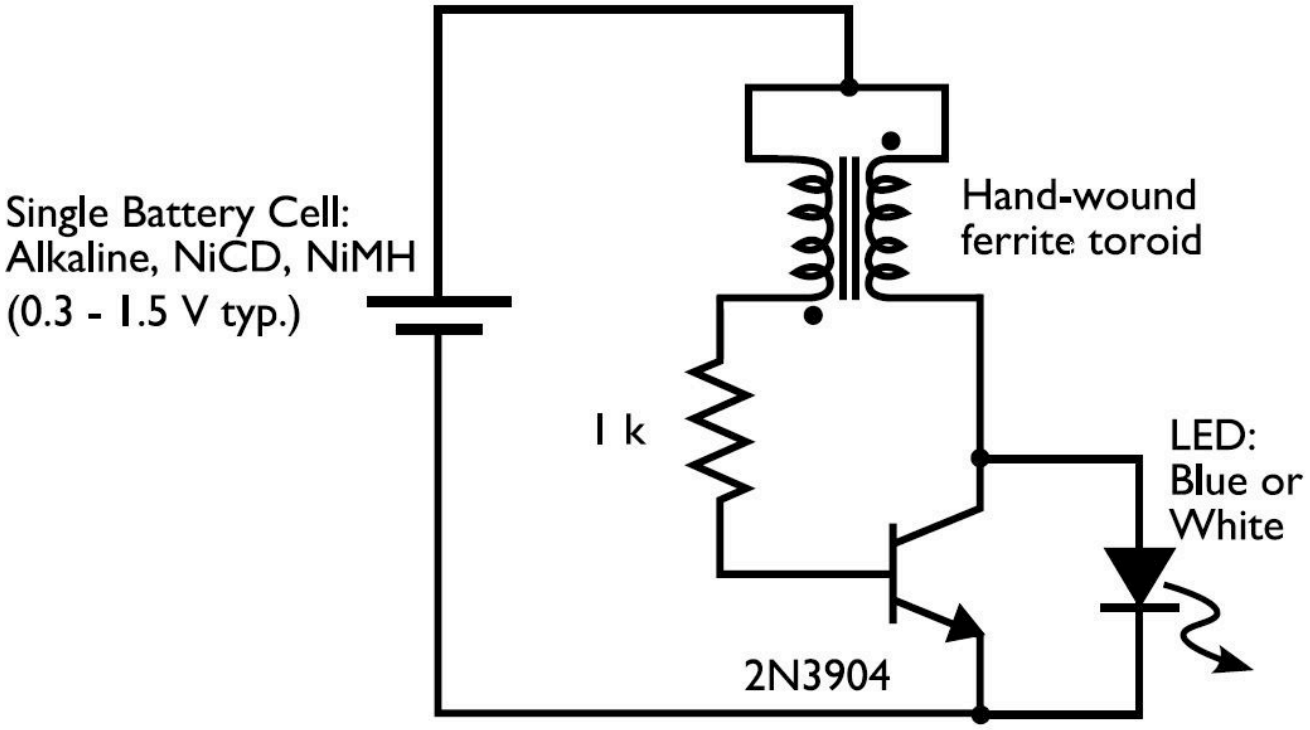


You're going to need a white or blue LED that is rated for 3 volts, a 1K resistor, a 2N 3904 NPN transistor, a toroid, two pieces of wire and a battery.

First Wind your toroid. After winding it, connect one red and one blue from each side and solder them together. You're going to solder the resistor to one of the sing leads that you have left.

Then take your transistor and spread the outside leads so they will be easy to solder to. Then take the center lead and bend it underneath and solder that to the resistor.

Then splay the leads on the LED and solder the shorter one that goes to the flat side of the LED to the left side of the transistor if you are looking at it so the writing is readable. Solder the other lead, the longer one, to the right side of the transistor.



Great, that's it! Now hook up your battery. You want to make sure you've got it the right way round and you're good to go, now you can use this to utilize all the energy left in batteries when they are dead. Because this is what you would do before you eventually recycle your battery, we're calling it "precycling." Don't forget to upload pictures of it to the Make: Flickr Pool at http://flickr.com/groups/make/pool!