

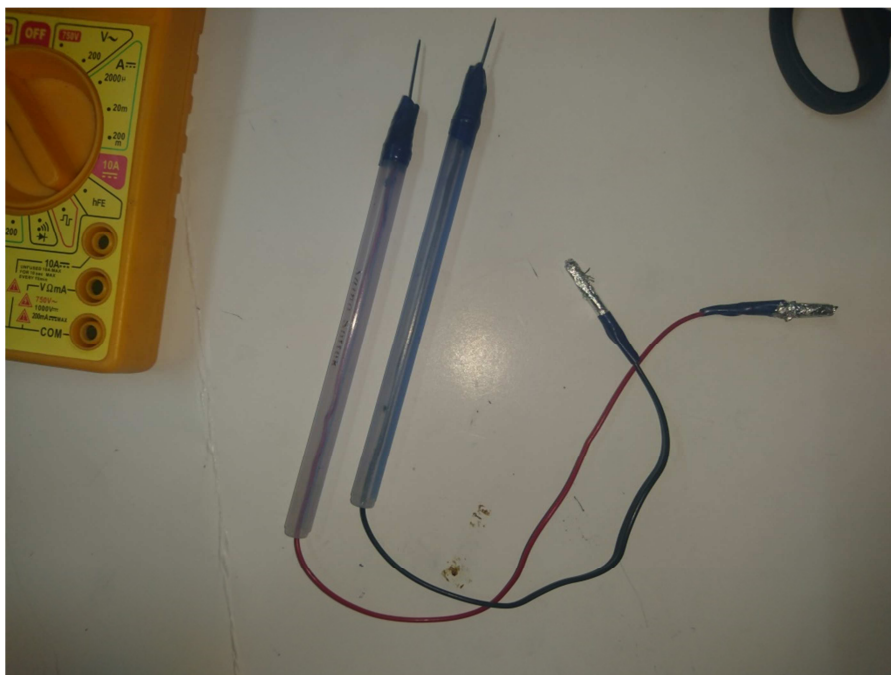
# Multi meter test leads from scratch

If you are electronics hobbyist you definitely uses multi meter. If you are working with few volts and few amps you may use cheap multi meters.

I am that kind of guy who uses cheap multi meter .I faced a problem because the probes got broken .Anyway I like to solve problems and I have solved it. But I got an idea of making multi meter test leads from easily available materials .I am an engineering student and I lives in hostel .I used pen, aluminium foil, refills, steel pins and wires to build a multi meter test leads . Except wires, components used in this project are useless if once it is used. This project comes with a reuse idea. The required material I could collect it from my surroundings easily .I can assure that to make this does not cost anything.

Note that it is fine for low voltages only not suitable for high voltages

Let's get started



## **Materials used:**

1. 2 pens
2. Wires
3. Refills
4. Aluminium foils
5. Steel pins-2
6. Insulation tape
7. Soldering iron –used to connect wire to steel pin

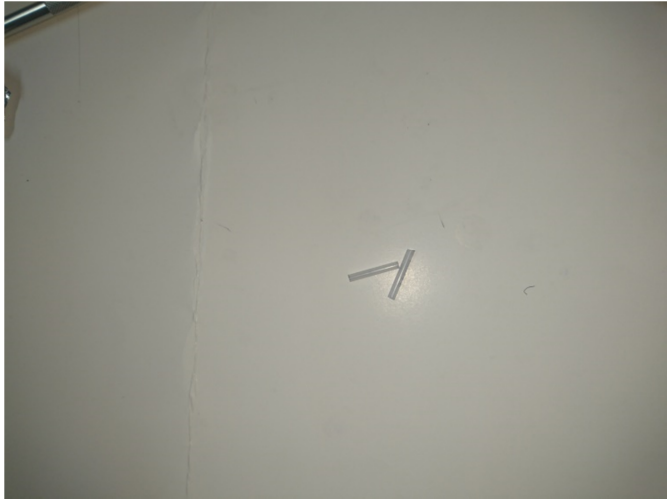


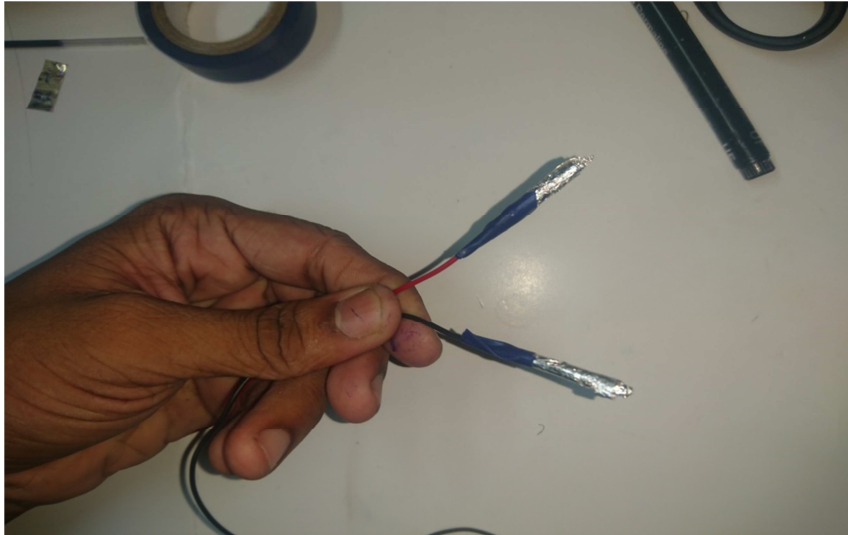
## **Plug design:**

I cut refill with a length of 2 cm, so it can be inserted into ports of multi meter. Refill will act as plug. The refill is plastic material so,

To provide conduction I covered it with aluminium foil.

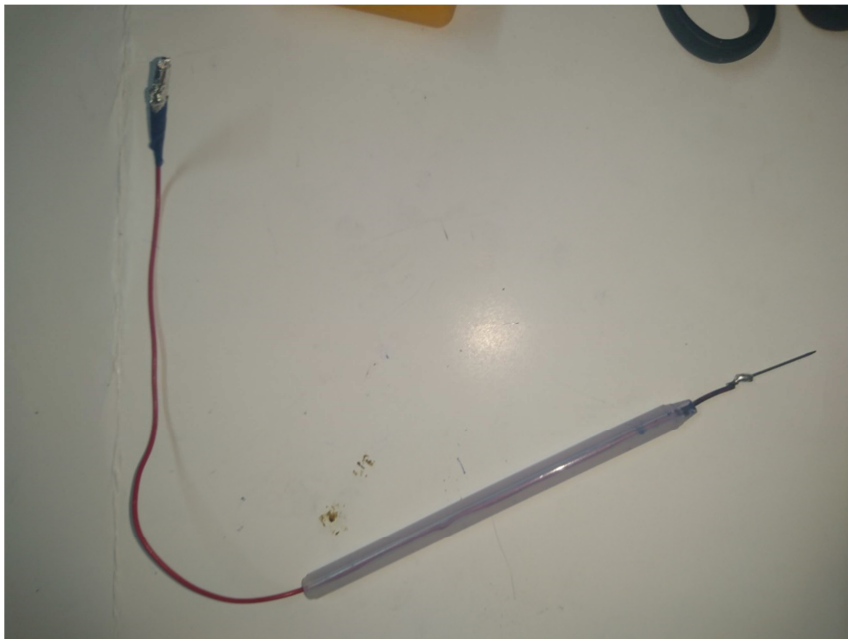
I used black and red wire.so it can be used to represent common (ground or –ve) and positive probes. I inserted wire through the refills and fixed one end with insulation tape.





### **Probe and tip design:**

I used pen as probe, and steel pin as tip. I inserted other ends of wires through the pen and I connected to steel pin with the help of soldering iron. I fixed on the ends with the help of insulation tape.



### **Testing:**

I tested the scratch made test leads to ensure that it works. Yes it works.

The testing of continuity and voltage measurement is included in the video.

**Scratch made multi meter test leads are ready for use:**

