

A16: Build a Mechanical Switch

1001-act16 Introduction to Electronics

Summary

Switches, in most basic terms, are a break you can enable/disable in a continuous connection such as a wire. Most function by having two metal contacts that can be brought in and out of contact to switch between a closed and open connection.

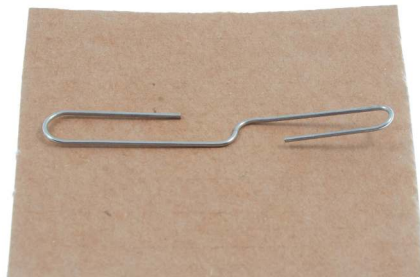
In this activity, you will build one such switch using some cardboard and a paperclip.

What You Need

- JackBord
- JackBord TOP
- 10x 10cm Jumpers
- 2 x 10cm Clip Jumpers (Jumpers with Crocodile Clip on one end)
- 1 x Paperclip (rounded metal ones work best)
- 1 x Piece of cardboard about twice as long as the paperclip

Instructions

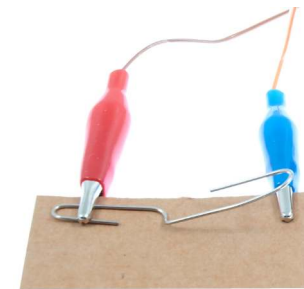
1. First, make sure that the JackBord TOP is already connected to the JackBord power pins and the two power LEDs are on (Check 1001-act5 if not). Turn off the JackBord.
2. Unfold the paperclip and place it onto the cardboard as shown.



3. Connect one clip jumper into a TOP 3V pin. Then, attach it to one end of the paperclip as shown.

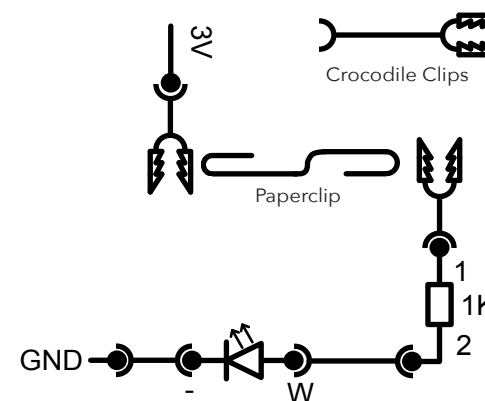


4. Connect the other clip jumper to 1K pin 1. Then from 1K pin 2, connect to TOP LED pin W. Connect LED to ground.
5. Attach the second clip jumper to the cardboard ensuring that it rests under the elevated end of the paperclip. You should be able to make the paperclip contact the metal on the jumper clip using your finger.



6. Now when the paperclip touches both jumper clips at the same time, the circuit closes, and the LED lights up!

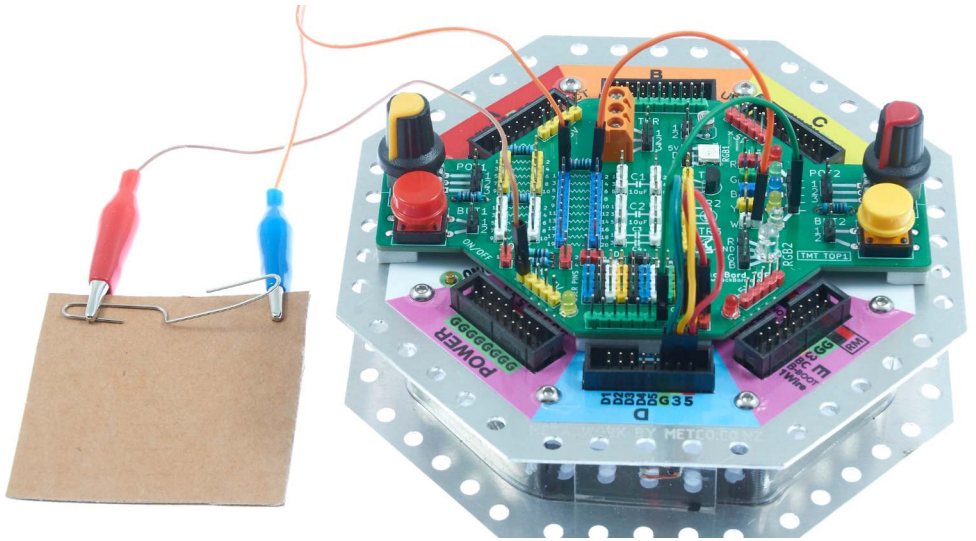
Circuit Diagram



TOP 3V pin	Clip Jumper
Clip Jumper	1K pin 1
1K pin 2	TOP LED W
TOP LED -	TOP ground

The table above contains the connections in the circuit diagram. Simply connect a jumper from the left column pins to the corresponding right column pin in the same row.

Completed Circuit



Extension

- Try replacing the paper clip with some other form of metal, explore which types of metal would be suitable for use in a switch.