

PREPARATION

Calculation of the resistors and source

In order to choose the right parts to begin connecting a circuit, make sure you have calculated correctly the resistors & the source that the circuit needs. You will find a guide of how to calculate the resistor for an LED circuit at the **Electrics** section in store or at:

www.modelshop.co.uk/Static/Model-Making-Guides

The source for an LED circuit of any kind has to be direct current, such as batteries or a DC transformer.

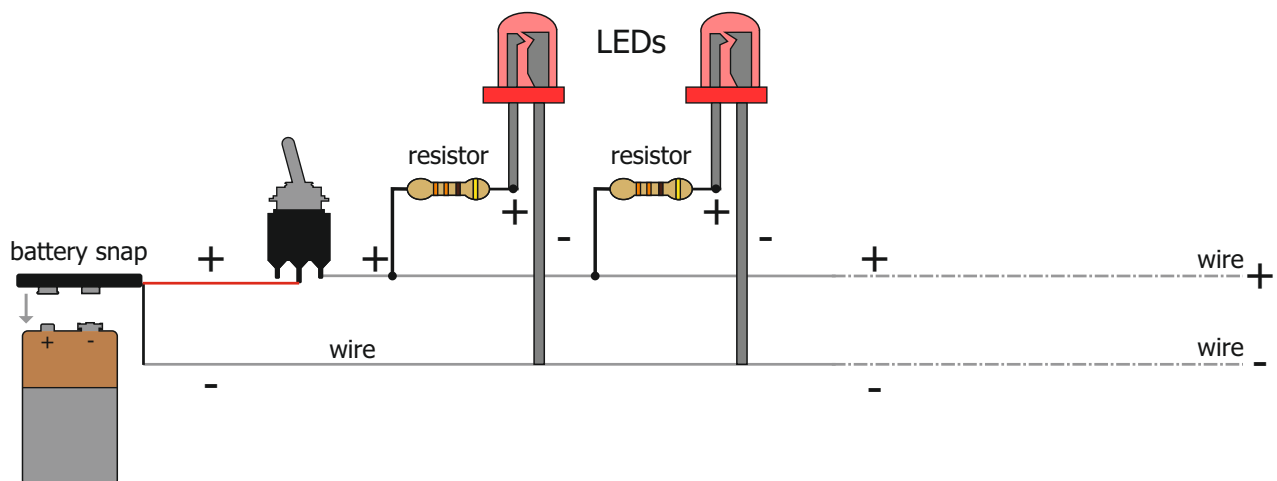
EQUIPMENT

Before you start connecting your circuit make sure you have everything you'll need:

- Source - battery or transformer (EB10008)
- Resistors (one per LED)
- Wire for electronics in black (EW00025) and red (EW00021)
- Wire cutter and stripper
- Electrical tape (EC00033)
- Switch (ES00003)
- Battery snap (if using a battery) (EB30003)

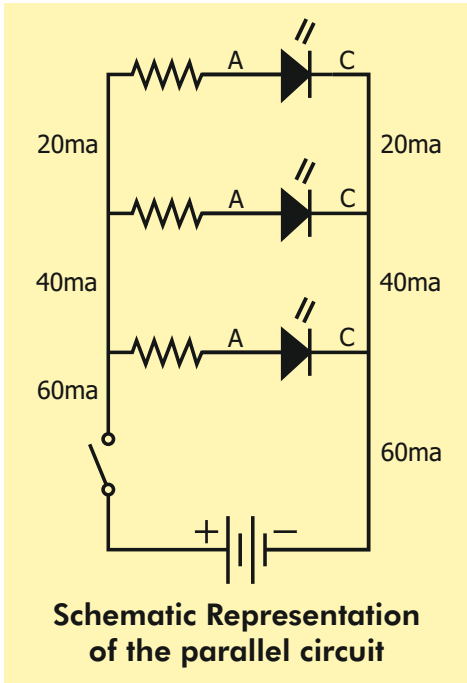
Other useful equipment:

- Soldering Iron (TO14002)
- Flux (TO30004)
- Solder (TO20020)
- Helping hands (TI00019)

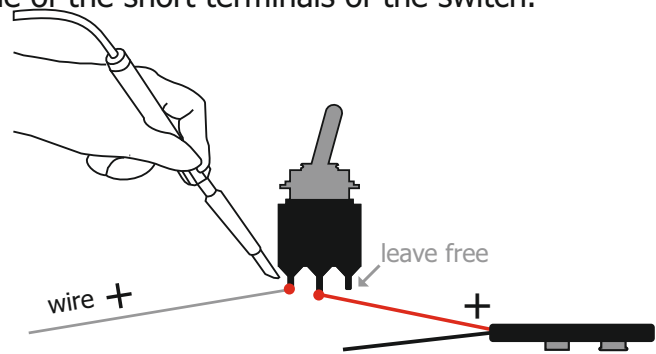


Warning: do not attempt to connect multiple LEDs with only one resistor in a parallel circuit. In theory it can work but in reality the LEDs have slight differences between them. This will cause uneven amount of current to run through each of the LEDs, creating differences in the intensity they emit light and even burning some or all of them gradually. A connection like this can be a fire hazard.

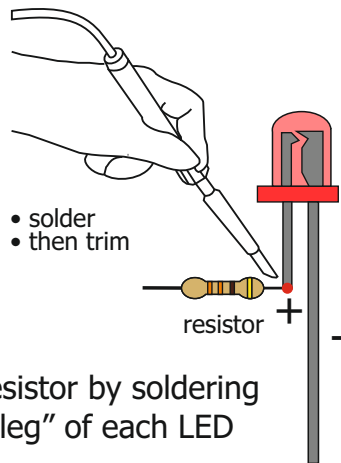
CONNECTING THE CIRCUIT



First connect the anode (+) of the **battery snap** (EB30001) red wire with the long terminal of the **switch** (ES00003) and solder them in place. To do that first strip a part of the red cable of the battery snap. Connect a fully stripped wire, which will be the anode (+) with one of the short terminals of the switch.

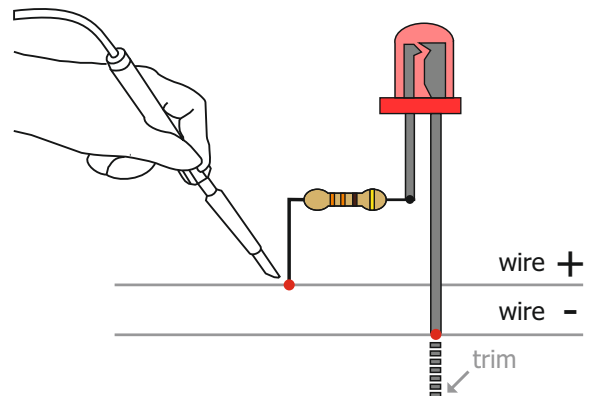


You can use **helping hands** (TI00019) to keep the wires connected and suspended from the working surface, without the need to hold the wires in place with your hands.



Connect one resistor by soldering it on the long "leg" of each LED (the anode +).

Then trim the excess wires of both the resistor and the LED.

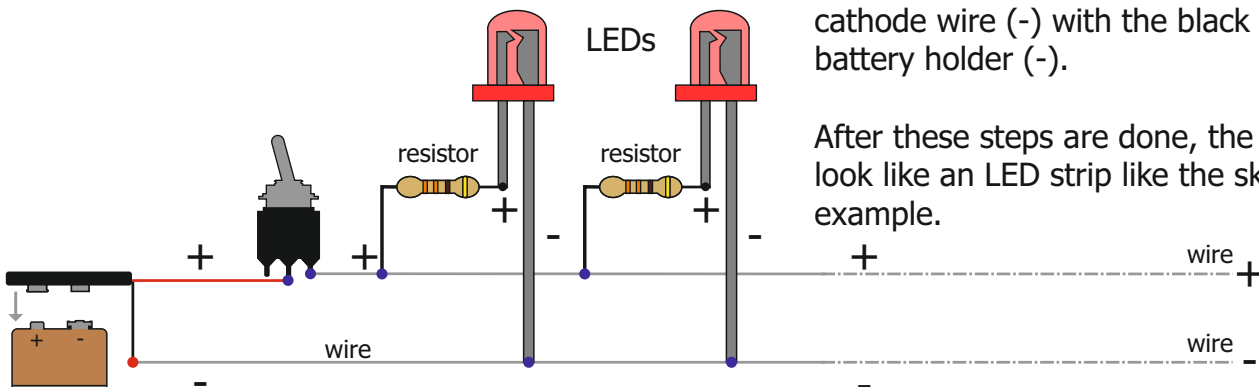


Connect the free end of the resistor, with the anode wire (+). Repeat that for each one of the resistor-LED connections, placing them in a row.

When this step is done, connect to the stripped wire that is the cathode (-) of the circuit, the free end of each LED-resistor that remain.

The last step is to solder the end of the cathode wire (-) with the black wire of the battery holder (-).

After these steps are done, the circuit will look like an LED strip like the sketched example.



Once all of the soldering is finished and the joints have cooled down, cover any stripped wire with electrical tape, making sure the wires do not touch each other in any places other than the soldered joints.