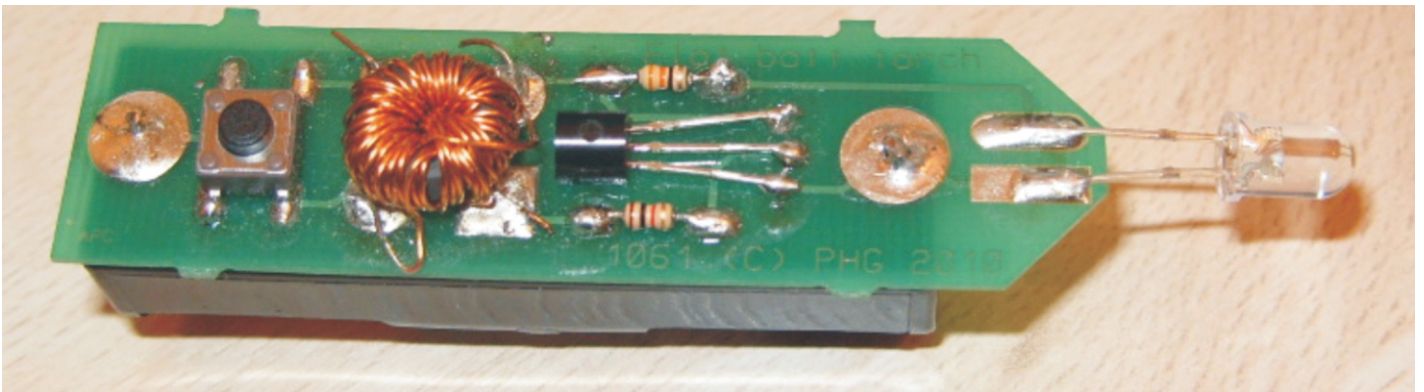


Flat battery torch assembly instructions

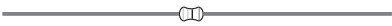
by Francis McGovern



Components

Resistors

orange/ orange/ black - 33Ω



brown/ black/ red - $1\text{ k}\Omega$

Transistor



Push switch



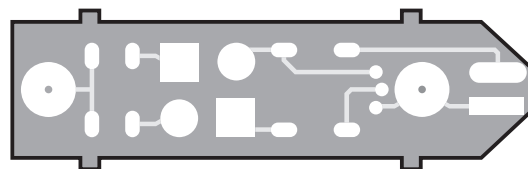
Small magnet



LED



PCB



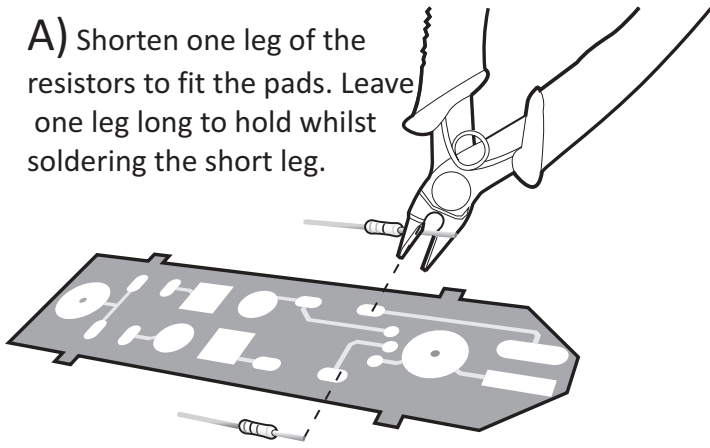
Battery holder



Solder and cable will be provided by the teachers

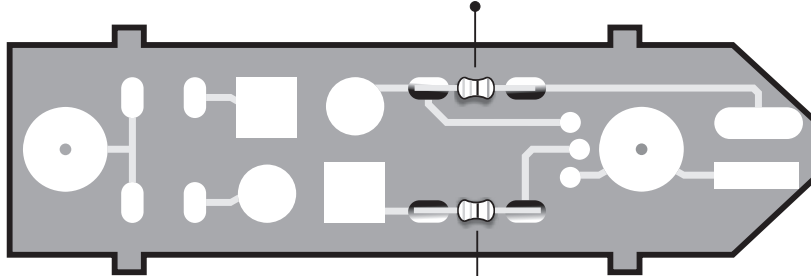
Step 1 - resistors

A) Shorten one leg of the resistors to fit the pads. Leave one leg long to hold whilst soldering the short leg.



B) Place one piece of solder to each half of the resistor pads, making it easier to hold and solder in place.

orange/ orange/ black - 33Ω

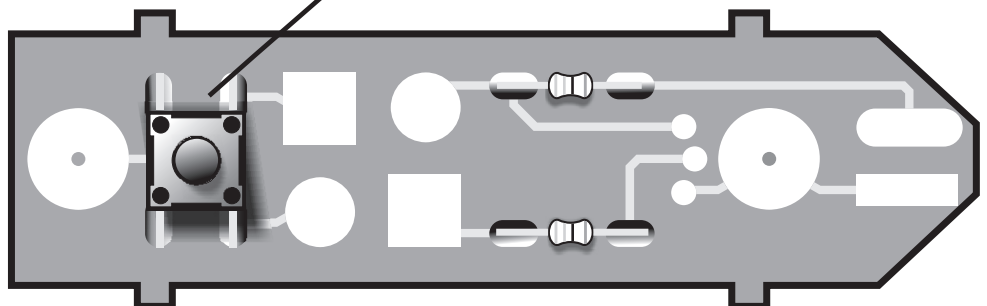
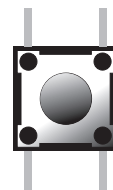
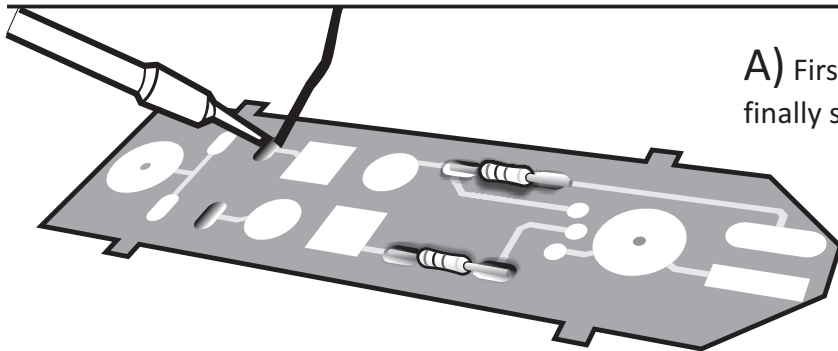


brown/ black/ red - $1\text{ k}\Omega$

C) After soldering the short side first, trim the long leg back and solder as normal.

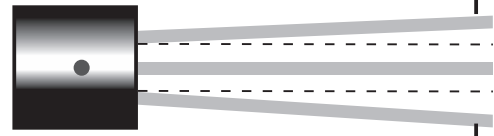
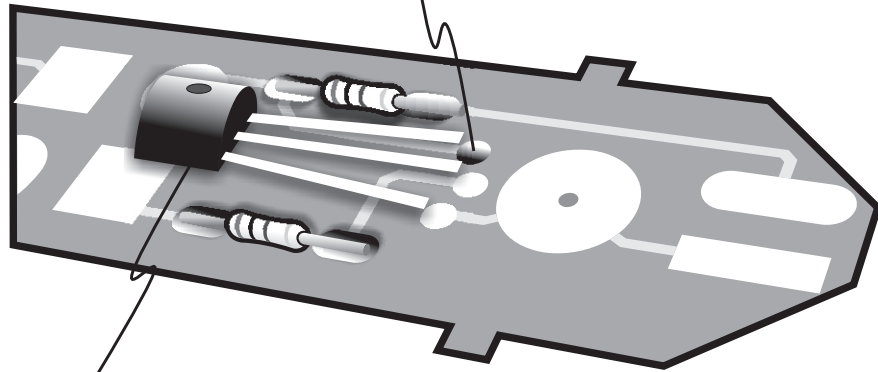
Step 2 - push switch

A) Firstly apply two pieces of solder to the pads before finally soldering the switch



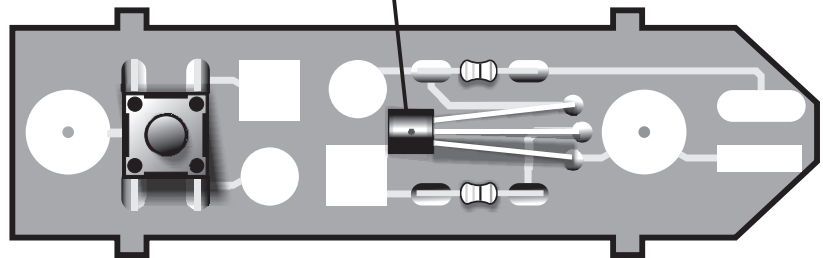
Step 3 - transistor

A) Again solder one of the pads to help secure.



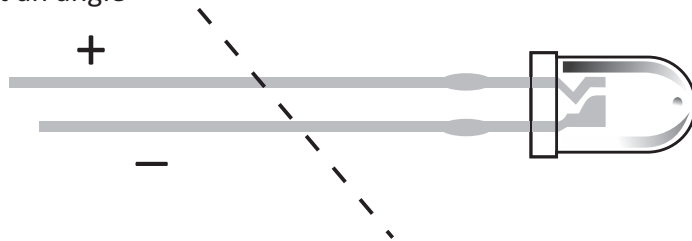
B) Gently spread the legs apart.

C) Solder the transistor flat side down.

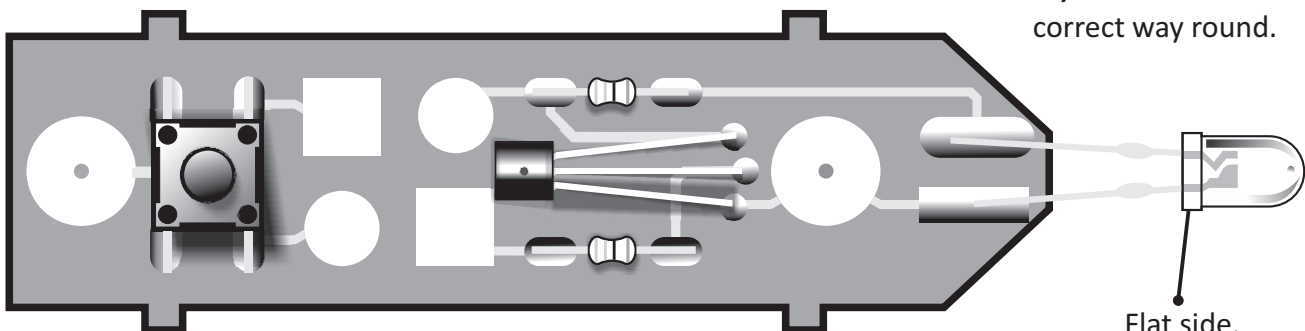


Step 4 - LED

A) Trim some of the LED legs off, but at an angle so that the positive long leg is still the longest.

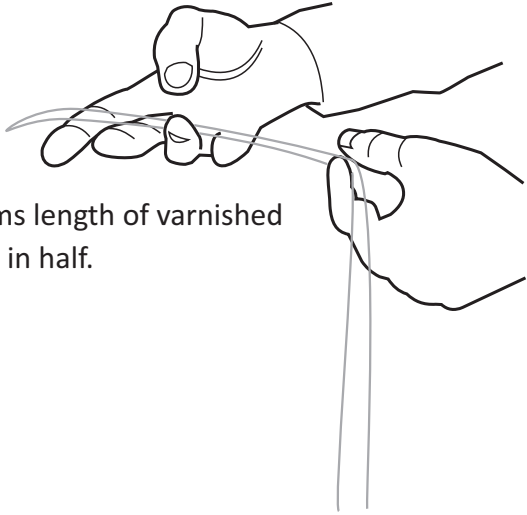


B) Open the legs and solder the correct way round.

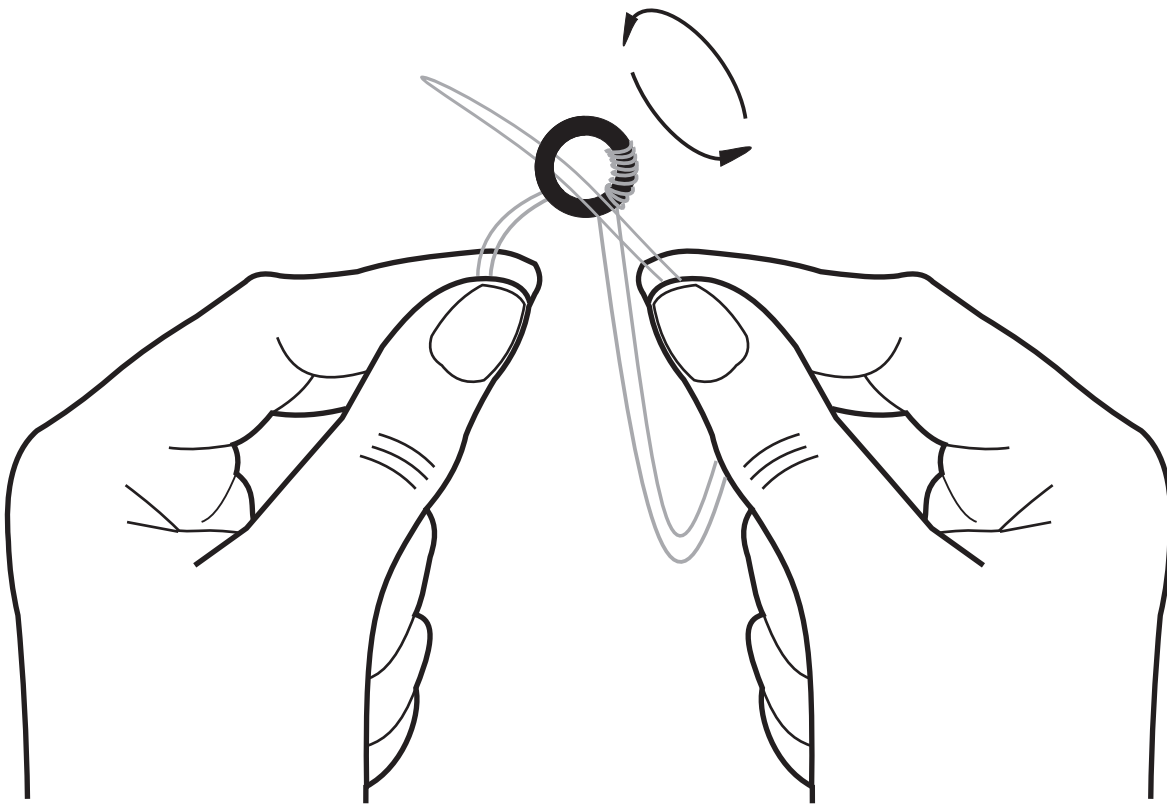
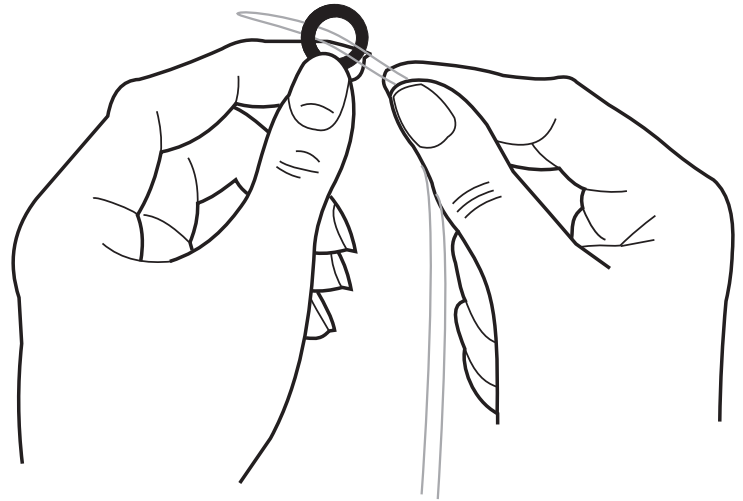


Step 5 - Transformer

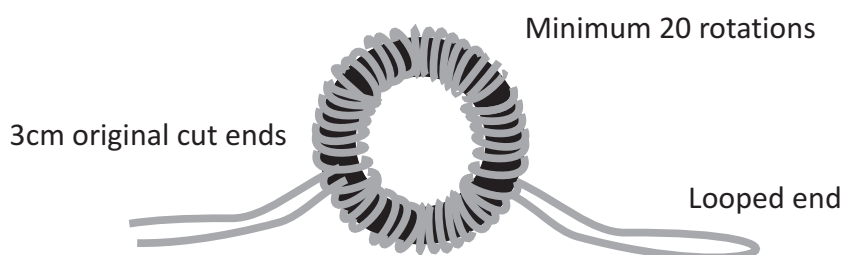
A) Take the arms length of varnished cable and fold it in half.



B) Thread the doubled end through the magnet loop leaving three centimetres to hold onto of the cut ends.



C) Whilst always holding three centimetres of both cut ends, continue to thread through and around the magnet 20 rotations.

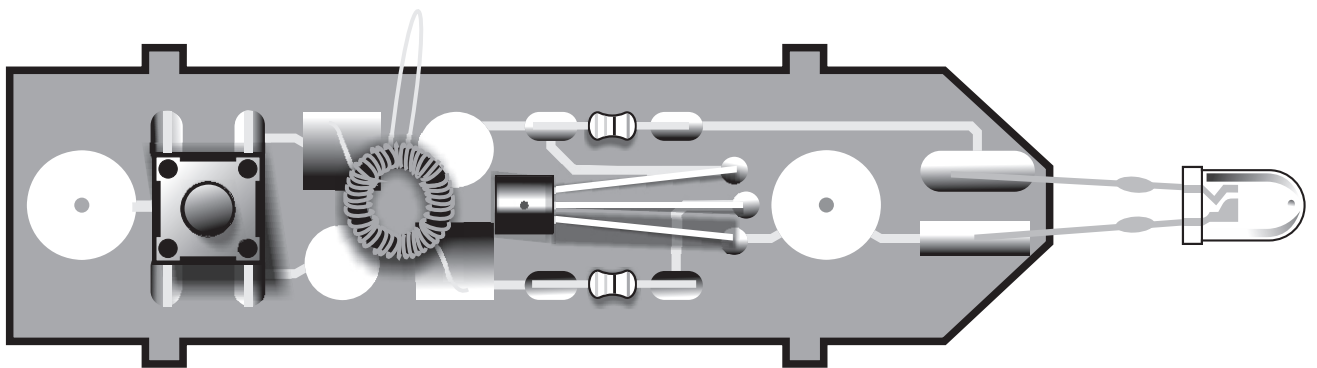
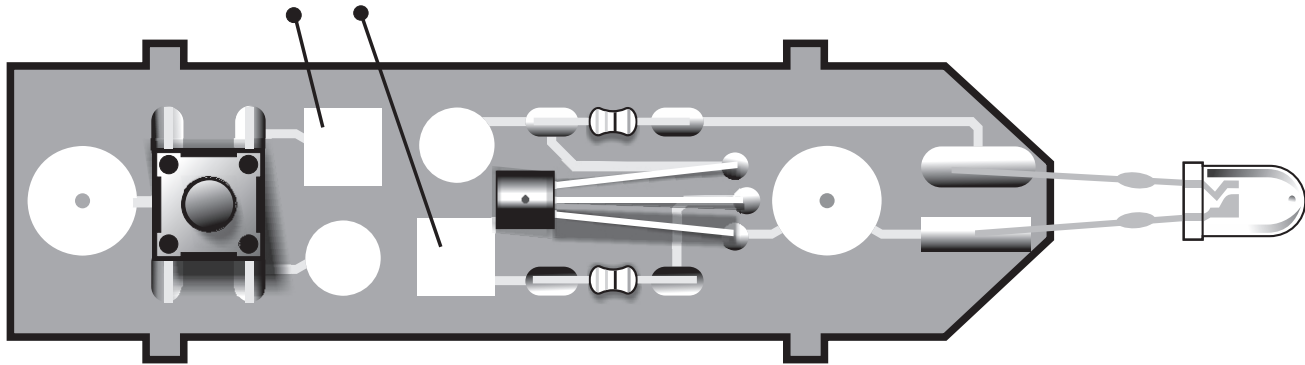


Step 6 - Transformer



D) Using the abrasive paper, remove the varnish coating from the ends of the cut and doubled cable. It will change colour when sanded free from the coating.

E) Solder the cut ends to the squares.



**ONCE AT THIS STAGE ASK FOR
FURTHER ASSISTANCE**

(Your teacher will use continuity tester to find out where the reminding two ends of the coil should be soldered)