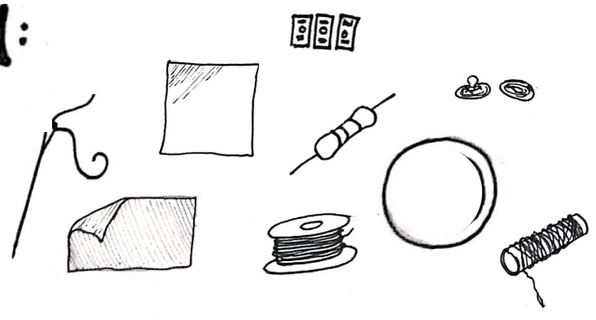
LED FABRIC BRACELET

Create a bracelet that lights up when you put it on! A challenging project which integrates different elctronic and sewing techniques.

What you need:



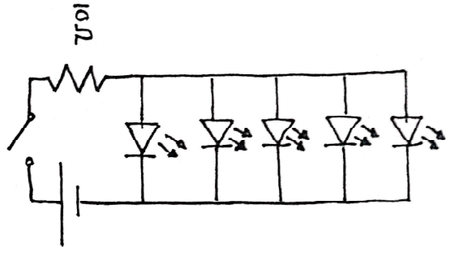
- CONDUCTIVE FABRIC
- CONDUCTIVE THREAD
- NORMAL FABRIC
- NEEDLE AND THREAD
- THIN COPPER WIRE
- MINI LEDS
- COIN BATTERY
- METAL POPPERS
- SEWING MACHINE
- RESISTOR (10 OHM)

How it Works

Test by touching the 2 parts of the popper together.
Here, the popper is acting as a switch. When undone, the circuit is not complete. When the popper is done up, the current is able to flow through as the popper is made from a conductive metal. This completes the circuit.

The LEDs are connected in PARALLEL as shown in the Circuit diagram. This means that the LEDs will continue to light up even if one or more of the other LEDs don't work. This is because the flow of electricity doesn't have to go through an LED to get to the next one.

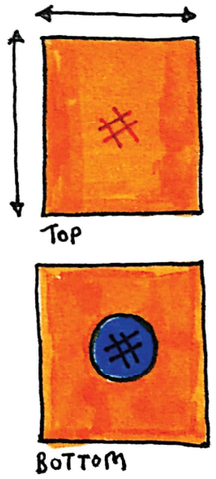
Circuit Diagram



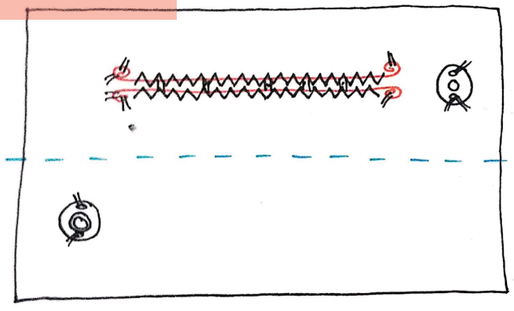
STEP 1

The first step is to cut out the correct pieces of fabric.
You will need one piece of fabric that will be the bracelet. This should be the distance to fit around you wrist + about 3 cm, and a height of 7cm.
(Detailed diagram is shown on the next page).

You will then need to cut out a square that is 2cm x 2cm. Cut out a small circle of conductive fabric and glue it to the centre on the back of this square.

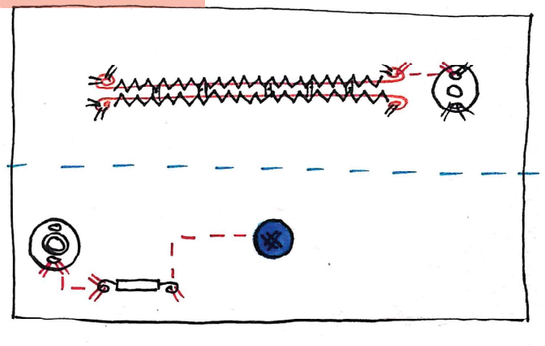


STEP 2



The second step is to sew down the first components. Take the fabric that will be your braclet and on the top half, sew down one half of the popper. On the bottom half, sew down the other half of the popper, so that they match up when the bacelet will be closed.
Sew down two pieces of thin copper wire. They should line up parallel to each other, with the distance of a mini LED between them. It is best to use a zig-zag stitch to hold them in position. This is best done using a sewing machine.

STEP 3



Solder the mini LEDs to the thin copper wire. Paying attention that each LED is the same way round. (Positvie connections are indicated by a green square on the back of the LED.

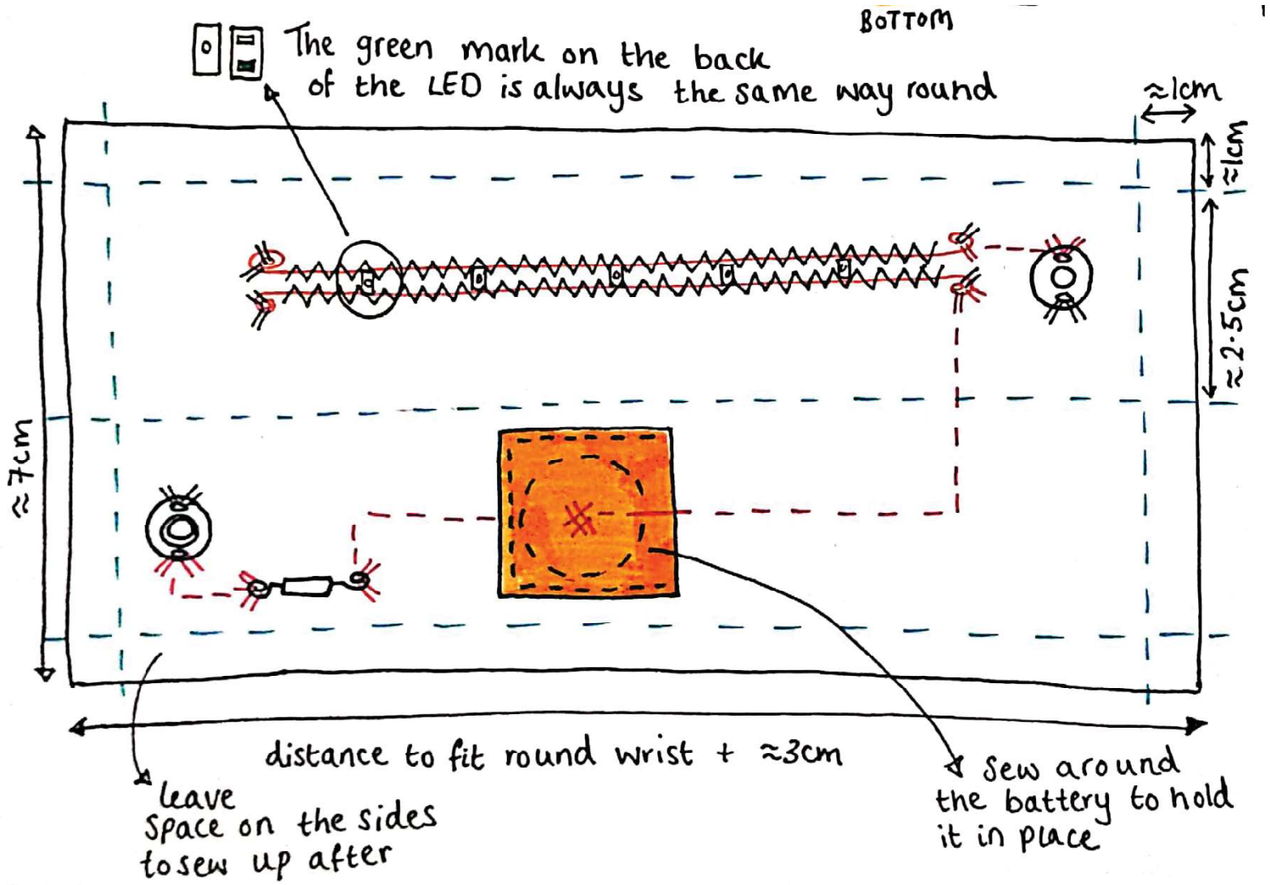
Next, on the bottom half of the fabric sew into position a resister and small circle of conductive fabric. This will be where the battery sits.
Join these up with seperate pieces of conductive thread, as shown in the diagram.

STEP 4

Complete the circuit by taking the square piece of fabric cut in Step 1. Sew in a connection point using conductive thread. Keep this thread on the needle and sew the square down, sewing along 3 sides.

Insert the battery and test that it is the correct way round by closing the circuit using the needle still threaded with conductive thread. The LEDs should light up.
Once you know the battery is the correct way round, sew around the battery to hold it securely and tightly in place.

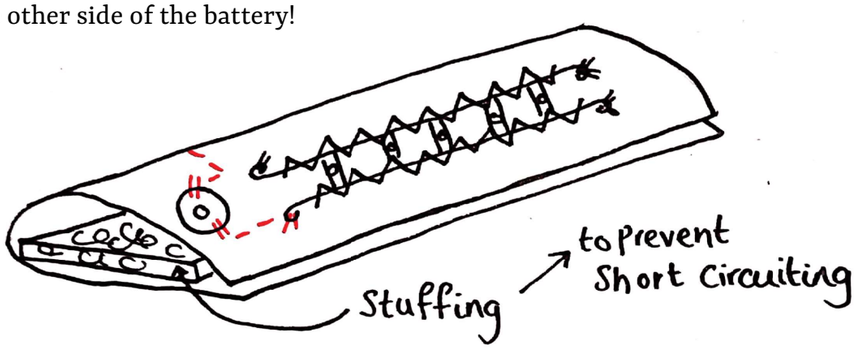
With the threaded needle with conductive thread, continue to form the connection between the battery and the thin copper wire as shown in the diagram.



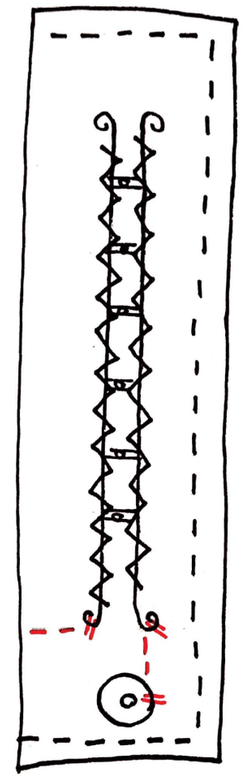
STEP 5

Check that your bracelet works by touching the two poppers together. The LEDs should light up. If not, there is probably something wrong with the battery pouch and it's connections. Make sure none of the connective fabric or thread, that touch one side of the battery are touching each other or the other side of the battery!

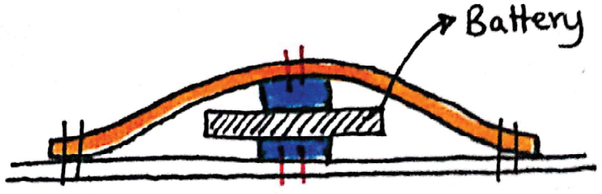
Once working, cut a small thin piece of stuffing, that is the size of your bracelet.
place this on the inside and fold the top of your bracelet over.
This will help prevent short circuiting.



STEP 6



The final step is to sew up your bracelet. You can use a quick running stitch to hold the bracelet in place. Then go around the edge with a blanket stitch to give a good and clean finish.
Your bracelet should now be ready to wear!



This diagram shows the side view of the battery pouch.
You should have a small circle of conductive fabric on the base fabric - this is connected to the resistor.
You should then have the battery.
Followed by the top piece of fabric which has a second piece of conductive fabric underneath - which connects to the popper.