Make your own flashlight

Follow this step by step guide on how to make your own flashlight.

What you'll need

Components and materials:
Bulb
Bulb holder
3 crocodile leads
Push to make switch
AA zinc chloride cell (**do not use alkaline or rechargeable cells** - if you accidentally short circuit your battery these will get hot)
Battery holder
Long red cardboard tube
Transparent plastic sheet e.g. lid off a yogurt pot
Foil tray
Plastic drinks bottle with neck large enough to slide the bulb holder into
Card wheel

Tools:
Pointed nail scissors
Transparent sticky tape
Large scissors
Double sided foam sticky tape
Low melt temperature glue gun (optional)
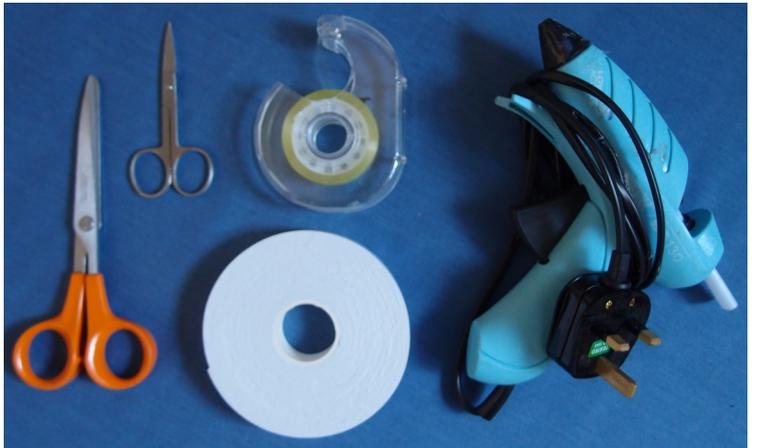
Step 1.

Make this circuit and check that the light comes on when you press the switch. Be careful not to short circuit your battery (i.e. connect the wires from your battery directly together) - they must go via the lamp. Disconnect the crocodile leads.
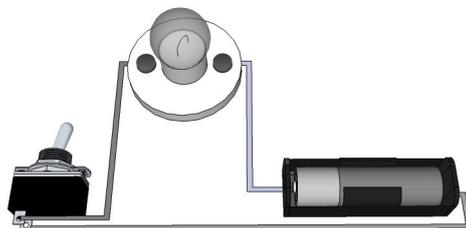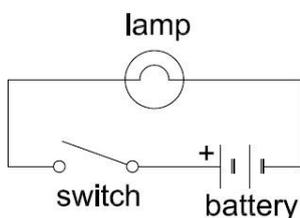

Step 2.

Use the nail scissors to enlarge the hole (push them into the hole and rotate them) in the card wheel until the hole is just big enough for the part of the switch with the screw thread to go into. Trim off the rough edges. To mount the switch, unscrew the nut and remove the washer. Don't lose them! Push the threaded part of the switch through the hole. Put back the washer and screw the nut back on firmly.

Step 3.

Use the nail scissors to cut the top 6-7 cm off the plastic bottle. If you have problems getting started you can make the initial cut with a Stanley knife. Pupils **must not** use Stanley knives. Cover the tops of the screws on the bulb holder with foam tape as shown. This is to prevent a short circuit if the aluminium reflector touches the screws. Clip two crocodile leads onto the bottom of the screws on the bulb holder. Feed the other ends of the crocodile leads down through the plastic bottle end as shown.

Step 4.

Use double sided foam tape or a glue gun to stick the bulb holder into the neck of the bottle. If using the tape remember to peel off the plastic film. Use the large scissors to cut a shape from the aluminium foil which will act as a reflector. Ease this into the bottle end as shown and hold in place with transparent sticky tape.

Step 5.

Use a felt tip pen to draw round the bottle end on the transparent plastic sheet, and cut out the disc with the large scissors. Use transparent sticky tape to attach this to the bottle end.

Step 6.

Feed the loose ends of the crocodile leads attached to the bulb holder through the red cardboard tube. Re-connect the circuit, being careful not to short circuit your battery. Check the light comes on when you press the switch.
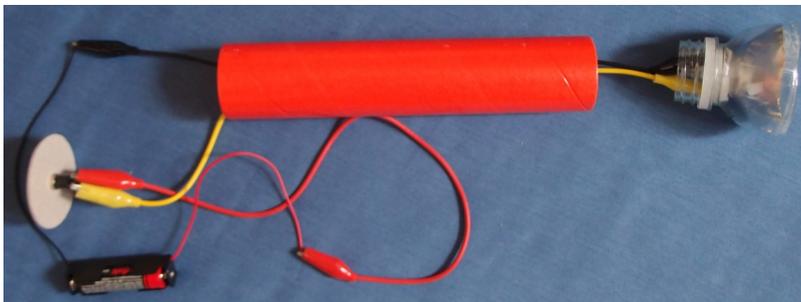
Step 7.

Use strips of foam tape to attach the neck of the bottle into the cardboard tube, and secure with transparent sticky tape. Use a strip of foam tape to attach the battery inside the tube. Push the spare wire into the tube, making sure the metal ends of the crocodile leads don't touch each other. Press the switch and check the light still comes on. Use strips of double sided tape (or a glue gun) to attach the cardboard wheel onto the end of the tube. Try out your flashlight in a dark room.