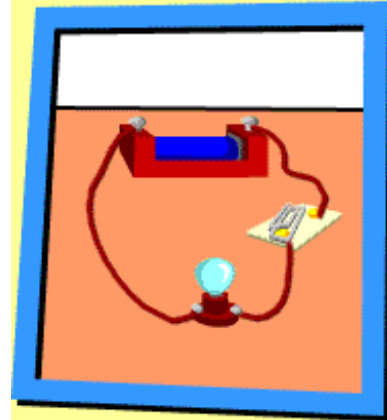




# Light Show

Use a small battery to create your very own light show. Turn the bulb on and off as electricity flows around the circuit you create.

Once you've got that far, you can start thinking of some really interesting ways to change or improve your light show. How about a scary blue light for your bedroom, or a small torch? The possibilities are endless!



## Equipment

1. One 9-volt battery. You can buy this from any newsagents, supermarket or hardware shop.
2. Three pieces of plastic-coated wire. An adult will probably be able to find you some scrap pieces very easily.
3. A small torch bulb and bulb holder (again you can buy this from a hardware store).
4. A small piece of card.
5. Two paper fasteners (the kind with split pins).
6. One paper-clip.
7. A screwdriver.

## Safety Stuff

Check with an adult before you begin, because you might need their help for some of these projects. Using items such as scissors can be dangerous, so be very careful when you use them. Make sure that you never leave them open or lying around where smaller children can reach them.

Be particularly careful when working with electricity and electrical circuits. A small battery is quite safe, because it doesn't contain enough power to give you a shock. But the electricity that's used in the home is very dangerous and can easily kill you! So make sure that you never touch any electric sockets, plugs or wires. Keep water well away from these items.

Before starting any of these projects, cover the work surface you're going to use with some newspaper or an old cloth, and make sure you're wearing an apron or some old clothes. Then gather together all the items you'll need before you begin. Most things can probably be found by simply hunting around the house, but remember to check with an adult before you take anything.

And don't forget to tidy up afterwards!

# Steps

## Step One

Start by asking an adult to strip about 1cm of plastic from both ends of each piece of wire. This gives a short piece of bare wire at the ends. You can also ask your helpful adult to help you screw the light bulb into its holder. Do this carefully so you don't break the glass.

Now you're ready to start making the electrical circuit.

Push one end of a piece of wire under one of the connecting screws on the light bulb holder. Screw it down so it makes a good connection.

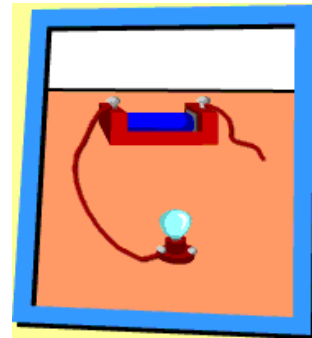
Screw another piece of wire under the second light bulb screw, and again tighten it.

## Step Two

Now connect up the battery.

First, twist the free end of one of the pieces of wire that you've already attached to the bulb around one of the battery terminals (the bits of metal on top of the battery). Make sure the wire is wound around it tightly.

Twist one end of the third piece of wire (the piece you haven't used yet) onto the other battery terminal.

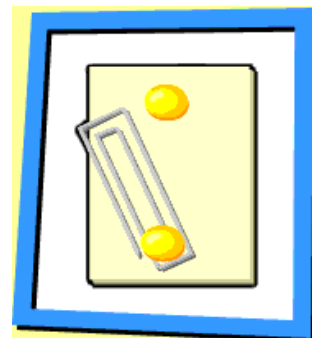


## Step Three

Now make a switch to complete the circuit. Start by making two holes in the piece of card. The holes need to be about 2cm apart.

Push a paper fastener through one hole and open the ends underneath the card, to fix it.

Push the second fastener through the paper-clip and then through the other hole. Again, open the ends underneath the card.



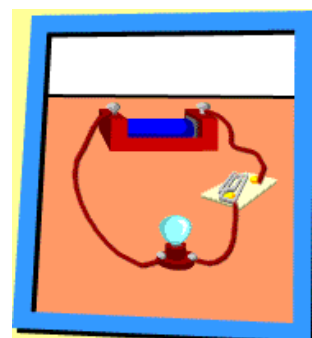
## Step Four

Now it's time to connect up your switch.

Twist one of the ends of wire around one of the paper fasteners. Then do the same with the second piece of wire around the second paper fastener.

Swivel the paper-clip to connect with the paper fastener. This makes the circuit. Your bulb will now turn on and off.

Congratulations! You've made a working light.



## Step Five

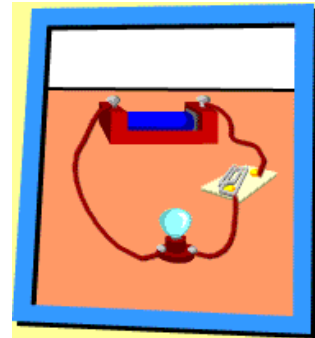
If you move the paper-clip away from the paper fastener, the circuit will be broken and the electricity will stop. The switch is off and the light will go out.

So what's next?

## Step Six

The light you've made works perfectly well, but it's not very practical. You can use it as a torch, for example, but it's difficult to carry around easily, the light doesn't 'point' in any particular direction, and if it rains, your electrical circuit could become very dangerous. It's also a funny shape, and could easily get damaged in your bag.

Can you think how to solve each of these problems?



## Step Seven

You could:

- Make the bulb shine more brightly, by surrounding it with silver foil to reflect some of the light in a particular direction.
- - Fix the bulb, switch and battery to a small, long piece of wood, to make it easier to hold.
- - Put it in a clear plastic bag and you have a waterproof torch!
- - Design a case for your torch. The design will depend on what sort of torch you want.