

ACTIVITY: How to get a light bulb to work

Electric circuits have at least three (3) different components or parts:

1. A source of electrical energy, such cells.
2. Conducting material, such as the electric wires.
3. A device that transfers the energy for a useful purpose, such as the bulb that provides light.

In this activity you will explore how to construct a simple electric circuit by getting a light bulb to work.

MATERIALS:

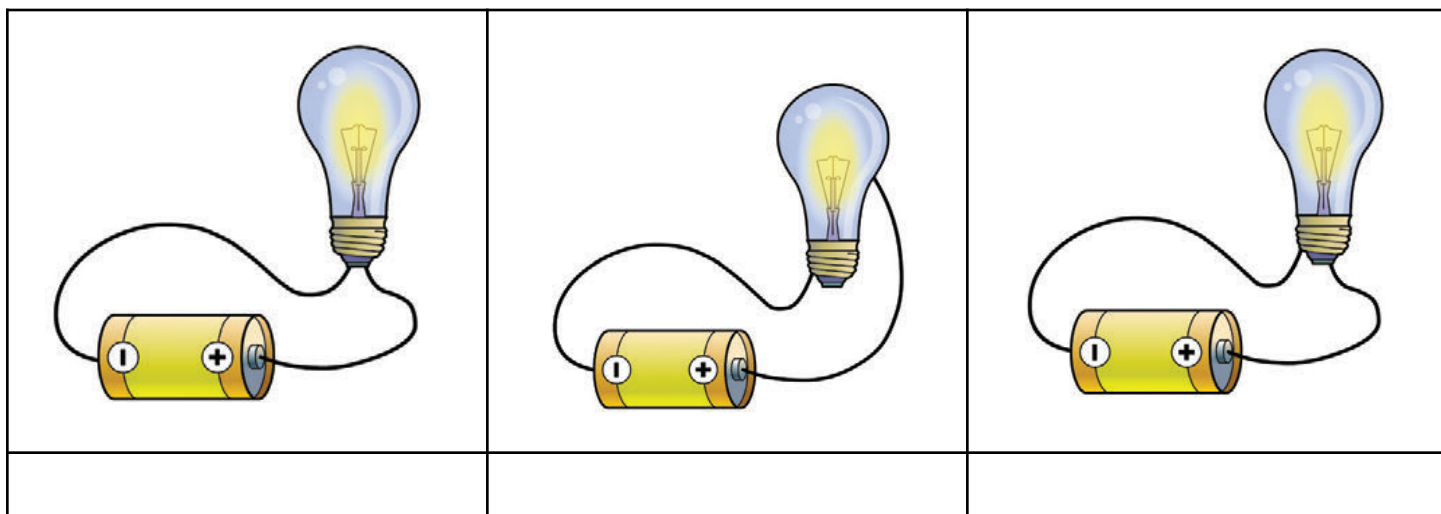
- D-size battery (1.5 V)
- Torch light bulb
- Three pieces of electric wire 15-20 cm long with the ends about 1 cm stripped of the plastic insulating material
- Adhesive tape or Prestik
- Piece of cardboard
- Two thumbnails with metal (brass) tops (remove plastic if tops are covered)
- A metal paper clip (remove the plastic if covered)

Note: The wires could be obtained from any electrical appliance not used anymore. If you cannot find a bulb that would work from 1.5 V, then try a 9 V battery.

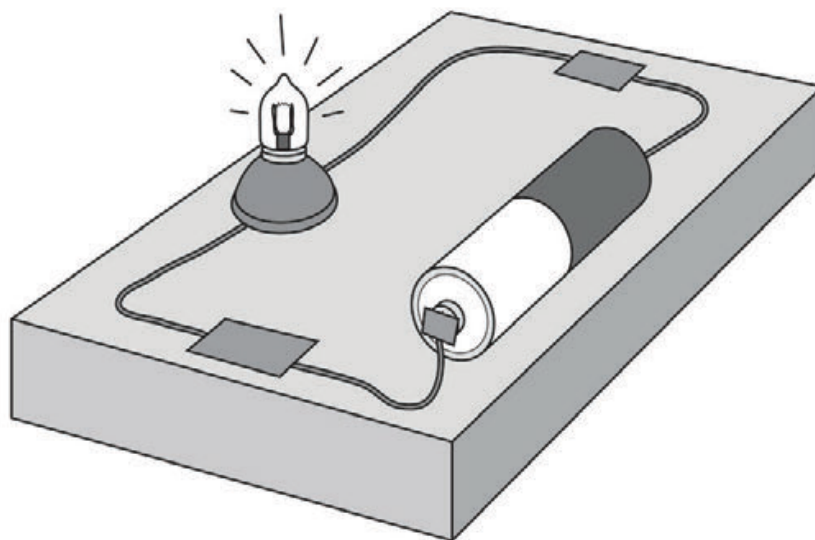
INSTRUCTIONS:

Look at the three pictures below. Only one method of the three pictured will light the bulb. Experiment to find out which one is the correct method. You will need to use tape to secure the bare wire to each part of the bulb and to the contact points on the battery.

Add photos and videos of your circuits to your science journals and write descriptions of your process.



This is a picture of a simple circuit that will be easier to handle than having the parts loose. The top of a shoe box would work. If you can't find a bulb holder like the one in the picture, you can poke a hole in the box to make a bulb holder and then two smaller holes to run the wire through to the contact points on the bulb. We will use this circuit on a box top in activity 10.2 when we add a switch.



Do you think there is something flowing through the bulb when it lights up? When we connect the bulb so that it lights up there is something flowing through the whole circuit. When it does not light up, we have not made a proper or complete pathway for electricity. This flowing "thing" is called electric current. If the bulb lights up, we say there is an electric current in the circuit. The electric circuit is a system for transferring energy.

Think again about the circuits that you have constructed so far.

What are the conditions for the bulb to light up? The circuit should have at least all three components as mentioned above. The circuit should be closed as described in the video in 10.0. The connections should provide electrical contact (metal on metal).

The battery is the source of energy. Some of the energy is transported through the electric wires to the thin wire inside the bulb. The thin wire becomes hot and emits (gives off) light. The energy is transferred in the thin wire to produce heat and light. So, chemical energy in the battery is changed into electrical energy and then into light and heat energy in the bulb.

