

Activity 4.2: "Electrical Current"

A: How to light a light bulb? (Individual activity or by pairs at the most)

Use a small light bulb, a 1.5 V AAA battery and 1 wire only to find several ways to put together a circuit so that the light bulb is turned on.

Make schematics such of the different circuits that allowed you to turn on the light bulb.

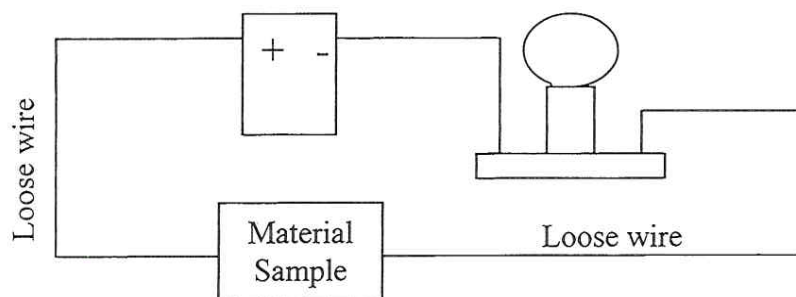
What are the essential elements required for an electrical circuit?

B: Simple electrical circuit

Once you have found several ways to turn on the light bulb, gather three other wires, a bulb holder and a switch to make your circuit more permanent and to be able to turn it on/off. Put your circuit together and draw a detailed schematic of this circuit showing in particular how the light bulb filament inside the bulb is connected to the circuit.

C: Electrical properties of materials

Modify your circuit such so that you have two wires with loose ends in the middle of the circuit. We will use this new circuit to characterize the conductive properties of materials. Objects of different known materials (material samples) can be found in a plastic bag. Close the circuit connection between the two "loose" wires with a material sample and check what happens to the light bulb. If the light bulb shines, electricity was able to pass through the material; if the light bulb does not shine, electricity was not able to go through the material. Before proceeding with the experiment, predict what materials will produce the least light (or no light at all) and which ones will produce the most and write down your predictions (no light at all, low light, bright light, etc). Record your results in the table below.



| Material no. | Material Tested | Prediction | Result (how bright is the bulb) | Comment on electrical conductivity of the material |
|--------------|-----------------|------------|---------------------------------|--|
| 1 | Wood | | | |
| 2 | Aluminum | | | |
| 3 | Chalk | | | |
| 4 | Nylon | | | |
| 5 | Brass | | | |
| 6 | Steel | | | |
| 7 | Graphite | | | |
| 8 | Plastic | | | |
| 9 | Copper | | | |
| 10 | Glass | | | |
| 11 | | | | |