



AN EXPERIMENT ABOUT ELECTRICITY

A SIMPLE CIRCUIT GAME

What you will need:

- 1 D size battery
- Electrical tape
- 1 piece of thin plain wire
- A flashlight bulb
- 3 pieces of insulated wire – your teacher will have prepared them for you

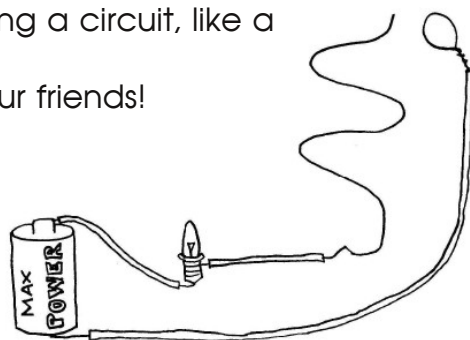
What you will do:

The aim of the game is to move the loop of wire over and along the plain wire without touching it. If you do touch it, the light will shine and your turn will be over. Here's how to make it:

- 1 One end of one of the insulated wires has been stripped back a long way. Make this end of the wire into a loop.
- 2 Tape the other end of this wire to the negative end of the battery.
- 3 Tape a different piece of wire to the positive end of the battery.
- 4 Tape the other end to the metal at the bottom of the bulb.
- 5 Tape the next piece of wire to the contact on the bottom of the bulb.
- 6 Join the other end of that wire to the plain, non-insulated wire. Tape up the connection.
- 7 Now bend plain wire around a bit so it sits up off the table.
- 8 Test the connections by touching the hoop onto the plain wire. If it doesn't light up, check all the connections until you find the problem. Remember that we are making a circuit, like a circle, so there mustn't be any breaks!
- 9 Have fun! Have a competition with your friends!

What is going on?

You have made a simple electrical circuit that has a break in it on purpose. When the hoop is not touching the plain wire, the circuit is not complete, so the electricity from the battery cannot get to the light. When the wires touch, the circuit is complete and the light comes on!



Monster Challenges:

- Swap the light for a buzzer you can get at most electronics stores.

TEACHING NOTES:

Monster Sciences Experiment: Electricity E02

Topic: Electricity

Suitable for Ages: 10 -12+

Key Concepts:

Harnessing and using electricity with simple circuits

Resources:

- Investigation Record IR01– one copy per student
- Experiment Description Electricity E02– one copy per student
- 3 pieces of insulated wire one of which has one end stripped back about 5cm/2in, length of plain but firm wire – about 30cm/12in long, D size battery, electrical tape, flashlight globe

Lesson Notes:

Begin by reviewing safety – making electrical circuits with batteries is safe, but going anywhere near power points or mains electricity is extremely dangerous.

Arrange for the children to work in small groups. Remind them that they are cooperating and that every member of the group can and should contribute to the experiment.

Remind students to listen carefully to instructions, and to OBSERVE their experiment. Remind them also that their connections need to be sturdy – if the wire falls off the connection is lost and the circuit won't work.

As a class discuss the experiment prior to undertaking it, and students should complete the sections of their Investigation Report IR01 from "Title to "Hypothesis".

What should happen in this experiment, and why?

You are making a simple kind of electrical circuit. A circuit, like a circle, must be unbroken. The electricity must be able to flow from the negative end of the battery around to the positive battery. If there is a break in the circuit, the electricity will not flow. This game relies on the break in the circuit when the hoop doesn't touch the wire to win.

Follow up discussion questions:

- How many of you found the circuit didn't work when you first tested it? What did you do to find the problem? What did the problem turn out to be? NB: You might like to discuss the problem solving methods used eg: change one variable then retest, deduct the most likely problem from known information etc.
- How well does the light work in this game? Would the game be better if we used something else, like a buzzer, instead of a light?
- What other ways could we use this idea to make a game or toy?