

Exemplar 26

Making a circuit

third and fourth classes

Initial problem: How can I make the bulb light?

Background

Electricity flows when there is a complete circuit. Children will discover that there are several ways to get a bulb to light. They should note that the battery has two terminals, the metal cap at the top and at the base. The children will succeed in lighting the bulb if one wire travels from the terminal to the side of the bulb and the other wire goes from the base of the bulb to the second terminal.

When two or more batteries are used in a circuit the brightness of the bulb is increased. The electrical energy in the circuit increases as the voltage increases. The batteries must be connected in the correct way in a torch: the positive

terminal of one battery should touch the negative terminal of the other.

Assessment: Among the techniques that may be used are

- teacher observation: willingness to try different ideas; willingness to work with others
- portfolio: annotated drawings of work
- concept maps.

Resources

A battery, bulb and two strands of wire. The wire should be bared at the ends.

Starting points

experimenting

predicting

Development of lesson

experimenting

recording

Extension of lesson: follow-up activities

experimenting

Structured exploration

In pairs the children try to light the bulb using two wires and a battery.

Encourage the children to predict what will happen before they construct their circuit.

- *How many ways can you light the bulb?*

Encourage children to connect the wires in different ways and at different points in the bulb or battery.

Children should make a record of each circuit that they construct and the results obtained.

The following questions may prompt children to further their investigations:

- *How many ways can you light a bulb using only one wire and a battery?*
- *How many ways can you light two bulbs with two wires?*
- *How many ways can you light two bulbs with three or four wires?*

When the children have succeeded in getting the bulb to light in different ways they should then progress to using a bulbholder and be asked to repeat the activity with the bulb in the bulbholder.

It will be necessary to show pupils how to attach the wires correctly to the bulbholder.

Encourage children to think about:

- *How many ways can you find to make the bulb go out?*

The children might later begin to experiment using two batteries.

- *Can you make a circuit with two batteries, two wires and one bulb?*

If the children are using two 1.5 V batteries, a 2.5 V bulb can be used. Question the children:

- *Is the bulb brighter or dimmer when two batteries are used?*
- *How were the batteries arranged so that the bulb would light?*