

45 Electric Breadboard

Classroom Activity: Learn about electric circuits using an electric breadboard.

Grade: 6

Strand (s): Understanding Matter and Energy

This task addresses the following overall expectations:

- investigate the characteristics of static and current electricity, and construct simple circuits;
- demonstrate an understanding of the principles of electrical energy and its transformation into and from other forms of energy.

and the following specific expectations:

- follow established safety procedures for working with electricity;
- design and build series and parallel circuits, draw labelled diagrams identifying the components used in each, and describe the role of each component in the circuit;
- use technological problem-solving skills to design, build, and test a device that transforms electrical energy into another form of energy in order to perform a function;
- use appropriate science and technology vocabulary, including current, battery, circuit, transform, static, electrostatic, and energy, in oral and written communication;
- use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes;
- identify ways in which electrical energy is transformed into other forms of energy;
- explain the functions of the components of a simple electrical circuit;
- describe series circuits (components connected in a daisy chain) and parallel circuits (components connected side by side like the rungs of a ladder), and identify where each is used.

Assessment Categories:

- Knowledge and Understanding
- Thinking and Investigation

- Communication
- Application
- Teambuilding skills

Type of Activity: Classroom or Science Lab

Preparation: Obtain supplies and build a prototype breadboard

Materials and Resources for Teachers: Same as students (to build prototype). The Lessons in Electric Circuits website is also useful:

<http://www.ibiblio.org/obp/electricCircuits/index.htm>

Time needed to complete this activity: 400 minutes

Materials/Resources for students:

flashlight bulb and socket

low voltage electric motor

8 1/2" X 11" pieces of masonite

SPST slide switches

small pieces of 5/16" wood.

1 35 mm film can

1.5 volt C battery

2 brass "copperpin" type paper holders (to use as battery contacts)

6 electrical experimenter clip leads

Activity Description:

Review the concept of electricity and electrical circuits. Explain and demonstrate the difference between parallel and series set-ups using the prototype breadboard.

Divide the students into teams and have them design and draw their breadboard, clearly marking all the components. The circuit should make the flashlight bulb light up.

The circuit is built by hot gluing the components onto the masonite. Using blobs of hot glue raises the components slightly, making it easier to attach the clip leads.