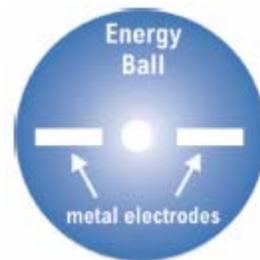


INTERMEDIATE ACTIVITY: Series & Parallel Circuits

An Energy Ball is a hollow ball that contains a light and a sound device, both of which are attached by wires in series to two metal electrodes that are attached to the outside of the ball as shown in the diagram on the right. When both electrodes are touched by one person or by several people in contact with each other, the circuit is closed and the ball lights and makes a noise. An Energy Ball can be purchased from most science supply stores, by emailing NEED at info@need.org or by calling 800-875-5029.



Thanks to Linda Fonner, New Martinsville, WV for developing and sharing this activity.

Objectives

Students will understand electricity follows the shortest/easiest path.

Student will understand series, parallel and short circuits.

Materials

1 D cell battery per student

1 insulated wire (15 cm) per student plus 15 extra wires

1 flashlight bulb per student

1 Energy Ball

Procedure

1. Provide each student with one battery, one wire, and one light bulb.
2. Ask the students to make the light bulb light, using only the materials provided them. Allow students time to complete the task. Review as a class how they were successful.
3. Group the students in pairs. Ask the students to light one bulb using both of the batteries and wires. Allow students time to accomplish the task.
4. Ask the students to light both bulbs, using only the materials from their pair. Allow students time to complete the task. Review as a class the successful configurations.
5. Have the students form groups of three-five. Ask the students to light as many bulbs in as many different configurations as possible, utilizing additional lengths of wire as they wish. Review as a class the successful configurations.
6. Ask the students to design a set up that allows them to light a bulb, disconnect one end of a wire, and still have the bulb light. Allow students time to complete the task and review successful configurations.
7. Pose this problem to the students to solve as a class: Using only the Energy Ball and your hands, design a circuit in which two people can let go of their hands and the Energy Ball will still stay lit. Have students diagram their planned circuits. Allow time for students to test their circuits and solve the problem.
8. Review with the students the various configurations of circuits they completed, including the terms open, closed, short, series and parallel.

