

Ages:

10 to 13

Activity 7:

Build a Parallel Circuit

(Adapted from *4-H Electrical Science Program -- Electrical Projects and Idea Sheets*. See “More Great Resources for Grab and Go with Science Activities” for more information.)

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Main idea: The lights are connected between the main wire from the battery and the main wire back to the battery. The electrons can flow through any light without having to flow through the others. If one bulb burns out, the rest will work. Each bulb gets the same amount of electrons.

Objective: Build a parallel circuit and understand how it works.

Materials: For each pair:

- q Screwdrivers
- q 5 pieces of conductor wire

- q Circuit board (see handout distributed at session)
- q D-cell batteries (4 four each circuit board)

Motivator: Use the question below to pique interest.

Questions: How can a two socket circuit be wired so that one lamp could be unscrewed while the other lamp stays lit?

Activity:

1. With the switch open, carefully connect the wires under the terminal screws in a clockwise direction as follows:
 - a. Wire #1: + battery terminal to front switch terminal.
 - b. Wire #2: Rear switch terminal to right terminal of socket #1.
 - c. Wire #3: Right terminal of socket #1 to right terminal of socket #2.
 - d. Wire #4: Left terminal of socket #1 to left terminal of socket #2.
 - e. Wire #5: Left terminal of socket #2 to - battery terminal.
2. Screw the two lamp bulbs into the sockets and close the switch.
3. Unscrew one of the bulbs, and notice if anything happens to the other bulb.

Learning checks: After the activity, the youth are able to:

- q Describe why one bulb on a parallel circuit can be unscrewed while the second bulb remains lit. (Each bulb has a closed circuit for electrons to flow.)

Background:

There is another way we can hook up devices in a circuit between the main wire from the battery and the main wire back to the battery. In this circuit, electricity can flow through any one device without having to flow through others. Each one works on its own. If one lamp burns out, the rest still work. This is called a parallel circuit.

Extensions: See additional activities in *4-H Electrical Science Program -- Electrical Projects and Idea Sheets*. (See “More Great Resources for Grab and Go with Science Activities” for more information.) Activities include:

- q Tinning Project Wires.
- q Tie an Underwriter's Knot and Attach Plug to Projects.
- q Build a lamp.
- q Define volts, amps, and watts. Calculate watt-hours for selected household appliances.
- q Learn how to read an electric meter.