**ELECTRICITY**

# SECTION 4: SWITCHES

**STANDARDS:**

*Students know* basic energy types, sources, and conversions.

*Students describe* the flow of energy through an object or system.



**Westminster College**

*Students recognize or illustrate* simple direct current series and parallel circuits composed of batteries, light bulbs, wire and on/off switches.

# BACKGROUND:

A circuit works when energy can flow through the circle. When the circuit is broken, the energy cannot get to the object requiring the energy. Sometimes we want to stop the energy from flowing through the circuit. We can purposely break the circuit with a switch. Almost everything that required electricity has a switch. Today we learn and better understand how a switch works.

# SAFETY:

Discuss safety with students prior to experiment. The bulbs break easily. The battery can produce enough heat to cause a slight burn. The wire is sharp.

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# MATERIALS:

D cell battery and battery holder

Wire (2-4 pieces per group, 5-6 inches long)

Light bulb and bulb holder (2 per group if possible-check that the kind of bulb is the same for each group. If the group has one oblong-shaped bulb and one circle- shaped bulb it will affect the circuit.

knife switch

3 x 5 cards cut in half

2 brad fasteners per group

1 small paper clip per group

# PROCEDURE:

1. Review the safety information.
2. Have students to get into groups.
3. Pass out the materials.
4. Ask students to connect a bulb and batteries in a circuit.
5. Pass out worksheet.
6. Instruct groups to brainstorm together to figure out how to connect the switch in the circuit. Demonstrate how to open and close the switch and how to put the wire on the screws under the black cap.
7. Remind students to fill in their findings on their worksheet.
8. Instruct groups to get a 1 ½ x 2 ½ card, 2 brads, and one paper clip. Using these materials, they are going to build a switch.
9. Have them put their new switch in the circuit.
10. Remind students to draw a diagram of the switch when they are done.
11. Guide groups into finding the answer.
12. Share results.

# CONCLUSION:

Discuss the flow of energy through the circuit and switch. When the switch is closed, the energy is able to move freely through the circuit. When the switch is open, the circuit is broken, stopping the flow of electricity. See if students can use their knowledge to explain to their partner what happens with the lights in the classroom. .



