

## Investigation Three – Lights On!

<b>Standard IV</b> Students will understand features of static electricity.
<b>Objective 2</b> Analyze the behavior of current electricity
<b>Intended Learning Outcomes</b> 1. Use science process and thinking skills

**Standard  
IV**

**Objective  
2**

### Background Information

Wire can be substituted with sections of wire cut from holiday lights or strips of aluminum foil. Sections of holiday lights that include bulbs can be used instead of flashlight size bulbs. A switch can be made from a small square of cardboard, two paper fasteners (brads), and a small paper clip. Make a small hole in the cardboard, slip the paper clip over the end of the brad and fasten the brad to the cardboard. Insert the other brad close enough to the first brad that the paper clip can touch it. To use as a switch, attach one wire to each of the brads. The swinging paper clip will open and close the circuit.

Ideally, students should work in pairs, but if supplies are limited, make the groups as small as possible.

“light and Sound Globes” or “happy Balls” are small balls with 2 contacts on the bottom. When we hold the ball, our skin conducts enough electricity to complete the circuit. Music plays and/or the ball lights up. These can be purchased through many of the large science supply companies.

### Pre-Assessment/Invitation to Learn

Use “Light and Sound Globe” or “Happy Ball.” Ask questions like: “What makes the globe light?” “Why can’t I use two pencils to push the contacts and make it light?” Or, tell students they will get to make an improvised flashlight.

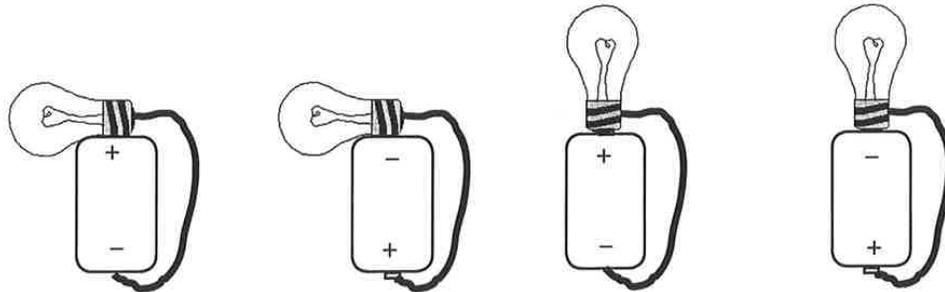
### Instructional Procedure:

1. Give each student or pair of students a number of materials including a battery, bulb, and an insulated wire. Instruct students to find a way to light the bulb using only three items.

#### Materials

- 1 D-size battery
- Flashlight size bulb
- 1 12-inch length of insulated copper wire with clips
- Student Worksheet “Light a Bulb”

- As groups find ways to light the bulbs, give them further instructions to find four ways to light the bulb. Have them record each of the ways on the journal sheet. Remind students that good technical drawings will be as realistic as possible. The drawings should show important details and include world labels.



- After allowing time for students to discover the four ways to light the bulb, have students put aside the materials. As a group, discuss the ways to light the bulb.
- Discuss as a class why some methods did not work and why others did. Through this discussion, lead students to come up with definitions for a complete circuit and an incomplete circuit. Record these definitions in science journals.
- Have students complete the “Light a Bulb” worksheet.

## Curriculum Extensions

### *Language Arts –*

- Write five fact sentences and five opinion sentences about your circuit. (Standard VII, Objective 3)
- Journal Writing: What is a switch’s job? (Standard VIII, Objective 6)
- Create a Venn Diagram comparing complete and incomplete circuits. (Standard VIII, Objective 6)

### *Science –*

- Create a circuit using a bulb or motor, battery, wires, and a switch. Discuss how using the switch changes the circuit from complete to incomplete very quickly. (ILO 1)

## Assessment Suggestions

- Performance assessment
  - ✓ Ask students to create a complete circuit and an incomplete circuit.
  - ✓ Describe the difference between a complete and an incomplete circuit.
  - ✓ Create a Venn Diagram comparing and contrasting complete and incomplete circuits.

Reference to Assessment Section:

	Multiple Choice	Constructive Response	Performance Test
Unit Test	7, 8, 9, 11	4, 5	

## Resources

Discovering Electricity

Newbridge

P.O. Box 1270

Littleton, MA, 01460

(800) 067-0307 FAX (800) 456-2419

[www.newbridgeonline.com](http://www.newbridgeonline.com)

Electricity Files: Shock

Discovery Channel School

P.O. Box 6027

Florence, KY

41022-6027

(888) 892-3484

(859) 727-8918

[www.discoveryschool.com](http://www.discoveryschool.com)

Teachers A-Z Resource Guide: Electricity

Discovery Channel School

## “Light a Bulb” Worksheet

Name \_\_\_\_\_

Using only three items, find four different ways to light the bulb. Draw and label the parts of each method.

1.	2.
3.	4.

What is a circuit? \_\_\_\_\_

\_\_\_\_\_

What is the difference between a complete and an incomplete circuit?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_