

# Simple Electric Circuits

Grade Level: 2, 3, 4

Duration: 30 - 50

Classification: Classroom, Science Fair

Subject(s): Electrical Engineering, Physics

Categories (STEM): Technology, Engineering, Science

Keywords: Electricity, Circuits, Current, Battery

## Introduction

- Summary: Demonstrate that a battery is a source of energy and can turn on a light bulb!
- Description: Students will be challenged to build a circuit out of supplies that they receive

**Online Resource:** <https://www.rookieparenting.com/build-a-simple-electric-circuit/>

## Materials

Materials	Quantity	Reusable?
D-Cell Battery	1 per student	Yes
Aluminum Foil	2 strips per student (5-6 in)	Yes
Flashlight Bulbs	1 per student	Yes
Masking Tape	1 roll per class	No
Buzzers	1 per 3-4 students	Yes
Test Bags*	1 bag per 3-4 students	Yes

*\*These should include a variety of insulators and conductors (paper clips, crayons, sticks, etc)*

## Directions

- Instruct the students to form pairs or groups of 3-4 and pass out materials
- Tell the students to look at the battery and compare both ends. They should notice one end is labeled with a negative (-) and one is labeled with a positive (+).
- Let the students experiment with their supplies to try to get the lightbulb to light up.
- **Helpful Hints**
  - Check to see if batteries or light bulbs are dead before activity starts
  - The connected parts must run from one end of the battery to the other. If the path is broken or interrupted, the circuit will be broken and the light will not light up.
  - To make a good connection the foil strip should be wrapped around the bulb base, leaving enough foil to connect to the battery ends.
  - If using multiple batteries or other add-on make sure that the current goes from (+) to (-)

### **Activity Extension**

- Try adding items from the Test Bags into the circuit, does it still function?
- In a group, try using the buzzers instead of the lightbulb.
- Add an additional battery to the circuit.

### **Discussion Questions**

- What do you think happens when a bulb in a string of Christmas lights is defective?
- Why do you think some circuits did not cause the bulb to light up?
- Compare the items in the Test Bags, what similarities do they have?
- Why is it dangerous to be wet or standing in water when working with something electrical?
- How can you use what you learned to stay safe around electricity?

### **What is happening?**

- The charge of the battery flows from the positive side to the negative.
- If the light bulb is connected to both sides of the battery, it will produce a light.

### **Applications**

- Majors
  - Electrical Engineering
  - Computer Engineering
  - Physics
- Jobs
  - Electrical Engineer
  - Electrician
- Hobbies
  - Building with Little Bits or Snap Circuits
  - Building a Computer
- Real world applications
  - Electricity is used all around us to power houses or charge devices
  - Rubber wheels on cars do not conduct electricity, protecting them from lightning strikes



This activity was last updated in fall 2020 by Student Role Models.