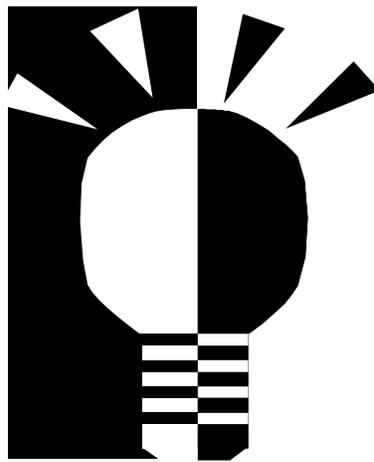


Curriculum Embedded Performance Task
Elementary School Science
Content Standard 4.4



Go With The Flow

Student Materials

Connecticut State Department of Education
Bureau of Curriculum and Instruction

Go With The Flow

A Guided Exploration of the Properties of Electric Circuits

Explore:

In this activity, you and your partners will explore different ways to light a light bulb.

To Get Ready:

1. Gather the following materials:

Batteries	Bulb holders
Wires	Assorted classroom objects (paper clips, erasers, rulers, etc.)
Battery holders	Magnifier
Flashlight bulbs	Scissors

Experiment #1: Different Ways To Light A Bulb

1. OBSERVE the wire, the battery and the bulb. Use the magnifier to get a closer look at the inside of the bulb.
2. In your science notebook, DRAW a detailed diagram of the wire, the battery and the bulb, and label the parts you have observed.
3. Work with your partners to make the bulb light. In your science notebook, DRAW a diagram of each arrangement of battery, wire and bulb you try. Record next to each diagram whether or not the bulb lit.
4. DRAW a diagram of your complete circuit, and use arrows to label the path you think the electricity is traveling. Then turn the light off by opening the circuit, and DRAW a diagram showing how an open circuit is different than a closed circuit.
5. CHALLENGE: Try to find 3 different ways to light the bulb. DRAW a diagram in your science notebook of each new arrangement you try, then TEST it to see if the bulb lights. RECORD your findings next to each diagram.
6. TALK with your partners about what you have discovered about electric circuits. Look at all your “bulb lit” diagrams. In what ways were they similar? Look at all your “bulb not lit” diagrams. In what ways were they similar?
7. PREPARE to share your diagrams and explain your findings to the rest of the class.

Background:

Have you ever seen electricity? If you've watched lightning flashing during a thunderstorm, you've seen a bright flash of electricity moving wildly across the sky. The electricity we use to make things work or move is not as easy to see as lightning. Over time, people have learned to control electricity in paths called **circuits**. Electric circuits are made of special materials arranged in certain ways.

In Experiment #1, you made electricity pass through wires. In this experiment, you will test different materials to find out which ones let electricity pass through them.

Experiment #2: Which Materials Conduct Electricity?

1. **OBSERVE** the wires. In your science notebook, **LIST** some properties of the wire materials.
2. **COLLECT** objects from home, the classroom or your backpack that are made of different materials. You will test these objects to see if they conduct electricity.
3. Place the objects you will test on your work table. **THINK** about the materials from which they are made. **PREDICT** which ones you think are conductors and which ones are not. **SORT** them into two piles.
4. **THINK** of an organized way to keep track of your test objects, your predictions and your findings in your science notebook. This is called a "**data table**". You will "**record**" the results of your experiment in your data table.
5. **DESIGN** and build an electric circuit that you can use to **TEST** your predictions about conductors. **DRAW** a diagram of your conductor tester circuit in your science notebook. **WRITE** a description of how you will use it to find out which materials let electricity pass through them and which do not.
6. **TEST** the objects you've collected and record your findings in the data table in your science notebook.
7. Compare your findings to your predictions. Were you surprised by any of your results?
8. **OBSERVE** each of the objects you classified as conductors. **WRITE** in your science notebook what you have discovered about the properties of electrical conductors and insulators.
9. **SHARE** and compare your findings with the rest of your class.

Experiment #3: Investigating Your Own Questions

You have worked with batteries, conductors and circuits to learn some things about controlling the flow of electricity. What were you curious about as you worked with your circuits?

1. TALK with your partners about things you were curious about during your circuit experiences. Decide on an electric circuit question that you can investigate.
2. THINK about how you can use your circuit experiences to test your idea. Then decide what results you will record.
3. PLAN the steps you will follow in your experiment, and use your science notebook to record the question you are investigating and the steps you will follow.
4. DO your experiment and record your findings in an organized way in your science notebook.
5. THINK about your results. What new ideas do you have as a result of your experiment? What are you still wondering about?

Communicate Your Learning

The school newspaper is doing an article about science projects going on around the school. Write an article for the newspaper describing your electric circuit investigations. In your article, tell about:

- The main ideas your class was studying;
- Why you think these ideas are important to know;
- What experiments you did;
- What you learned from your experiments about electricity and about how scientists work; and
- What was difficult for you and what was fun for you.