

# CIRCUITS ACTIVITY

**SCIENCE:** Electricity  
**TECHNOLOGY:** Invention  
**ART:** Technical drawing

**AIM:** Students learn how to complete a circuit.

**BACKGROUND:** Wires and cables carry electricity from a power source (such as a battery or power plant) to its destination (such as a flashlight bulb or a lamp in your house). When you flip a light switch, you are completing one of these pathways, called a circuit. When you close the circuit, the bulb lights.

## BEFORE PLAYING

**Discussion and Activity:** Remind students that electricity can be dangerous. Discuss electrical safety as it relates to power sources—batteries, electrical outlets, power lines, and so on. Break students into groups. Have them unscrew the top of a flashlight and look at the flashlight's parts. How do the parts fit together? How are the batteries positioned? Draw a picture of the flashlight's components and their placement.

## AFTER PLAYING

**Discussion:** Ask your students how lemons could power iCat. Since lemon juice is a weak acid, lemons are able to act much like the solution in a wet cell battery. When a lemon's acid reacts with two metals—for instance, copper and steel—it can create a weak electric current.

**ASSESSMENT:** Observe students as they investigate circuits. Assess students' Before and After Playing Worksheets.

## RESOURCES

**Spy Science**, by Jim Wiese (John Wiley & Sons, 1996, \$12.95, ISBN 0-471-14620-X). Students use science to build fun spy gadgets. Several of the playful devices utilize electricity. To order, call 1-800-225-5945.

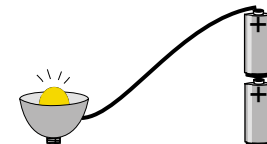
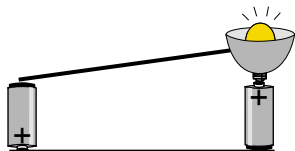
<http://www.brainpop.com/science/electricity/electricity/index.weml>

Through a movie, a cartoon, and an experiment, this great site teaches students the basics of static and current electricity.

## ANSWERS

**Before Playing, Worksheet:** (a. Flashlight does not turn on. b. Flashlight turns on. c. Flashlight does not turn on.)

**After Playing, Worksheet:** (Answers may vary. **Examples:**



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## CONNECT TO YOUR CURRICULUM

This activity can help you meet these National Standards:

### Science:

- Systems, order, and organization
- Abilities necessary to do scientific inquiry
- Transfer of energy
- Understandings about science and technology
- Science and technology in society

### CURRICULUM AREAS

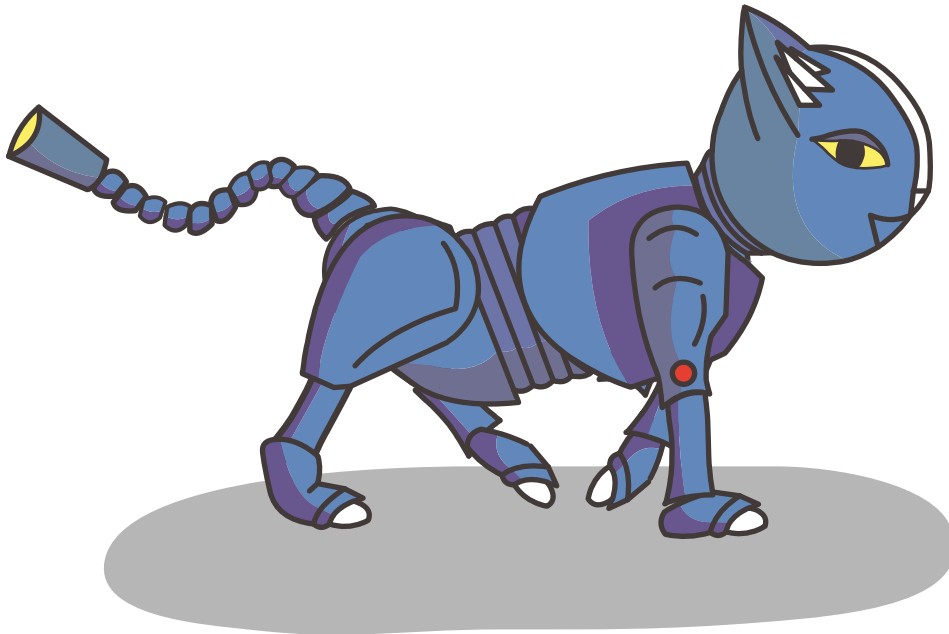
**Science:** electricity, circuits, voltage, amps, power sources.

**Scientific Inquiry:** testing variables; experimenting; observing; gathering data; drawing conclusions; interpreting results.

**Language Arts:** following directions.

**Technology:** computer science; invention.

**Art:** technical drawing.



TA-8.2

# CIRCUITS ACTIVITY

(Before Playing Worksheet)

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Gather the following materials, then experiment to answer the questions below.

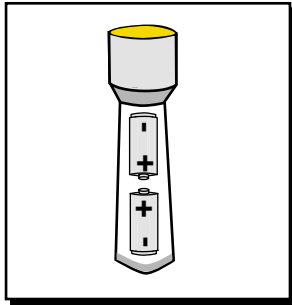
**Materials:**

Flashlight that uses two "C" or "D" batteries  
Two "C" or "D" batteries

**Procedure:**

1. Look at the pictures below.
2. Load the batteries into your flashlight according to each picture.
3. Try to turn on the flashlight.
4. Record your results.

a.)



Results:

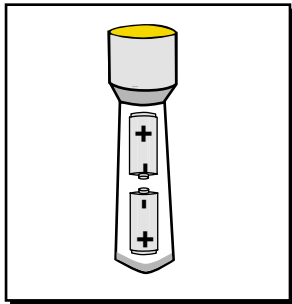
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b.)



Results:

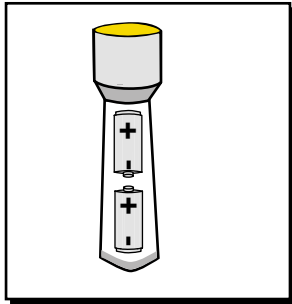
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c.)



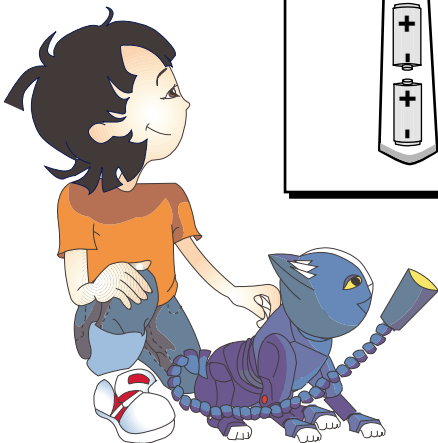
Results:

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# CIRCUITS ACTIVITY

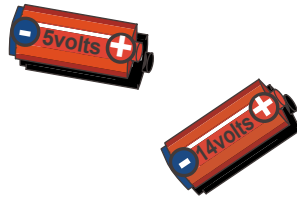
(After Playing Worksheet)

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Materials:

- Aluminum foil
- Ruler
- Scissors
- Two "C" or "D" batteries
- Top of a flashlight (bulb and rim unscrewed from the bottom of the flashlight)
- Tape



**Think:** Think back to the activity you performed before playing the circuits game. How are the parts of a flashlight positioned?

**Predict:** How can you turn foil, batteries, and a bulb into a circuit?

## Procedure:

1. Cut a 20-cm (8-in.) by 20-cm (8-in.) piece of aluminum foil. Fold the foil in half three times so it forms a long, thin strip.
2. Repeat Step 1 with a second piece of foil. These two foil strips will act as your wires.
3. Arrange the materials to form a circuit that lights the bulb. Use the tape to hold the materials together.

## Conclusions:

In the space below, draw a diagram of the circuit that lit the bulb.

