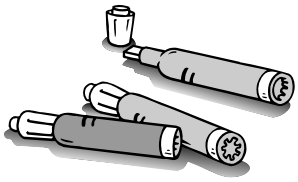
Chapter Science Investigation Name _____

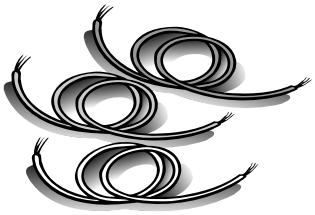
Testing for Electrical Conductivity

What You Need

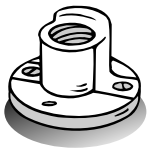


markers

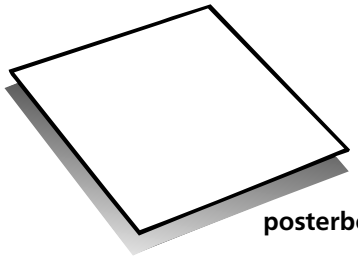
D battery



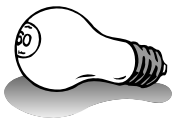
three 51-cm lengths of insulated copper wire with the ends stripped



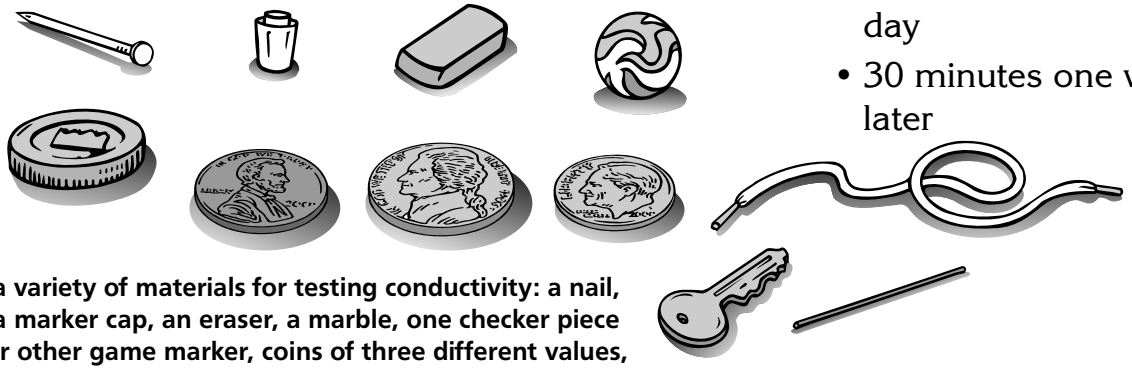
bulb holder



posterboard



lightbulb



a variety of materials for testing conductivity: a nail, a marker cap, an eraser, a marble, one checker piece or other game marker, coins of three different values, a shoelace, a key, pencil "lead"

Find Out

Do this activity to see what materials will conduct an electric current.

Process Skills

Observing
Communicating
Experimenting
Classifying
Designing Investigations

Time

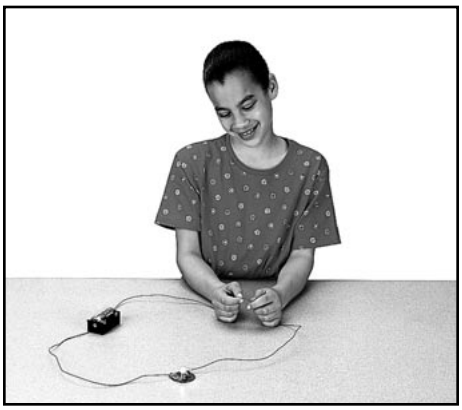
- 30 minutes the first day
- 30 minutes one week later

What to Do

1. Use two copper wires, the battery, bulb, and bulb holder to set up a circuit. **Observe.** Does the light go on? It should. Open and close the circuit several times. **Observe** what happens.

2. Detach one wire from the battery only. Attach a third wire to the battery only.

3. Touch the free ends of the two loose wires to close the circuit. Again, **observe** the light. It should go on.



4. Now place one of the materials for testing conductivity between the free ends of the two loose wires. Then touch both loose wires to the material you are testing.

5. **Observe.** Does the light go on? If it does, the material is conducting an electric current. Open and close this circuit several times and **observe**.

6. During the next week, collect about 15 different materials to test.

7. **Test** your new materials and **record** the results on your chart.

8. **Communicate** your results by making a poster titled "What Conducts Electric Current?" On the poster, write the headings "Insulators" and "Conductors." **Classify** your materials under one of the headings.

Test for Electrical Conductivity	
Material	**Did It Conduct Electricity?**
piece of chalk	**no**

Conclusions

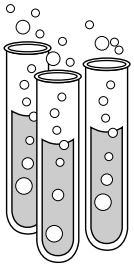
1. What kind of materials conducted electric current?

2. What kind of materials do not conduct electric current?

New Questions

1. What metals besides copper conduct electric current?

2. How can the materials that did not conduct electric current be used?



Name _____

ACTIVITY

Make a Bulb Light Up

What do you **predict** will happen when you connect the wires to the bulb and battery?

Draw the ways you used the wires with the battery. **Write Closed Circuit** or **Didn't Work** beneath each drawing. In the drawings under **Closed Circuit, draw** arrows to show the direction of the electric current.

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Conclusions

1. Compare your predictions with your observations.

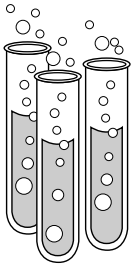
2. What does the battery do in your investigation?

3. What did you do each time you made the bulb light up?

Asking New Questions

1. Why did you fold the aluminum foil on the inside of the tape?

2. Do you need two wires to make the bulb light up? **Explain.**



Name _____

ACTIVITY

Making Circuits

Draw and **label** Circuit 1.

What do you **predict** will happen when you remove one of the bulbs?

What did you **observe?**

Is Circuit 1 a series or parallel circuit? How do you know?

Draw and **label** Circuit 2.

What do you **predict** will happen when you remove one of the bulbs?

What did you **observe?**

Is Circuit 2 a series or parallel circuit?

Name _____

Conclusions

1. Compare your predictions with your observations.

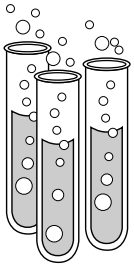
2. What happened in each circuit when you removed a lightbulb?

3. Which circuit had the brighter bulbs? Why?

Asking New Questions

1. How is removing and replacing a bulb like opening and closing a switch?

2. Which kind of circuit do you think works better to light your home? Why?



Name _____

ACTIVITY

Turning a Magnetic Field On and Off

Did any paper clips stick to the nail? **Record** your results.

What happens when you attach the wire to the nail and the battery? **Record** your observations.

How could you pick up more paper clips?

Make a **graph** to show the results of each test.

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Conclusions

1. What happened when you placed the nail in the paper clips when the circuit was closed?

2. What happened when the circuit was opened?

3. What did you do to pick up more paper clips?

Asking New Questions

1. What other items could the nail pick up?

2. What kind of machine could you make with your electromagnet?