

Topic: Circuitry

Teacher Information

Time Allowance

PRE LAB: 30 min.

LAB: 40-45 min.

POST LAB: 10 min

Background

Electricity must travel in a complete circle. A battery creates the movement of *electrons* which travel from the *negative terminal* of a battery through a *metal wire*, through the appliance (when turned on) and back to the positive terminal of the battery in a *circuit*. A *switch* puts a gap or break in the circuit and stops the electron flow when it is turned off.

A good *conductor* of electricity allows electrons to move from one atom to the next quite freely. Some substances resist the transfer of electrons, causing them to heat up – we call these *resistors*. Others allow no transfer of electrons. We call these good *insulators*.

Materials

(per group)

- (8) 4" x 6" lined index cards
- (1) single-hole punch
- (1) roll cellophane tape
- (1) sheet 12" x 12" aluminum foil
- (4) pairs of scissors
- (1) Mars Fact Sheet
- (1) stapler*
- (1) circuit tester*

* *These items may be shared among groups.*

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Student Activity

When building a space probe, we must make sure all the parts are working properly before it can be launched. The parts all have indicator lights. When the parts are assembled and working properly, the lights will come on, indicating that the circuits are complete.

Objective

To identify and build a complete electrical circuit.

Materials

- (8) 4" x 6" lined index cards
- (1) single hole punch
- (1) sheet 12" x 12" aluminum foil
- (1) roll cellophane tape
- (4) pairs of scissors
- (1) circuit tester
- (1) stapler
- (1) Comet Fact Sheet

Procedure

1. Create 4 questions and answers from the Comet Fact Sheet. Create 2 wrong answers for each question.
2. On one 4" x 6" index card, write COMET TRIVIA at the top. Starting at the far-left first line, write a #1, then punch a single hole next to the number. Then write the first question. Underneath the questions, write the 3 possible answers using A, B, and C with a hole punched next to them. (See diagram.)
3. Repeat step 2 for the other 3 questions.
4. Cut 4 strips of aluminum foil 2 cm x 14 cm or just long enough to reach from the question to the right answer.
5. Tape a small piece of aluminum over the holes (on the back of the card) for each of the incorrect answers, making sure that they are completely covered with tape.
6. Look at question #1. Find the correct answer, then tape to the back of the card a strip of aluminum so that it covers the hole for the question, goes all the way to the correct answer and completely covers the hole for the answer. Since the wrong answers are already covered with tape, the aluminum for the correct answer should not touch them.

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Student Activity *(continued)*

- Repeat steps 5 and 6 for the other 3 questions.
- With the questions face up, place a second 4" x 6" card behind the Trivia card, covering the hidden circuits. Tape or staple the cards together.
- Now use your circuit tester to answer the questions. To do this, place one wire by each answer. The correct answer will complete the circuit and the light bulb should light. Now trade with your classmates, and see if they can find the correct answers.

view of front of card

COMET TRIVIA	
1.	● Comet Halley will return in the year _____. ● A. 1999 ● B. 2062 ● C. 2014
2.	● The comet nucleus contains frozen ice, dust and _____. ● A. plants ● B. fossils ● C. gases
3.	● The thin atmosphere around the nucleus is called the _____. ● A. coma ● B. air ● C. oxygen
4.	● The comet's tail is caused by _____. ● A. gravity ● B. solar wind ● C. magnetic field

smaller view of back of card

(answers: 1-B, 2-C, 3-A, 4-B)

