Educator Guide to

Electric Avenue

A workshop presented
by the Reuben H. Fleet
Science Center for
grades 4

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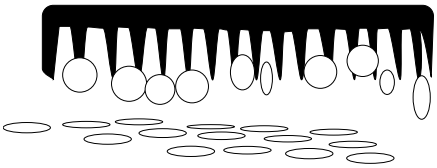
Pre-Visit Activity

ELECTRIC HAIR

OBJECTIVE:
Students will experiment with combs and paper to observe static electricity.



MATERIALS:

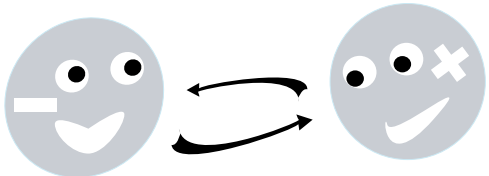
- Plastic combs
- Hole-punched notebook paper
- Hole punch
- Hair or clothing
- Tables or desk

NOTE:
When doing this activity, NO-ONE should share combs. Also, combs should be thrown away when the activity is complete.

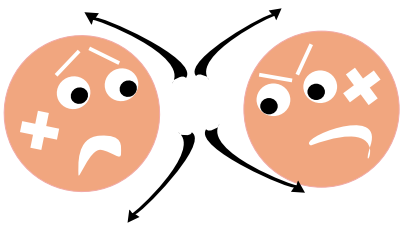
TO DO:
Give each student 10 pieces of paper. Tell them to run the comb through their hair 10 - 15 times. Then they need to hold the comb an inch above the pieces of paper. The pieces of paper should jump up on the comb. If combing hair does not work, have them try rubbing the comb back and forth over clothing and hold it over the paper again.

WHAT'S GOING ON?
This experiment is an example of static electricity. Every object has negatively charged electrons and positively charged protons. Electrons can move, but protons cannot move.

When we rub the comb on our hair or clothing, we create friction that causes electrons to move. In this experiment, the negatively charged electrons jump from the hair or clothing to the comb. This gives the comb extra electrons and a negative charge. With electrical charges, opposites attract. The negatively charged comb seeks out a new object that has protons that can balance its electrical charge. In this case the protons on the paper are attracted to the electrons on the comb.



ATTRACTION



REPULSION

Post-Visit Activity

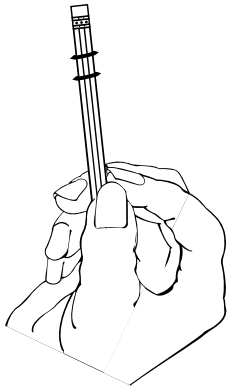
NORTH & SOUTH

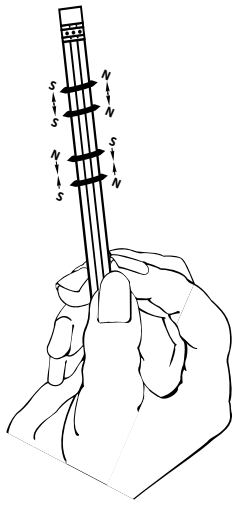
OBJECTIVE:
Students will observe magnetic effects using a pencil and magnets.

MATERIALS:

- Pencil
- Two 1-2 inch (3-5 cm) wide round magnets with holes in the middle (hole should be wider than the pencils)

TO DO:
Move the magnet close to each other using both sides to see how they can come together (attract) and move away (repel) from each other. Push the pencil through both magnets so the magnets rest in the middle of the pencil. Depending which way the magnets are facing, they will either come toward or away from each other. Place them on the pencil so they repel each other. While supporting the bottom magnet with your hand, hold the pencil upright and the top magnet should float over the other magnet.





WHAT'S GOING ON?
Every magnet has two zones of attraction called its north pole and south pole. As with electrical charges, opposite magnetic forces attract each other. North is attracted to south or south is attracted to north. However, like forces repel each other. South repels south and north repels north. When you put the south end of one magnet on top of the south end of the other magnet, the magnets stay apart. They repel each other so much that it causes one magnet to stay in the air to avoid touching the other magnet.

KEY WORDS
Teachers, the following glossary terms are used in the lessons above as well as the lessons that will be covered during your workshop. It will be beneficial for your students to know these words in order to get the most out of their field trip.

ATTRACT: To draw to itself or oneself.

BATTERY: Connected group of cells storing an electrical charge.

CIRCUIT: Unbroken conducting path from and back to a power supply.

CONDUCTOR: A substance or thing that leads or guides electricity, heat, sound, etc.

CURRENT: Flow of electric charge in a conductor.

MAGNET: An object that is able to attract iron, cobalt or nickle.

POLE: Either of two opposed forces, parts or principles.

REPEL: To drive away.