
Learning About Static Electricity

An Educator's Reference Desk Lesson Plan

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Grade Level: 6

Subject(s):

- Science/Physics

Duration: 50 minutes

Description: This lesson presents activities for learning about static electricity.

Goals: National Science Education Standards (NSES) :

- *Content Standard A: Science as Inquiry* - As a result of activities in grades 5-8, all students should develop
 - Abilities necessary to do scientific inquiry
 - Understandings about scientific inquiry
- *Content Standard B: Physical Science* - As a result of activities in grades 5-8, all students should develop an understanding of
 - Properties and changes of properties in matter
 - Motions and forces
 - Transfer of energy
- *Content Standard E: Science and Technology* - As a result of activities in grades 5-8, all students should develop
 - Understandings about science and technology

Objectives:

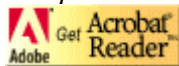
1. Students will be able to define static electricity.
2. Students will be able to explain what happens when neutral, positively charged, and/or negatively charged objects come into contact with one another.
3. Students will be able to identify what causes two objects to attract or repel from one another.

Materials:

- balloons

- access to a sink
- fluorescent light bulb
- thread
- puffed rice of wheat
- tape
- computers with access to the Internet (optional)
- [Sample Rubric](#)

Sample Rubric in .pdf format; requires free Adobe Acrobat Reader.



Click the icon to obtain the free Reader.

Vocabulary:

1. *atom* - The smallest particle that can exist either alone or in combination.
2. *nucleus* - Located in the center of each atom, containing protons and neutrons. Smaller particles called electrons orbit around the nucleus.
3. *proton* - A particle that is positively charged (+), located in the nucleus of an atom.
4. *neutron* - A particle that has no charge, located in the nucleus of an atom.
5. *electron* - A particle that is negatively charged (-); orbits around the outside of the nucleus of an atom.
6. *attract* - Occurs when objects that have different charges (a positive and a negative) pull towards each other.
7. *repel* - Occurs when objects with the same charge (two positives or two negatives) push away from each other.
8. *static electricity* - Occurs when there is a separation of charges, due to electrons moving from one atom to another.

Procedure:

Introduction:

Begin by reviewing what students have been learning in previous lessons. Review vocabulary terms if necessary.

Focus:

Inform students that they will be observing and participating in some experiments related to static electricity. First, students will observe how water can "bend." Gather students around a sink. Turn on the faucet and let the water run about 1/8 inch thick. Rub a balloon vigorously on hair or a sweater to charge the balloon. Slowly bring the balloon near the running water; the water will "bend." Ask students why they think this occurred. (The positively charged water is attracted to the negatively charged balloon and moves the water towards it -- opposites attract.)

For the next demonstration, the teacher will need access to a darkened room.

The teacher will need a fluorescent light bulb and a balloon. As in the previous activity, rub the balloon vigorously on hair or a sweater. (Make sure to build up a lot of charge!) Place the charged part of the balloon at the bottom of the light bulb. Students should be able to see small sparks. Ask students why they think this occurred. (When the charged part of the balloon touches the light bulb, the electrons move from it to the bulb, causing the small sparks of light inside of the light bulb.)

Now students will have an opportunity to conduct an experiment. Divide students into pairs. Each pair needs a piece of puffed rice or wheat, a 12-inch piece of thread, tape, and a table or desk. Students will tie the piece of puffed rice to the end of the thread. Then they will tape the thread to the edge of a table or desk so that the puffed rice does not hang close to anything else. Have students generate predictions of what they think will happen when a charged balloon is brought near the puffed rice. Record students' predictions on the board. Give each pair a balloon, and have students charge the balloon. Then they can bring the balloon near the puffed rice and observe what occurs. (The puffed rice will swing to touch the balloon.) Students should hold the balloon still until the puffed rice jumps away. Ask, "What happens when you try to touch the balloon to the puffed rice again?" Students should observe that the puffed rice will move away as the balloon approaches. "When you charged the balloon, electrons moved from your hair or sweater to the balloon; the balloon had a negative charge. Being neutral, the cereal was attracted to the balloon. When these items touched, electrons slowly moved from the balloon to the cereal. With both objects having the same negative charge, they repelled."

Closure:

Review the activities conducted in class today. Discuss other examples of static electricity in students' everyday lives, such as lightning, being shocked, and our hair.

Lesson Extension Ideas:

- Students could write an entry in their science journals describing what happened in the experiments.
- Students could watch a short movie and take a quiz dealing with static electricity on BrainPOP: <http://www.brainpop.com/science/electricity/>

- Students could construct a three-dimensional model of an atom, including protons, neutrons, and electrons.
- Have students go to this web site: <http://www.school-for-champions.com/science/staticcont.htm> . In their journals, students should answer the following: "How can I stop getting shocked?", "How can I stop static cling?", and "How can I protect from damage caused by sparks or lightning?"

Assessment: Observe students' participation during discussions on static electricity. Observe students' involvement and cooperation during the cereal experiment. Observe students' abilities to make predictions based on discussions prior to the experiment. See sample rubric in **Materials** for other general evaluation criteria.

Reference: "What is Static Electricity?" by Science Made Simple (<http://www.sciencemadesimple.com/static.html>)

Useful Internet Resource:

* [National Science Education Standards \(NSES\)](#)

<http://books.nap.edu/html/nses/>