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# Static Electricity

An Educator's Reference Desk Lesson Plan

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**Grade Level(s):** 4

**Subject(s):**

- Science/Physics

**Duration:** 30 minutes

**Description:** A learning cycle format for inquiry teaching. Journal about what students think causes a lightbulb to light up when rubbed with a plastic bag. Then several activities for students to explore how static electricity works. An opportunity to use knowledge learned and get an accurate assessment of students' understanding of static.

**Goals:** To teach through inquiry method about static electricity. For students to learn these main points about static electricity:

\* Positive and negative charges attract each other.

\*Charges can jump from one object to another when there is a build-up of electrons.

\* This build-up is called static electricity.

**Objectives:**

Students will be able to explain how static electricity works in journal entry. They will also show how objects can become negatively charged and attract other objects, causing static electricity.

**Materials:**

balloons, salt, pepper, plastic rulers, cloth or wool, torn up pieces of paper, paper plates, questions for each activity

**Procedure:**

*Concept Assessment:* Hold up a lightbulb and a plastic sack and say: In your journal describe what you think will happen when I rub the plastic bag up and down the light bulb? Why do you think this happens?

*Concept Exploration:* Two activities will be given to each group of students (groups of 3-4) in the class.

1. This activity is with pepper and salt. A pile of pepper and salt will be on a paper plate. Take a plastic ruler and place it above the pile and see what happens. Then, rub the ruler with the cloth or wool for 5-10 seconds. Then place the ruler one inch above the pile of salt and pepper. Note the reaction.
2. This activity involves the use of a balloon. Students will try to stick the balloon to the wall. Then they will rub the balloon on their head or a piece of cloth and then try to stick it to the wall. They will take note of what happens in both instances.

*Closure:* Students will then share their results. Discuss as a class:

What happened when you tried to stick the balloon to the wall without rubbing it?

What happened to the salt and pepper when you didn't rub the ruler?

Why don't you think anything happened?

What does rubbing the balloon and the ruler do that causes there to be a reaction?

What were your other findings and why do you think they occurred?

Introduce facts about static electricity. Discuss that electrons are negatively charged and when rubbed with other objects they build up excess electrons from the other object. Those electrons need to be released and thus, when it comes in contact with something else they are released by a zap or an attraction to positively charged protons. Draw on the board the placement of excess electrons on the outer edge of a balloon and then when you stick a balloon to the wall all the electrons jump away and the balloon is held up by the attraction of the positive and negative charges. Talk about getting shocked when you're walking around the house and what is actually happening. Have the students help you explain it by asking: So when I scuff my feet what's happening? What happens when I touch someone else? Why is there a shock?

**Assessment:**

Concept Application: Students will be asked to find a way to use a balloon to pick up pieces of paper without touching them. All they will be given is a balloon and several torn up pieces of paper. They will have to ask for any objects they might

need. Afterwards, we would discuss why they used the method they did and why it worked. Then they'd enter in their journal what they learned about static electricity, and briefly explain what causes static electricity.