

Lesson Plans & Activities

Static Electricity

Grade 3-4

Materials

- Balloons – 1 per student
- Puffed rice cereal or plastic foam pellets
- Piece of wool
- _ tsp of salt and _ tsp of pepper – combined pile/student

Background

All materials contain millions of tiny particles, called protons and electrons that have electric charges. Protons have positive charges, and electrons negative ones. Typically, they balance each other, but sometimes when two surfaces rub together, some of the electrons rub off one surface onto the other, and we can have static electricity. Materials with like charges (all positive or all negative) move away from each other; those with opposite charges attract each other.

Introduction

What is static electricity?

Ask students if they've ever dragged their feet across the room. What happened when they touched something afterward? Did they ever:

- Give a shock to someone in their family?
- Receive a shock when they've touched something?

These are forms of static electricity. Static electricity is a form of energy. Energy can move to make things work. Since we are made up of mostly water, electricity can move through our body to try to get to the ground, and that's why we must act safely around electricity.

Static electricity application

Ask who has seen lightning during a storm. Lightning is a powerful form of static electricity. Just like when we shock someone, lightning is a shock from the clouds to the earth. Positive and negative charges move to make static electricity.

How does static electricity work?

Perform an activity with students to explore charges and explain static electricity. Use a magnet if it helps demonstrate the concept.

Procedure

Step 1: Have students blow up balloons and rub them with the piece of wool.

After the balloon has been rubbed, it becomes negatively charged.

Step 2: Have the students hold their balloons over the plastic foam pellets and observe what happens.

The pellets should cling to the balloon's surface (humidity will impact the effectiveness of this demonstration). The pellets are positively charged and are attracted to the negative charge of the surface of the balloon – opposites attract.

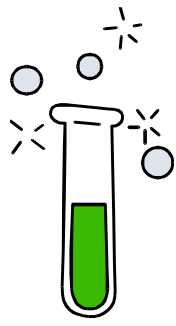
Step 3: Have the students watch the pellets for three to five minutes and discuss what they observe.

Some of the pellets should leap off the balloon and return to the table. The pellets become negatively charged again and repel the negative charge of the balloon – like a magnet.

Follow-up Activity

Explain the *scientific method* to students – it is the process scientists use to conduct experiments. Have students read the purpose and question, stating that the *purpose* is the reason for the experiment. Ask students what *hypothesis* means – an educated guess. Have students write a complete sentence for their hypothesis. For example, the salt will be attracted to the balloon. Go through the *procedure* of how the experiment will be conducted and the *data chart*, where students will write down their observations during the experiment. The *result* is what actually happened, so ask students to record what they saw, using their data. The conclusion states whether your hypothesis was right or wrong and why.

During the experiment, students will notice that the grains of salt and pepper will leap toward and away from the balloon. Salt is negatively charged.



Scientific Method

Experiment 1: Static Electricity

- **Purpose:** Comparing the affect of charges on the movement of objects.
- **Question:** Which material will attract to the balloon that is rubbed with wool -- the salt or pepper?
- **Hypothesis:**

- **Materials:** Balloons, wool, salt and pepper.
- **Procedure:** Rub the balloon with a piece of wool. Hold the balloon close to a pile of salt and pepper. Record what the salt and pepper does in the Data chart.



Data

Test	Movement of Salt/Pepper
1	
2	
3	

Results

What did you observe about the affect of charges on the movement of objects?

Conclusion
