

Community in the Classroom Presentation Plan

Lesson Name: Sticky ballons and static electricity

Presenter(s): Margot Paulick

Grade Level: 4th grade **Standards Connection(s):** Physical science – matter is made up of atoms; behavior of electrically charged objects

Abstract:

In this lesson, we're going to learn about static electricity. We will first talk a little bit about electricity, matter, and atoms. Atoms are made up of protons and electrons, and the movement of these electrons is what causes electricity. Next, we will do an experiment called "sticky balloons". The students will have a chance to experiment with balloons that they electrically charge by rubbing on their hair. The students will then try to pick up certain materials with their balloons without touching the balloon to the materials. We will then discuss what stuck and what didn't stick to the balloons. Finally, we will discuss how this experiment works thanks to static electricity. If there is time, the students may also try another experiment called "soda can races" where the students will use static electricity to race empty soda cans across the floor.

Vocabulary/Definitions:

Electricity – energy produced by the movement of electrons

Atom – very tiny particles that make up matter

Proton – very tiny particle that makes up part of an atom; has a positive charge

Electron – very tiny particle that makes up part of an atom; has a negative charge

Static electricity – a build-up of electrons (electricity) that stays in one place until it jumps to another object

Materials:

I will bring all of the materials needed for the experiments.

The students should have pencils and lots of enthusiasm for science!

Classroom Set-up:

I need a chalk/whiteboard and something to write with. I need the students to be arranged in groups of 4 (4 desks together is fine). I also need some table space and about 10 minutes for set-up and 10 minutes for clean up time.

Classroom Visit

1. Personal Introduction:

5 Minutes

I am a recent graduate of UC-Berkeley where I studied chemistry. I am a chemist who also does biology. Most importantly, I am a scientist – I like science. It's a great way to explain stuff that happens in the world around us.

How many of you like science? How many of you have parents who are scientists? Do you know what kind of scientists your parents are?

Today we're going to learn about electricity and do some cool experiments.

Topic Introduction:

10 Minutes

1. Big box of stuff – what do these things have in common? All of these things involve electricity.
2. Explanation of electricity, matter, atoms, protons, and electrons.

2. Learning Experience(s):

20-30 Minutes

"Sticky balloon experiment" – see attached worksheets.



3. Wrap-up: Sharing Experiences and Building Connections 5-10 Minutes

How does the sticky balloon work? Static electricity! We can't see atoms, but we can see how they behave. Opposites attract and like charges repel. When you rub the balloon on your hair, you transfer electrons from your hair to the balloon – now the balloon has a negative charge. When you place this balloon near another object, the electrons (which have a negative charge) in that object “run away” from the electrons in the balloon. The protons (which have a positive charge) in that object are attracted to the balloon, causing the object to stick to the balloon. Some objects, such as Cheerios, weigh too much to be picked up by the balloon – the electrical charge on the balloon is not strong enough to overcome gravity.

4. Close: 5 Minutes

If time permits, we will also try “soda can races” (see attached sheet). Otherwise, the students can try this experiment at home or during other classroom time. We'll also discuss where we see static electricity in our everyday lives (lightning, shocking ourselves after shuffling our feet on the carpet, socks after coming out of the dryer).

TOTAL 50 – 60 Minutes

Follow-up – After Presentation

See attached worksheets. 1 – Sticky balloon experiment
2 – Sticky balloon write-up
3 – Soda can races

Also, for a bunch of other cool static electricity experiments/reading, see
<http://www.sciencemadesimple.com/static.html><http://www.sciencemadesimple.com/static.html>

