



Activity Title: Adventures With Electricity

Recommended Grades

Kindergarten, Grade 1, Grade 2, Grade 3
Could be expanded to older grades.

Curriculum Connections

Energy

- K – how objects move
- 1 – how movement can be influenced
- 2 – sources of light

Computer Science

- K – instructions to be followed, have steps
- 1 – instructions to be followed, have steps

Scientific Methods

- 1 – carry out an investigation, make predictions
- 2 – methods and processes used in investigation, observations
- 3 – record observations to explore questions asked

Time

10-30 minutes for set up and lesson, depending on how many experiments you do

Skills Focused On

<ul style="list-style-type: none"> • Critical Thinking • Hypothesizing 	<ul style="list-style-type: none"> • Problem-solving • Observation
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Materials Needed

Experiment 1: Water Bending	Experiment 2: Floating Salt and Pepper	Experiment 3: Pop Can Race
<ul style="list-style-type: none"> • Balloon • Sink or stream of water 	<ul style="list-style-type: none"> • Balloon • Plate • Salt • Pepper 	<ul style="list-style-type: none"> • Empty/dried aluminum pop can • Balloon • Finish line • Timer-optional

Background Information

Energy comes in many forms - electricity is one of those forms. We use electricity every day of our lives - from turning on the lights, keeping our food cold, to using computers and more!



But what *is* electricity? It is a form of energy that involves the flow of electrons. Everything around us is made of atoms which are made of protons (positively charged), electrons (negatively charged) and neutrons (neutral). Atoms can lose electrons when affected by outside sources. When these electrons start jumping from atom to atom, we get an electric current.

Static electricity is a stationary charge which does not generate current. It is generated when there is an imbalance of electric charges. Think about when your hair sticks to a balloon or when you get shocked after rubbing your feet on the carpet. Static electricity happens when one object gives up its electrons to another, so one is more positively charged and the other is more negatively charged. Like charges repel each other and opposites attract, so two negative charges will push away from each other but a positive and a negative charge will come together.

With these experiments, we will explore atoms, electrons, electricity, and especially static electricity.

Experimental Steps

Experiment 1: Water Bending

1. Rub the balloon on your hair until your hair sticks to it. (This is “charging” the balloon.)
2. Turn on the water so that it flows straight down, but is only a small stream of water.
3. Make a guess or a hypothesis. What will happen when you move the balloon towards the water?
4. Slowly move the charged side of the balloon towards the stream of water without actually touching it.
5. Now try again with a balloon that you didn’t rub on your hair. What happens?

Experiment 2: Floating Salt and Pepper

1. Sprinkle some salt and pepper on top of the plate.
2. Charge the balloon on your hair until your hair sticks to it.
3. Make a guess or a hypothesis. What will happen when you move the balloon towards the plate?
4. Move the charged balloon towards the plate of salt and pepper without touching it. What happens?

Experiment 3: Pop Can Race

1. Place the pop can sideways on a flat surface.
2. Charge the balloon on your hair until your hair sticks to it.
3. Move the balloon close to the can until you start to see the can move.
4. Move the balloon towards your finish line, pulling the pop can.
5. You can race someone else, or time yourself to see how fast you can finish the race!



Discussion/Experimental Extensions

What do you use electricity for? Discuss uses in the classroom and home.

Experiment 1: Water Bending

Do the results change depending on whose hair you rub, or for how long?
How about if we turn up the sink - can we still move a thicker stream of water? Why or why not?

So what happened? The charged balloon has excess negative charges near the surface so when we put it near the water, it attracts the positive charges in the water, acting like a magnet. Without the charged balloon acting like a magnet, the water has balanced charges so it does not bend.

Experiment 2: Floating Salt and Pepper

See how much salt and pepper you can pick up! (Careful not to get any in your eye.)
Does the amount you pick up change depending on whose hair you rub or for how long?
Do we have more pepper or salt? Why?

So what happened? Like the water, the salt and pepper have balanced charges so they are neutral. When we add our charged balloon which has extra negative electrons, they attract the positive protons of the salt and pepper and pull it up.

Why do we have more pepper than salt? Pepper weighs less and is easier to pick up!

Experiment 3: Pop Can Race

Does the speed of the can change depending on whose hair you rub or for how long?
How about if we use cans of a different size or colour?

So what happened? The excess negative charge on the balloon acts as a magnet, pulling the pop can by attracting to its positive protons.

Additional Resources

Adventures With Electricity experimental video produced by Future Energy Systems - provides background information and instructions for experiment: <https://youtu.be/sOHgNAJslh8>.

Learn more about Future Energy Systems (<https://www.futureenergysystems.ca/>) and access more learning content, including storytimes, lab tours, ask an experts and more (<https://www.futureenergysystems.ca/engage/learning> <https://www.youtube.com/channel/UCJr8N9KyFJ6d-t36TPtUlwg>).