



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 can 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
- 2 – creativity support design
- 3 – could relate to creativity and relationship to computational thinking (designing instructions)

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 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 pretty much use electricity everyday of our lives - from turning on the lights, keeping our food cold, using computers and more.

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 - this is static electricity. This happens when one object gives up its electrons to another, this means 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 go 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. Charge the balloon on your hair until your hair sticks to it.
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 of 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 of 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.

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 whose hair you rub or for how long?

Experiment 2: Floating Salt and Pepper

See how much salt and pepper you can pick up! Does it change depending whose hair you rub or for how long? Do we have more pepper or salt? Why?

Experiment 3: Pop Can Race

Does it change depending whose hair you rub or for how long?

WHAT HAPPENED?

Experiment 1: Water Bending

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

Like the water, the salt and pepper has 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 - because it is lighter.

Experiment 3: Pop Can Race

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-t36TPtUlwq>).