

# Electrifying Electricity

**Objective:** To teach the basics of electricity and how it is important in our everyday lives.

**Materials:**

Dry Cell Battery  
Wire  
Key  
Steel Nail  
Lemons  
Copper Wire  
Balloon  
Unflavored Gelatin Powder  
2 Paper Plates  
Wool Scarf or Sweater  
Rice Crispy Cereal  
Record Album

**5 to 10 minutes;** Discuss electricity.

Ask children what they know about electricity and how it works.

- Atoms are the tiny building blocks that make up everything! Atoms are made up of a nucleus with one or more electrons circling the nucleus.
- Electrons carry a negative charge. They can jump from one atom to another, taking their negative charge with them. We call the movement of charge “electricity”!
- When you have a source of electricity (like a battery or a wall outlet), it causes a “pushing” force that moves the electrons along a path (called a “circuit”) – that’s an electric current!
- Electrons can only move through a circuit if it is complete (or “closed”) – if you take away part of the circuit (or “open” the circuit), the electrons stop. This is what happens when you flip a light switch – you open the circuit (to turn the light off) and close the circuit when

you turn a light on! (You can even turn the lights in the class on and off as you explain this).

- Electricity was not invented. It occurs naturally in our world. People, however, have invented ways to measure it and to control it for our use.
- Electricity can travel through water. Never touch something electrical switches with wet hands or use electrical appliances around water.

More information at <http://en.wikipedia.org/wiki/Electricity>

### **10 minutes;** Electricity Relationships

Have a box with the following items inside:

Dry cell battery, wire, steel nail, and copper penny

Pull out each item out of the box one at a time. Ask the students to guess what the item is and how it relates to electricity.

- Dry cell battery - Store chemical energy that can be used as electrical energy when paired with other objects required for electricity
- Wire – carry electricity from battery to object receiving the electrical energy
- Steel Nail – used as an electrode (an electrical conductor used to make contact with a nonmetallic part of a circuit)
- Copper penny – Copper is inexpensive and highly conductive, making it a commonly used conductor of electricity.

### **5 minutes;** Lemon Activity

Have each child squeeze a lemon by hand, rolling it to build up charge. Put two copper wires very close to each other but not touching each other in the lemon. They will then put their tongue on the wires and feel the tingle.

### **10 minutes;** Electric Gelatin

1. Pour some unflavored gelatin powder on a paper plate.
2. Blow up a balloon and tie the opening shut.
3. Rub something made out of wool on the balloon for 10 seconds.
4. Now you've stuck electrons from the wool on the balloon. Hold the charged area of the balloon (the part that you rubbed with the wool) an inch

above the gelatin powder. Don't let the balloon touch the gelatin. See what happens.

5. Slowly raise the balloon. Now what happens?

When you rub the balloon on the sweater, you charge the balloon with static electricity. You may have seen static electricity before. It is what makes your hair stick up when you take off your sweater, or what makes socks stick to other clothes when you take them out of the dryer. When the balloon is charged with static electricity, it attracts the gelatin particles. When the charged balloon is brought near the gelatin, the gelatin becomes charged, too. That is why the gelatin sticks together.

**10 minutes; Snap, Crackle, Jump**

1. Rub the record with wool. You can use a sweater or a scarf, anything made out of wool will do.
2. Pour some of the cereal onto a paper plate. Hold the record above the cereal.
3. Notice how the cereal stand on end and then jumps from the table and then back again.

Here's why this happens. Everything is made up of atoms. You're made of atoms; the record is made of atoms. Atoms are made up of smaller particles. Remember that one kind of particle is called an electron. Some materials pick up electrons really well, like the record. Other materials are really good at giving electrons away, like the wool. When the wool rubs the record, electrons from the wool stick to the record. This is called static electricity.

Now the record has a negative charge. Negative charges don't like to be near other negative charges. So, the record pushes away some of the electrons in the cereal and the cereal has a positive charge. Since the cereal and the electrons on the record now have opposite charges, the record attracts the cereal. This attraction is strong enough to lift the pieces of cereal up, against the force of gravity.

When the cereal touches the record, electrons on the record move to the cereal. Now the cereal has a negative charge. Since the record and the cereal both have a negative charge and negative charges don't like to be near each other, they repel each other and the cereal jumps down from the record.

When the cereal hits the table, the extra electrons can get away, and the cereal is not positive or negatively charged. Then, the whole thing can start again. When the cereal hits the record enough times, the cereal will carry all the extra electrons on the record away and the jumping stops.

To make it start again, you need to rub the record with wool, which will stick more electrons on the record.