

**SOUTH CAROLINA STATE MUSEUM
PRE-VISIT MATERIALS
FOR THE MUSEUM PROGRAM**

TAKE CHARGE ELECTRICITY

TO THE TEACHER

Have you ever shuffled your feet along carpeting and then touched a doorknob? What happened? During a thunderstorm, have you every watched lightning flash across the sky? In both instances, electricity was released. Electricity is one of the most important sources of power in the world. Have your students think about how life would be different without electricity! (Have students make a list of all the objects they have in their homes that depend on electricity to work). What kinds of adjustments would they have to make if there were, for example, no electric lights, no power for the washer/dryer or refrigerator?

We are dependent on electricity but do we know **what it is and how it works?** From scientific observations made by ancient Greeks, to experiments conducted by Benjamin Franklin in the late 1700s, to the work done by the English scientist Michael Faraday in the early 1800s, people have long been fascinated by the power called electricity.

Electricity is a form of **energy**. It can be measured, used, controlled, and even changed into other forms of energy. Electricity is created by the movement of **electrons**. Electrons are those particles that move around the **nucleus** of an **atom**. The nucleus is composed of **protons and neutrons**. Orbiting around the nucleus are the constantly moving electrons. This motion is called **kinetic energy**. If the electrons are moved from their orbits around the atom, then their kinetic energy can be used.

Electrons can be moved from their orbits by **friction**. **Static electricity** is an example of electrons being moved from their orbits by friction and then piling up on another object. Static electricity builds up on clothes in a dryer, causing clothes to cling to each other. Have you ever had “fly-away” hair? Combing your hair creates static electricity, which causes hairs to repel each other.

Electricity is useful to us when it moves along a **conductor**. This electric current is used to power everything from our microwave ovens at home to the lights in your classroom.

In the Science Discovery Theatre program “Take Charge Electricity” your students will learn more about how electricity works, how we control it and have a few “hair-raising” experiences.

GOALS:

To define for students the atomic nature of electricity.
To illustrate to students the many sources of electricity.

TERMS AND DEFINITIONS

1. Alternative Energy Source – A phrase used to describe non-polluting methods of electricity production.
2. Atoms – The smallest part of an element that retains all of its chemical properties.
3. Battery – An apparatus that can store an electrical charge.
4. Charge – Positive or negative particles usually caused by addition or removal of electrons.
5. Conductor – Material that allows electrons to flow.
6. Electricity – A form of energy caused by moving electrons. This energy can be measured, used, controlled and even changed into other forms of energy.
7. Electrolyte – Chemicals capable of conducting an electric current.
8. Electrons – Chemicals capable of conducting an electric current.
9. Geothermal – A method of fueling electric power plants utilizing the pent-up force contained deep inside the earth such as geysers (Old Faithful)
10. Hydroelectric Power – A method of using the power of water to run electric power plants.
11. Insulator – Material through which electrons will not flow easily.
12. Kinetic Energy – The energy of motions.
13. Solar Power – An alternative energy source that collects its power from the sun.
14. Static Electricity – Electrons are transferred from one object and are piled up on another object.

15. Wind Power – A method of producing electrical power by harnessing the power of the wind.