

**Learning Objectives**

- 1) Learn that electricity is a form of energy that can give us light and heat. Electricity can also produce a force that makes objects move.
- 2) Understand that electricity exists in nature. Lightning, for example, is a form of electricity.
- 3) Learn that electricity flows from one object to another. For example, lightning is like a spark; it can jump between clouds, within the same cloud, or even flow between the clouds and the earth.
- 4) Understand that lightning is a form of static electricity. Static electricity is electrical energy that moves from one place to another. Static electricity is created when friction occurs.
- 5) Understand the concept of an electrical charge. Everything has a positive (+), negative (-), or a neutral charge. Most objects are neutral, meaning they do not push away from or pull towards one another. Positive and negative charges cause a push/pull force. Objects with the same charge repel (push away from) each other. Objects with opposite charges attract (pull toward) each other.
- 6) Recognize that some things can carry an electrical current; these things are called conductors. Many metals, such as copper, are conductors.
- 7) Recognize that some things do not carry an electric current; these things are called insulators. String and paper, for example, are insulators.
- 8) Recognize that currents of electricity flow in a circle, or circuit, through a conductor.
- 9) Know the different kinds of circuits:
  - a) A simple circuit consists of a power source, a switch, and a single light bulb (in this case). A simple circuit is connected in a continuous line.
  - b) A series circuit is in one continuous line. It has more than one bulb. One can add more batteries to a series circuit to improve the power. If one bulb goes out, the circuit is cut, and the electric current is stopped. Consequently, the other light bulb will not work.
  - c) In a parallel circuit, each light bulb has a power source. The power source and light bulb are attached to the circuit on a separate line. If one adds more batteries to the circuit, the power will not increase; however, the batteries will last longer.
- 10) Realize that electricity can be expressed in the following units:
  - a) Volt- the electrical pressure, or push, in a circuit.
  - b) Ampere- the number of electrons pushed through the circuit.
  - c) Watt-the work done by the current, or the electrical power.

- 11) Understand that electricity is related to magnetism. An electromagnet picks up objects, just like a regular magnet. However, the electromagnet only remains a magnet while an electric current is moving through it.
- 12) Be familiar with the inventions that use electromagnets.
  - a) The telegraph was a way of communication before the telephone was invented. When the electromagnets of two telegraphs are connected, one can send messages to the other.
  - b) The telephone is another way of communication. A permanent magnet holds a metal disk, called a diaphragm, in place. When a person listens, a voice comes over the telephone in the form of an electric current. An electromagnet responds to the impulses of the current and moves the diaphragm in the exact pattern of the voice. When a person talks, another diaphragm moves; this movement creates an electrical current that matches the pattern of the person's voice. The current is then sent over telephone wires to another person.
- 13) Understand how an electrical generator works. A metal wire loop is present inside a magnet. This magnet creates a push/pull force against the loop. Consequently, an electric current is produced.

**Suggested Activities**

- 1) **Before viewing the video:**
  - a) Anticipatory Set: Give the class 3 minutes to write as many ways they use electricity as they can. List the results on the board.
    - i) Access student's prior knowledge to motivate them.
    - ii) Accessing also helps them to focus on important information.
  - b) Open-ended web: Draw a circle on the board and write "Electricity" in the circle. Ask the students what they know about electricity. Radiate lines from the circle and write each fact in a different circle at the end of each line.
- 2) **Specific activities after viewing the video:**
  - a) Have children bring in pictures of everything that uses electricity. Paste all pictures on a huge piece of paper for a class collage.
  - b) Draw a large circle. Divide it into fourths (math activity). Label the fourths: heat, light, energy (does work), and communication. Students list objects that use electricity under each heading.
  - c) Write on the board: 110 Volt, Batteries, and Both. Have students list things that use these forms of electric power.
  - d) Play "Vocabulary Match". Write the words found on the Vocabulary list on green 3X5 cards. Write the definitions on

- e) Play "Wheel of Fortune" with the vocabulary words. Put blanks \_\_\_\_\_ on the board. Read a definition. Select students to guess letters. First one to guess correct answer wins.
- f) Questions to ask, based on the video:
  - i) What causes lightning?
  - ii) What happens when two negative charges are next to each other?
  - iii) What is electricity?
  - iv) What does electricity give us?
  - v) What is a conductor?
  - vi) What is an insulator?
  - vii) What do you like best about electricity?

**Vocabulary**

**Electricity** – A form of energy that can give us light and heat. It can also produce a force that makes things move.

**Static Electricity** – An electric current moving from one place to another. It is caused when objects rub against each other.

**Charge** – An object can have a positive, negative, or neutral charge. Positive and negative charges cause a push/pull force. Similar charges repel each other, and opposite charges attract each other. Neutral charges do not have a push/pull.

**Conductor** – A material in which an electric current can flow.

**Insulator** – A material in which an electric current cannot flow.

**Circuit** – The circle in which an electric current flows.

**Volts** – A measure of electrical pressure in a circuit.

**Ampere** – A measure of how many electrons are pushed through a circuit.

**Watts** – A measure of electrical power – the work done.

**Permanent Magnet** – A magnet that always has magnetic power.

**Electromagnet** – A magnet that can pick up objects only when an electric current is running through it.