



Kato's Electrical Safety Video Game Adventure

Teacher's Guide

INTRODUCTION

This teacher's guide contains three sections: pre-video discussion, post-video discussion, and extension activities. Each section offers teachers a range of simple and complex questions and activities to choose from.

AIM

To teach students the basic rules of indoor and outdoor electrical safety.

OBJECTIVES

Students will be able to:

- Define energy and classify electricity as one form of energy.
- Understand where electricity is made and how it travels to homes and schools.
- Recognize at least six dangerous situations that involve electricity.
- Identify safe behaviors in each situation.

MOTIVATION/PRE-VIDEO DISCUSSION

1. What are some ways you use electricity in the classroom? (Students might identify lights, TV, VCR, computers, science equipment.)
2. What are some ways you use electricity at home? (Students might identify refrigerator, range, microwave, toaster, food processor, dishwasher, radio, CD player, video games, TV, vacuum cleaner, clothes washer, clothes dryer, hair dryer, computer, cell phones, etc.)
3. What is electricity? (Students may offer all kinds of ideas.)
4. Tell students electricity is a form of energy. Energy makes things work. Ask:
 - What makes a car go? (Gasoline, a form of energy)
 - What heats your house? (Electricity, natural gas, fuel oil, solar, or wood, all forms of energy)
 - What do you use for energy? (Food, a form of energy)
 - How do you use the energy that you get from food? (Help students think of things they do. For example: run, walk, jump, dance, talk, laugh, write, read, watch TV, work, and even think.)
5. Ask: Where does electricity come from? Is electricity dangerous? (Accept all responses. Tell students to look for the answers to these questions in the video.)
6. Ask students if they have ever played a video game. If not, explain what video games are so students will understand the reference in the video.

POST-VIDEO DISCUSSION

1. Begin with a general discussion about the video.
 - What did you like about the video? What didn't you like?
 - Did you find out where electricity comes from? (Power plant.)
 - Did you find out if electricity is dangerous? (Students should say yes.)
2. Assess students' comprehension of the concepts in the video and help them integrate this knowledge using the discussion points below.

Introduction to Electricity

- In the video, what is the dangerous side of electricity called? (Mr. Negative.) What symbol does he wear? (-) Why is electricity sometimes considered to be negative? (Because electricity can be dangerous.)
- In the video, what is the good side of electricity called? (Mr. Positive.) What symbol does he wear? (+) Why is electricity considered to be positive? (Because it runs things we use every day.)
- What is a conductor? (Something that electricity can pass through easily, like metal or water.)
- What is an insulator? (Something that electricity cannot pass through easily, like special rubber or glass.)
- What makes electricity dangerous? (Human beings are about 70 percent water, and water is a good conductor of electricity. So, if a person touches electricity, it will flow through him or her and the person will get hurt or killed.)

Production and Distribution of Electricity

- Where is electricity made? (At power plants.)
- How does electricity travel from the power plant to homes, schools, and businesses? (In wires.)
- What keeps electricity in the wires? (Insulation.)
- What do transformers and substations do? (They change the voltage, or strength, of electricity.)

Electrical Safety Overview

- What is the special sign for “Don’t” used in the film? (The red danger logo of a circle with a slash through it.)
- Ask students to remember how Kip’s parents would tell him to STOP before he or his friends did something around electricity where he could get hurt. Why do adults tell you to stop when you are doing things that are dangerous? (To protect you from getting hurt.)
- Ask students to name the nine dangerous situations that Kip and his friends found. Write the list on the board. (Substations and transformers; frayed or broken cords; overloaded outlet; water on an electrical fire; touching anything electrical when you are wet or standing in water; sticking a fork into a toaster that is still plugged in; kite tangled in electrical wires outdoors; insulators on electrical poles; and fallen overhead lines.)

Indoor Electrical Safety

- What should you do if you see a damaged electrical cord? (Don’t touch. Tell an adult to have it fixed.)
- Why is an overloaded outlet dangerous? (Too much electricity can start a fire.) What should you do if you see one? (Stay away. Tell an adult to take some plugs out.)
- Why is it dangerous to put water on an electrical fire? (Water conducts electricity. Electricity could flow through the water and through you.) What should you use instead? (A fire extinguisher that’s made for electrical fires.)
- Why is it dangerous to handle electrical appliances if you are wet or standing in water? (Water conducts electricity. If the appliance is damaged or you accidentally contact electricity, electricity will flow through you.)
- If toast gets stuck in the toaster, what should you do? (Unplug the toaster and then remove the toast.)

Outdoor Electrical Safety

- Why is it important to stay away from substations and transformers? (They carry a lot of electricity. You could be seriously hurt.)
- Where should you fly kites? (In open areas, away from overhead power lines.)
- What would happen if an insulator on a power pole broke? (Electricity could travel down the pole and could hurt someone.)
- Why should you stay away from fallen power lines? (Fallen power lines carry a lot of electricity and are extremely dangerous.) What should you do if you see one? (Tell an adult to call the power company.)

EXTENSION ACTIVITIES

1. **Safety Sign**

Ask students to make a safety sign, showing one safe way to behave around electricity. Ask students to take their signs home to help their families.

2. **Overhead and Underground Lines**

Overhead lines are the outdoor wires that carry electricity to where we need it. There are also underground wires that distribute electricity. You cannot see them, but students may have seen large metal boxes in their neighborhoods with the sign DANGER: HIGH VOLTAGE. These are the transformers for underground lines.

Take students for a walk outside the school. Locate overhead lines, the service drop (where power lines enter the school building) and the electric meter (which shows how much electricity is being used.) If lines are underground in your area, locate any transformers for underground lines. Remind students not to touch or throw things at any of this equipment.

3. **Conductors and Insulators**

Ask each student to bring in a small object of any kind—paper, paper clips, pencils, erasers, aluminum foil, silverware, wood, dirt. Using a flashlight battery and a holiday mini-light, test each material with the class to see if it is a conductor or an insulator. If it is a conductor, the bulb will light; if it is an insulator, the bulb will not light. Make a list of conductors and insulators on the board. Then wet the objects and try again. See if water makes any of the insulators into conductors.

Preparation and Materials: Bring a “D” battery (from a flashlight) and a holiday mini-light (cut from a string of lights, leaving an inch of wire on each end of the bulb). Strip the end of each wire. Hold one wire to each end of the battery to light the bulb. When testing materials, keep one wire against one end of the battery, and use the materials to connect the other wire and the other end of the battery. Safety reminder: Be sure to dispose of the string of lights after you cut it up.

4. **Electricity Tour (Field Trip)**

Check with your local electric utility. Many utilities offer tours of their facilities to help students understand where electricity comes from and how it is distributed.

5. **Home Safety Inspection**

Ask groups of students to work together to create home safety inspections. The inspections should list a variety of electrical hazards that might be found in or around the home. Students should take the inspections home and, with the help of an adult, look for the listed hazards and take action to correct them. Ask students to report back to class what hazards they found and which they were able to correct.