



SafetyCircuit: Electric Safety & You

Total program time: 50 minutes, 3rd-6th Grades

Grade-specific emphasis:

3rd Grade – Injury prevention, personal safety knowledge and skills

4th Grade – Forms & sources of energy, electrical circuits, injury prevention

5th Grade – Earth systems science, non-renewable energy, injury prevention

6th Grade – Physical science, forms and sources of energy, injury prevention

Desired outcomes: by completing this lesson, students will be able to:

- ✓ Apply **science concepts** while learning about electricity
- ✓ Apply **safety concepts** while learning about electricity
- ✓ Understand that energy transformation takes place in electrical circuits.
- ✓ Understand what electricity is, how it is generated and delivered.
- ✓ Demonstrate an understanding of electricity concepts and terminology
- ✓ Better understand electricity hazards and safety rules indoors and outdoors

1. Outdoor safety: demo board and warning sign visuals
2. Electrical components and info: demo board and posters to show substations, voltage, watts, conductors, wires, etc.
3. Indoor safety: visual aids (hair dryer, vacuum cord, etc)
4. Circuits: hands on demo with Energy Stick
5. How electricity is generated and delivered: poster as visual

1. Introduction

- Colorado Springs Utilities subject matter expert background and role, what is a lineman?
- What does Colorado Springs Utilities do, and what will we learn today?
- Concepts of electricity with the interactive “Safety Town” will be demonstrated to learn about electrical safety and experiments to demonstrate circuits will be conducted.

2. How do we generate and receive ELECTRICITY?

****Show ELECTRICITY POSTER**

- Illustration: Generation -> Transmission -> Distribution
- Different sources of electricity used by Colorado Springs Utilities:
 - Traditional power plants with coal (Martin Drake and Nixon)

- Colorado Springs Utilities non-renewable energy (coal, natural gas) and renewable energy (solar)

3. Electricity Basics

- **What is electricity?**

- A type of energy fueled by the transfer of electrons from positive and negative points within a conductor. Electricity can build up in one place or flow from one place to another. When electricity gathers in one place it is known as **static electricity**. Electricity that moves from one place to another is called **current electricity**.
- If you traveled as fast as electricity, the speed of light, you could go around the world 8 times in the time it takes to turn on a light switch.

- **Why is electricity dangerous?**

- Electricity can travel through water and you to deliver a painful and sometimes deadly shock. It is always looking for a way to the ground. We are 75-80% water and we are excellent conductors for electricity.

- **How do we use electricity? (SHOW ELECTRICITY USES POSTER)** Electricity is all around us, we use it to: power technology like our cell phones, computers, lights, hair dryers, refrigerators, and air conditioners.

- **What are conductors and insulators?**

(Show WIRES & PORCELAIN INSULATORS)

- **Conductors** are materials that help electricity travel from one place to another. Your body, water and metals are good conductors.
- **Insulators** are materials that stop electricity from traveling from one place to another. Rubber, wood, porcelain and glass can be insulators.

- **What is a circuit?** An electric circuit is a path in which electrons from a voltage or current source flow. (**Energy Stick group demonstration**)

4. Top 5: Play it safe: INDOORS:

1. Never put your finger or anything else that does not belong in an outlet.
2. Only pull on the rubber plug when you are unplugging something, not the cord.
3. Do not overload extension cords or power strips.
4. What's the most dangerous room in the house? The bathroom! Use electrical appliances away from water.
5. Make sure all electric cords are in good condition.

5. Play it Safe OUTDOORS:

- Demonstration with Safety Village electric demonstration board
 - Bus, bird, child demos
 - Obey the signs: DANGER, HIGH VOLTAGE, STAY AWAY! Stay away from all electrical equipment: meters, transformers, poles, support wires, and substations. (**Show DANGER SIGNS and field EQUIPMENT posters**)
 - When thunder roars, go indoors! Always go inside if the weather is stormy and includes thunder and lightning.
 - Never play on or around electrical equipment

6. Conclusion: SAFETY POSTER

1. Stay away from downed power lines. Call 9-1-1 to report.
2. Always go inside if there is thunder and lightning.

3. Find another place to play if you are near electrical equipment.
4. Electricity is deadly and always tried to find a path to ground
5. Thinking of planting a tree? Call 811 to know what's below.

Be a Safety Champion! Share these lessons with family and friends!