

# Electric and Natural Gas Safety and You

## Teacher's Guide, Grades 2-3

### Introduction

This discussion guide contains questions for each page in the booklet, and suggested activities that can be done in class or as homework. You can do as much as you wish in one lesson and then continue the rest in other lessons. Please refer to the last page for a glossary of terms used in this booklet.

### Cover

Ask students these questions:

- Why must we do things safely? (*So we don't get hurt.*)
- Why should you be careful around electricity and natural gas? (*You can get hurt if you use them incorrectly.*)

### Page 2

Ask students these questions:

- Which item in the picture works on natural gas? (*The barbecue.*)
- Which item in the picture works on electricity? (*The train.*)
- What would your life be like without electricity and natural gas? (*Answers will vary.*)

Suggested activity: List on the chalkboard the things students have in their homes or in the school that use electricity and natural gas.

### Page 3

Ask students these questions, then encourage them to follow the instructions to find the hidden message:

- What is the striped cat holding? (*A plug.*)
- Why is it important to put only plugs in outlets? (*You could get a shock if fingers or other objects get stuck in outlets.*)
- Do you use safety caps in outlets in your home? (*Answers will vary.*)

Activity answer: **Be Safe** Around Electricity & Natural Gas

### Page 4

Ask students these questions:

- Who is at the switch in the home? (*The cat.*)
- What travels through the wires? (*Electricity.*)
- Where does electric energy come from? (*Power lines.*)
- When do you use a switch in your home? (*To turn on a light.*)
- Why do we need electricity in our homes? (*It runs lights and appliances like TV, refrigerator, etc.*)

Encourage students to color this page and to color the electricity in the wires yellow. Explain that electricity travels in a continuous path called a circuit. Electricity in circuits requires a complete loop through which an electrical current can pass. Electricity in circuits can produce light, heat, and sound. Ask students for examples of

heat, light, and sound from electricity. (*Heat comes from electric heaters and ovens; light comes from electric lightbulbs; sound comes from electric doorbells.*)

### Page 5

Ask students these questions, then encourage them to decode the message:

- Why should you stay away from substations and utility towers? (*They have electrical equipment that is dangerous to touch.*)
- Where have you ever seen a substation in your town or city? (*Answers will vary.*)

Activity answer: Danger High Voltage

### Page 6

Ask students these questions:

- Who do you think the striped cat is calling on the telephone? (*911 or an adult.*)
- Who should you call if you see a fallen power line? (*911.*)
- Why should you stay away from fallen power lines? (*They can hurt you.*)

Suggested activity: After coloring this page, have the students act out a telephone call to the utility company reporting a downed power line.

### Page 7

Ask students these questions:

- Why is it dangerous to swim during a thunderstorm? (*Lightning could strike the water.*)
- Why is it dangerous to go near a substation? (*It contains electrical equipment that is dangerous to touch.*)
- Why is it dangerous to go near a fallen electrical wire? (*It can shock you.*)
- Why is it dangerous to fly kites near electric lines? (*If the kite goes into the lines you could get shocked.*)

Encourage students to match the sentences to the pictures. Tell the students that some things allow electricity to flow through them easily. Water and most metals are good conductors. Because your body is mostly water, you are a great conductor, too! So if you touch an electric circuit and the ground at the same time, you will become electricity's easiest path. Electricity will flow through you, and you could be seriously hurt or killed.

### Pages 8 & 9

Ask students these questions:

- Describe what you see in each of the three pictures. (*A frayed cord, someone turning on a light while standing in a puddle of water, playing near natural gas appliances.*)
- What is the safe thing to do in each of the situations in the pictures? (*Don't use the dryer with the frayed cord, dry the puddle and your hands before turning on the light, play away from gas appliances.*)

### Page 10

Ask students these questions:

- What does the picture in the circle show? (*Someone turning on a light while standing in water.*)
- Why is this a dangerous situation? (*Water conducts electricity and the cat could get shocked.*)

Explain to students that water is an excellent conductor for electricity. You can become electricity's path to the ground if you are touching water that touches electricity. Electricity would travel through the water and through you to the ground and you could get seriously hurt or killed.

Activity answer: Water and Electricity Don't Mix!

### Page 11

Ask students these questions:

- What is an electrical fire? (*A fire that involves something electrical like appliances, wiring, or outlets.*)
- Why don't you pour water on an electrical fire? (*Water conducts electricity so it could make the fire worse or it could conduct the electricity to you!*)
- What should you use to put out an electrical fire? (*A special fire extinguisher made for electrical fires.*)
- What is the meaning of "Don't overload electrical outlets"? (*Don't plug in too many things.*)
- What can happen if an outlet is overloaded? (*An electrical fire can happen.*)

Explain to students that if they have an electrical fire in their home, they should get out of the house quickly and call for help. Explain that adults who put out electrical fires should use Class C fire extinguishers. Never use water to extinguish these fires, as the risk of electrical shock is far too great!

### Page 12

Ask students these questions:

- What is the orange cat doing? (*Trying to get something out of the toaster.*)
- Why must you unplug appliances before you work on them? (*To prevent an electric shock.*)

Encourage students to find the missing word on the page ("unplug"). Emphasize that only qualified adults should fix appliances.

### Page 13

Ask students these questions:

- What is the blue cat doing? (*Putting clothes into a dryer.*)
- What form of energy is the dryer using? (*Natural gas.*)
- Why should adults call the local utility before starting a digging project? (*To find out where underground utilities are located so as not to contact them.*)

### Page 14

Ask students this question: How can each of the dangerous scenes be made safe? (*Play somewhere else, clean up all the papers near the natural gas appliances.*)

Activity answer: Play Safely

### Page 15

Review with students the correct procedure for what to do if they smell gas in their home. Explain that natural gas can also leak out of underground pipelines outdoors, and that it can be recognized by the smell or a hissing noise. Tell them that if they notice this they should leave the area right away and tell a trusted adult to call the utility. They should not go back until safety officials say it's okay. Here is the correct sequence for the four pictures:

1. The cats smell a natural gas leak.
2. They leave the house.
3. They tell a trusted neighbor.
4. They wait at the neighbor's house while the gas company comes to fix the leak.

### Page 16

The pictures can be found on these pages:

- Flying a kite near power lines, page 7
- Leaving the house due to a gas leak, page 15
- Turning off the light while standing in water, pages 8 or 10
- Playing near gas appliances, page 14
- Overloaded outlet, page 11

## Glossary

APPLIANCE	A household machine powered by electric current or natural gas. A refrigerator is a household <i>appliance</i> .
DANGER	Something that might hurt you. Stay away from things with signs that say <i>danger</i> .
ELECTRICITY	One of the basic forms of energy. It can also give light and heat. <i>Electricity</i> makes televisions and toasters work.
ENERGY	The ability to do work. <i>Energy</i> makes machines run.
FIRE EXTINGUISHER	Container filled with chemicals that, when sprayed upon fire, put it out. Your school has a <i>fire extinguisher</i> in the hall.
FRAYED	When the insulation on a wire is worn off or broken. <i>Frayed</i> wires can cause fires.
GAS PIPES	Underground tubes that carry natural gas to homes, schools, and businesses.
OUTLET	A place to plug in appliances. Never put anything but a plug into an <i>outlet</i> .
OVERLOAD	To give something too big a load or demand. It is dangerous to <i>overload</i> an outlet with too many appliances.
POWER LINE	Wires used to send out electric energy for public use. Never fly a kite near <i>power lines</i> .
POWER PLANT	A place where electricity is generated. The <i>power plant</i> sends power to the substations.
SUBSTATION	A smaller plant that receives energy from the power plant and then sends it to our homes. We were told not to play near the <i>substation</i> because it could be dangerous.
SWITCH	A device for making or breaking an electric circuit. When you are not using a light in a room, turn the <i>switch</i> off.
UTILITY POLE	A pole used to hold up power lines and other wires. Don't ever climb a <i>utility pole</i> .