

Lesson Overview	<p>In this lesson, students will take what they have learned about energy safety and apply that knowledge to create a comic strip that illustrates safety tips. From previous classroom work and the Alliant Energy safety presentation, students will have learned that energy safety requires knowledge of certain principles and characteristics of electricity and natural gas. In order to avoid accidents such as electrocution, fires, or explosions, students must be prepared to react appropriately to hazards created by careless or incorrect use of both electricity and natural gas. This lesson will identify how to use energy safely.</p>
Objectives	<ul style="list-style-type: none"> • To synthesize and apply energy safety information • To identify potential safety hazards associated with the use of electricity and natural gas • To create an energy safety statement presented in a cartoon format
National Standards Addressed	<p><i>K-4 Science Standard B – Light, Heat, Electricity, and Magnetism</i> Electricity in circuits can produce light, heat, sound, and magnetic effects. Electrical circuits require a complete loop through which an electrical current can pass.</p> <p><i>K-4 Personal Health</i> Safety and security are basic needs of humans. Safety involves freedom from danger, risk, or injury. Security involves feelings of confidence and lack of anxiety and fear. Student understandings include following safety rules for home and school, preventing abuse and neglect, avoiding injury, knowing whom to ask for help, and when and how to say no.</p> <p><i>K-4 Language</i> #4 – Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes. #5 – Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.</p>

Desired Outcome	<p>After completing this lesson, students will:</p> <ul style="list-style-type: none"> • Have a working knowledge of the principles and characteristics of two sources of energy: electricity and natural gas • Be able to compile lists of potential electricity safety hazards and natural gas safety hazards • Understand that scientific information can be communicated in a variety of modes • Be able to create a comic strip or cartoon that makes an energy safety statement
Time Required	<p><i>Teacher preparation:</i> 20 minutes <i>Class time:</i> Two 30-45 minute classes</p>
Materials Needed	<ul style="list-style-type: none"> • Teacher and/or student resources such as the following Web sites: (not all-inclusive) www.alliantenergykids.com/playingitsafe/ www.alliantenergykids.com/energybasics/ www.reuben.org/wannabe.asp [good sampling of comic strips] www.artsedge.kennedy-center.org/content/2126/ [great detailed lesson plan on comic strips] • white construction paper, rulers, pencils, markers
Reproducible	<p>This lesson includes a reproducible to guide students in creating a cartoon strip. It gives the students an opportunity to tap into acquired knowledge about energy safety to create their own cartoon strip dialogue and illustrations.</p>
Important Terms	<p>Conduction, insulation, electric circuit, carbon monoxide, explosion</p>

Lesson Steps/Activity

1. Review prior knowledge of the principles of electricity and characteristics of natural gas. Pose questions such as: What is the difference between a conductor and an insulator? What is an electric circuit? Why is it dangerous to use electrical appliances near a water source? When can a gas leak become dangerous? Why is it hard to detect carbon monoxide?
2. Initiate a whole-class brainstorm session to generate two separate lists: one for potential electricity safety hazards and one for potential natural gas safety hazards. Some possible responses might be:

Electricity

- playing near or on any part of a substation or pad mount transformer
- climbing trees or flying kites near power lines
- standing in or near water while using an electrical appliance or tool
- using a metal utensil to remove toast from a plugged-in toaster
- putting metal objects or fingers in electrical outlets
- incorrectly removing electrical cords from the wall
- using more than one extension cord
- using a nail or staple to attach an electrical cord to another surface
- climbing a ladder near a power line
- digging near buried power lines
- touching someone who has apparently been shocked

Natural Gas

- lighting a match if there is a possible natural gas leak
 - using a poorly functioning natural gas-powered appliance
 - digging near a natural gas line
 - playing near a natural gas appliance, pipe or meter
3. Model how to depict one of those safety hazards in a cartoon strip to generate a safety hazard message, using the format of the reproducible.
 4. Have students choose one of the generated safety hazards to create their own cartoon strips, using the reproducible or their own drawings and sequence of events. Try to ensure that the safety hazards are all represented and that students don't focus on the same few hazards!

Lesson Steps, continued

5. Have students present their cartoon strips to the class. Ask students to evaluate the strips based on their ability to warn readers of energy hazards (perhaps in a way that models safe behavior) and on their creativity.

Extensions and Modifications

- This lesson could be shortened by eliminating the brainstorming session in Step #2 and presenting the two lists to the students as review and reference sheets. Encourage the students to add other potential safety hazards to the lists if they come to mind.
- This lesson could be extended to include the compilation of a class booklet with a theme of energy safety, which could be distributed to other classes in the school. The booklet could also be compiled in a black and white format and distributed to lower grades as a coloring book.
- Have ESL students or special needs students work with a partner. At your discretion, these students may or may not be expected to create their own comic strip from scratch.
- Arrange to have the students take their finished products to another class, preferably a lower grade, and use the comic strips to “teach” safety to those students.

Make a (Safety) Statement!

Comic strips are a group of cartoons that tell a story. They contain story elements such as setting, plot, and character. They often use humor to draw attention to something bad or foolish. Ideas that are not easily expressed through words alone can make a good comic strip. Now you will create your own comic strip on energy safety!

In our study of energy safety, we have learned how electricity and natural gas work to make our lives better. We have also discovered that electricity *is* dangerous and natural gas *can be* dangerous if it is not handled properly. Follow the steps below to create a comic strip that makes a strong point about being safe around electricity or natural gas.

Write down at least five different safety measures that you have learned in studying electricity or natural gas. Next to each safety measure, write down your ideas about how you could present it in a comic strip. For example, could you show what you *should do* to be safe? Could you show what you *should NOT do*? Could you show both in the same comic strip?

Safety measure

How to present it

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Pick one safety measure (or perhaps two that are closely related), and write down the types of characters that should be in the comic strip to help illustrate safety. For instance, what age should the characters be? What will they be wearing?

Use the following empty frames to design a comic strip that makes a statement about your safety measure. You may use one or more of the frames, but you don't have to use all of them. Since this is your rough draft, concentrate on getting the message written first. When you are satisfied with that, begin to fill in the pictures. Once your draft has been approved and edited, you may copy it onto construction paper.

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Be ready to present your comic strip to the class.

