



Portland General Electric

The Clubhouse Kids Make a Big Difference: An Energy-Saving Adventure Teacher's Guide

Introduction

The Clubhouse Kids Make a Big Difference: an Energy-Saving Adventure builds students' comprehension and inference skills in reading fictional text while introducing concepts of energy efficiency, renewable energy, and global warming, and exploring ways to take individual responsibility for energy use.

While reading about children their own age, the story builds comprehension skills while also teaching students how they can make a positive difference for the planet by being more energy-efficient. The content is appropriate for students in grades 2-4.

The Clubhouse Kids Make a Big Difference supports the following Oregon Academic Content Standards for science education:

Grade 2

2.3 Scientific Inquiry: Scientific inquiry is a process used to explore the natural world using evidence from observations.

- 2.3S.1 Observe, measure, and record properties of objects and substances using simple tools to gather data and extend the senses.

Grade 3

3.3 Scientific Inquiry: Scientific inquiry is a process used to explore the natural world using evidence from observations and investigations.

- 3.3S.1 Plan a simple investigation based on a testable question, match measuring tools to their uses, and collect and record data from a scientific investigation.
- 3.3S.2 Use the data collected from a scientific investigation to explain the results and draw conclusions.

Grade 4

4.1 Structure and Function: Living and non-living things can be classified by their characteristics and properties.

- 4.1P.1 Describe the properties of forms of energy and how objects vary in the extent to which they absorb, reflect, and conduct energy.
- 4.1E.1 Identify properties, uses, and availability of Earth materials.

4.2 Interaction and Change: Living and non-living things undergo changes that involve force and energy.

This presentation guide provides the objective for each page spread, ideas for classroom discussion, activity and puzzle answers, and suggestions for activity completion.

PART 1: STORY DISCUSSION TOPICS

Read the booklet aloud to the class. Throughout the story discuss the following questions, as well as “Did You Know?” topics and “Try This!” activities.

- **Cover:** Ask students, “What do you think all the kids are holding? What do you think this story is going to be about?”
- **Pages 2-3:** Ask students, “How would you feel if you were going to lose your clubhouse? Would you be willing to make small changes to keep it?”
Try This! (Answers: *Open door, short-sleeved shirts inside on a cold day, standing with the refrigerator door open, open window, dripping faucet, computer and TV left on but not being used, lights on in the daytime.*)
Did You Know? Encourage students to ask their parents to show them one of their utility bills. If you send home a class newsletter, encourage parents to show the bills to their children and together come up with ways to save energy. Ask students to share these ideas in class if there is an opportunity for follow-up discussion.
- **Pages 4-5:** Ask students to describe the things on these two pages that the kids have done as a way to start saving energy. (*Pull curtain across window to keep cold air out; close refrigerator door; turn off computer; turn off lights; put on sweatshirt; close door.*)
Try This! Keep a tally on the board as students list the many items that use energy. Don't forget battery-operated items.
Did You Know? If you have a power strip in your classroom, show it to your students as an example. Be sure to emphasize the importance of shutting off the computer properly before turning off the power strip.
- **Pages 6-7:** Ask students where else they can find information on how to save energy.
Try This! The water drip activity is easy to do in the classroom. Set it up so you can measure how much water escapes during the next recess or lunch break, perhaps in a paint jar. Ask the class to guess how high the water will fill it. Your students will be very surprised to see how much water accumulates by the time they return.
Did You Know? Ask students if they have ever felt the heat given off by a computer or TV. Discuss how these appliances can act as mini-heaters, and are therefore energy wasters if left on unnecessarily.
- **Pages 8-9:** Ask students if they have heard of global warming. Explain that certain gases trap the heat in the Earth making the temperature rise. When we make and use energy we produce more of these gases, so if we use less energy, we can help keep the Earth cooler. Remind students how each individual's actions in conserving energy can make a difference.
Also discuss the renewable forms of energy on page 9. Explain that energy generated by sources that will never run out, such as the sun, wind, and hydropower (generated from falling water) can be continuously renewed, so we call them “renewable” sources of energy. See if your students can come up with reasons why we won't run out of these energy sources. (*The sun always shines, the wind will always blow, and water will continue to flow due to*

gravity and the pull of the tides.) By comparison, coal and oil have a finite supply and are “nonrenewable.”

Did You Know? Ask students to try to make up sentences using the word “conserve” correctly. Be sure to read aloud the text on the pages of the book in the picture.

Try This! Ask students how hanging a towel outside to dry saves energy. Challenge them to ask their families to do this as well.

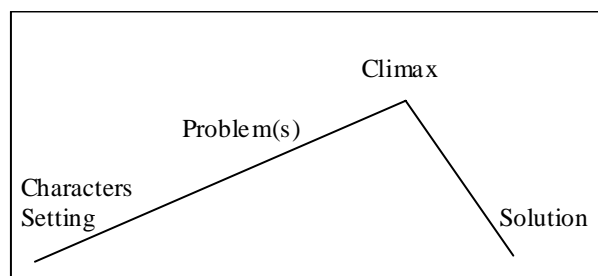
- **Pages 10-11:** Have students look at the Energy Star logo in the picture on page 11. Explain that appliances with this symbol help the Earth by using less energy. Ask if anyone has ever seen this symbol before. (When you are done reading and discussing the story, be sure to do the Energy Star activity on page 4 of this guide.)
Try This! Ask students if they have ever felt the floor or window pane when the sun was shining on it on a hot day. What did it feel like? (*Warm*) Use the blinds or curtains in your classroom to demonstrate the heating power of the sun. Discuss how adjusting the curtains or blinds can save energy by requiring the air conditioning or heater to run less frequently. Ask your students if they think they could do something this simple at home on hot or cold days to help the Earth.
Did You Know? Ask students if they know who their local utility is. Ask if any of them, or anyone they know, uses any green energy sources, such as solar or wind power, to power their house. Describe examples of renewable energy such as windmills or solar power. (*Solar power is created when the rays of the sun shine on a special solar panel. These panels trap the energy from the sun’s rays and store this energy in batteries. Then people can use this stored energy to power things they need in their homes—like a TV or refrigerator. Wind power is made when the wind spins a windmill. The spinning windmill creates energy as it turns. This energy is then transferred to power lines and then to people’s homes for them to use.*)
- **Pages 12-13:** Ask students how many things in the pictures on these pages they can see that show it’s a classroom where saving energy is important. (*Class rule #2: “Respect the Earth”; “Solar Energy Is Renewable” poster; “Stop Global Warming” poster; “Paper Only recycling bin; vocabulary: Weather stripping and Energy-efficient; “Conserve Water with a Water-Saving Showerhead” poster; “Save the Rainforest” poster; “All About Energy” textbook*)
Ask students if it ever occurred to them that a leaking faucet wastes energy as well as water—even if it’s cold. Ask them what would be conserved by installing a water-saving showerhead in their bathroom at home? (*Both water and energy.*) See if any students already have one of these in their home.
Page 12 Try This! Ask students how refrigerator tea saves energy. (*No energy is used to heat the water first.*)
Page 13 Try This! Ask students to predict how far up their legs the water will come during both a 1-minute and 5-minute shower. Suggest they try it at home and report back in a follow-up discussion.
- **Pages 14-15:** Ask students, “What are some of the ideas that Elena, Rachel, and Lily are sharing about more ways to save energy?” (*Turn off the lights when you leave a room. Use CFL bulbs. Wash full loads of laundry. Wash clothes in cold water in the washing machine. Wear clothes until they are actually dirty.*)
Did You Know? CFLs save energy, which helps the Earth. If you have a CFL available, show it to the class. Ask students if they think it would be easy to change a few light bulbs in their house to help the Earth and save energy. Ask how many of them already use CFLs. Ask them to go home and see how many fixtures their parents would be willing to switch to CFLs.

Try This! Ask if anyone currently washes their clothes in cold water. Encourage students to talk to their parents about the energy savings of using cold water to wash clothes. This is another great topic for a class newsletter or note to take home.

- **Pages 16-17:** Ask students to name some good ways to keep cold air out and warm air in during the winter, or warm air out and cool air in during the summer. (*Open and close doors quickly; close drapes, shades, or blinds to keep the sun out in the summer and open them to let warmth in during the winter; use weather stripping to seal leaks at the edges of windows.*)
Did You Know? Ask students to predict where there might be leaks in your classroom.
Try This! After reading the story, make a leak detector of your own and ask students to test for leaks in your classroom.
- **Pages 18-19:** Ask students, “Do you think the new clubhouse rules will be easy to follow? What rules could we have in our class to help save energy and save the Earth?”
Try This! When finished reading the story, have students color and cut out the Energy Tip cards on pages 29 and 30. Discuss each card and how energy is saved.
Did You Know? Discuss with your students how easy it is to replace one light bulb.
- **Pages 20-21: Summary Discussion Questions** – Ask students to recall the ways in which the Clubhouse Kids saved energy. Do they think the Clubhouse Kids did a good job of changing small things to save a lot of energy? Was it easy for the kids to be more energy-efficient? Discuss how simple and easy saving energy can be. How could the students in your class make small changes to be more energy-efficient and help stop global warming?

PART 2: EXTENSION ACTIVITIES

- **Plot Chart** As a whole class, make a plot chart for the story on the board or overhead projector. Discuss characters, setting, problem, climax, and solution for this story.



- **Summary Writing** Have students work in pairs to write down the main ideas of the story.
- **Energy-Saving Poster** Have your students create a poster featuring their favorite animal, based on one of the many energy-saving ideas in this story. Remind students to be sure to include an energy-saving phrase, a border, color, and their name. Consider hanging these posters on a bulletin board or around the school to encourage wise energy use.

(Some examples of energy-saving tips: *Turn off the lights when you leave a room. Use CFL bulbs. Keep heat at 68 degrees or lower. Wash full loads of laundry. Wash clothes in cold water in the washing machine. Wear clothes until they are actually*

dirty. During the summer, hang your washed clothes out on a clothesline. Think about what you want to get out of the refrigerator before you open it. Keep windows closed in cold weather to keep heat inside. Turn off the TV or radio when you are not watching or listening.)

- **Leak Detector Activity** Make a leak detector and test for leaks around the doors and windows of your classroom. Take a piece of tissue and glue it to a Popsicle stick or tongue depressor. Have students hold it around the edges of the doors and windows when they are closed to see if air is moving through small openings around them. If the tissue moves, you have a leak!
- **Energy Star Activity** Discuss with students that some appliances help the environment due to their superior energy efficiency. The government marks these appliances with a special logo called the Energy Star, such as that on page 11. Ask students to find all the appliances in the clubhouse that have the little blue square on them, which is meant to depict that logo. Ask if there are any of these symbols in the classroom, or if anyone can think of an appliance at home that has it. Challenge students to look in their homes for the Energy Star on appliances. Encourage them to report back to school on what they find. For more information, visit www.energystar.gov.

PART 3: ACTIVITY PAGES After giving students time to do each exercise on their own, discuss each page as follows:

- **Page 22: Savers and Wasters** Make sure students understand that one picture in each box shows an energy-wasting activity.
Objective Students are able to identify where energy is being wasted in common everyday activities.
Discussion Discuss each pair of pictures with the students. Identify the activity and whether or not energy is being wasted. Discuss why the other option in each picture does not waste energy.
Answers In each of the four boxes, the following pictures that show energy wasting should be circled and colored red:
 - Faucet:* Turn off any dripping faucets in or around your home.
 - Open refrigerator:* Think about what you want to get out of the refrigerator before you open it. Get what you need quickly and close it to keep the cold air inside. This saves electricity.
 - Open window:* Keep windows closed in cold weather to keep heat inside. This saves electricity since the heater doesn't have to run as much.
 - Light on at empty desk:* Turn lights off when you aren't using them. This saves electricity.
- **Page 23: World Puzzler**
Objective Students use counting skills to solve a word puzzle with a message.
Discussion What does "conserve" mean? How can people conserve energy? How can we conserve energy?
Answer We SHOULD CONSERVE ENERGY TO help the Earth.
- **Page 24: Renewable Energy Matching**
Objective Students identify forms of energy that are renewable.
Discussion Which forms of energy are renewable? Which forms are not renewable?
Answers Students should draw lines from

- Solar Power to *the solar panels*
- Wind Turbines to *the three wind turbines (windmills)*
- Wave Energy to *the crashing wave*
- Hydropower to *the water falling through a dam*
- Geothermal to *the geyser*
- Biomass to *the pile of debris being dumped by a backhoe*

* Note that coal (*man pushing bucket of coal*), oil (*three brown barrels*), and natural gas (*single blue flame*) are not renewable forms of energy.

○ **Page 25: Math Decoder**

Objective Practice math skills while identifying forms of green (renewable) energy.

Answers 86 cents = W; 18 = S; 218 = I; 11 = N; 24 = R; 99 = O; 12 = D; 90 cents = A
Fill in the blank phrase: *SOLAR & WIND POWER*

○ **Page 26: Energy Scramble**

Objective Reinforce key concepts from the booklet about energy efficiency.

Answers Discuss each answer as the letters are unscrambled.

1. Solar; 2. wind; 3. use less; 4. energy; 5. heat

○ **Pages 27-28: Club Certificate**

Read through the pledge with students and discuss the meaning. Have students cut it out. Send page 27 home to remind parents and students to be energy-efficient at home. Hang page 28 on a bulletin board in your classroom to remind students of their pledge.

○ **Pages 29-30: Energy Tip Cards**

Discuss each card and how the tip saves energy. Have students color and cut out each card. Encourage your students to talk with their parents about where they can post the cards at home. (*On a bulletin board, the refrigerator, in the bathroom, next to a light switch or appliance.*)

○ **Pages 31: Home Energy Inspection**

Read and discuss this page with your students. Encourage them to take it home and complete it with their parents. Consider offering an incentive (class points, tickets, stickers, etc.) for students who complete it and return it to school.

○ **Back Cover: Search and Find**

Objective Review energy-saving activities demonstrated by the Clubhouse Kids.

Discuss Review each energy-saving activity. Call on students to explain how each activity saves energy.

Answers:

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| <i>Kid beneath monitor Page 5</i> | <i>Boy at window Page 17</i> | <i>Girl at sink Page 7</i> |
| <i>Girl closing curtain Page 4</i> | <i>Dinosaur with CFL Page 15</i> | <i>Girl adjusting thermostat Page 20</i> |

Research Project Extension Activity

As a class, or in groups, have students find information on saving energy from your local utility. They can also use the Internet to find ways to save energy in the classroom or at home. Make an “Energy Savers” bulletin board with the information that students find. Have a class discussion about how small changes can help slow global warming by saving energy.

This activity meets the following K-12 National Standards for the English Language Arts written by the National Council of Teachers of English and the International Reading Association.

- Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.
- Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

For more information on the standards listed above, contact:

- International Reading Association, www.reading.org
- National Council of Teachers of English, www.ncte.org