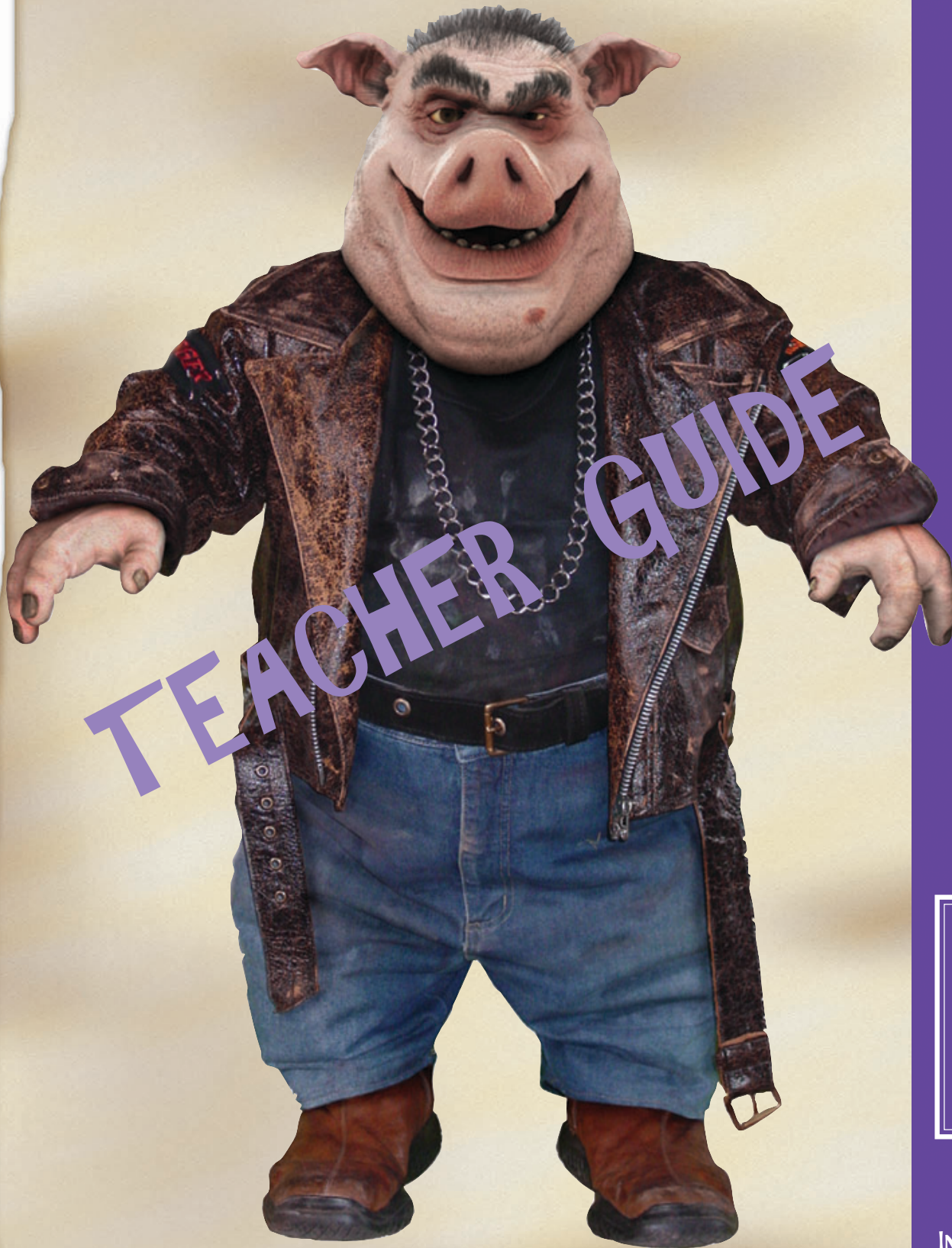


ENERGY HOG CHALLENGE



E

GENERAL
ENERGY

\$

EFFICIENCY &
CONSERVATION

A QUICK LOOK

Information and activities to explore different sources of energy, how energy is used and wasted and how students can save energy by becoming Energy Hog Busters!

Grade Level

3 – 8

SUBJECT AREAS

Science
Math
Technology
Language Arts
Social Studies

Energy Hog Campaign

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IN cooperation With the
NEED Project

www.need.org

National Science

STANDARDS

UNIFYING CONCEPTS & PROCESSES

ALL GRADE LEVELS

SYSTEMS, ORDER, & ORGANIZATION: The goal of this standard is to think and analyze in terms of systems, which will help students keep track of mass, energy, objects, organisms, and events referred to in the content standards.

EVIDENCE, MODELS, AND EXPLANATION: Evidence consists of observations and data on which to base scientific explanations. Using evidence to understand interactions allows individuals to predict changes in natural and designed systems.

STANDARD D: EARTH & SPACE SCIENCE

PRIMARY (K–4)

PROPERTIES OF EARTH MATERIALS: Earth materials are solid rocks and soils, water, and the gases of the atmosphere. The varied materials have different physical and chemical properties, which make them useful in different ways; for example, as building materials, as sources of fuel, or for growing the plants we use as food. Earth materials provide many of the resources that humans use.

OBJECTS IN THE SKY: The sun provides the light and heat necessary to maintain the temperature of the earth.

CHANGES IN EARTH AND SKY: Weather changes from day to day and over the seasons.

STANDARD E: SCIENCE & TECHNOLOGY

PRIMARY (K–4)

UNDERSTANDING ABOUT SCIENCE AND TECHNOLOGY: People have always had problems and invented tools and techniques to solve problems. Trying to determine the effects of solutions helps people avoid some new problems.

STANDARD F: PERSONAL & SOCIAL PERSPECTIVES

PRIMARY (K–4)

TYPES OF RESOURCES: We get resources from the living and nonliving environment to meet the needs and wants of a population. Some resources are basic materials, such as air, water, and soil; some are produced from basic resources, such as food, fuel, and building materials; and some resources are nonmaterial, such as quiet places, beauty, security, and safety. The supply of many resources is limited. If used, resources can be extended through recycling and decreased use.

STANDARD B: PHYSICAL SCIENCE

INTERMEDIATE (5–8)

TRANSFER OF ENERGY: Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei, and the nature of a chemical. Energy is transferred in many ways. The sun is the major source of energy for changes on the earth's surface. The sun loses energy by emitting light. A tiny fraction of that light reaches earth, transferring energy from the sun to the earth. The sun's energy arrives as light with a range of wavelengths.

STANDARD F: SCIENCE IN PERSONAL & SOCIAL PERSPECTIVES

INTERMEDIATE (5–8)

NATURAL HAZARDS: Human activities can induce hazards through resource acquisition, urban growth, land-use decisions, and waste disposal. Hazards can present personal and societal challenges because misidentifying the change or incorrectly estimating the rate and scale of change may result in either too little attention and significant human costs or too much cost for unneeded preventive measures.

RISKS AND BENEFITS: Students can use a systematic approach to thinking critically about risks and benefits. Important personal and social decisions are made based on perceptions of benefits and risks.

Table of CONTENTS

The Energy Hog Challenge is a fun way to educate students in grades 3 - 8 about how they use energy in their homes and how to become responsible, smart energy users. It can be adapted by educators for younger and older students. Many other NEED Project activities complement the Energy Hog Challenge including "Building Buddies", "Monitoring and Mentoring", "Energy House", "Energy Conservation Contract", and "Today In Energy". These activities and the Energy Hog Challenge are available online at www.energyhog.org.

The Energy Hog Challenge focuses on saving energy at home through family-oriented activities. As students become aware of the ways energy is used and how it can be saved at home, they can expand that awareness to their schools.

The Energy Hog Challenge helps develop student skills in science, math, technology, language arts, critical thinking and social studies.

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Energy Hog Challenge

GLOSSARY

Biomass — organic material that has stored sunlight in the form of chemical energy. Biomass fuels include wood, straw, manure, and many other byproducts from agricultural processes.

Coal — a fossil fuel formed by the breakdown of vegetable material trapped underground without access to air.

Electricity — the flow of electrical power. We produce power by converting other sources of energy, like coal, natural gas, oil, or uranium into electricity. Typically, anything plugged into a wall (like a toaster or the TV) uses electricity to run.

Energy — the ability to do work or the ability to move an object.

ENERGY STAR® — a trustworthy label on things like home appliances and computers to show that these products use less energy and save money compared to similar products.

Fossil Fuels — materials that were formed from ancient plant and animal life that were compressed underground over millions of years. Examples are coal, oil and natural gas.

Fuel — any material that can be used as an energy source.

Hydropower — the energy of moving water. A **Hydroelectric Power Plant** uses moving water to power a turbine generator to produce electricity.

Insulation — material that helps keep your home cool in the summer and warm in the winter because it resists the flow of heat. Glass fiber is one example of insulation. It should be found in places like behind your walls, underneath your floor and in the attic.

Nonrenewable — fuels that cannot be made (or renewed) in a short period of time. Nonrenewable fuels include oil, natural gas, and coal.

Natural Gas — an odorless, colorless, tasteless, clean-burning fossil fuel. It is usually found in fossil fuel deposits.

Oil — raw material from which petroleum products are made.

Power — the rate at which energy is transferred. Electrical energy is usually measured in watts.

Programmable Thermostat — a thermostat that controls a household's heat or air conditioning temperature. It can be used to keep the temperature lower (70° or lower) in the winter and higher (80° or higher) in the summer while you are sleeping or out of the house.

Renewable — fuels with limitless quantities or that can be used over and over again. Renewable fuels include solar, wind, hydropower, biomass, and geothermal energy.

Solar — the radiant energy of the sun, which can be converted into other forms of energy, such as heat and electricity.

Turbine — a device for converting the flow of a fluid (air, steam, water, or hot gases) into mechanical motion. Turbines can be connected to generators that convert the motion of the turbine into electricity.

Wind — the term given to any natural movement of air in the atmosphere. It is a renewable source of energy used to turn turbines to generate electricity.

Unit One:

ENERGY AT HOME

Overview

Energy At Home...

introduces primary students to energy sources, energy use at home and at school, and energy efficiency and conservation through a series of hands-on activities. The reading and activities in unit one reinforce the concept that energy is what makes everything happen—it powers our lives. We use energy to light, heat, and cool our homes, and to run our appliances. Energy is bought and sold—someone pays for the energy used in each of our homes. When we waste energy it results in higher household energy bills, so when we save energy we also save money.

Energy at Home uses the home as a real-world laboratory. The activities encourage the development of cooperative learning, math, science, art, language arts, technology, social studies and critical thinking skills.

Concepts

- ★ Energy consumption has changed dramatically as the United States has become industrialized.
- ★ We use energy to make our lives more comfortable and easier.
- ★ The climate and the season affect the ways we use energy.
- ★ We use many different energy sources.
- ★ Being aware of the ways we use energy can help us save it.
- ★ Conserving energy saves money and helps protect the environment.

Objectives

- ★ To develop an awareness of the ways energy use changed in the U.S. as the country industrialized.
- ★ To develop an awareness of the ways we use energy and the energy sources we use at home.
- ★ To develop an awareness of the ways we can save energy and the effects of saving energy.
- ★ To encourage family efforts to save energy at home.

Time

This unit can take one - two class periods, plus out-of-class activities and on-going monitoring.

Preparation: 30 Minutes

Familiarize yourself with the reading and activities in the Teacher and Student Guides.

Materials

- ☑ *Energy at Home* (Reading)
- ☑ *Energy At Home Activities: One and Two* (Both activities are included in the Student Guide). The in-class activity, *Energy Hog Buster Home*, is included in the Teacher Guide.

Procedure

- 1) Distribute Student Guides.
- 2) Have students read "Energy at Home" individually, in groups, or out loud in class.
- 3) Begin the activities with **Step One** below.

STEP ONE: ENERGY HISTORY

Have the students **Read the section, "Energy History", on page 4 of the Student Guide** or read along with them using the Teacher Guide (p. 7). Using the discussion topics provided on page 7 of the Teacher Guide, lead a discussion.

STEP TWO: HOW DO WE USE ENERGY?

Have the students **Read the section, "How Do We Use Energy?", on page 4 of the Student Guide** or read along with them using the Teacher Guide (p. 7). Using the discussion topics provided on page 8 of the Teacher Guide, lead a discussion.

STEP THREE: LOOKING FOR ENERGY HOGS IN YOUR HOME

Have the students **Read the section, "Looking For Energy Hogs In Your Home", on pages 5 of the Student Guide** or read along with them using the Teacher Guide (p. 8). Using the discussion topics provided on page 8 of the teacher guide, lead a discussion.

STEP FOUR: WHERE DO WE GET ENERGY?

Have the students **Read the section, "Where Do We Get Energy?", on pages 5-6 of the Student Guide** or read along with them using the Teacher Guide (p. 9). Using the discussion topics provided on page 9 of the Teacher Guide, lead a discussion.

STEP FIVE:

After the students have completed the reading and discussion, play **Energy Hog Jeopardy** to reinforce what they have just learned. (Note: Instructions provided on page 10 of the Teacher Guide. Before class, make an overhead using the master provided on page 11.)

STEP SIX:

Go to pages 7–8 of the Student Guide – Activity One: Explain the activity to the students and have them complete the **Energy Hog Scavenger Hunt** with their families as homework. Discuss the results in class.

STEP SEVEN:

Go to page 9 of the Student Guide – Activity Two: Have the students complete the activity, **Busting the Energy Bill**, in class or as a homework assignment. Students can work individually or in groups. Discuss their results. **Answers:** 1) 891, 2) 330, 3) 264, and 4) 165

Step Eight:

Go to page 12 of the Teacher Guide – Energy Hog Buster Home: Explain this activity to the students using the instructions provided on page 12 of the Teacher Guide. On a separate piece of paper, have each student write a paragraph for each statement provided. On another piece of paper, have each student draw his/her own energy efficient home. Use the drawing provided as an example. Divide younger students into groups to design a home together.

STEP NINE:

Homework: Energy Hog Buster Pledge (page 10 of Student Guide) – Have the students take the pledges home and instruct each of them to write a paragraph with his/her family on what they plan to do to save energy at home. Instruct them to have each family member sign the pledges, then bring them back to school. After you and the class have looked at the pledges, have the students take their pledges home to place on their refrigerators.

STEP TEN:

Want to do more? Check out the extension activities on page 14 of the Teacher Guide! And don't forget to fill out the evaluation on page 15 of the Teacher Guide and then send it in to the address provided.

Unit One: Energy at Home

Energy History

A long time ago, the Native Americans (Indians) used **biomass** for energy. Biomass is anything that was alive a short time ago, like plants and animals. They burned wood (biomass) to cook food and warm their homes. Sometimes, they burned dried animal dung (biomass).

The sun gave them light in the day. Their fires and the moon and stars gave them some lights at night.

Some Indians lived in tents made of animal skins, called **teepees**. Others lived in rock and mud homes or in caves. Some of the caves were deep in the earth. These caves were warm in the winter. Heat from inside the earth—**geothermal energy**—kept them warm.

Then new people, known as the early settlers, arrived in America. They traveled on boats with sails. The sails captured the energy in the **wind** and pushed their boats to the New World.

The settlers built houses out of wood—**biomass**. They burned wood to keep warm and cook their food. They had no fans or air conditioners to keep them cool in hot weather.

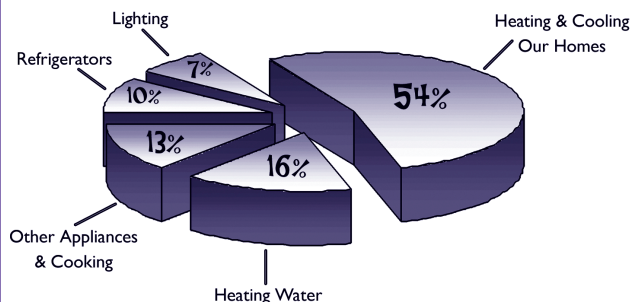
The settlers didn't have light bulbs back then, so they made candles from animal fat to see in the dark. Most settlers rose at dawn and went to bed when the sun went down.

The settlers used water wheels to capture the energy in moving water—**hydropower**. They were able to run sawmills to cut wood by using hydropower.

As the nation grew and became more industrialized, people learned to use different energy sources, such as coal, oil, and natural gas to make heat and electricity. Electricity changed people's lives. For the first time they could use light bulbs to see at night. Later, scientists learned that uranium from inside the earth could be used to make **nuclear energy** by splitting atoms. Today, many different sources of energy are used to make electricity. We use electricity because it is a safe, easy way of using energy.

Discussion - Energy History

- ★ Q: What is industrialization and how did it change America's demand for energy?
- ★ Q: What would your life be like if you didn't have any modern day energy?
- ★ Q: What things would you miss most without electricity?



How Do We Use Energy?

We need energy to live. Think about what you did from the moment you woke up today until now. You probably used energy to turn on the lights, heat your shower water, listen to music on the radio, or cook your breakfast.

You use energy in the winter to heat your home, and energy in the summer to cool your home. Think about how

much heat people in Alaska need to stay warm in the winter! Think about how much air conditioning people living in Florida need to stay cool in the summer!

The more energy you use, the more it costs. Energy bills show how much energy you use every month and how much money your family pays for that energy.

It takes a lot of energy to heat and cool our homes, and to heat water. Look at the pie chart to see how the average home in the United States uses energy.

Unit One: Energy at Home

Discussion - How Do We Use Energy?

- ★ Q: In what months of the year do you think your energy bills are the highest?
- ★ Q: How do weather changes affect how much energy you use?
- ★ Q: What are some other ways that your family uses energy in your daily life?

Looking For the Energy Hogs in Your Home

The more energy you use at home, the more money you pay. An Energy Hog is anything that wastes a lot of energy, like an old refrigerator running in the garage or basement. If your family uses a lot of energy, you might have Energy Hogs in your home! An Energy Hog might also be a drafty window that lets cold air sneak in, or an attic that doesn't have enough insulation. There may be other things in your home that use energy all day long. Did you know that even when you are not using the DVD player and VCR, their little bright clocks still use energy? You can help your family save energy by learning about Energy Hogs and how you can bust them. When you save energy at home, your energy bills are lower, and this helps your family save money.

At home, this means doing things like turning off lights and appliances when you are not using them, and taking shorter showers. This also means setting the thermostat at 70 degrees Fahrenheit or lower during the colder seasons when you want to heat your home and setting it at 80 degrees Fahrenheit or higher in the warmer seasons when you want to cool your home. Using a programmable thermostat makes this job easy. You can also use energy-saving compact fluorescent light bulbs (CFLs) instead of the "old-fashioned" incandescent light bulbs. Your family can caulk or weatherstrip around windows to stop air leaks. Your home should have plenty of insulation in the walls and in the attic. Your family can replace old, worn-out appliances with energy efficient ones that have the ENERGY STAR® label on them.

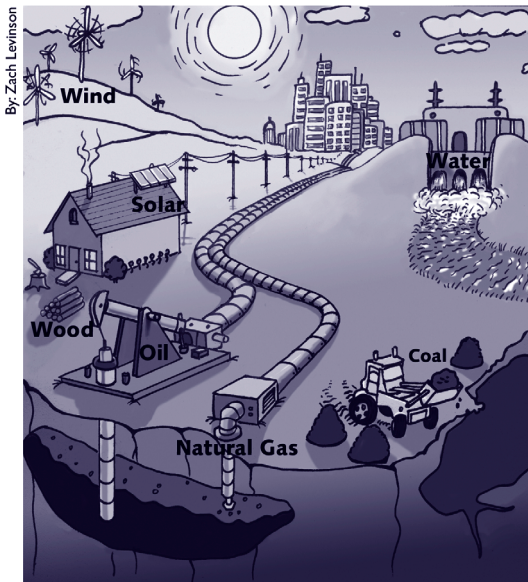
Remember, watching out for the Energy Hogs in your home is easy and fun when you're energy smart. Saving energy will save your family money and help the environment too!

Discussion - Looking For the Energy Hogs In Your Home

- ★ Q: Can you think of other ways to save energy in your home?
- ★ Q: What is "insulation" and where is it found in your house? A: Insulation can be made from a variety of materials; it usually comes in four types—batts, rolls, loose-fill, and rigid foam boards. Typically, insulation is found in walls, in the attic, in floors and in the basement or crawl space. A properly insulated home offers many benefits—it keeps your home cooler in the summer and warmer in the winter. Because insulation saves energy, you may see savings on your energy bills.
- ★ Q: What is "weatherstripping"? What is "caulk"? A: Weatherstripping looks kind of like tape and caulking looks a lot like glue. Both are designed to seal gaps or spaces where energy is leaking from your home - most often around doors and windows.
- ★ Q: What is a "programmable thermostat"? A: A programmable thermostat helps you save money and keep your home comfortable by automatically adjusting your temperature settings while you are asleep or away.
- ★ Q: What are "compact fluorescent light bulbs (CFLs)"? A: CFLs last up to 10 times longer, use about 1/4 the energy, and produce 90% less heat, while producing more light per watt than old fashioned incandescent light bulbs.
- ★ Q: What is "ENERGY STAR®"? A: Energy Star is a government-backed program that assigns energy efficiency ratings to products. Purchasing Energy Star rated appliances like refrigerators, and other products such as programmable thermostats, can save you money on your energy bills.
- ★ Q: Why is it important to save energy? What are the benefits?

Unit One: Energy at Home

Where Do We Get Energy?



Can you find the seven sources of energy?
Label each one!

Before we can use energy in our homes, we need to get it from somewhere. So where do we get energy? Some is found underground and some is found above ground. There are two main categories of energy sources: nonrenewable and renewable.

NONRENEWABLE: Coal, oil, natural gas, and uranium are found underneath the ground. Coal, oil, and natural gas came from dead plants and animals that lived a long time ago, and decayed under pressure deep inside the earth. They take millions of years to form. We can dig them up or put a long pipe into the ground to remove them. We call these sources of energy nonrenewable. Once we use them, they are gone forever. In the United States, 92 percent of the energy we use comes from nonrenewable energy sources.

RENEWABLE: Scientists have figured out ways to make energy from moving water (hydropower), the sun (solar power), the wind (wind power), and plants (biomass). We call these sources renewable because we will never run out of **them**. The

sun gives off energy that travels to earth as light with a range of wavelengths. Long wavelengths turn into heat when they touch the earth. By using technology like solar panels, we can capture the energy from the sun and turn it into electricity. Wind turbines capture the energy in the blowing wind. Dams are used to get energy from moving water. You can feel the heat energy coming out of wood when it is burned. In the United States, 8 percent of our energy comes from renewable energy sources.

Some energy sources change the environment more than others. Coal and oil, for example, can pollute the air when they are burned. Wind turbines do not pollute.

Some energy sources cost more than others. Some renewable energy sources can cost more money. For example, solar panels are very expensive, even though sunshine is free.

Discussion - Where Do We Get Energy?

★ Q: What are some different energy sources?

★ Q: How does energy get to your home? A: Natural gas and oil move through pipelines underground; coal is moved on trains and trucks; wind and solar are converted into electricity that travels through power lines underground or above ground (electric lines attached to power poles).

★ Q: What is the role of the sun? A: The sun is the major source of energy for changes on the earth's surface. The sun's energy arrives on earth as light with a range of wavelengths. Long wavelengths turn into heat when they touch the earth. Hot air rises, creating wind energy. Fossil fuels were once living plants and animals that wouldn't have lived without the sun.

Energy Hog Jeopardy INSTRUCTIONS

Overview

The questions in the game will help students think critically about their knowledge of energy and reinforce what they learned from reading **Unit One: Energy at Home**.

Preparation: 30 minutes

Familiarize yourself with the game categories, questions and answers. Make an overhead transparency of the game board provided on page 11 of your Teacher Guide. Cover the answers with slips of paper that can be easily removed (Post-Its® work very well).

Playing the Game

Have the students play as individuals or in teams. If playing in teams, each team should select a spokesperson to signal and answer the questions. Share the following rules of the game:

- ★ One student or a team begins the game by selecting an energy topic and a clue in numerical order, beginning with 100. Example: "Energy Hog or Not for 100."
- ★ The clue and the topic provide the information for the answer, which must be posed in the form of a question. Example: Topic - Sources of Energy for 100. Clue - We will eventually run out of this kind of energy. Answer - "What is nonrenewable?"
- ★ When the topic and number are selected the teacher reveals the clue and reads it. Students raise their hands if they believe they know the question. The first student or spokesperson to raise his/her hand gets to pose the question. If the question is correct, the points are awarded and the student gets to choose the next clue. If the question is incorrect, the points are subtracted and a different student or team is chosen to pose the question. If the question is correct, the points are awarded and the student chooses the next clue.
- ★ When the first topic is complete students can select another topic. Students and teams are required to keep track of their points. You can award prizes to top performers; or try applying the total winning points as \$\$\$ saved on home energy bills and suggest that those savings can buy new games for their X boxes, or more trips to the movie theatre.

ANSWER KEY FOR Energy Hog Jeopardy GAME BOARD

	Sources of Energy	Energy Hog or Not	Household Energy Use	Busting Energy Hogs
100	What is Nonrenewable Energy?	What is an ENERGY HOG?	What is the Furnace (or Heating)?	What is Insulation?
200	What is Renewable Energy?	What is an ENERGY HOG?	What is the Refrigerator?	What are Compact Fluorescent Light Bulbs?
300	What is Natural Gas?	What is NOT?	What is Insulation?	What is the ENERGY STAR® Symbol?
400	What is Hydropower?	What is NOT?	What is Electricity?	What is Using Caulk or Weatherstripping?

Energy Hog JEOPARDY Game

	Sources of Energy	Energy Hog or Not	Household Energy Use	Busting Energy Hogs
100	We could eventually run out of this kind of energy.	A really, really old refrigerator.	In the winter, this uses the most energy in your home.	A great way to bust Energy Hogs at home is to add more of this to your attic.
200	This kind of energy lasts forever.	A house without insulation in the walls and attic.	Of all kitchen appliances, this one is the biggest Energy Hog (uses the most energy).	Old fashioned light bulbs waste energy in the form of heat. These new ones are cool!
300	This nonrenewable energy source is used to heat more homes in the U.S. than any other source.	A refrigerator with an ENERGY STAR® label on it.	The more of this stuff you have inside your walls, the lower your energy bills will be.	When buying a new TV, VCR, computer, dishwasher, or refrigerator, what symbol means that it is NOT an Energy Hog?
400	The energy in water flowing through a dam is used to make electricity.	A house with plenty of insulation in the attic.	Things that are "plugged in", like a computer or a lamp, need this kind of energy to work.	Energy Hogs sneak into homes that have small gaps around windows and doors. You can keep them out by doing this.

Energy Hog BUSTER HOME

Overview

Students design an energy efficient home. This activity helps them think about where they get energy, how energy is used, and how they can save energy at home. By drawing and describing their homes, critical thinking, creativity, art and writing skills are reinforced.

Preparation: 5 minutes

Look at the example of the home and be prepared to help students incorporate energy saving measures into their drawings (students should list all of the energy saving measures in their drawings).

Materials

At least two pieces of paper per student. Pencils, crayons, or markers.

Activity

Step 1: On the first piece of paper, have students write a paragraph for each statement below. (Note: There are many ways to answer the following. Students should think about energy sources too.)

1. To keep the temperature in my home comfortable I'll (examples: add insulation, use a programmable thermostat)
2. My home's energy will come from... (examples: sun, natural gas, oil)
3. For light, I'll use... (examples: compact fluorescent light bulbs, sun)
4. To heat water, my home will use... (examples: sun, natural gas, oil)
5. To cool my home, I will use... (examples: ceiling fans, close window coverings during the day)

Step 2: On the second piece of paper have each student draw a picture of his/her energy efficient home. **Don't forget to draw in the insulation!**

This is my energy-saving home:



1. A ceiling fan is used instead of air conditioning and a tree provides shade.
2. Blinds and curtains are on the windows. During warmer months, I can close the blinds and curtains during the day to keep my home cool. During colder months, I can keep them open during the day to let in the sun.
3. I am using a compact fluorescent light bulb in my lamp.
4. I have an Energy Star rated refrigerator.
5. When my family cooks we leave the lids on pots and pans.
6. I have insulation in the walls and attic.
7. The Energy Guide label on my water heater tells me that it's efficient.

Unit Two:

ENERGY HOG MEDIA CENTER

Overview



The Energy Hog campaign was developed by the Ad Council, the creators of Smokey Bear and other famous campaigns. This campaign features a dastardly new character, the Energy Hog, who puts an exciting face to the invisible concept of energy waste. The Energy Hog takes a topic of low interest and makes it fun for children, while empowering them to take the lead at home in inspiring their parents to make wise energy choices. By logging onto www.energyhog.org students can learn why it's important to save energy and how they can be more energy efficient by playing five fun, interactive games. If they win all five games, they will earn their Official Energy Hog Buster certificates.

Time

Make sure that each student has 15 to 20 minutes to spend on www.energyhog.org.

If set up in a library or computer lab on multiple computers, the Energy Hog Media Center activity should only take one—two class periods.

If set up in a classroom on a single computer, the Energy Hog Media Center activity will take up to a week.



Preparation: 30 minutes

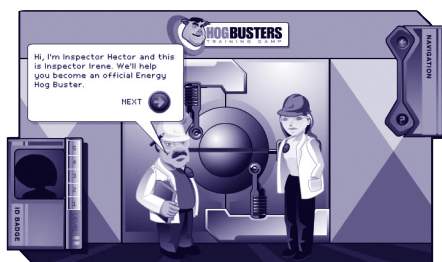
Set up the website either in your classroom or schedule time to access the site in the library or computer lab. Familiarize yourself with the website in case students have questions about the content and games on the site.

Materials

- One or more computers set up in a classroom, library or computer lab.
- Student Guides

Procedure

1. Each student should be able to spend 15 to 20 minutes on www.energyhog.org.
2. After the students have completed their time on the website, lead a discussion about what they learned from the website and what they liked the most.



3. Assign the students to choose one of the following activities:

- ★ Write a short story about being an Energy Hog Buster in your own home and incorporate one idea or lesson from the website, including what you learned from it.
- ★ Create a poster, PowerPoint presentation, or song depicting your favorite game incorporating what you learned from that game and what it means to be an Energy Hog Buster.

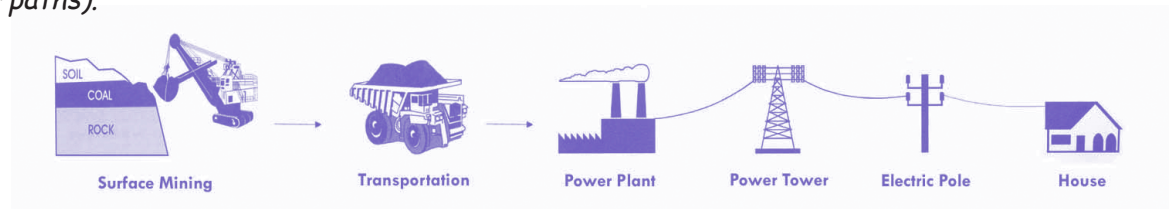
Energy Hog Challenge EXTENSION Activities

To expand the Energy Hog Challenge we recommend that you do the **Extension Activities** outlined below. In addition, do the "Building Buddies", "Monitoring and Mentoring", "Energy House", "Energy Conservation Contract", "Insulation Race" and "Today In Energy" activities available through the NEED Project and online at www.energyhog.org (teachers page).

The Power Path: How Energy Gets to Our Homes (Skills: critical thinking, research, creativity)

- ♦ This extension activity is highly recommended to further the education and knowledge base of energy, the different sources of energy, and how energy gets to our homes.
- ♦ Divide students into groups of five. Assign each group an energy source (coal, oil, natural gas, solar, wind and hydropower). Instruct each group to research how its source is found, harvested, transported, processed, converted, and used in homes. Each group constructs a Power Path for its source.
- ♦ Students can use magazines, the Internet, books, markers, crayons, paint and more to create their power paths. The power paths can be displayed on posters on classroom or school walls.

Example of a basic power path for coal (please encourage your students to be more creative with their paths).



Insulation Race (Skills: measurement, math, writing, critical thinking)

Students examine the relationship between materials and heat transfer. They use thermometers to help them understand conduction and the best insulation for saving energy. The **Insulation Race** can be downloaded at www.energyhog.org (teachers page).

Press Conference (Skills: communication, writing)

Do you want to involve the entire school in your **Energy Hog Challenge** project? Consider holding a press conference to let everyone know about the project.

VIP (school principal, mayor, or congressional representative) (Skills: communication, writing, critical thinking)

Brainstorm VIPs that the class might be able to enlist in your efforts and have them sign an Energy Hog Buster Pledge. Students can also write a letter to a congressional representative or the President and explain what the class is doing to raise energy awareness in your community. Enclose the results of your efforts.

Morning Awareness Campaign (Skills: writing, public speaking)

Have each student write a tip for saving energy at home and at school. Have one or two of the students read their tips each morning. Example: "Good morning "x" Middle School! This is a special announcement from Energy Hog Busters Julia and Zach. The tip for today is: save energy at home by making sure to turn off the TV when you're not watching it. And you can be an Energy Hog Buster too, by going to www.energyhog.org. Thanks everyone, have a great day!"

Each student should have the chance to give the announcement and the tips should change each day.

Energy Hog CHALLENGE EVALUATION FORM

State: _____ Grade Level: _____ # of Students: _____

- | | | |
|--|-----|----|
| 1. Did you conduct all of the activities for the Energy Hog Challenge? | YES | NO |
| 2. Were the instructions clear and easy to follow? | YES | NO |
| 3. Did the Energy Hog Challenge meet your academic objectives? | YES | NO |
| 4. Were the activities age appropriate? | YES | NO |
| 5. Were the allotted times sufficient to conduct each activity? | YES | NO |
| 6. Were the activities easy to use? | YES | NO |
| 7. Was the preparation required acceptable for each activity? | YES | NO |
| 8. Were the students interested and motivated? | YES | NO |
| 9. Was the energy knowledge content age appropriate? | YES | NO |
| 10. Would you use the Energy Hog Challenge again? | YES | NO |

How would you rate the Energy Hog Challenge activities overall?

Excellent Good Fair Poor

How would your students rate the Energy Hog Challenge activities overall?

Excellent Good Fair Poor

What would make the Energy Hog Challenge more useful to you?

Other Comments:

Please Fax or mail to:

Energy Outreach Colorado ♦ 225 E. 16th Avenue ♦ Denver CO 80203 ♦ Fax: 303-825-0765

The Energy Hog Challenge is Supported By:



Energy Outreach Colorado



National Fuel Funds Network

Alaska Energy Authority

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Arkansas Department of Economic Development, Energy Office

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Georgia Environmental Facilities Authority

Guam Energy Office

Kansas Corporation Commission Energy Office

Kentucky Division of Energy

Louisiana Department of Natural Resources

Maryland Energy Administration

Minnesota Department of Commerce, State Energy Office

Missouri Energy Center

North Dakota Department of Commerce

New Mexico Energy, Minerals and Natural Resources Department

Nevada State Office of Energy, Office of the Governor

Ohio Department of Development, Office of Energy Efficiency

Oklahoma Department of Commerce, State Energy Office

Texas State Energy Conservation Office

Utah Energy Office

Virginia Department of Mines, Minerals and Energy

Wyoming Business Council

Tracy Locke and the Ebeling Group/Lobo are responsible for the creation and production of the Energy Hog.