



# SOLAR ENERGY FOR THE CLASSROOM



Provided by Pierce Cedar Creek Institute  
www.cedarcreekinstitute.org

## Activity Overview

Grade Level: 6-8

### General Description

During these activities, students will discover how much electrical energy their families use in their homes and will learn the importance of conserving energy through brainstorming, classroom discussion, debate, family surveys, and on-line interactive games and quizzes.

### Learning Outcome

Students will develop a higher level of energy awareness and will better understand the major impact that their own behavior has on local conservation efforts. Students will also learn how to become good consumers of electricity.

### Science Content Standards

Content Area: Constructing New Scientific Knowledge (C) I.1.1

Standard: All students will generate scientific questions about the world based on observation.

Content Area: Constructing New Scientific Knowledge (C) I.1.5

Standard: All students will use sources of information in support of scientific investigations.

Content Area: Reflecting on Scientific Knowledge (R) II.1.4

Standard: All students will describe the advantages and risks of new technologies.

Content Area: Reflecting on Scientific Knowledge (R) II.1.5

Standard: All students will develop an awareness of and sensitivity to the natural world.

Content Area: Ecosystems (LEC) III.5.6

Standard: All students will describe ways in which humans alter the environment.

## Energy Conservation in Our Homes

### Background

Energy is more than numbers on a utility bill; it is the foundation of everything we do. All of us use energy every day-for transportation, cooking, heating and cooling rooms, manufacturing, lighting, and entertainment. We rely on energy to make our lives comfortable, productive, and enjoyable. To maintain our quality of life, we must use our energy resources wisely.

The choices we make about how we use energy-turning machines off when we're not using them or choosing to buy energy efficient appliances-impact our environment and our lives. There are many things we can do through energy conservation and energy efficiency to use less energy and use it more wisely.

Energy conservation is any behavior that results in the use of less energy. Energy efficiency is the use of technology that requires less energy to perform the same function. A CFL that uses less energy than an incandescent bulb to produce the same amount of light is an example of energy efficiency. The decision to replace an incandescent light bulb with a CFL is an example of energy conservation. As individuals, our energy choices and actions can result in reductions in the amount of energy used in all sectors (residential, commercial, industrial, and transportation) or the economy.

### Materials

- Paper
- Pencils
- Poster board (one per student work group)
- Markers
- Internet access (not necessary for all activities)



# SOLAR ENERGY FOR THE CLASSROOM

---

## Methods

### Home Energy Survey

1. The class brainstorms a list of product categories that use electrical energy. Volunteers will check the yellow pages for the number and variety of sub-headings under the heading “Electrical.” Students then discuss and define terms such as Energy Hog, energy efficiency, and vampire devices—items that are always plugged in using a small amount of current. Students then each make a list of all items which use energy in their home with items listed under the category by room where it is found (i.e. KITCHEN: toaster, microwave, stove, BATH: hair dryer, curling iron, electronic toothbrush, LIVING ROOM: TV, stereo, overhead lights, lamp, air conditioner).
2. Students are asked to complete a chart covering 7 days of electric usage in 1 room of their home. Name the room at the top of the chart, then make a list of all energy-using items in that room. Indicate whether the item is plugged or unplugged during non-use, and an approximate amount of time the item is used each day for one 7-day period. Have students make one column for vampire devices.
3. Students can then ask their parents or grandparents which of these items were used and not used in the home when they were the student’s age. Students compare the differences and put P by the items parents had and G by the items grandparents had. Each student compares differences and determines how home energy use has changed over time.
4. Students chart individual findings, and share this information with their Energy Team members.

### Creating an Energy Efficient Home

1. The entire group will answer the question: Why should we care about energy efficiency? Put the answers in a list and post the list for all to see.
2. Within a small group, students will design a large poster of one room in a home
3. The poster will include all of the items that this room may have, in normal circumstances, that use energy. Each finished poster will be displayed in the classroom.
4. Within their Energy Teams, students will have 5 minutes to visit each poster station, and brainstorm ways energy is possibly wasted. They list ways to reduce energy use and cost without major changes in lifestyle (such as sitting in the dark) in each particular room.
5. The team earns a Team Energy Saver Star point for each energy saving behavior or action listed.
6. These lists will then be presented to the entire class, and a classroom chart will be created.
7. The chart will be divided into two parts. One side will have a list of energy saving ideas, and the other side will show a list of how energy is wasted (i.e. Energy Savers: turn off the television when you leave the room, Energy Wasters: stand in front of an open refrigerator looking for a snack).
8. The chart is copied for each student for a take-home activity (See *Becoming and Energy Saver Star* activity).



# SOLAR ENERGY FOR THE CLASSROOM

---

## Becoming an Energy Saver Star

1. Students take home the “creating an energy efficient home” lists of ways energy is wasted and how to save energy. They will share it with their family.
2. For one week, students will write down each energy saving behavior, and receive Energy Saver Star points for their family.
3. The family will discuss how they could implement more saving energy ideas in their home to earn more points.
4. Students make a sign near each appliance and light switch for family members to record a point each time they perform an energy saving behavior (i.e. turn off the light, TV, and computer when leaving the room).
5. The family will begin to implement some of these energy saving ideas. Each week the student will keep a list to see if their points have increased.
6. The checklist can be expanded to include energy saving ideas that do not directly use electricity in their home (i.e. recycling, buying food with less packaging, etc.).

## Smart Buying Behavior

1. Class creates a definition of term “hidden costs” of items and gives examples (i.e. remote-control car that requires batteries, coat that requires dry cleaning, clothes that require special detergent, autos that require oil changes and replacement tires, pools that require cleaning and chemicals, lamps that require bulbs, tennis racquet that needs restringing).
2. Which hidden costs in the examples are also normal maintenance? Which can be unusually costly?
3. Group narrows focus to examples of electrical products that have hidden costs. Introduce and explain the ENERGY STAR® label, sponsored by the Environmental Protection Agency (EPA) and the Department of Energy (DOE).
4. Display and discuss incandescent bulbs and compact fluorescent lights. If he visited us today, what would Thomas Edison likely say about the fact that his basic incandescent bulb technology changed very little and is still used in millions of homes today? (Note: the light is a mini heater). Group gets in Energy Teams to compare incandescent and compact fluorescent lights in design differences, price, cost to run (hidden cost), expected life span, merits, and drawbacks (See Activity 6a).
5. Energy Teams make a poster to illustrate the findings and give presentation to the class.
6. Ask the class to list examples of places they would likely use incandescent light bulbs and places they would likely use compact fluorescent lights. Call on individuals to read lists and explain reasoning.



# SOLAR ENERGY FOR THE CLASSROOM

---

7. DEBATE: Have volunteers participate in a debate over which gets more energy savings: human behavior or energy efficient products? Once a panel has argued one side of the question, they must then re-debate supporting the other side of the question.
  - a. Behavior viewpoint: to get the most efficiency from electricity, we should put the most time, money and effort into teaching energy efficiency behavior to people.
  - b. Product viewpoint: to get the most efficiency from electricity, we should put the most time, money and effort into getting energy efficient products for people to purchase.

## Family Home Energy Quiz

Take this online quiz to help you find ways to make your home more energy efficient.  
(Developed by Energy Smart Schools, U.S. Department of Energy)

<http://www.rebuild.org/sectors/quiz/quiz.html>

## Energy Hog

Try this online, interactive educational Web site that encourages students in grades 3-7 to become Energy Hog Busters, teaching them about energy efficiency. (Developed by the Advertising Council and Energy Outreach Colorado)

<http://www.energyhog.org/>