
ENERGY SMARTS TEAM

Training Manual

A teacher's guide to energy
conservation activities for grades 3-8

*Adapted by Oregon State University Extension Energy Program
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Bonneville
POWER ADMINISTRATION



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his manual was written for the Oregon State University (OSU) Extension Service by John Bezelj, resource conservation teacher on special assignment in Eugene, Ore. It describes training Bezelj gives to 4th and 5th grade classes to help them monitor and reduce their school's energy use. Additional activities in the manual are appropriate for grades 3-8.

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Introduction

The Energy Smarts Team



Energy Smarts Team members are energy conscious students who want to save energy at school and at home. Students in a classroom and their teacher form an *Energy Smarts Team*. Selected students monitor their building each day, at recess, lunch, or after school.

Energy Smarts Team members hope to find everything dark and quiet. They dislike energy waste and make sure that lights and equipment not used are turned off. *No, they don't unplug refrigerators or incubators.*

However, they do turn off lights, overhead projectors, radios, or other unused electrical gizmos they come across during their search.

They leave gentle reminders with offenders and positive notes with those who watch their watts. They keep careful records to document progress. They regularly recognize rooms with perfect records.

School District 4J in Eugene, Ore. began its aggressive energy conservation program in 1987. The school district has achieved significant savings by installing energy efficiency measures, including behavioral conservation activities. The *Energy Smarts Team* program, called *Watt Watchers* in Eugene, has brought an awareness of resource conservation to students and staff and has encouraged students to make a significant difference in reducing energy consumption at their school.

From this program and other conservation efforts, the Eugene School District saved more than \$271,000 in avoided energy costs during the 1991-92 school year.

The *Energy Smarts Team* program has been instrumental in empowering students and staff to start thinking about using resources wisely. It provides activities for students to observe firsthand their school's energy consumption. The program not only draws attention to a school's energy use, but also illustrates the cost of that valuable resource.

Who Are Energy Smarts Team Members?

Energy Smarts Team members are *responsible* students who work *independently* as well as part of a *team*. Teachers choose team members.

What do they do?

Energy Smarts Teams monitor their school to help conserve energy. Each *Energy Smarts Team* has an assigned area in the school.

Energy Smarts Teams patrol the school checking for unnecessary lights and other wasted energy. They sometimes keep track of how much energy their school uses and how much that energy costs.

How do they work?

Energy Smarts Teams keep a log where they record when lights and other electrical equipment have been left on or turned off in empty rooms. If people in a classroom, work area, or office have forgotten to turn off the lights, the *Energy Smarts Team* member leaves a friendly reminder "ticket" to help them remember the next time. A "Thank You" note is left when people in the area have remembered to turn off lights and other equipment.

Energy Smarts Teams are important because:

- The money your district is spending for lights and equipment left on in empty rooms could be put to better use for educational purposes.
- Using resources wisely is part of being responsible and taking care of where you live.
- *Energy Smarts Teams* are fun and give students an opportunity to contribute to their school and learn about using resources wisely.

Energy Smarts Team Purpose and Procedures

The purpose of *Energy Smarts* Team training is to provide students with tools and information they need to effectively monitor energy use within their school building.

Energy Smarts Team activities build teamwork among participants. They also increase awareness of energy resource issues.

Team members typically monitor the school once a day—during lunch, recess, or after school. They work in pairs—never alone! An adult or experienced team member should accompany each team the first few times it is on duty.

The teacher or designated sponsor provides log sheets (see p. 31) on clipboards and badges (some type of I.D. tags) for team members to wear while on duty.

The school is divided into routes, each including a small number of rooms to monitor.

Each day, four or five teams pick up a clipboard corresponding to their route. The same team might do the same route at the same time for a week. Scheduling is up to the teacher. Log sheets can be altered to meet a teacher's specific needs.

Team pairs pick up their equipment in a specified place, such as the office, and drop it off immediately upon finishing their rounds. It is good to have them check in with an adult when starting and finishing their rounds so someone knows where they are at all times.

Activity Overview

On the following pages is the outline of a program used in Eugene, Ore. to train *Energy Smarts Team* members. The training, as done in Eugene, takes about 2-1/2 to 3 hours.

This manual includes a detailed outline of activities used during the training, plus additional activities.

Depending on your interests and needs these additional activities could be substituted for part of the basic training. Or they can be used during follow-up meetings with your team. You can modify any activity to meet your needs.

Here is a brief overview of each activity in the manual along with a summary of its goal.

***Energy Smarts Team* Pretest/Post-test**

Take a few minutes and find out how much your students already know and help them focus on important concepts. Test again at the end of the training to determine how successful the training has been.

White Water Rafting

An exercise to familiarize students with the idea of simulations. It also serves to loosen up the group.

H.T. Rae Simulation

Builds problem solving and teamwork skills. Begins a discussion and appreciation of finite resources and how they can be managed for the greatest benefit.

Cookie Mining Simulation

A fun exercise that ends with the students being able to eat the cookie. It reinforces the meaning of finite resources and builds an appreciation of different perspectives and the implications they have on management strategies. This exercise provides information that strengthens graphing and math skills.

School Energy Consumption

Starts to build an awareness for how energy is used in a school. It begins to relate energy use to specific activities at the school. The material reinforces lessons relating to graphing and developing different hypotheses.

Electrical Pathways

In this exercise a poster, not contained in this manual, is used to motivate a discussion of how electricity is produced and used. A source for the poster is indicated in the training agenda. Other resources can be substituted for the poster to help motivate a similar discussion.

What's a Watt?

A watt-rate meter is used to measure and compare energy used by typical classroom appliances such as lights, an overhead projector, radio, etc. A watt-rate meter can be made from an old electric meter by retrofitting it with a standard electrical outlet. Local electric utilities often will donate these. This is an excellent tool for demonstrating the effect of different measures such as replacing an incandescent bulb with a fluorescent one. The watt-rate meter also helps students develop a feeling for how much energy a watt-hour represents and the effect their actions as part of the *Energy Smarts Team* can have.

What's a Therm?

Many of the in-school activities focus on lighting, computers, and other equipment that use electricity. As students apply their knowledge at home and as they become more sophisticated at school they will increasingly become involved with space and water heating and with other appliances that may be fueled by natural gas. "What's a Therm?" presents background information and exercises to increase

awareness of gas as an energy resource, how it is measured, and the relationship between it and other resources.

Meter Reading

This is a follow-up activity that helps motivate students to apply their *Energy Smarts Team* training outside of school. After instruction at school, the students are able to read and record their electric and gas meters at home. Following a week or other specified time period, students can compare data. This presents a good vehicle for use of math and graphing skills and for discussions about energy use in their homes. It can be the start of the student becoming *Energy Smart* at home too.

Top Ten Tips to Try to Tame Terrible Temperature Thieves

This activity grew out of an energy-related student poster contest. The poster depicts ten typical actions available to *Energy Smarts Team* members. The graphics have been reproduced in the *Energy Smarts Team Training Manual* along with a short description of the activities. As you and your team discuss them, you may think of other actions that should be added.

***Energy Smarts Team* Procedures and Materials**

These materials provide a starting point for you to work with your team on the steps you want them to take in your building. You are free to use the procedures and materials used in Eugene that are included. You may use them *as is* or customize and improve them based on your experience and setting.

Energy Smarts Team Training Agenda

(If teachers want their students to take the Energy Smarts Team pretest [pp. 11-12], this might be a good time to do it.)

Note: This is the agenda that Eugene 4J School District used for its *Energy Smarts Team* training. The manual includes activities in addition to those described below.

1. Name that energy

Name tag energy introductions. Participants create colorful energy name tags (3 by 5 index cards). Include first name and two energy illustrations. Participants introduce themselves and briefly explain their energy illustrations.

2. Simulations

- **Ask participants to define simulation.**

- **White water rafting simulation.**

To illustrate a simulation, have participants pretend they are white water rafting. Explain that we are going white water rafting and ask them to put on their life jackets, making sure to tie both strings. Demonstrate each part of this simulation in front of the class. Get your oars out and start paddling. Half of the class might paddle on one side and half on another. Don't forget to stop for lunch on a big rock! Paddle around dangerous rocks, and perhaps paddle backwards furiously when you get too near a waterfall.

- **H.T. Rae simulation.**

Divide participants into problem-solving groups and read aloud the H.T. Rae story (p. 14) or show it on an overhead transparency. Encourage groups to suggest possible solutions to the problem presented in the story. Have groups share one or two of their solutions with the rest of the class. Read the ending of the story.

- **Cookie mining simulation.**

See pp. 15-16.

(Possible break. You may want to use this time to tour the boiler room and observe the heating system of the building.)

3. School energy consumption

Show participants how to interpret data on the pie chart (p. 17) and line graph (p. 18). Ask participants to guess what energy uses different slices in the pie chart represent. Also ask them to deduce why electricity use is less during summer months.

4. Electricity pathways

To stimulate discussion about electricity producers, use the *Electricity Serves Our Community* poster available for \$3 each plus shipping and handling from the National Energy Foundation, 5160 Wiley Post Way, Suite 200, Salt Lake City, Utah 84116, telephone 801-539-1406. Emphasize similarities in generation of electricity from many different producers—solar, fossil fuels, wind, hydroelectric, geothermal, and nuclear.

Have participants brainstorm a list of devices at school that use electricity. List them on the chalkboard and categorize them according to use, e.g., electricity used to heat, electricity used to light, electricity used to perform work.

5. What's a watt?

Have participants do activities suggested on pp. 19-20. Use the watt-rate meter to show participants actual electrical consumption of electrical devices such as a 100 watt bulb, compact fluorescent bulb, hair dryer, electric drill, overhead projector, radio, etc. Point out the relationship between electrical consumption and generation of heat. Discuss watt, kilowatt, and kilowatt hours. Calculate the cost of using lights for one year.

6. Energy Smarts Team procedures and agreements

Read and discuss *Energy Smarts Team* procedures and agreements (pp. 29-30). Train participants in how to use the *Energy Smarts Team* log. Make up humorous scenarios to present to participants. Have them mark their *Energy Smarts Team* log appropriately.

7. Tickets and certificates

Make your own "Positive tickets," "Gentle Reminders," and "Perfect Energy User Certificates." (See pp. 32-33 for ideas.)

8. Evaluation.

To close the workshop, use either "What did you learn" questions or the post-test on pp. 27-28.