

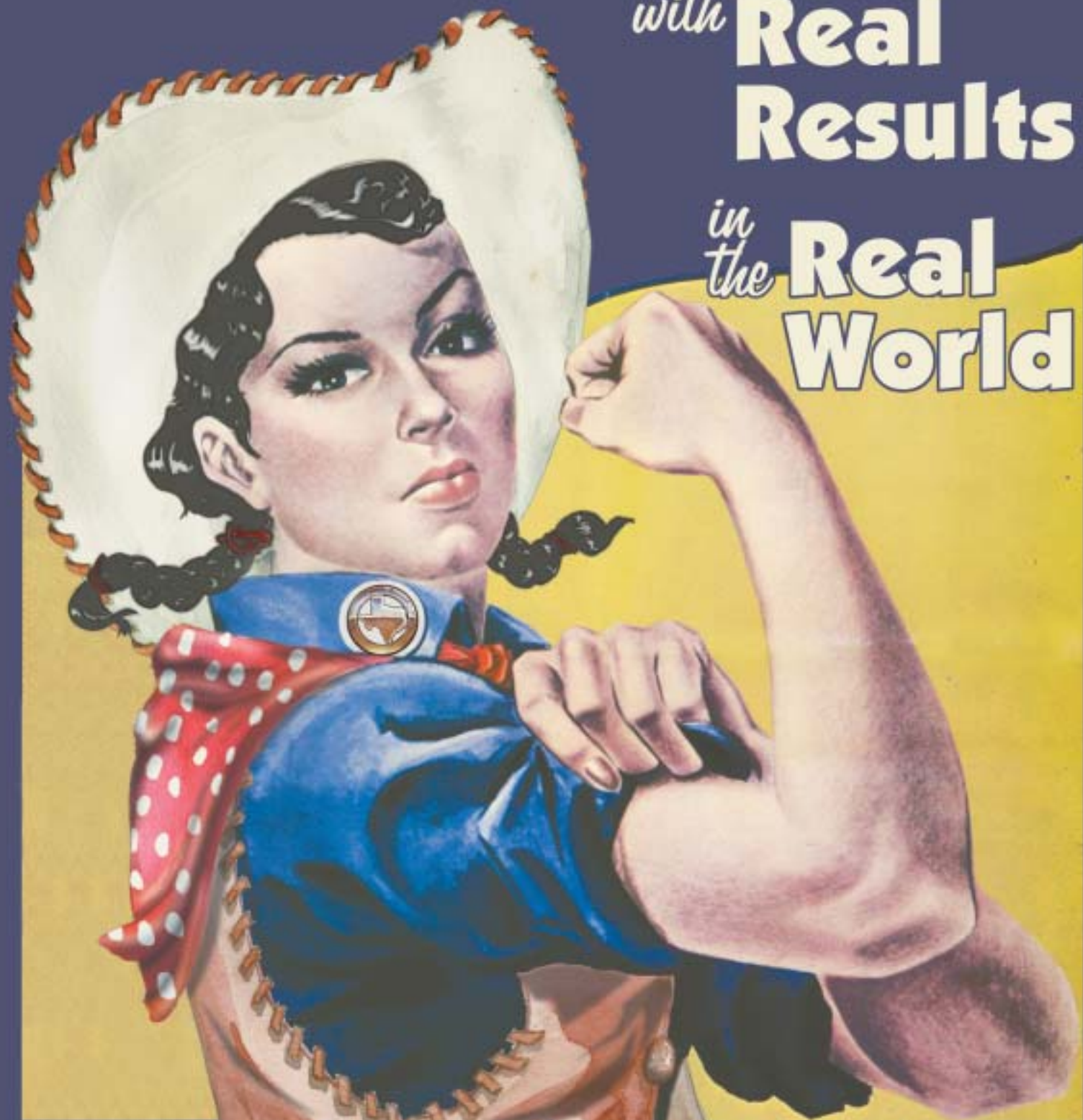
# Real Projects

*with*

# Real Results

*in the*

# Real World



**An Energy Project Handbook  
for High School Groups**

Watt Watchers is a free, state-sponsored program to help schools save energy and money by getting students involved. Students patrol their school looking for empty classrooms with the lights on. They turn out the lights and leave a ticket for the teacher. It may sound trivial but...when the teacher forgets to turn out the lights an extra 2 hours per day, at lunch and after school, for example —it costs the district \$50 every year. Watt Watchers also expand on this basic project in many ways - - see details inside.

Save energy,  
save money,  
and prevent pollution.

"I dare you to step up...

...and do real energy projects.



Watt Watchers of Texas  
University of Texas at El Paso – Energy Center  
P.O. Box 68660  
El Paso, Texas 79968

Toll Free Phone and Fax: 1-888-US-WATTS ● e-mail: info@wattwatchers.org ● Internet: <http://wattwatchers.org>

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Phone: 1-888-US WATTS  
Fax 1-888-US WATTS

Sponsored by:  
The Texas Comptroller of Public Accounts,  
State Energy Conservation Office,  
U.S. Department of Energy





**“Never doubt that a small group of thoughtful, committed citizens can change the world, indeed it’s the only thing that ever has.”**

**Margaret Mead**  
*Anthropologist*



**Real Projects with Real Results in the Real World**

**An Energy Project Handbook for High School Groups**

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**Real Projects**

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Real Projects  
with Real Results  
in the Real World  
An Energy Project Handbook  
for High School Groups



# Introduction

## Real Projects with Real Results in the Real World

**F**rom working with students all across Texas over the years, the staff of Watt Watchers has discovered that student leaders are highly capable and highly motivated. They can make things happen. They do not hesitate to challenge the status quo. And, contrary to conventional wisdom, adults listen to what they say. Yes, your small group of dedicated students can make a big difference in your school and community.

Watt Watchers wants to support strong, self-sufficient, patriotic, and plucky students across Texas who are ready to roll up their sleeves and use their can-do attitudes to help save energy for their schools. This handbook has descriptions of dozens of energy projects for you to consider. Now you can flip through a wide variety of projects to pick and choose the ones that fit your school and community.

It is important for student groups to consider some challenging projects along with the short and simple ones. You can take it up a notch and do projects that will save your school district thousands or even hundreds of thousands of dollars each year. Watt Watchers challenges you to do one major project each semester and to do one short and simple project per month. We dare you to go beyond the usual expectations for students. Be like Rosie. Y'all Can Do It! In fact, we double-dog-dare you to do two major energy projects each semester and two short and simple projects every month. Because we know – Y'all Can Do It! Just like Rosie, you will exceed expectations and change some old ideas.

As you do your projects and impress your school and community be sure to keep in touch with Watt Watchers. We want to celebrate your success by including an article about your project in the next Watts News. Other schools across Texas want to know what's working and how you did it.

Send us stories about your new idea for a project and how you did it. We will publish it and include them in the next edition of Real Projects with Real Results in the Real World. Take credit for your original ideas and spread good project ideas to many other schools. Check our website and CD-ROM for updates to the handbook between printings.

Call or e-mail us if you need help with any of your projects. We can do it.



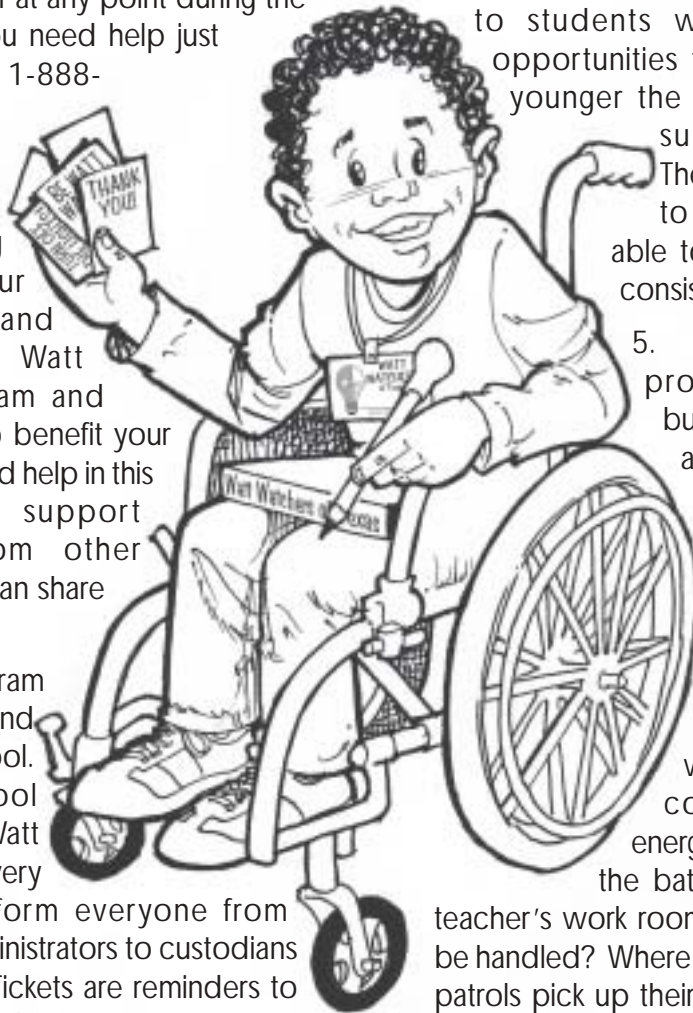
# Watt Watchers of Texas Student Energy Patrols

Watt Watchers of Texas is done by students all across the state from Kindergarten to 12<sup>th</sup> grade. We currently have over 3000 programs in Texas schools – is yours one of them?

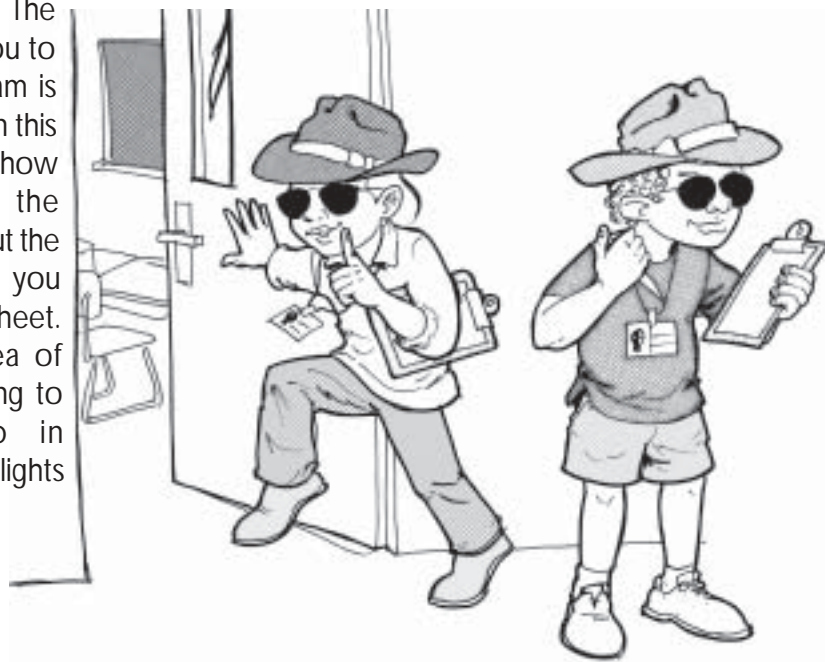
Here are some steps you should take in setting up your program:

1. Contact Watt Watchers and get enrolled! You will receive a free kit that gives you all the supplies you need to run a successful patrol. We also provide free support to your program so if at any point during the setup process you need help just give us a call at 1-888-USWATTS!
2. Get support from the administration. Set up a meeting with your administrators and discuss the Watt Watchers program and how it is going to benefit your school. If you need help in this area we have support information from other schools that we can share with you.
3. Present the program to the teachers and staff at your school. The whole school participates in Watt Watchers and it is very important to inform everyone from teachers and administrators to custodians and volunteers. Tickets are reminders to help people establish energy efficient habits. Enthusiastic and supportive staff makes it more fun and more effective.

4. Choose the students to be on the Watt Watchers Patrol. This program is successful at any grade level and with diverse student populations including at risk, learning disabled, special education, and gifted and talented. Being a member of the Watt Watchers Patrol could provide recognition to students who rarely receive opportunities for leadership. The younger the students, the more supervision needed. The students must want to participate and be able to carry out the tasks consistently and honorably.
5. Develop procedures for your building. Where, when and how often will the Watt Watchers patrol? Which rooms and areas will be included? Will any areas be off limits? Do you want to include doors, windows, ceiling fans, computers or other energy gobblers? How will the bathrooms, stage areas, teacher's work room, offices and closets be handled? Where will the Watt Watchers patrols pick up their supplies? These are all things that you will need to decide before setting up your team of patrols.



6. Set up your Patrol Team. Get excited!! The goals are to help the school reduce energy waste (save money) and to teach every one in the school to be energy efficient (change behavior). It would be appropriate to discuss energy production, fossil fuels, consumption, pollution, waste and high cost while introducing the program. Invite them to count the light bulbs in one room and multiply it by the number of rooms in the school, then add other schools, cities and the whole state! The Watt Watchers of Texas program is based on the idea that each person makes a contribution by helping reduce waste. Energy efficiency benefits people, the school, community, state and planet.
7. Sign Contracts. Being a member of the Watt Watchers of Texas program is a privilege and a responsibility to be taken seriously. Sponsors may want to use the contracts provided in your kit. The contract underscores the importance of being on the team and is a reminder of duties which students must perform.
8. Secret Mission. Shhh. It is time to go on your first mission. Watt Watchers suggest making this mission a secret. The secret mission will allow you to see how much the program is needed in your school. On this mission you will be able to show the students how to do the program without passing out the tickets or thank you notes; you will just mark the check sheet. This will give you an idea of which classrooms are going to need the most help in remembering to turn the lights out!
9. Get started and keep going. Intercom announcements, such as "Watt Watchers are Watching!" arouse the interest before patrols begin. An assembly to introduce the other students to the program can be helpful. Inform the media. Support from the principal keeps interest high: occasional announcements of Watt Watchers patrol results; recognition of rooms/grade levels which have good records; bulletin board displays; energy efficiency competitions between areas; special notes or privileges for winners; and pats on the backs for the patrols and staff are little things which make successful programs.
10. Have questions, need assistance or more materials? Call 1-888-USWATTS or email [info@wattwatchers.org](mailto:info@wattwatchers.org) we would love to help you with your program! Get a Watt Watchers Manual for even more information.



# Alternative Watt Watchers of Texas Program for High Schools

There are many High School Watt Watchers of Texas programs that find it difficult to patrol on a daily basis due to the program being run by an extracurricular group like Student Council or Science Clubs. Watt Watchers has developed a way to make it work in that High School setting.

Your Watt Watchers program becomes an awareness program for your campus and goes beyond turning off the lights. Watt Watchers would like these student groups to do a monthly patrol to see where they stand each month on energy waste – are there lights being left on? Are people changing their behaviors?

With a monthly patrol your student group will be encouraged to put up signs on light switches to remind teachers/students to turn the lights out when they leave the room – these signs should

be changed monthly – so that it continues to catch the attention of the occupant. The signs can be recycled from month to month by simply laminating them and adhering them to the wall or light switch.

We would also like you to post your findings in the school. Give the occupants some feedback on what you are discovering during your patrol time. Percentage of lights left on, percentage of lights left off, money saved by the amount off, money wasted by the amount left on – these are all great examples of how you can make your occupants aware of the energy used/wasted on your campus. Put a dollar amount to it – let the occupants of your school know how much it costs to power your school every month. The amount always amazes people. Chart the decrease in money spent on energy since the implementation of your program. Get the word out on energy – make everyone aware of it.



# Mentoring a Watt Watchers of Texas Program in Your Feeder Schools

Watt Watchers of Texas wants your help in getting all the schools in your district watching watts! The best way for everyone to be eliminating energy waste in their school district is to make sure that the schools that feed into your school are busy watching watts. It is simple, free and fun for high school students to go to the middle schools and elementary schools in your district and share the message about Watt Watchers, take the students on their first patrol and then check up on them from time to time to make sure they are giving out tickets to those energy wasters and thanking the Zero Heroes in their schools.

Follow these 5 simple steps to get your feeder schools started today:

1. Contact a teacher. Did you have a favorite teacher in the elementary school and middle school that you went to before coming to your high school? Is that teacher still teaching at that school? Or is there a science club or other organization in the middle or elementary school that is interested in doing energy projects? Contact that teacher; inform him or her about the Watt Watchers of Texas program.
2. Contact Watt Watchers for a kit. The kits are free and every school that participates in Watt Watchers needs to have a complete kit. Call or email us and we will ship a kit for each school where you are implementing a program.
3. Set up a time to meet the new Watt Watchers. Coordinate a time with the new Watt Watchers of Texas sponsor. Go to the feeder school and teach the students about the new program. Help them come up with ways to teach the other students, teachers and administrators about this new

program at their school. One great idea is to do a skit about the program during an assembly - this allows everyone to learn about the program, have fun and be excited about the energy saving program that is starting at the school.

4. Go on Patrol. Be there to take the younger students on their first Watt Watchers patrol. Help them design their route and make sure they are marking their charts and giving out tickets and thank you notes. Remind the students to keep the charts in a file so that they can award the Zero Hero Award at the end of the school year to the teacher that wasted the least amount of energy!

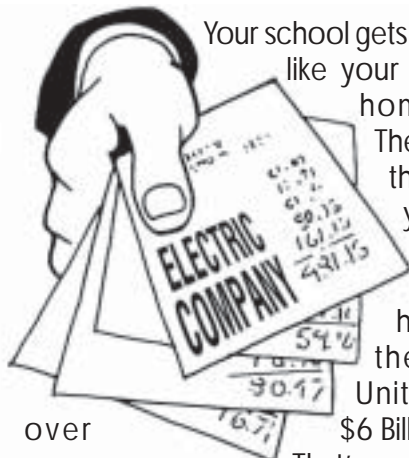
5. Stay in Touch. It is very important that you contact the feeder school to make sure



that their program is running smoothly and answer any questions they might have. Watt Watchers would also like to know how you and your mentoring schools are doing so please send us an update on your program!



# Track Your School's Monthly Energy Savings



Your school gets an electricity bill just like your parents receive at home every month. The main difference in the two bills is that your school's electricity bill is probably really huge. Nationally, all the schools in the United States spend over \$6 Billion dollars per year on energy. That's more than is spent on books and computers combined. An average U.S. school uses \$4,500 per month and large high schools can have electricity bills of \$30,000 per month. The average spent on energy for each student is \$115 each year. How much would that be at your school?

Students, teachers and administrators need to realize the amount of funds that are spent on utilities in your school. Studies have been done on providing feedback to energy users. They indicate that when people know how much they are using they tend to save energy (probably because they are thinking about it rather than operating on "automatic pilot.") A good way to illustrate energy use on your campus is by posting a large banner with a chart of your school's energy use. Chart the dollars of energy used each month. Contact your Energy Manager and ask him/her for a copy of the energy bills.

Once you implement Watt Watchers we would like you to track your school's energy savings and it is a very simple task. Compare current energy use (since you have implemented Watt Watchers) to energy use a year before you started Watt Watchers. The data may not compare directly if the seasons were significantly different for the two years. Ask your Energy Manager about adjusting for weather differences. Chart the bills from last year and this year and post them in your school foyer (or another highly visible place) so that everyone can see the energy savings that you are achieving by simply reducing energy waste.

# Portable Posse Patrols

Portable classrooms can also be known as "Energy Gobblers." Because most of the portable buildings at schools are temporary classrooms they are not connected to the main Energy Management system, which means that each portable occupant is responsible for his or her own thermostat and lighting. Many times these systems are left on at night and over the weekends. Not only are they forgotten about but portables normally are not well insulated which all combines to create a huge waste of energy.

A Portable Posse Patrol could help eliminate that waste by checking the portables at the end of the school day and before the weekends to make sure the thermostats, lights, TV's, computers, and other equipment are turned off.



# Sleep is Good

To implement computer monitor power management in your school, you need to have a few things ready. First, familiarize yourself with the EZ Wizard program. This program, written by Dave Ensign at The Department of Energy, makes enabling monitor power management easy and hassle free. Practice implementing it on your home computer or a computer at school and you will see just how easy it is to implement. Just double click the program, it runs, reads your current settings, suggests new settings (or lets you know that your settings are set correctly already) and 30 seconds later, you are done. If you double click it again, you have the opportunity to change the settings back to their original state.

So, let's get started!!

1. Always get permission from your sponsor or teacher in your school and from the school principal.
2. Announce the program in your school.
  - a. Thoroughly explain the program to the faculty and student body.
  - b. Explain that the monitor is all that will go to sleep and to wake it up, just move the mouse or tap a key and within a few seconds, the monitor will wake up.

3. Find out how many computers there are in your school.
  - a. Figure out how long the project should take assuming that each computer will take approximately 30-60 seconds to implement.
4. Let your teacher know how much time you will need to complete this project and work out an appropriate schedule.
5. Make sure you have all the materials needed to complete this project.
  - a. The Disk or CD with EZ Wizard on it.
  - b. The Frequently Asked Questions – provided to you on your CD or disk.
    - i. This will ensure that you are well equipped to deal with a teacher or administrator that does not see the benefits of EZ Wizard.
  - c. The Fact sheets to show how much money EZ Wizard will save for your school.
    - i. The on-line calculator is especially helpful when figuring monetary savings for your schools. (<http://www.energystar.gov/powermanagement>)
  - d. Bring the Watt Watcher handouts that illustrate manual implementation of power management for those teachers that would rather do it themselves. (See the Watt Watchers website for more information: <http://wattwatchers.org/newwwsite/sig.htm>)
6. Do not forget your pledge form.
  - a. Watt Watchers pledged to help K-12 schools implement power management on 100,000 computers across Texas. Help us by filling out your pledge and faxing it to us at 1-888 US WATTS. Sending in your pledges will ensure that we recognize you and your school for your efforts during our 100,000 Monitor Pledge in Texas.





Watt Watchers 200,000 Monitor Pledge Form for:  
Energy Star® Million Monitor Drive Pledge

\_\_\_\_\_ (*name of organization*) is committed to saving energy and protecting the environment through computer monitor power management. With our pledge, \_\_\_\_\_ (*name of organization*) joins Energy Star in its quest to activate power management on one million computer monitors nation wide. We recognize the significant financial (over \$30 million/year), energy (over 400 million kWh/year), and environmental (over 300,000 tons of avoided CO<sub>2</sub> emission/year) savings achievable through setting one million monitors to enter a low-power sleep mode during periods of inactivity.

We pledge to enable power management features on \_\_\_\_\_ (*enter amount*) monitors organization-wide by \_\_\_\_\_ (*enter month*), 200\_\_\_\_ (*enter year*)

---

**Information Technology Representative**

---

**Date**

---

**Energy Efficiency Representative**

---

**Date**

**Please return this form to:**

Watt Watchers of Texas  
UTEP-Energy Center  
P.O. Box 68660  
El Paso, Tx 79968  
Phone/Fax: 1-888 US WATTS  
[Http://wattwatchers.org](http://wattwatchers.org)  
Saving Energy in Texas Schools

**Watt Watchers will return this form to:**

Robert Huang  
The Cadmus Group, Inc.  
(Energy Star Technical Support Contractor)

# Lighting Audit

It is a relatively simple task to count the lighting fixtures (usually called luminaires) in a single classroom. However, it is sometimes harder to know what is behind the diffusing panel (usually called the lens). A typical Texas classroom will have about 9 luminaires with four bulbs inside.

There is more than one way to find out what kind of bulbs your classroom has. You could ask either the custodian (who changes them when they burn out) or the district energy manager. Or you could investigate inside one of the luminaires in your classroom.

The bulbs will have information identifying them printed on the glass at one end. For example, you may see F40T12CW printed on the bulbs. It sounds complicated but is really simple – it is just in a shorthand code.

F stands for fluorescent, 40 represents the wattage of the bulb, T stands for tubular, 12 represents the diameter of the tube (in eighths of an inch, or 1-1/2 inches in this case) and CW designates the color temperature of the lamp (Cool White, in this case). This is the standard bulb found in classrooms today but it is yesterday's technology and definitely on its way out. It is the least efficient choice available but may have a cheaper first cost than other options. New installations are very likely to have much higher efficiency components.

Your class can calculate the lighting use with several levels of efficiency:

Standard F40T12 with magnetic ballasts with no concern for use

Standard F40T12 with Watt Watchers (2hrs/day saved)

Upgrade to F32T8 with electronic ballasts

Each classroom is assumed to have 9 – four foot light fixtures with four fluorescent tubes each (or an equivalent). Such a fixture requires 192 Watts

of electricity (4 tubes at 40 Watts each plus 20% for ballasts). The school year is assumed to last 180 days. Electricity is assumed to cost \$0.08 (8 cents) per kilowatt hour (kWh). Two hours per day was chosen based on a teacher leaving the classroom at lunch for one hour and one other hour during the day (for example, preparation period, recess, the first hour after school).

If conditions differ at your school it is easy to recalculate your specific costs. The costs will still be huge at half this amount. If half of the teachers in the United States remembered to turn out the lights on their way to lunch (just one hour per day) it would save \$34 MILLION dollars every year. How many scholarships would that be? How many classrooms are in your district? Can your school district afford an extra \$25 to \$50 per classroom every year? Wouldn't you rather spend the money on books or supplies for your class?

$$9 \text{ fixtures} \times 192\text{W} = 1728 \text{ W} \times 2 \text{ hours} \times 180 \text{ days} = 622,080 / 1000 \text{ W} = 622 \text{ kWh}$$

$$\begin{aligned} & \text{(to convert to kilowatt hours)} \\ & 622 \text{ kWh} \times \$0.08 = \$49.76 \end{aligned}$$

Standard F40T12 with magnetic ballasts use 192W per 4 foot 4 lamp fixture while producing 3050 lumens with a color rendering index of 73.

New F32T8 with electronic ballasts use as little as 101W per 4 foot 4 lamp fixture while producing the same 3050 lumens with a higher color rendering index (CRI-85).

Go through your school and do a lighting audit. When you are finished pass the report on to your administrators and explain to them the savings that can be incurred by doing a lighting retrofit project.



# Exit Sign Audits

If it seems like there are exit signs everywhere, it's because there's an estimated 100 million exit signs in the United States consuming between 30 and 35 BILLION kWh of energy each year. Most use incandescent bulbs, which use large amounts of energy and require more maintenance.

The typical exit sign with incandescent bulbs uses 2 - 20 watt bulbs. The signs are lit 24 hours a day and 365 days a year.

Let's do the math for a single sign.

$2 \times 20 \text{ watts} = 40 \text{ watts} \times 24 \text{ hours} = 960 \text{ watt hours}$

$960 \times 365 \text{ days per year} = 350,400 \text{ watt hours}$

Electricity is billed by the amount of kilowatt hours (kWh) used and the national average cost is \$0.08 per kWh (adjust this cost for your school/business)

To convert watt hours to kilowatt hours (kWh), divide watt hours by 1,000.

$350,400 \text{ watt hours divided by } 1,000 = 350.4\text{kWh}$   
 $\times \$0.08 \text{ per kWh} = \$28.03$

Now let's look at the other costs.

The incandescent bulbs cost approximately \$3.00 each and the sign has 2 bulbs.

$2 \times \$3 = \$6$

The bulbs have to be replaced an average of 3 times each year.  $3 \times \$6 = \$18$

The bulbs don't replace themselves so we have to add the labor cost.

Figure 1/2 hour per change or \$10 labor per change  $\times 3 = \$30$

Our annual total cost now includes:

Electricity costs = \$28.03

Bulb cost = \$18

Labor = \$30

Total = \$ 76.03 per year for 1 sign



How many signs are in your school? In your district? Count them and prepare a report to be submitted to the principal, your energy manager, other administrators, or the school board.



# Vending Machine Audit

It's basically a refrigerator, disguised as a vending machine. In exchange for your money, it's supposed to provide cold drinks and it's pretty reliable at doing just that. Now, if that's all it did, there would be no need for this page, so if you're guessing that there's an energy problem - you're right.

Let's go back to looking at this machine as a refrigerator. Besides the obvious difference: that this refrigerator requires you to deposit money, the big difference is that when a refrigerator door is closed, the light is supposed to go off. In this case though, the light stays on (the one lighting up the display advertisement on the front of the machine). It stays on 24 hours a day, and we're not talking about a little appliance light bulb here.

Most cold drink machines are lit up from floor to ceiling. The typical lights used in newer machines are 6' long fluorescent (two bulbs) with a combined wattage of 170 watts (2-T-12 high output). Add another 20% for the energy required by the ballast and we're up to 204 watts.

Now the math!

$204 \text{ watts} \times 24 \text{ hours} = 4896 \text{ X } 365 \text{ days/year} = 1,787,040 \text{ watt hours.}$

$1,787,040 - \text{Divided by } 1000 = 1787.04 \text{ kWh}$

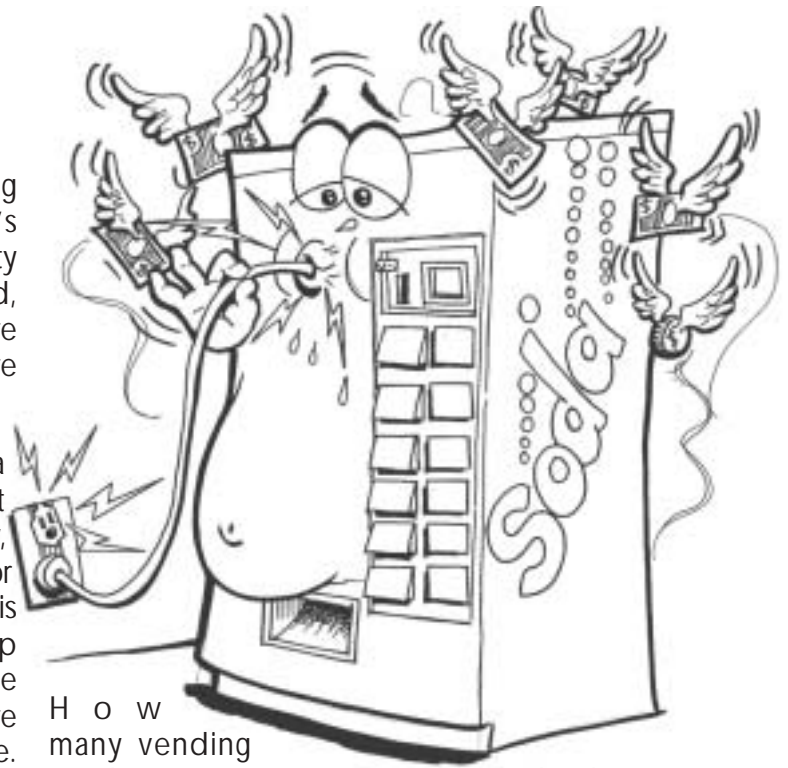
(Watts divided by 1,000 = kilowatt hours which is how you are billed)

$1787.04 \text{ X } \$0.08 \text{ (national average cost per kWh)} = \$142.96$

(Your actual cost depends on your electric rate.)

\$143 just to light up the vending machine. Actually the purpose isn't to provide light but to advertise a product.

Who pays this \$143 advertising cost? If the machine is plugged in at your school or any public building, then it's you, the taxpayer who pays.



How many vending machines are in your school? How much money are we talking about now? How many machines in your district?

What Can You Do?

Get permission from your school principal to have the lights turned off. The next time the machine is filled, have the service person disconnect the ballast and bulbs. There's a simple plug connection so turning them off costs nothing. Just think how much money your district could be saving.

Get more information at:

Energy Star Vending Machines

[http://www.energystar.gov/index.cfm?c=vending\\_machines.pr\\_vending\\_machines](http://www.energystar.gov/index.cfm?c=vending_machines.pr_vending_machines)

National Renewable Energy Laboratory Study

[www.nrel.gov/docs/fy03osti/34008.pdf](http://www.nrel.gov/docs/fy03osti/34008.pdf)

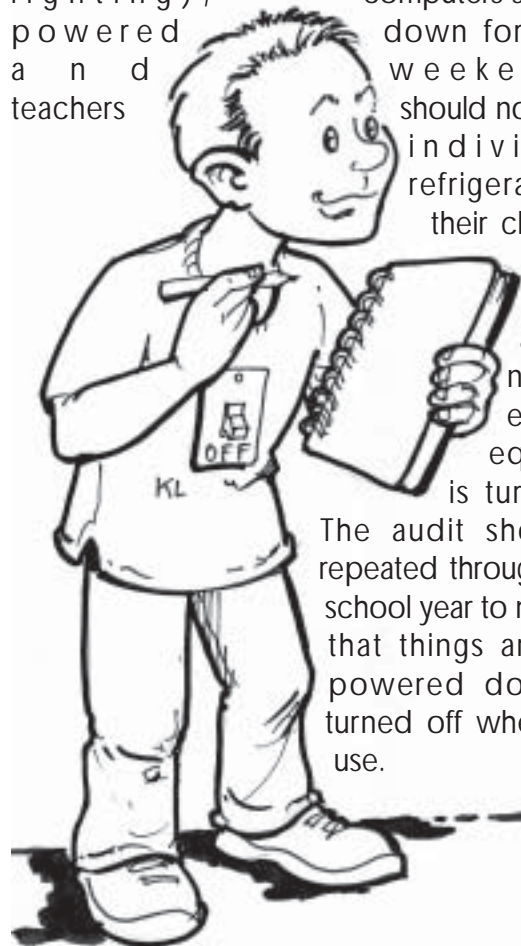
School District Vending Contract Survey

[http://www.squaremeals.org/fn/render/channel/items/0,1249,2348\\_2515\\_0\\_0,00.html](http://www.squaremeals.org/fn/render/channel/items/0,1249,2348_2515_0_0,00.html)



# Overnight & Weekend Meter Audits

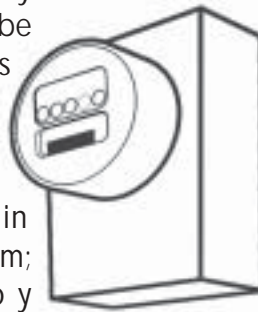
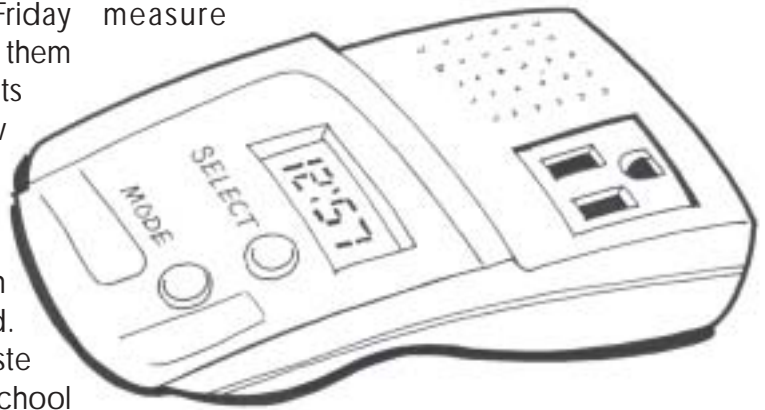
This project will make the administrators in your school and district aware of where large amounts of energy are being wasted. Students should read the meters at the close of the day (or Friday afternoon for a weekend audit) and read them again the next morning (or before school starts on Monday for a weekend audit) to see how much energy is being used when the school is shut down. The data should be reported to the Energy Manager and principal. Efforts to reduce the amount of energy used when school is closed should be implemented. Suggestions for reducing that energy waste include making sure all lights are off in the school when it is closed (with the exception of security lighting), computers should be powered down for nights and weekends, teachers should not have individual refrigerators in their classroom; copy machines and other non-essential equipment is turned off.



The audit should be repeated throughout the school year to make sure that things are being powered down and turned off when not in use.

# Kill-A-Watt Audits

Contact Watt Watchers to check out some tools to do audits in your school. When the tool box arrives use the kill-a-watt meter to measure



the energy use of soda machines, computers, monitors, copy machines, fax machines and other equipment found around your school. Put the data collected in a spreadsheet and give the information to the school principal and energy manager along with information on Energy Star equipment.

For more information:  
<http://www.p3international.com/products/special/P4400/P4400-CE.html>  
<http://www.energystar.gov>



# Weatherization

Weatherization is a fourteen letter word that strikes fear into the hearts of many Watt Watchers. The Community Weatherization Project is among the biggest and most challenging of all school energy projects. A school group (often a Student Council) goes out into the community and installs energy saving measures in the homes of elderly or low-income residents. Often multiple Student Councils band together to pull off this "Mega Project." Installing energy saving devices is often called "weatherization" since many of the measures improve the homes' energy performance in hot or cold weather.

Students must coordinate with several community partners in addition to coordinating between several schools to get the students turned out on a Saturday to do the work. Typically, local home improvement centers or local gas and electric utility companies are asked to donate the materials that the students install in area

Locating ten to twenty homes to weatherize can also be a challenge. Obviously, you can't go door to door asking if each homeowner might be interested. Here again, you will need to coordinate with social service agencies and find the right person within each organization to work with.

Then there is the problem of knowing which energy efficiency measures to install and getting good information on how to install them. If you don't have a local energy expert or good support from a utility company this can be a sticky problem.

I think you are getting the idea. This is a big project. But don't despair — some good support is now available.

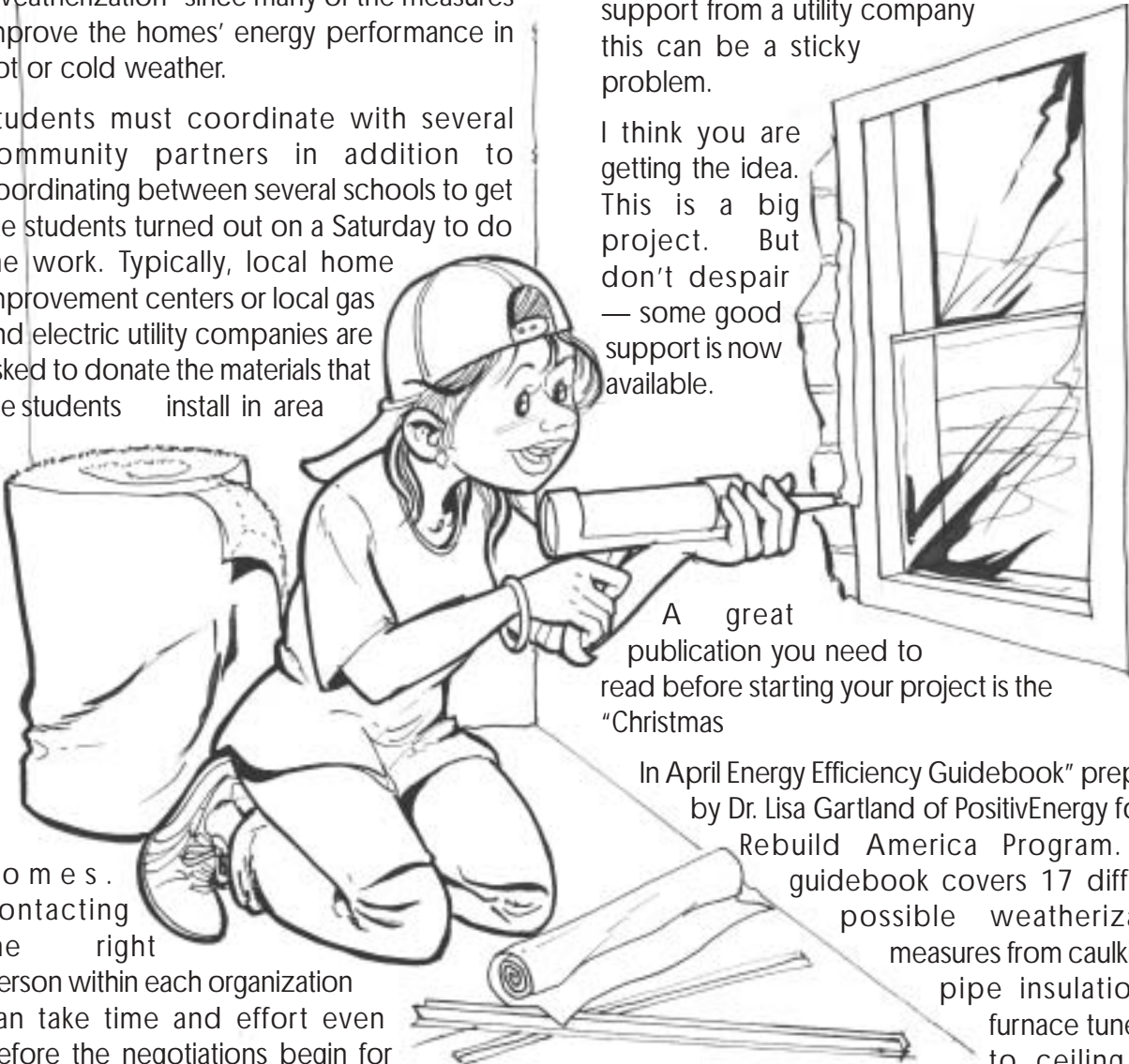
A great publication you need to read before starting your project is the "Christmas

In April Energy Efficiency Guidebook" prepared by Dr. Lisa Gartland of PositivEnergy for the Rebuild America Program. The

guidebook covers 17 different possible weatherization measures from caulking to pipe insulation to furnace tune-ups to ceiling and

floor insulation. Of course, it is unlikely that you will be insulating attics or

homes. Contacting the right person within each organization can take time and effort even before the negotiations begin for what materials can be provided.



retro-fitting furnaces but you can choose a handful of measures suited to your project, skill levels, and donated materials.

The value of the book is that it explains what each measure is, has a photo of the item, gives approximate cost, assigns a skill level required for installation, explains how much each measure will save, how to install it, and even estimates the length of time needed to perform the work. This is basically everything you need to know about a measure to see if it fits your project. You can now request specific items to be donated by the home improvement centers and be much less dependent upon local experts.

Go to Dr. Lisa Gartland's homepage (she is an energy expert with a PhD in Mechanical Engineering!) at <http://www.pstvnrg.com/xina> and click on... everything – this is all really good information. “Organize Your Own Energy Team” is a good place to start. This section tells you how to organize teams of volunteers to incorporate energy efficiency into the general rehab work of Christmas in April in the homes of senior and low income citizens. Hmmm, does this sound familiar?

Dr. Gartland has some very good resources, including a sample letter to request donations of supplies. In addition, there is advice for House Captains and a questionnaire to help you survey each house in advance. Don't forget to read everything and “Volunteer Training” has especially excellent advice for your project.

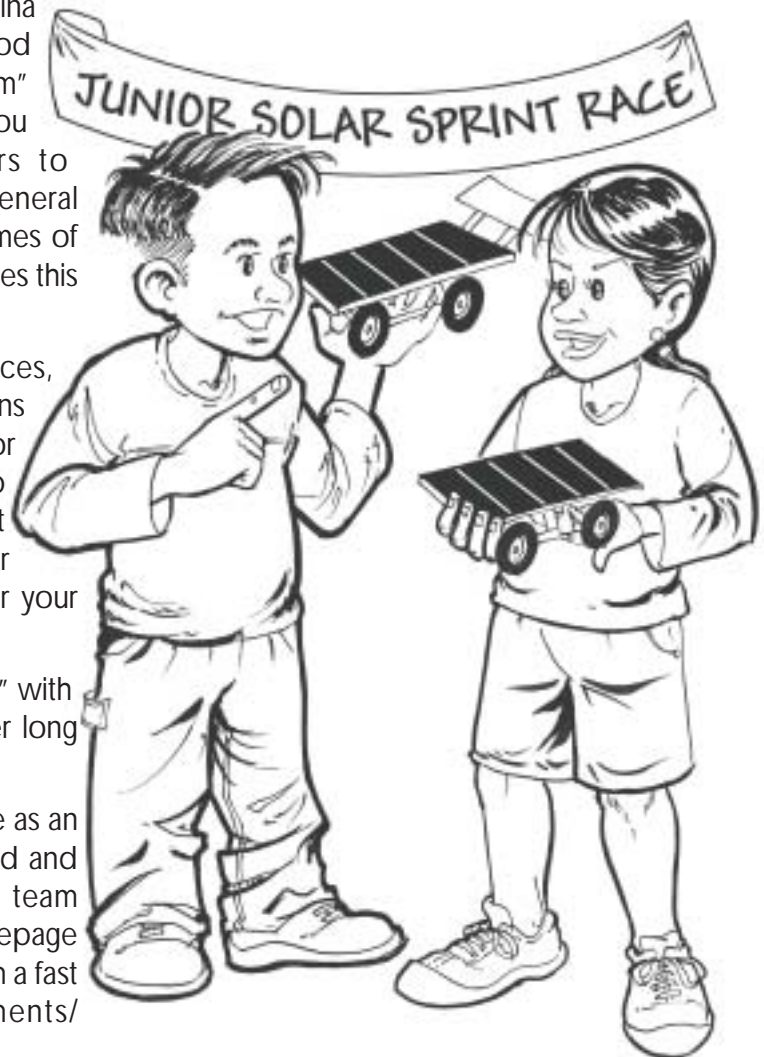
So now you can take on the “Mega Project” with no fear, weatherization can be just another long word for a successful project.

The Christmas in April Handbook is available as an Adobe Acrobat file that you can download and view or print or even e-mail to all your team captains. It is at the Rebuild America homepage and is a 2.1 MB file, so try to download from a fast connection. [www.rebuild.org/attachments/guidebooks/christmasinaprilhandbook.pdf](http://www.rebuild.org/attachments/guidebooks/christmasinaprilhandbook.pdf)

But be sure to go to the PositivEnergy site [www.pstvnrg.com/](http://www.pstvnrg.com/) for all the details.

## Host a Junior Solar Sprint Race

Watt Watchers of Texas is working with Middle School Science Teachers across the state of Texas to get them involved in the Junior Solar Sprint program. Junior Solar Sprint is a fun program where middle school students build model solar cars and race them against their peers. As an organization you could plan and hold the race at your school. For more information on how to host a JSS race, please refer to the National Renewable Energy Laboratories website [www.nrel.gov/education/jss\\_hfc.html](http://www.nrel.gov/education/jss_hfc.html) and click open the file host site guide book.



# Start and Maintain a Recycling Program

1. Do your homework. You must do your homework before you propose a recycling program to administrators. If you are an administrator, there are things you'll want to investigate before you implement a recycling program at your school.
  - a. Determine disposal service level and costs.
  - b. Conduct an informal "waste audit" for your campus.
  - c. Contact recycling collectors.
2. Get your administrator's support. After conducting an informal waste audit and gathering information from local recyclers, you will be ready to make educated estimates of your school's disposal service needs and opportunities for recycling. The prospect of reducing your school's disposal costs, backed up by the information you have collected, should help to gain the support of school administrators.

Having your administration's support is important for the success of the program. Without proper backing, allocating staff and funding the program may be impossible. Keep in mind that administrative decisions are strongly influenced by economics. From an economic standpoint, a recycling program will cost money, but it will also save money, and might also make money. Only by considering all of these factors can you determine the "bottom line" for your program. Use the information you have collected to prepare an oral or written proposal to the superintendent or principal.

3. Pick a coordinator for the program. Finding the right faculty or staff person to coordinate your recycling program is an

important step. This person should have a personal interest in and enthusiasm for recycling, as well as good communication and organizational skills. The amount of time required of this person may be considerable at first. His or her involvement could taper off as the program becomes more routine. You may also want coordinators for the cafeteria, the administrative office, and each classroom. These people can help promote the importance of putting recyclables in the correct containers and keeping the wrong materials out.

4. Select a Recycling Committee or Team. A school recycling committee or team is necessary to help organize and oversee the recycling program. One option is to use your site-based management committee. On a district-wide level include all divisions of the district. Recruit support for recycling in your school or school district from

- custodial/janitorial staff
- food service/cafeteria staff
- teachers
- student representatives
- facilities/maintenance personnel
- grounds personnel
- business managers
- district purchasing agents
- Adopt-a-School partners
- parent—teacher organizations

Involve all of the above groups in planning the program from the very beginning. They will be an integral part of your success and should feel ownership of the program. Custodial staff and facility managers, for example, have special knowledge that will be vital in developing the collection system and will play a key role in the process.



Make everyone aware that the school may not be reimbursed for its recycled materials. The main economic benefit is likely to be in reducing or holding down your school's disposal costs.

5. Develop a collections system plan. Before collection begins, work out each step involved in moving the materials from their point of generation to the collector. Make your program simple and reasonably convenient for people to use. Be sure your plan fits with the collector's equipment and schedule. Considerations in planning the recycling system include where to collect the materials, types of containers to use, moving and handling the materials, storage, and pickup.

6. Kick-Off the Program. It is important to take a high level of awareness about your recycling program from the start. Plan several elements to be part of your kick-off.

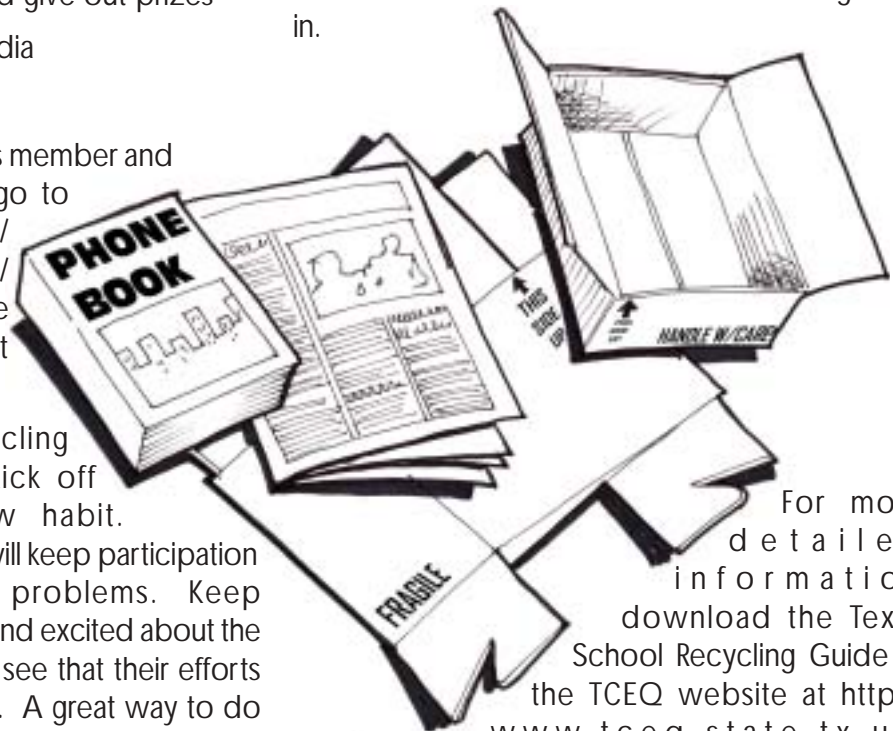
- Develop a logo and slogan
- Have a pep rally to celebrate the kick-off
- Conduct contests and give out prizes
- Contact the local media
- Distribute posters
- Become a Clean Texas member and get recognition (go to <http://www.cleantexas.org/> for more information about Clean Texas)

7. Reinforce the recycling habit. After the kick off reinforce the new habit. Continual reminders will keep participation high and minimize problems. Keep everybody updated and excited about the program so they can see that their efforts are producing results. A great way to do this is through posters, announcements, bulletin boards, report cards, contests, etc.

8. Monitor and evaluate your progress. Be especially watchful for problems during the first weeks of your recycling program. Make regular evaluations thereafter. Responding quickly and appropriately to problems is necessary for a successful program.

9. Close the loop: buy recycled. Remember, recycling hasn't come full circle until you purchase products made from recycled-content materials. Your purchase of these products is important in stimulating recycling markets. Products with recycled content include office and computer paper, notebooks, forms, phone message pads, calculator tape, napkins, toilet paper, paper towels, and much more.

When recycling paper products, do not overlook any sources of paper. Used textbooks are often thrown out after they have been replaced. Speak to the person in charge of new textbooks to be sure the old ones go in your recycling bin. Shredded office reports could also go into your bin. Everything at schools is delivered in cardboard boxes. Those are paper products. Remember to break them down flat before throwing them in.



For more detailed information download the Texas School Recycling Guide at the TCEQ website at [http://www.tceq.state.tx.us/comm\\_exec/forms\\_pubs/pubs/gi/gi-030.html](http://www.tceq.state.tx.us/comm_exec/forms_pubs/pubs/gi/gi-030.html).

25 Also see <http://www.earth911.org>



# Start and Maintain Other Recycling Programs

Once you have the basic steps for starting a recycling program you can expand to other areas that you see as a need in your school.

Does your school have plastic bottle or aluminum can soda machines? Start a campaign to recycle those soda containers. Contact your local recycling company to find out if they can handle the particular material you want to recycle and how much it would cost your school. Find or design bins that will accommodate the shape of container you are working with. You can contact your local soda bottling company and ask for a donation of leftover syrup barrels to use as bins. If the hole in the top of your bin is the same shape and size as the container, you will have less trash in with your recyclables. Remember to always get permission from your principal first.

The recycling triangle symbol you often see on products actually has three words: reduce, reuse,

and recycle. Look around your school for ways your group can help with reducing consumption and reuse as well.

Does your school have a dress code or uniforms? Have the seniors donate gently used clothing at the end of the year to be distributed to those in need. Expand that same project to include all grade levels for clothes they have outgrown.

Instead of throwing away all the leftover supplies in your locker at the end of the year, donate them to a teacher, an elementary school or a group in your area that could help distribute these. On locker cleanout days, set out boxes clearly labeled as donations. You will need to sort through these to weed out the unusable supplies. Be sure to have a destination in mind for these products before you start the project. You may end up with boxes full of crayons and nowhere to go with them.



# Host an Energy Encounter

An Energy Encounter is a day-long event to provide lots of information, ideas, and excitement about energy projects for students, teachers and administrators. Groups from several different schools in a district or region come together for fun, learning, and motivation. It is a great way to pick up ideas for energy projects that any Student Council, Future Teachers of America, National Honor Society, Future Business Leaders of America, your Science Club or other group can do.

Typically, the day starts with a motivational speaker. The day continues with great information about the Texas State Energy Conservation Office Programs, Watt Watchers-in-a-Nutshell, Monitor Power Management – Sleep Is Good, Weatherization, and recaps of many fun and easy energy projects.

After breaking for lunch, students return energized and ready for encounter missions. The basic structure of the mission is that students are divided into four groups. Leading the groups will be a staff member from Watt Watchers, an energy manager or a school sponsor. Once the groups are formed and in place, the leader of the group explains the title of the mission. For an example, we will use “How to Do an Exit Sign Audit.” The leader will give information on exit signs and their energy consumption, how they differ from energy-efficient exit signs, how to tell the difference, and how to conduct an audit of exit signs in your school. Once the mock audit is completed, then the group comes back together and using materials provided by Watt Watchers, assembles a presentation for the other encounter participants. The presentations will be given by each group and will additionally serve as model presentations that students can give to school boards and school officials to offer energy-saving ideas and measures that schools and schools districts can take to become more energy efficient.



All this, and more, is condensed into one full day that includes handouts, prize drawings, and a little frivolity along with serious savings sessions to help your group encounter energy and emerge efficient.

So what does this mean for your student group? Well, hosting an Encounter at your school means that you provide the facility needed to host between 40 and 60 students on a Saturday from 9am to 4pm. We would need your help to coordinate the set-up of the room. We would also need your group to do a short presentation on the energy projects that you have done at your school so you can share your ideas as the host school. There will be a breakout session where students from different schools can share ideas.

In all, hosting a Watt Watchers Energy Encounter at your school will help broaden the energy projects and ideas within your group and at other schools, provide you with the useful experience of hosting an event for other schools and it will give you a chance to meet fellow high school students from around your area.



# Make a Presentation on School Energy Efficiency

1. Talk to your teacher/sponsor and find out how often the school board meets. Figure out if they allow students to come and talk to them about different issues. Many times they allow students to talk at meetings, but you have to schedule in advance so you will be on the agenda.

2. Plan approximately a 5-15 minute presentation on topics, such as the following:

- a) The benefits of using recycled paper in the district
- b) Starting a recycling program in the district.
- c) The benefits of starting an energy monitoring program, i.e. Watt Watchers, in your district.
- d) The cost savings of taking the light bulbs out of the soft drink machines.

e) The cost savings of changing to low flow shower heads in the school gyms.

f) The cost savings of changing Exit signs to LED signs.

g) Implementing Sleep is Good for all the computers in your school or district.

Descriptions of these projects are available in this manual.

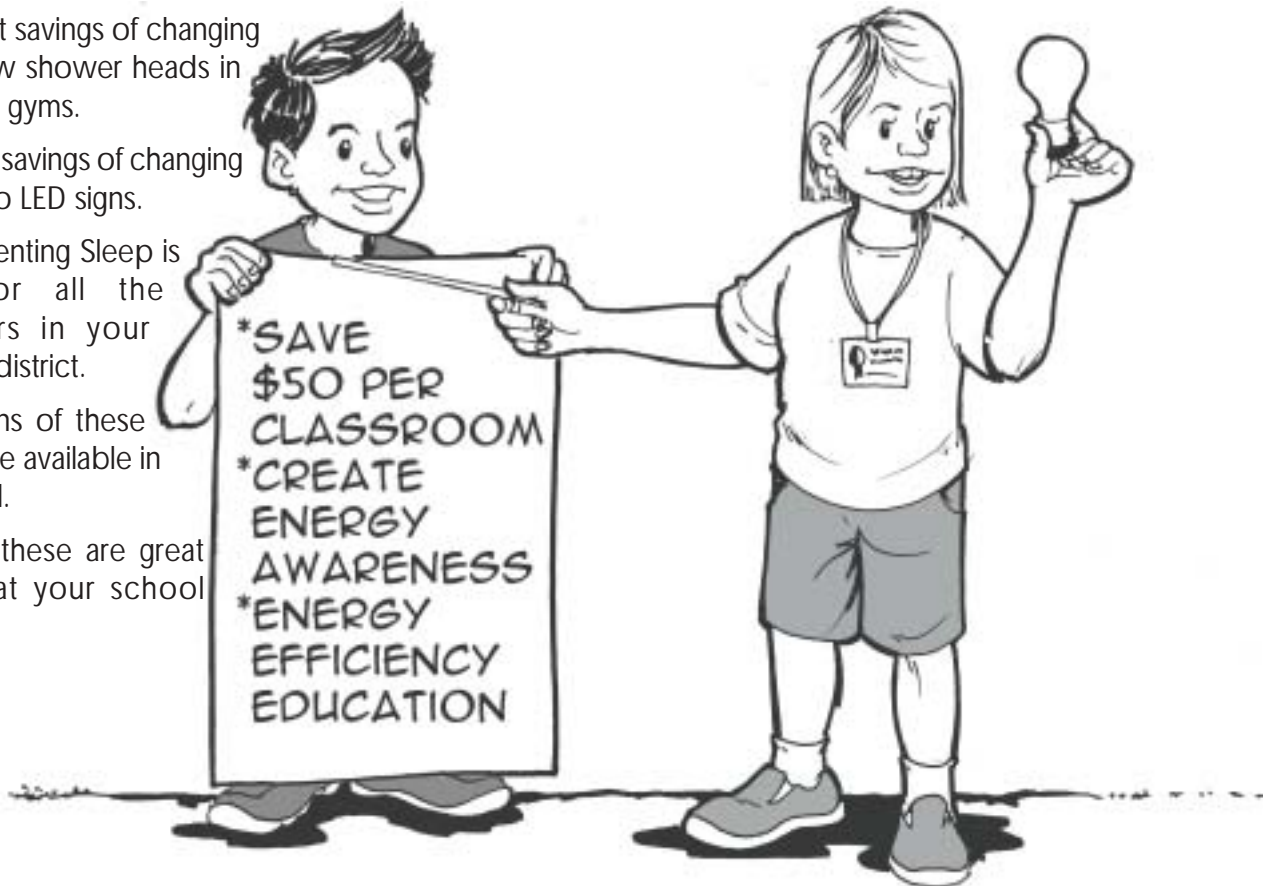
3. All of these are great topics that your school

board would be very interested in hearing about. They all involve making your school district good stewards of the environment.

4. Make sure that your teacher and principal have approved your presentation before you go before the school board.

5. You should prepare a handout to give to all the people present at the meeting, giving facts about the topic that you are presenting.

6. You can also modify this project and do presentations to other organizations, clubs, and groups within your school and community.



# Ask Local Energy Professionals in Your Area to Speak at Your School

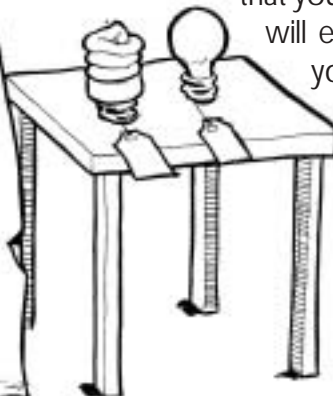
Energy is a very hot topic these days, with the price of oil higher than ever, the demand for companies to add renewable energy to their mix and the increased concern of air pollution. We are asking you to develop a list of energy professionals that would be interested in coming to your school to speak to students and teachers. There are many ways to develop this list – you could simply “let your fingers do the walking” in your local yellow pages or contact your utility company to get information about the people in your area. Once



the list is developed pass it out to the teachers in your school and assist them in contacting these professionals for presentations.

# Oil Recycling Project

1. To start a project like this, it is best to try to partner with the vocational department, especially if they have an auto mechanics class. They can always help to store the used oil until it is taken to the recycling center. Some places will even come to pick up used oil.
2. If this event is going to be successful, you need to make sure that you advertise for a good period of time. It might even be helpful if you say that every first Tuesday of the month, you will collect used oil. People might have better luck remembering that they need to bring their oil to school.
3. For the location of a used oil/oil filter collection center near you, call 1-800-CLEANUP, or visit the web site at [www.1800cleanup.org](http://www.1800cleanup.org). You can also search the Texas Commission on Environmental Quality, <http://www.tceq.state.tx.us/> or the [www.earth911.org](http://www.earth911.org). Both of these websites have information about used oil recycling programs and centers that take used oil. Many times if a company knows that you are doing a project like this, they will even offer to come and pick up your school's used oil, which can save your council the trip to a recycling center.
4. It would also be a good idea to figure out exactly how much oil you collect each time.



# Leaky Faucet Alerts

Stop those leaks! This project is great for students



to take part in. You are in the school everyday and you may notice a leaky sink in a classroom or bathroom that might go unnoticed by others. Create a sheet that you can give to the custodian, energy manager or maintenance personnel that tells them the location of the leak and the time and date that you detected the leak. Do your job to help Stop the Leaks!

# FAX Facts

Create several forms to report energy waste on your campus. Place them in an area that is easily accessible. Complete the form when you discover problems like doors recurrently left open (or that get stuck open), stuck flush valves, stadium lights/parking lights on during the day, broken sprinklers or water waste, etc. Fax the form to the Energy Manager or Maintenance Director so that the problem can be addressed. These individuals can't be on every campus in your district every day and they need your help in identifying problems.



**Energy Waste - FAX Alert**

Students: Use this form to report problems such as lighting, stuck flush valves, window doors recurrently left open, or other suspected energy wastes.

To: Energy Manager: \_\_\_\_\_ FAX: \_\_\_\_\_

From: \_\_\_\_\_ Contact: \_\_\_\_\_

Your School: \_\_\_\_\_

Your contact information: \_\_\_\_\_

We found this problem: \_\_\_\_\_

Describe location and give other details: \_\_\_\_\_



# Short and Simple Projects



# Energy Week

1. Make sure to pick a week that works well with your school. If possible you could coordinate with national Energy Awareness Month in October, but any week during any month will work.
2. There are many things that you can incorporate into an Energy Week. You could have your town's Mayor come to your school and sign a Proclamation announcing that this week is Energy Week. You could have Energy Dress Days, do a carpool to school contest, have an alternative transportation day, have your student body sign a Declaration of Energy Independence, plant trees, and the list goes on and on.
3. Just make sure to start advertising as soon as you know when the energy week will take place. The best way to get people to participate is by letting them know exactly what will be going on.
4. A good end to your Energy Week is to have a recycled sculpture building contest. During the week have students and teachers bring recycled cans, paper, boxes etc. and during the last day of energy week have a contest between grade levels to see who can build the best recycled art sculpture. Don't forget to recycle the entries when the contest is over.
5. An Energy Week is a great way to get the word out about all of the different types of energy that are available in the world today. Another thing to keep in mind is to try to get as much information out about the different types of energy that are available, especially if you have some of them in your community.

# Adopt a Highway

You can follow these steps to setup a highway clean-up site.

1. Speak with your teacher/sponsor to find out if it is possible for your group to participate in adopt a highway clean-ups.
2. Then contact the Texas Department of Transportation "Don't Mess with Texas" campaign. This website will give you all the information for your area <http://www.dontmesswithtexas.org>. Each area has a different coordinator who assigns highway sections. They will assign a two mile strip of highway in your area to your group.
3. Make sure when you sign on to take part in this project, you understand that you will sign a two year agreement to clean your highway section four to six times a year.
4. Everything you need to do this project, except the people, is provided by the Adopt a Highway program. They provide the volunteers with the appropriate permits, safety vests, litterbags, and safety training.
5. The benefits to your group are great: first it is FREE - you can't beat that. You get FREE advertisement on the Adopt a Highway sign for your group. Most of all you are helping keep Texas highways clean and helping to Keep Texas Beautiful.

If you need any additional information, go to the Don't Mess with Texas website - [www.dontmesswithtexas.org/adopt.php](http://www.dontmesswithtexas.org/adopt.php). If your area is not listed, contact the Texas Department of Transportation. Their web address is <http://www.dot.state.tx.us/>.



# Automobile Efficiency Mini Lessons

1. Speak with your auto mechanics teacher and find out if they would be willing to help teach people about some of the different ways to make their cars more efficient.
2. If this is something they are interested in, find out how easy it would be to set up a demonstration after school, where people could come by and learn about their cars.
3. This program could be an extra credit project for the auto mechanics class. They might also want to help your group put together fact sheets that you could hand out to make people more aware of their cars and what they can do to make their cars more environmentally friendly.

Get tips and info at:

<http://www.fueleconomy.gov>



# Student Automobile Efficiency Day (plus Safety)

*So, when was the last time you checked your tire pressure?*

Have the class survey the school parking lot. Give out ribbons to drivers – if they want their tire pressures checked they put the ribbon on their dash or rearview mirrors. The class then checks all the marked cars in the lot and leaves a note card under the windshield wiper with the pressures for each tire recorded.

Provide an “Air Station” after school to get under-inflated tires pumped up. (This will require some air compressors, hose, etc.) Or this could be coordinated with a nearby service station that would permit students to help people get their tires inflated.

Borrow a Cross Reference Manual from a local auto parts store or contact an auto parts manufacturer like Car Quest, FRAM or Puralator to request a copy. Once you have the manual you can look up information on air filter size for the car.

Recommended tire pressures can be read from the tires and recorded on a chart. Windshield wiper size can be measured and recorded.

Your group can leave the driver a small chart they can put in their glove box with all this useful information. It will now be easier and more likely for your fellow students to keep up with routine maintenance that can save energy, save them money, and prevent pollution.

You can also pass out a flyer from the Department of Energy that will give your drivers some additional information on saving energy in their automobile.

To print the news releases go to <http://www.eere.energy.gov/news/press.cfm>

Keep a score of the recorded tire pressures and use the data to compare with national averages and make a large chart to hang in the school to make everyone aware of your



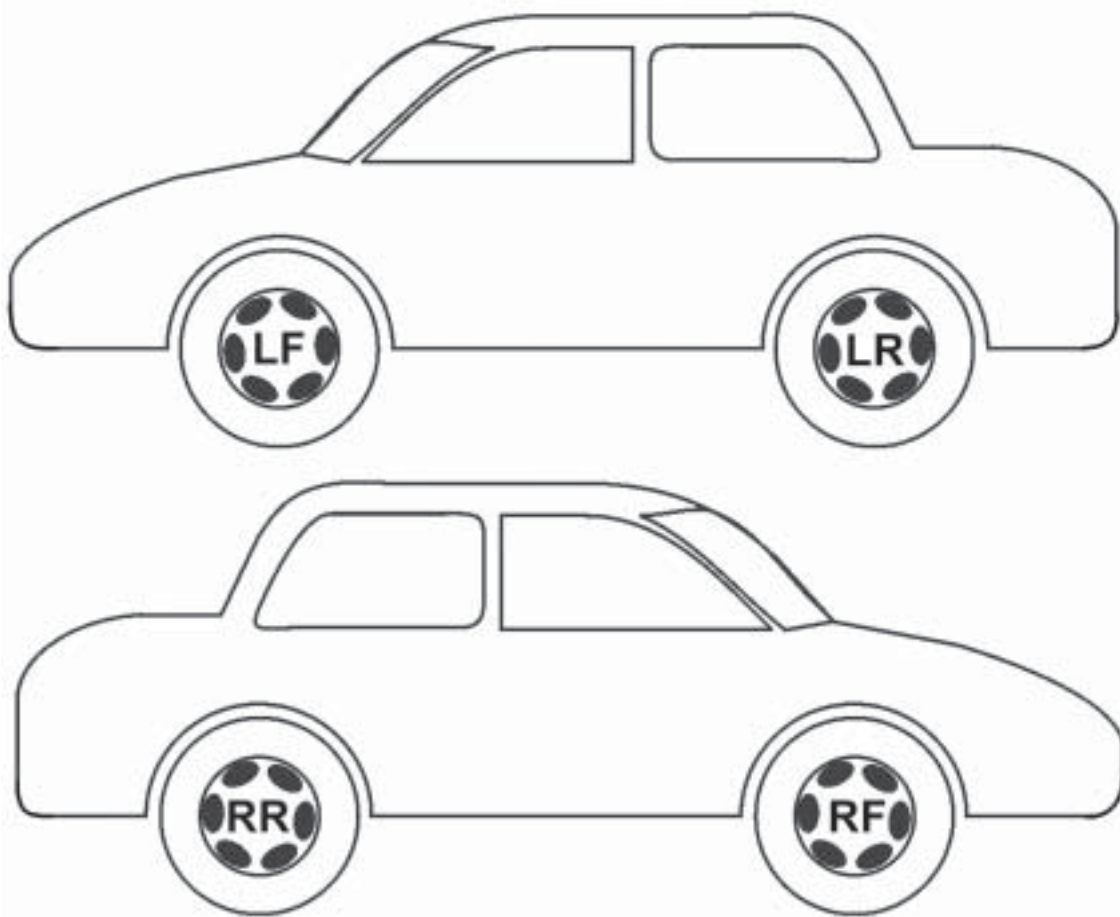
Student Name: \_\_\_\_\_

Date: \_\_\_\_\_

Transportation

Auto Tire Pressure Gauge Worksheet

Total Number of Under Inflated Tires \_\_\_\_\_



Tire	Recommended Tire Pressure	Actual Tire Pressure
LF - Left Front		
LR - Left Rear		
RF - Right Front		
RR - Right Rear		

## Checking for Oil Leaks

This can be an easy project to do. Get a few members of your council together around lunchtime and go to the parking lot and check all the cars in the lot to see if any of them are leaking oil. If they are leaking oil, leave them a note saying that they have an oil leak and should get it checked out. Leave them additional information as recommended in other automobile projects in this manual. You will be reminding them that a well-tuned car helps fuel efficiency and reduces emissions.



## Organize an Alternative Transportation Day

1. Plan a day to see how creative your student body can be with how they get to school.
2. Make sure you do a lot of advertising to make sure that you get a good turnout for the project.
3. Some options for transportation are biking, skating, skateboards, pogo sticks, row boats, other boats (if energy efficient), wheel barrowing, horses, dog sled, or via lawn mower if it can be shown to be energy efficient.
4. Give a prize for the most creative form of transportation and for the most environmentally friendly mode of transportation used.



## Carpool Days

1. Get the information out that your group will be having a contest to see how many people can carpool to school in one car. Make sure you tell them that every person must be legally in a seat belt. You want this to be a safe project. Make flyers, posters, announcements and so on letting people know what you will be doing. It might also be a good idea to see if you can get door prizes to hand out to the winners. Consider inviting a local radio station to broadcast live from your campus the morning of the contest.
2. In the morning have members of your group posted at the entrances to your school parking lots counting all the people in the cars. Make sure to get the names of the participants so that everyone can be recognized for their participation.
3. Make the announcement at the end of the day, so that everyone knows who won the contest. The better the prizes the more likely people are to participate in the contest.



# Energy Announcements, Posters, Marquee Signs, Display Cases

1. All of the projects listed above are ways to get the word out about your class/organization focus on energy.
2. You can do weekly announcements about energy conservation or environmental awareness.



3. Posters can be made that explain the different energy sources, remind people to recycle, or deal with Energy or Environment topics.
4. Display cases can be done to promote energy conservation or environmental awareness.
5. Banners can be done just like posters – only bigger.
6. Marquee signs are a great way to remind people of energy conservation or environmental awareness tips.

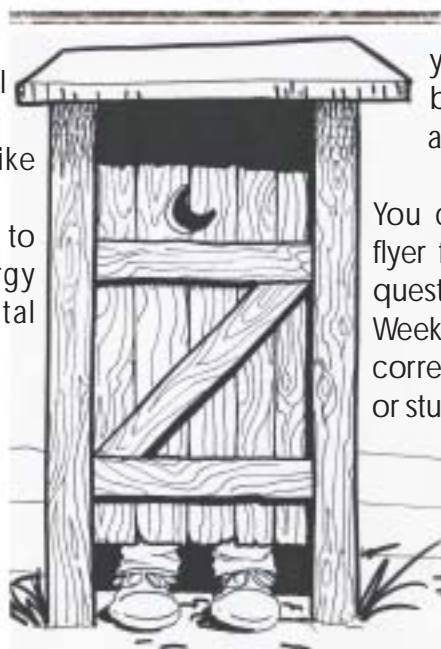
# Toilet Times and Potty Periodicals

Everyone knows (girls at least) that anything posted in a bathroom stall will get read. Even if it is just so you can spend a couple more minutes outside of class. Use that free advertising to spread your energy and environmental message.

Have students find tips on conserving energy, recycling, energy sources, how much water is used every time you flush, or on any project you are about to begin. Write them on a sheet of paper and decorate it to attract attention. Make photocopies and then plaster those bathroom stalls. Send the boys in to put them on mirrors, in stalls, and above urinals in the men's room. Don't forget the teacher's bathrooms; just get permission before going in.

When making photocopies, remember that you are doing energy projects and it saves energy and paper when you print double-sided. You could reuse your flyers by printing on both sides and flipping them at the end of the week.

## TOILET TIMES

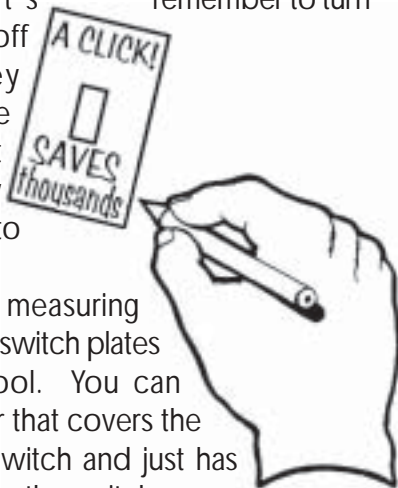


You can use this informational flyer for all your projects. Post questions the week after Energy Week. Have students bring their correct answers to your sponsor or student council mailbox/room for a treat. Instead of doing a survey in the cafeteria on recycling, post your survey questions in the Toilet Times and have students bring their opinions to you.



# Light Switch Covers

1. This is a great project to help teachers and students remember to turn their lights off when they leave the classroom. It is also a very easy project to do.
2. Start off by measuring different light switch plates in your school. You can make a cover that covers the whole light switch and just has an opening for the switch or you can make a border for the outside of the cover plate. Either way they will remind people to turn the lights off.
3. Make a pattern for the covers. You can decorate them with tips on conserving energy or a reminder about turning off the lights to help save energy and money for the school district.



4. Once they are decorated, you can copy them on cardstock or you can laminate them so they will last longer. Take them to your group meeting and let your members cut them out and deliver them with a note about turning off the lights.

For more information: see the Spring 2005 Watts News article "Remember: Turn It Off" on page B-4.

# Computer Monitor Reminder Cards

Now that technology has made the monitor power down without any human input, it is easy to forget to turn off your computer CPU when you are not using it. Many school computers are accidentally left on overnight for just that reason. Just as light switch reminders help us to remember to turn off the lights, computer reminders will do the same.

1. Find out how many computers are in your school. Remember to count teacher computers as well as computer labs. You can get this information by making a physical count or by asking the technology person or principal at your school. Double this number so you have two covers per computer (one for the monitor and one for the CPU).
2. Come up with a short slogan or theme for your reminders such as "Off at Night" or "I need my rest."
3. Cut out shapes (check your library for a machine to help you with this) that represent your theme (stars, moons, etc). Use card stock or construction paper.
4. Write your slogan on the shapes and have them laminated so they will last longer.
5. Attach one to each computer and monitor in an easily visible place. If the CPU is under a desk or not easily visible, place the reminder somewhere it will be seen.



# Unplug the Extras During Long Breaks

Do teachers at your school have microwaves, small refrigerators, lamps, and other appliances in their classrooms? A great project to do before long breaks from school is to distribute a reminder announcement about unplugging those items. There is no need to keep a refrigerator plugged in to cool something that is going to be moldy by the time your break is over. So unplug those extras!

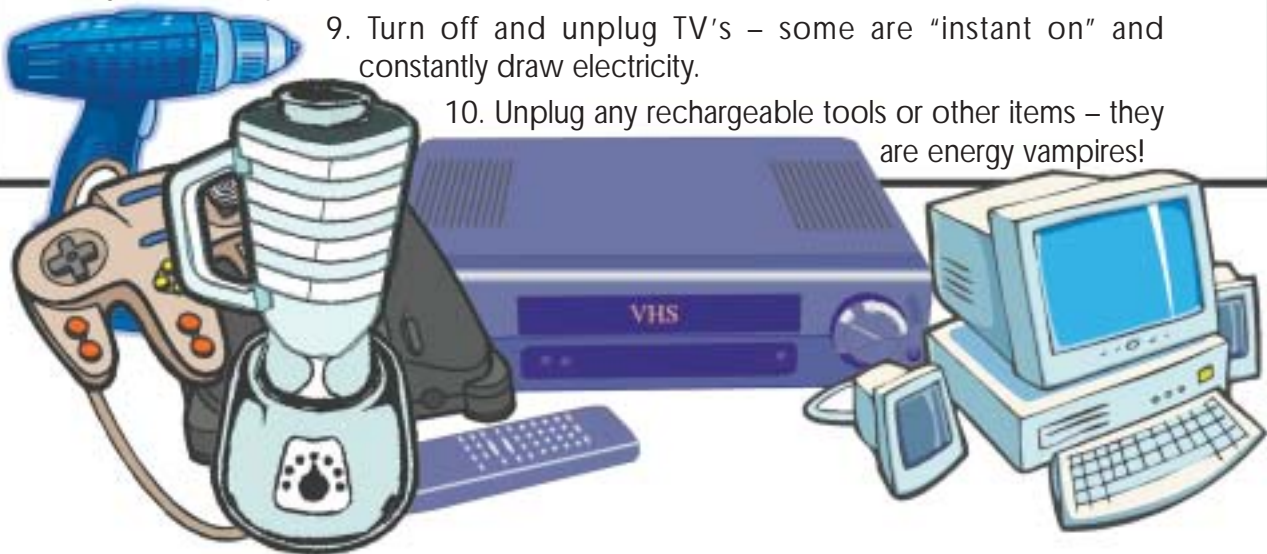
Here is a sample announcement:



## Unplug the Extras

Thanksgiving Break and Winter Break are just around the corner and there are a few things that we encourage you to do before you leave.

1. Turn off all computer monitors and computers in your room.
2. Unplug refrigerators and microwaves in your classroom or teacher's lounge.
3. Take home any class pets or plants (check your school policy for aquariums).
4. Make sure all the lights are out.
5. Turn off other common equipment like copy machines, printers, laminators, etc.
6. Close the windows and adjust your shades (open your shades if your classroom is south facing and close them if your classroom is north facing.)
7. Unplug any seasonal decorations.
8. If you are in a portable make sure heaters are off or set back.
9. Turn off and unplug TV's – some are "instant on" and constantly draw electricity.
10. Unplug any rechargeable tools or other items – they are energy vampires!



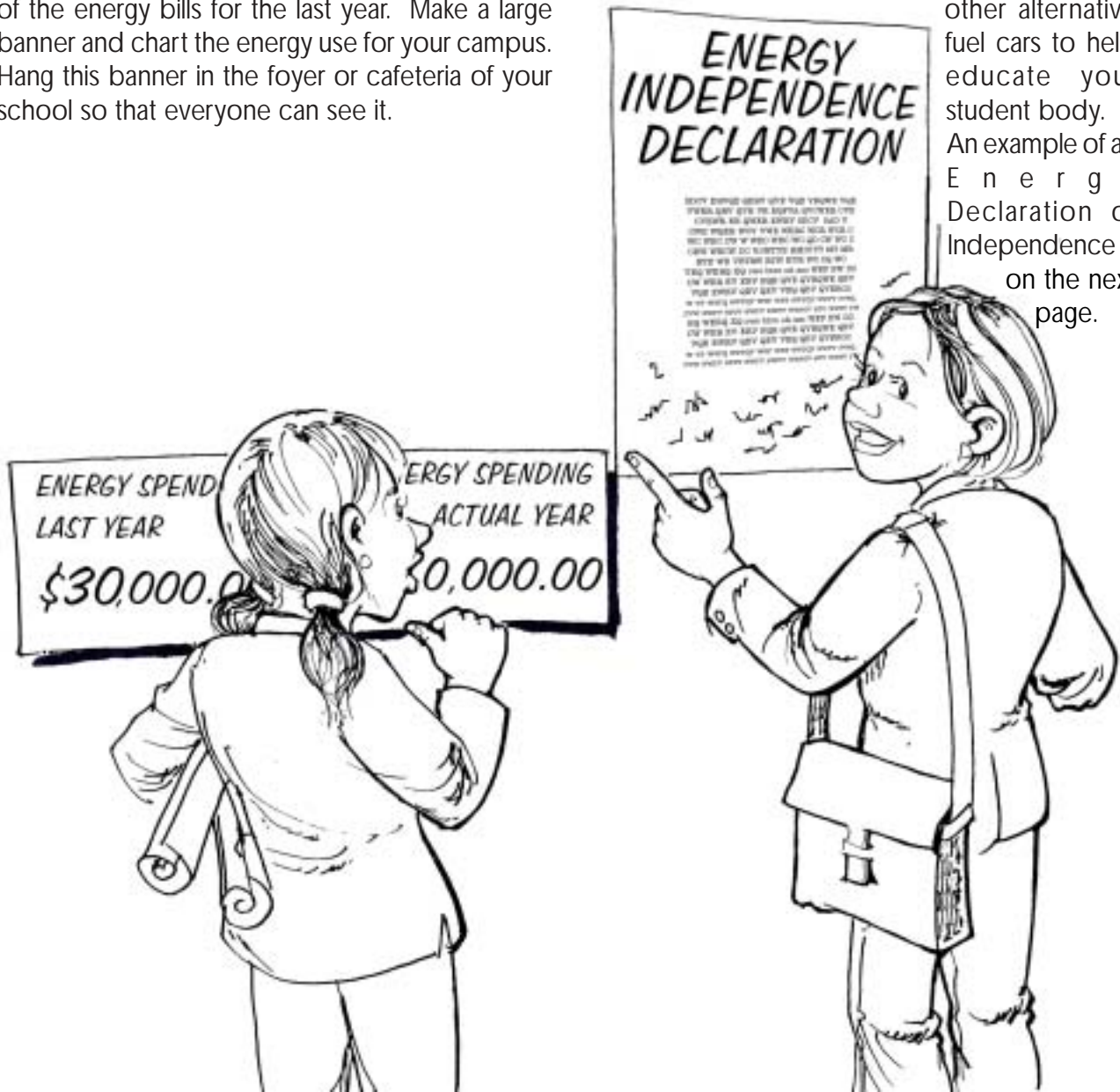
# Posters/Banners on School Energy Use

Educating the occupants of your school about the amount of energy the school uses is a great way to kick off an energy week or energy awareness campaign for your campus. Many people have no idea how much energy it takes to keep a school going or the money it takes to allow you to have an air conditioned school with computers! Contact your principal or energy manager to obtain copies of the energy bills for the last year. Make a large banner and chart the energy use for your campus. Hang this banner in the foyer or cafeteria of your school so that everyone can see it.

# Energy Independence Declaration

Write a declaration of American independence from foreign oil and have students and adults sign it. Mail it to your Congressperson. Another idea along these same lines is to write the declaration on a piece of butcher paper and have students sign it and leave it posted in your hallway as a reminder to all students. You can also hand out information about fuel efficient cars, hybrids, and

other alternative fuel cars to help educate your student body. An example of an Energy Declaration of Independence is on the next page.



# Declaration of Sustainable Energy Use

When in the Course of human events, it becomes necessary for one people to dissolve the bad habits of excessive energy use which have connected them with pollution, economic suffering, and social ills, and to assume among the various energy sources and powers of the earth, a separate and equal station then a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

## We hold these truths to be self-evident:

- § That all energy sources are not created equal,
- § That they are endowed with certain undeniable consequences,
- § That among these are pollution, economic cost, and political realities.
- § That to secure these energy sources, Governments and Men must do so responsibly, and without harming the environment for future generations.
- § That whenever any Form of Energy becomes destructive of these ends, it is the Right of the People to use alternative energy sources or to institute energy efficiency,
- § Prudence, indeed, will dictate that energy sources long established should not be changed for light and transient causes; and accordingly all experience hath shewn, that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed.
- § But when a long train of abuses and usurpations, evinces a pattern of pollution, high costs, and negative social consequences, it is their right, it is their duty, to throw off such energy sources, and to provide new Guards for their future environmental, social and economic security.
- § Such has been the patient sufferance of the citizens of Planet Earth; and such is now the necessity which constrains them to alter their former Systems of Energy use.

We, therefore, the students of Texas of the United States of America, assembled, do, in the Name, and by Authority of the good People of Planet Earth, solemnly publish and declare, That we shall use energy in the most efficient manner possible, use sustainable energy sources, and cause much less pollution from this day forward.

The Citizens of Planet Earth are, and of Right ought to be Free and Independent; that they are Absolved from all Allegiance to non-sustainable, polluting sources of energy, and that all connection between them and the State of inefficient energy use, is and ought to be totally dissolved; and that as Free and Independent people, they have full Power to levy higher efficiency standards, conclude to use sustainable energy sources, contract to reduce pollution, establish sustainable Commerce, and to do all other Acts and Things which a sustainable society may of right do. And for the support of this Declaration, with a firm reliance on the protection of divine Providence, we mutually pledge to each other our Lives, our Fortunes and our sacred Honor.

See other examples of Energy Declaratons at: <http://www.savebiogems.org/declaration.asp>  
<http://www.eng.yale.edu/me185/Declaration%20WEB.pdf>  
<http://www.energyquest.ca.gov/library/ben/ben8.html>  
<http://www.txses.org/docs/DeclarationofSustainability-1.pdf>

# Solar Cooking Demonstrations

Solar cooking is a great outreach program you can do with feeder schools in your district or at an Earth Day Celebration. It would be a great way to teach students about how much energy and power the sun is able to produce.

Solar cooking is not only fun, but it's a great educational tool. Solar cookers work using the greenhouse effect to trap energy. Students have experienced the greenhouse effect many times when they've opened a car door, only to find the car interior warm on a cold winter day or extremely hot on a summer day.

There is a wide variety of solar cookers students may build, some of which can be constructed during a class period and others which may require a whole day.

Solar box cookers constructed using cardboard, newspaper, aluminum foil, and a piece of glass, will typically cook at temperatures between 225 - 275 F. (Crock Pots cook at 185 F.)

It is a real oven and will cook most anything you would put in your oven at home. It is considered a slow cooker, usually taking about twice as long as your conventional oven. Put your food out early and you can run errands, etc. and not worry about your home burning down. The food can be left unattended for hours without fear of overcooking or burning. Unlike your oven, the solar cooker does not add heat to the kitchen.

There's no need to rotate the oven to follow the sun with single reflector designs, though it will improve cooking times. You can take a solar oven to the beach or camping, and you can also use it to pasteurize water.

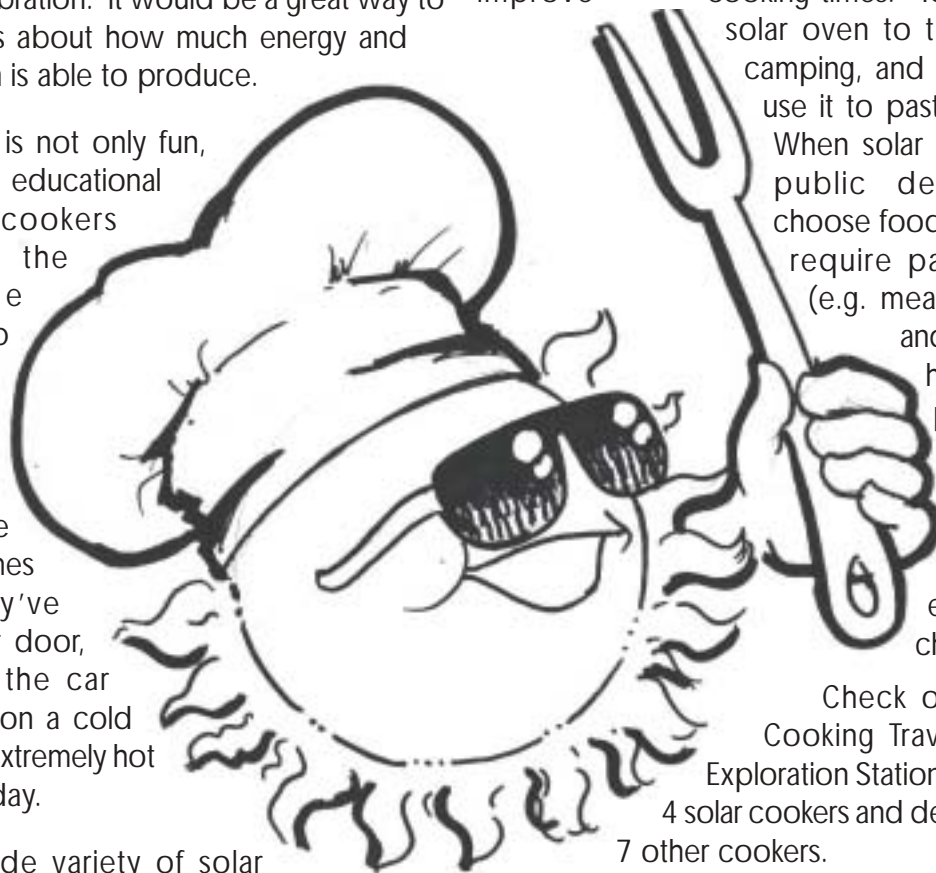
When solar cooking as a public demonstration choose foods that do not require pasteurization (e.g. meats and eggs) and follow good hygienic practices. Hot dogs or packaged cookie dough are easy, safe choices.

Check out the Solar Cooking Traveling Energy Exploration Station that includes 4 solar cookers and designs to build 7 other cookers.

For more information:  
<http://www.solarcooking.org/>

## Solar Cookout

It is very popular on campuses to have a cookout to raise money for a project or cause. Our suggestion is to make it a Solar Cookout. Building solar cookers can be very simple. There are many types of cookers and choosing the right cooker is easy once you know what you are cooking. Watt Watchers has a solar cooking traveling energy exploration station that you can check out and use to help you in building your cookers for your cookout. The important key for this project is the SUN!



# Earth Day Celebration

## Earth Day Celebration

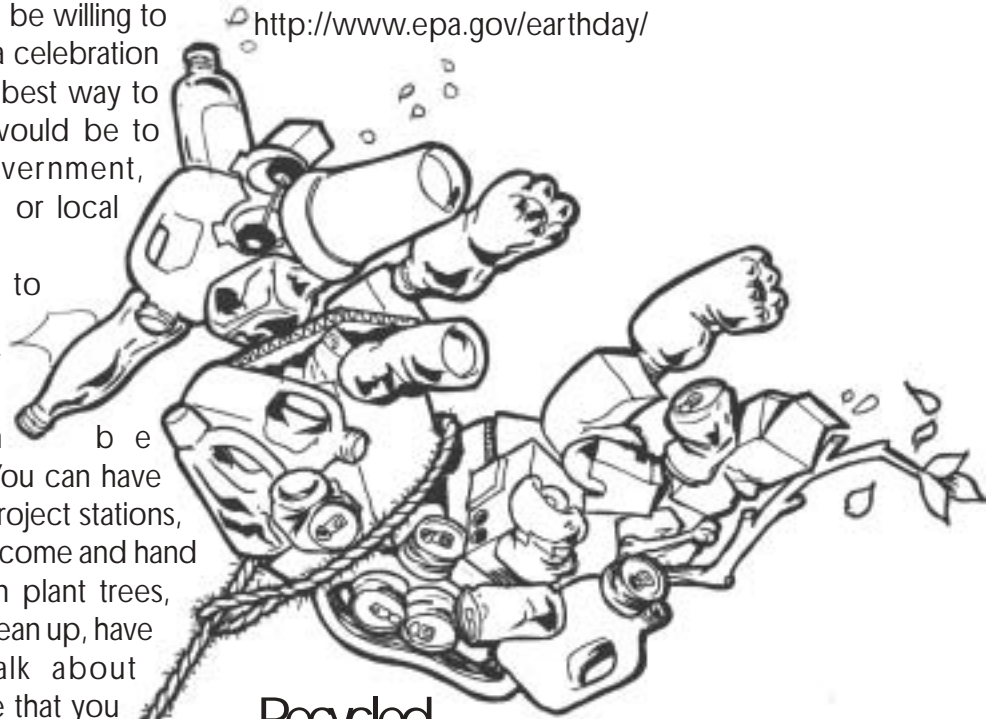
1. Check to see if your community does anything for Earth Day. If they do, ask if they would like any volunteers to help plan the day or just be there to help where needed. If your community does not do anything, ask if they might be willing to help your group put on a celebration for the community. The best way to get something started would be to contact your local government, Chamber of Commerce, or local recycling center.
2. The next thing to do is to figure out exactly what you want to do with your Earth Day Celebration. Many different things can be done at a celebration. You can have live music, recycled art project stations, the utility company could come and hand out information, you can plant trees, host a community wide clean up, have people come and talk about recycling, etc. Make sure that you

3. Advertise heavily, especially if you are doing a community wide celebration. Contact the radio station, newspaper and local TV station to let them know all the particulars that will be occurring during the celebration.
4. Remember, every day is earth day.

For more information:

Earth Day Network <http://www.earthday.org/>  
Environmental Protection Agency

<http://www.epa.gov/earthday/>



make it fun for everyone involved.



## Recycled Art Contest

Your recycling project may need a little boost and doing a recycled art contest is a great way to get people pumped up about recycling. A great way to do this simple project is to have grade levels compete against each other. You might want to select the recycled material, for instance everyone must use recycled cans or paper or milk jugs. Or you could allow them to just use anything that can be recycled. While this is not an energy saving project it is a fun way to get your campus re-energized about recycling which is an energy savings project.



# Campus Beautification Project

1. Determine which area of your campus needs the most help or is most visible to your student body or pick an area in town that needs a little extra touch.

2. Then start asking your group what kind of beautification project they would like to do. There are many options; for example, your organization could do monthly cleanups around the school, they could plant trees and add flowerbeds, or they can add some sort of permanent structure that can be used by the students at your school. If you decide to do something community related, look to cleaning up parks for children, cleaning up a cemetery, adding flowerbeds to visible areas in the community, or doing a mixture of these ideas.

3. Once you decide on this, you will know how to budget for your project. Doing campus cleanups requires little to no money. Adding trees and flowerbeds involves getting flowers and trees donated or using some of your organization's funds to make the project a reality. Adding a permanent structure like a picnic table or a campus wide beautification involves getting the materials donated or doing some fundraisers to pay for the project.

If you are interested in doing a permanent structure, you might want to survey the student body to find out what they would like to see in that area.

4. Make sure that whichever way you decide to do a campus beautification project, that you help maintain your project.

That could mean watering the flowerbeds and trees, posting signs to help promote cleaning up the campus, or using the structure that you helped put on your campus or in the community.

Doing a project like this could make your organization want to do something in your community. You could adapt this project to use in your community very easily. Talk to people in your community and find out some places that they think need sprucing up. Then contact your local government leaders or your Chamber of Commerce, and they would be more than willing to help you with a project like this. A project of this kind will take a lot of volunteers so make sure your organization is supportive of the project and willing to help before you commit.



## Participate in Energy Awareness Month

October is America's Energy Awareness Month sponsored by the Federal Energy Management Program (FEMP). Each year FEMP selects a theme for Energy Awareness month and makes materials available to the public for no cost. You don't have to celebrate October as Energy Awareness Month; you could select any month and use their materials. The important thing is to make your school occupants aware about energy – sources, efficiency, cost, and future. For more information: [http://www.eere.energy.gov/femp/services/energy\\_aware.cfm](http://www.eere.energy.gov/femp/services/energy_aware.cfm)

## Write Letters to Local and State Officials

Many times you may wonder what your senators and representatives are doing to help do their part for the environment. A good way to find out is to



**NOT IN USE?**  
**TURN OFF THE JUICE!**

LEAD BY EXAMPLE WITH  
**SMART ENERGY CHOICES**  
AT WORK AND AT HOME.

- USE YOUR WITS. SAVE YOUR WATTS!**  
Switch off unnecessary lights.  
Energy marks love the sun!
- UNPLUG THAT DRAIN!**  
Shut off or unplug electrical "drains" such as  
telety chargers, radios, printers, scanners, and cellphones.
- BE WISE ABOUT OFFICE SUPPLIES.**  
Use energy efficient products with the ENERGY STAR® Label
- BURN CARBOHYDRATES...NOT HYDROCARBONS!**  
Walk, bike, or take public transport to work.

**YOU HAVE the POWER**

U.S. Department of Energy  
**Energy Efficiency and Renewable Energy**

write to your senators and representatives to find out what their stand is on different environmental issues. To get addresses for your U.S. House of Representatives, go to <http://www.house.gov/writerep/> . For U.S. Senate members, go to <http://www.senate.gov/> . To get the addresses for your Texas House and Senate members, go to [http://www.tml.org/links\\_texas.html](http://www.tml.org/links_texas.html) . There is a link to get the names of members of the House and Senate. Make sure to write to the correct senator or representative from your district.

When writing letters, make sure that they are written on your school or organization letterhead. They will look more professional and will also be better received by your congressperson. Make sure that your sponsor, teacher or principal approves the letter before you send it.

A good way to start a letter to your senator or representative is to describe the projects that your organization has been working on throughout the year. Then you can ask what some of their environmental concerns are and how they have been able to use their position to help their cause.



## Write Articles for Watt's News

Are you doing energy projects at your school? Do you want to share your successful project ideas with other schools in Texas? Let others know how much your school does to save energy and



promote energy awareness. Start by sending Watt Watchers an article about your energy projects and let us put the information in the Watt Watchers newspaper, Watts News. Submitting an article to Watt Watchers is one of the simplest projects with a lot of recognition. Your school does a project, you take some pictures and some notes (who, what, when, where and why), write an article and email it to Watt Watchers – and we will do the rest! The circulation for each Watts News is 5,000 to 10,000 issues! You could become famous.

Student groups all over Texas are doing projects to help raise energy awareness in their district and this is an opportunity to share that project information with the rest of the state's schools. Use the projects within this handbook. If your school does a project not mentioned here, this can be a great way to share your original project idea. If you have any questions at all just call 1-888 US WATTS (879-2887).

## Host an Energy Science Fair

Science fairs are a great way to get people involved in learning. Energy is a great subject that has lots of experiments/projects. We encourage you to hold an Energy Science Fair – have students at your school do an experiment dealing with Energy and then have a contest at the fair to see whose experiment was the best. This gets students of all kinds involved in learning about energy.

## Survey Your School to Determine Its Energy IQ

A survey's main point is to access a group and find out how much information they know and what information they are unsure of. The best way to do this is to find questions that are easily answered, typically yes or no questions. Using that method, you will most likely get answers that you can work with.

Below are some sample survey questions:

- Do you leave the water running when you brush your teeth? Yes or No
- Do you turn off the lights when you leave the room? Yes or No
- Do you litter? Yes, Often, Seldom, or No
- Have you seen people litter? Yes or No
- If so, did you pick up their litter or ask them not to litter? Yes or No
- Do you combine errands on automobile trips? Yes No
- Do you carpool to school? Occasionally Yes No
- Do you walk or ride a bike to school? Occasionally Yes No
- Do you ride a school bus? Occasionally Yes No
- Do you recycle the plastic rings that are on 6-pack drinks? Yes No
- Do you recycle paper at home? Yes No
- Do you recycle aluminum cans at home? Yes No
- Do you recycle plastic at home? Yes No
- Do you take a shower or a bath? Bath Shower
- Do you participate in recycling projects at school? Yes No



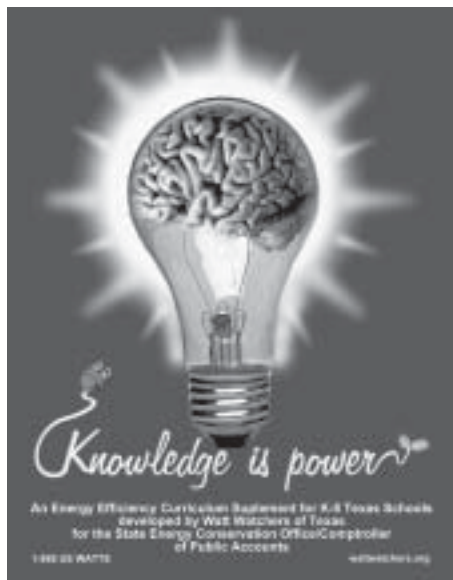
# America's Most Wanted Energy Wasters

Do you know of classrooms or teachers that consistently leave their lights on when out of the room or leave their computers on at night? Then you need an America's Most Wanted Energy Wasters campaign! Take a picture of the Most Wanted and List the "crime". Post this information in a visible part of the school to help get the attention of the others in the school and post a sign that says: "Would you want your picture here? ...Then remember to help save energy at our school."



# Distribute Knowledge is Power

Watt Watchers of Texas has developed an Energy Efficiency curriculum supplement called



Knowledge is Power for K-8 grades. We encourage you to use that curriculum in your Energy Education projects but also distribute it to science teachers in your district. They can

use these lessons during their energy unit and the lesson plans are already correlated to the TEKS and TAKS.

## Read Your Meter

Reading your electric meter is easy. You can read your meter to check your electric use in kWh and monitor your energy saving efforts. Your meter has either four or five numbered dials which record your electric use. The numbers on each dial alternate between clockwise and counterclockwise.



The reading is 66,649.

On a dial meter, there are five dials, numbered 0 through 9, with the 0 at the top. Look closely and you'll see that the numbers go around the

face clockwise on some of the dials, but counterclockwise on every other dial.

The hands of the dials move in the same direction as the counting order of the numbers.

To read the meter, just write down the number that each hand has just passed. Start with the dial on the far left, and proceed to the right.

If a hand is directly on a number, look at the dial to its immediate right. If that hand has passed zero, write down the number that the left hand is pointing to.

If the hand on the right has not passed zero, write down the last number that the left hand has passed.

Some commercial meters are digital and even easier to read. Always remember to put safety first and use common sense. Get a custodian or energy manager to assist you the first time you read the meter.

Once you know how to read your meter, it's easy to figure out how much electricity you've used since your last electric bill. Simply look at last month's electric bill to find the reading recorded by your local power company. Then, subtract last month's reading from the number you just took off your meter. What you end up with is the total number of kilowatt-hours you've used since your last reading.

### For more information:

<http://el Paso.apogee.net/res/refrmtr.asp>  
[http://www.ci.seattle.wa.us/light/accounts/stretchyourdollar/ac5\\_read.htm](http://www.ci.seattle.wa.us/light/accounts/stretchyourdollar/ac5_read.htm)  
[http://www.nfsmi.org/Information/energy\\_tech\\_info.pdf](http://www.nfsmi.org/Information/energy_tech_info.pdf)





# Notes



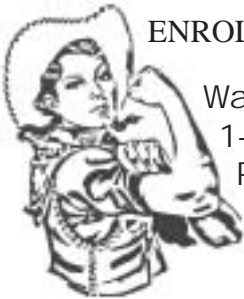


# Notes



# Pass it on!

Do you know a teacher that would benefit from Watt Watchers? Encourage them to enroll. Every school should be a Watt Watchers school.



## ENROLLMENT FORM

Watt Watchers of Texas  
1-888-US WATTS (1-888-879-2887) Toll Free Phone & Fax  
P.O. Box 68660, El Paso, Texas 79968  
e-mail: [info@wattwatchers.org](mailto:info@wattwatchers.org)  
<http://wattwatchers.org>

(Please Print Clearly)

Your Name: \_\_\_\_\_

School Name: \_\_\_\_\_

School Address: \_\_\_\_\_

(Free kit will be shipped to your school – Street address preferred)

City: \_\_\_\_\_ Zip: \_\_\_\_\_ County: \_\_\_\_\_

School Phone: ( ) \_\_\_\_\_ - \_\_\_\_\_ School Fax: ( ) \_\_\_\_\_ - \_\_\_\_\_

E-mail Address: \_\_\_\_\_

Name of School District: \_\_\_\_\_

Date: \_\_\_\_\_

# We Can Do It!



# Y'all Can Do It!

Over 50 years ago, a mythical American icon named "Rosie the Riveter" inspired millions of World War II women to join the workforce to help defeat our wartime enemies. Rosie the Riveter appeared on a famous poster urging women to take factory jobs to build bombs, airplanes and practically everything else. These women took over roles traditionally held by men and proved what gutsy, productive women workers could accomplish. They changed some old ideas about a woman's place being in the home. Strong, self-sufficient, patriotic, and plucky women all across America helped win the war with rolled up sleeves and a can-do attitude.

Watt Watchers chose Rosie as a symbol for our Energy Project Handbook for High School Groups because we think students can step up and go beyond their traditional roles just like Rosie did. We believe students can do Real Projects

with Real Results in the Real World! This project handbook is filled with dozens of clear, step-by-step projects that will save energy, save money, and prevent pollution. Use the handbook to change some old ideas about a student's place being in the classroom.

Of course, we have made Rosie the Riveter a little more Texas-like just as we did for Uncle Sam's little brother — Uncle Tex. We gave her a new outfit and a new name. We hope you like Rosie the Riveter's little sister — Rodeo Rosie as much as we do. Make no mistake, the same strong spirit and determination that helped win a world war is alive in Rodeo Rosie. Please use her image to inspire your next energy project. Y'all Can Do It!

# Y'all Can Do It!



## Watt Watchers of Texas

The Energy Center  
University of Texas at El Paso  
P.O. Box 68660  
El Paso, Texas 79968

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