2017

NEF

BE *WATT*SMART, BEGIN AT HOME

WASHINGTON

Program Report

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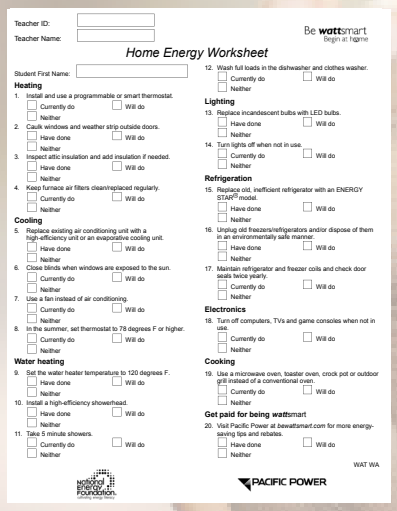
March 20, 2018

Savings



Teacher ID:
Teacher Name:

Be wattsmart Begin at home

Home Energy Worksheet

Student First Name:

Heating

1. Install and use a programmable or smart thermostat.
   ☐ Currently do ☐ Will do ☐ Neither
2. Caulk windows and weather strip outside doors.
   ☐ Have done ☐ Will do ☐ Neither
3. Inspect attic insulation and add insulation if needed.
   ☐ Have done ☐ Will do ☐ Neither
4. Keep furnace air filters clean/replaced regularly.
   ☐ Currently do ☐ Will do ☐ Neither

Cooling

5. Replace existing air conditioning unit with a high-efficiency unit or an evaporative cooling unit.
   ☐ Have done ☐ Will do ☐ Neither
6. Close blinds when windows are exposed to the sun.
   ☐ Currently do ☐ Will do ☐ Neither
7. Use a fan instead of air conditioning.
   ☐ Currently do ☐ Will do ☐ Neither
8. In the summer, set thermostat to 78 degrees F or higher.
   ☐ Currently do ☐ Will do ☐ Neither

Water heating

9. Set the water heater temperature to 120 degrees F.
   ☐ Have done ☐ Will do ☐ Neither
10. Install a high-efficiency showerhead.
    ☐ Have done ☐ Will do ☐ Neither
11. Take 5 minute showers.
    ☐ Currently do ☐ Will do ☐ Neither
12. Wash full loads in the dishwasher and clothes washer.
    ☐ Currently do ☐ Will do ☐ Neither

Lighting

13. Replace incandescent bulbs with LED bulbs.
    ☐ Have done ☐ Will do ☐ Neither
14. Turn lights off when not in use.
    ☐ Currently do ☐ Will do ☐ Neither

Refrigeration

15. Replace old, inefficient refrigerator with an ENERGY STAR® model.
    ☐ Have done ☐ Will do ☐ Neither
16. Unplug old freezers/refrigerators and/or dispose of them in an environmentally safe manner.
    ☐ Have done ☐ Will do ☐ Neither
17. Maintain refrigerator and freezer coils and check door seals twice yearly.
    ☐ Currently do ☐ Will do ☐ Neither

Electronics

18. Turn off computers, TVs and game consoles when not in use.
    ☐ Currently do ☐ Will do ☐ Neither

Cooking

19. Use a microwave oven, toaster oven, crock pot or outdoor grill instead of a conventional oven.
    ☐ Currently do ☐ Will do ☐ Neither

Get paid for being wattsmart

20. Visit Pacific Power at bewattsmart.com for more energy-saving tips and rebates.
    ☐ Have done ☐ Will do ☐ Neither

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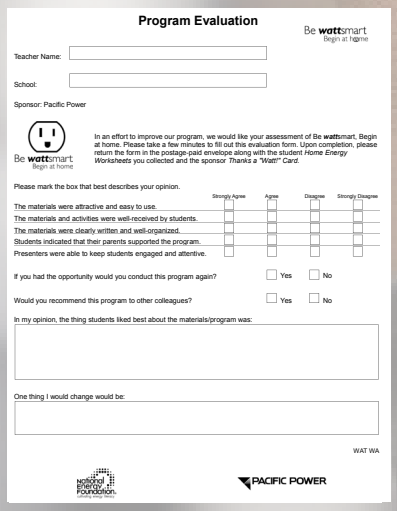
Home Energy Worksheets

– Returned: 2,625 –

– 65.03% –



Program Evaluation

Be wattsmart Begin at home

Teacher Name:

School:

Sponsor: Pacific Power

Be wattsmart Begin at home

In an effort to improve our program, we would like your assessment of Be wattsmart, Begin at home. Please take a few minutes to fill out this evaluation form. Upon completion, please return the form in the postage-paid envelope along with the student *Home Energy Worksheets* you collected and the sponsor *Thanks a "Watt"* Card.

Please mark the box that best describes your opinion.

	Strongly Agree	Agree	Disagree	Strongly Disagree
The materials were attractive and easy to use.	☐	☐	☐	☐
The materials and activities were well-received by students.	☐	☐	☐	☐
The materials were clearly written and well-organized.	☐	☐	☐	☐
Students indicated that their parents supported the program.	☐	☐	☐	☐
Presenters were able to keep students engaged and attentive.	☐	☐	☐	☐

If you had the opportunity would you conduct this program again? ☐ Yes ☐ No

Would you recommend this program to other colleagues? ☐ Yes ☐ No

In my opinion, the thing students liked best about the materials/program was:

One thing I would change would be:

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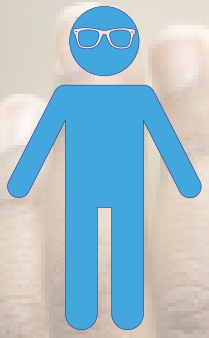
Teacher Packets

– Returned: 112 –

– 71.33% –

Participants

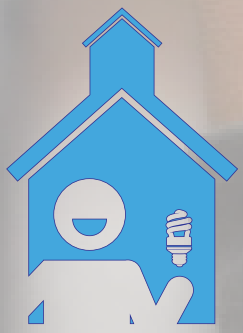


Students

– 4,036 –

Teachers

– 157 –



Schools

– 47 –

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Program Overview

Program Description

Be *watt*smart, Begin at home, an energy efficiency education program, is a collaborative partnership between PacifiCorp and the National Energy Foundation (NEF). This unique and interactive program teaches the importance of energy and natural resources and their impact on the environment. The objective is to expand and promote energy awareness through a school-based education program which encourages Washington students and teachers to change behaviors which will impact the energy consumption in their homes and community. Teachers are also provided teaching materials to support further classroom instruction on this valuable message.

Program Administration

Be *watt*smart, Begin at home is administered by NEF, a non-profit organization (established in 1976) dedicated to the development, dissemination and implementation of supplementary educational materials, programs and services relating primarily to energy, energy safety, the environment and natural resources. Our mission remains constant, to cultivate and promote an energy literate society. NEF is pleased to report on activities of the Be *watt*smart, Begin at home energy efficiency education program conducted during the 2017 – 2018 school year.

Anne Lowe, Vice President – Operations, oversees program organization. Gary Swan, Vice President – Development, oversees contract accounting. Janet Hatch, Program Director, is responsible for overseeing the scope of work. Patti Clark, Program Manager, is responsible for implementing the scope of work. Megan Hirschi, Program Manager, oversees school enrollment and communication with teachers and is responsible for scheduling presentations. A team of trained and seasoned presenters brought the interactive, hands-on program to Washington Schools.

Building Collaborations

Washington Office of Superintendent of Public Instruction Learning Standards correlate well to the content of Be *watt*smart, Begin at home. Teachers appreciate the collaborative efforts to align program components to their learning standards. Curriculum correlations were provided to teacher participants in their *Teacher Materials Folder* prior to the presentation date.

Program Implementation

During the month of May 2017 participating schools from the 2016 program were contacted and informed the registration for the 2017 program was available. In September 2017, a reminder email was sent to all priority unregistered 2016 participating schools. In August and September, Megan Hirschi made phone calls to all unregistered schools.

Program Registration

Registration for the program was online at bewattsmart.com/begin. Each registered school was checked against the qualified school list before communication was made with teachers to determine optimum presentation dates and student numbers.

After registration was qualified, a series of email communications with teachers, were sent automatically by the program registration website. The website calculated *Home Energy Worksheet* returns as well as earned gift card levels and communicated this information to the participant. Later communications were customized through programming to be sent only to teachers needing a reminder to return their program documents.

Be *watt*smart, Begin at home Presentation

Be *watt*smart, Begin at home presentations were given during the period of October 9th through November 10th 2017. The presentation featured a custom Keynote slideshow that brought energy concepts to the forefront of

Washington education. The presentation focused on important concepts, such as natural resources, electrical generation, the energy mix used by Pacific Power to generate electricity and tips for energy efficiency in the home.

The presentation provided interactive activities that involved and engaged the audience. Students participated in making a human electrical circuit, during which they learned key core curriculum concepts such as insulators and conductors of electricity and electrical generation. Student volunteers used props to demonstrate the process of electrical generation for their classmates. All students reviewed material learned with an "Energy Lingo" review activity at designated points throughout the presentation. To help students remember energy efficiency tips, participants watched Slim the Lineman energy efficiency video vignettes. At the end of each short video, students learned a rhyme about Slim's wise energy choice.

The last portion of the presentation communicated the importance of the program take-home pieces. These documents enabled households to participate in energy education along with students.

Program Materials

A *Parent Letter* was provided to explain the importance of Be *watt*smart, Begin at home. In addition, students took home a *Student Guide* and *Home Energy Worksheet* to share with their families. Students who returned their worksheet received an Energy Star© rated nightlight featuring the PacifiCorp logo as a reward.

Educators were also given helpful energy educational materials. Each teacher participant was provided a custom Be *watt*smart, Begin at home folder. The folder contained a custom *Teacher Guide* with additional information and activities to supplement and continue energy education in the classroom. Also in the folder were two NEF instructional posters, *Energy Efficiency in Action* and *Electricity Serves Our Community.*

A program *Implementation Steps Flier* assisted teachers in carrying out the program. It also gave simple steps for successfully returning *Home Energy Worksheets*, the *Program Evaluation* and the sponsor *Thanks a "Watt" Card* in the postage paid envelope provided in the *Teacher Materials Folder*. A *Rewarding Results Flier* gave information concerning the mini-grant that teacher participants could receive for returning their student surveys. Educators received a $50 gift card for an 80% return, or a $25 gift card for a 50 – 79% return by the December 1, 2017 deadline.

Program Accomplishments – Fall 2017

- 52 Be *watt*smart, Begin at home presentations completed at 47 schools (schools that had over 160 students were approved for two presentations).
- 1 school waitlisted
- 4,036 students and families reached
- 157 Washington teachers reached
- 65.03% student *Home Energy Worksheet* surveys return
- $50 mini-grant checks delivered to 88 Washington teachers
- $25 mini-grant checks delivered to 17 Washington teachers

Program Attachments – Fall 2017

- Fall 2017 Participating Schools
- Program Promotions
- Program Documents
    - Keynote Presentation
    - *Teacher Implementation Steps Flier*

    - *Rewarding Results Flier*
    - *Student Guide*
    - *Teacher Guide*
    - Lingo Card
    - Washington Core Curriculum Correlations
    - *Parent Letter*
- *Teacher Evaluation*
- *Teacher Evaluation* Compilation
- *Home Energy Worksheets*
- *Home Energy Worksheet* Summary – Pacific Power
- Wise Energy Behaviors in Pacific Power Washington Homes
- Sampling of Thanks a "Watt" Cards

Attachments

Fall 2017 Participating Schools

School Name	School Address	City	State	Zip
Adams Elementary - Wapato	1309 S. Camas Avenue	Wapato	WA	98951
Adams Elementary - Yakima	723 S. 8th St.	Yakima	WA	98901
Ahtanum Valley Elem School	3006 S. Wiley Rd	Yakima	WA	98903
Arthur H. Smith Elementary	205 Fir Avenue	Grandview	WA	98930
Artz-Fox Elementary	805 Washington	Mabton	WA	98935
Barge Lincoln	219 East I Street	Yakima	WA	98901
Blue Ridge Elementary	1150 W. Chestnut	Walla Walla	WA	99362
Camas Elementary	1010 S. Camas Avenue	Wapato	WA	98951
Chief Kamiakin Elementary	1700 E. Lincoln Ave	Sunnyside	WA	98944
Christ the Teacher Catholic School	5508 W. Chestnut Ave.	Yakima	WA	98908
Cottonwood Elementary	1041 S. 96th Ave	Yakima	WA	98908
Davis Elementary	31 SE Ash St	College Place	WA	99324
Dayton Elementary	302 E. Park St.	Dayton	WA	99328
Discovery Lab School	2810 Castlevale	Yakima	WA	98902
Dixie Elementary School	10520 E. Highway 12	Dixie	WA	99329
East Valley Elementary	1951 Beaudry Rd.	Yakima	WA	98901
Edison Elementary	1315 E. Alder	Walla Walla	WA	99362
Garfield Elementary - Toppenish	505 Madison Ave	Toppenish	WA	98948
Garfield Elementary - Yakima	612 N. 6th Ave	Yakima	WA	98902
Gilbert Elementary	4400 Douglas Drive	Yakima	WA	98908
Grace Lutheran School	1207 S. 7th Ave	Yakima	WA	98902
Green Park Elementary	1105 E. Isaacs Street	Walla Walla	WA	99362
Harriet Thompson Elementary	1105 W. 2nd St.	Grandview	WA	98930
Hoover Elementary	400 West Viola Avenue	Yakima	WA	98902
Lincoln Elementary	309 North Alder	Toppenish	WA	98948
Martin Luther King Jr.	2000 S 18th Street	Union Gap	WA	98903
McClure Elementary - Grandview	811 W. 2nd	Grandview	WA	98930
McClure Elementary - Yakima	1222 S. 22nd Ave	Yakima	WA	98902
McKinley Elementary	621 S. 13th Ave	Yakima	WA	98902
Naches Valley Elementary	151 Bonlow Drive	Naches	WA	98937
Nob Hill Elementary	801 South 34th Avenue	Yakima	WA	98902
Outlook Elementary	3800 Van Belle Rd	Outlook	WA	98938
Prospect Point Elementary	55 Reser Road	Walla Walla	WA	99362
Ridgeview Elementary	609 West Washington Ave	Yakima	WA	98903
Riverside Christian School	721 Keys Road	Yakima	WA	98901
Robertson Elementary	2707 West Lincoln	Yakima	WA	98902
Roosevelt Elementary	120 N. 16th Avenue	Yakima	WA	98902

School Name	School Address	City	State	Zip
Satus Elementary	910 S. Camas Ave	Wapato	WA	98951
Selah Intermediate School	1401 W. Fremont Avenue	Selah	WA	98942
Sharpstein Elementary	410 S. Howard St.	Walla Walla	WA	99362
St Joseph-Marquette School	202 N. 4th St	Yakima	WA	98901
Terrace Heights Elementary	101 N. 41st Street	Yakima	WA	98901
Tieton Intermediate School	711 Franklin Road	Tieton	WA	98947
Waitsburg Elementary	184 Academy	Waitsburg	WA	99361
Washington Elementary	800 E. Jackson Avenue	Sunnyside	WA	98944
Whitney Elementary	4411 W. Nob Hill Blvd.	Yakima	WA	98908
Wide Hollow Elementary	1000 S. 72nd Ave	Yakima	WA	98908
Zillah Intermediate	303 2nd Ave	Zillah	WA	98953

Be *watt*smart
Begin at home

Be wattsmart, Begin at home is a free energy education program sponsored by Pacific Power that is available to you in the fall of 2017. This program utilizes local presenters to focus on the Washington Office of Superintendent of Public Instruction Standards while showing students and teachers how wise energy actions make a difference. Here is what local teachers have to say about the program:

> ***The students loved seeing their peers be an electric circuit.***

> ***This presentation was a perfect connection to our science unit on electricity.***

Please join us in this important effort. You may qualify to receive a **mini-grant of up to $50** depending upon participation.

What:	A 45 - 60 minute educational presentation with **FREE** wattsmart energy education posters, activities and student materials
When:	October 10 - November 10, 2017
Where:	Your school
Who:	Your school chooses either fourth- or fifth-grade, depending upon placement of learning standards
How:	Enroll at **bewattsmart.com/begin** at your earliest convenience to ensure a spot or contact Megan Hirschi at **megan@nef1.org**

National Energy Foundation®
cultivating energy literacy

PACIFIC POWER

bewattsmart.com

Dear Be ***watt***smart, Begin at home 2016 program participant:

Thank you for participating in the Be ***watt***smart, Begin at home program. Pacific Power will once again be supporting teachers in educating students on required energy standards during the 2017-18 school year.

As a former program participant, you have the opportunity to enroll your fourth- or fifth-grade class in advance for the fall 2017 Be ***watt***smart, Begin at home program.

The 45 - 60 minute school presentations include **FREE** wattsmart energy education posters, activities and student materials. They will be scheduled during the weeks of **October 10 - November 10, 2017.** Teachers may qualify to receive a mini-grant of up to $50 depending upon participation.

Register soon at bewattsmart.com/begin to ensure your 2017 participation or email megan@nef1.org.

Thank you.

Program Documents

Keynote Presentation

Be **watt**smart,
Begin at home

PACIFIC POWER

What we will do today.

Learn about natural resources.

Learn how we make and use energy.

Learn how to use energy wisely by being **watt**smart.

Play energy LINGO.

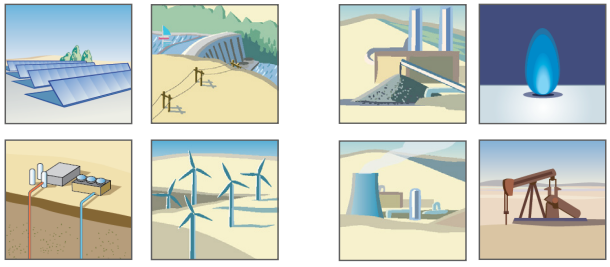
What is ENERGY?

ENERGY is the ability to do WORK.

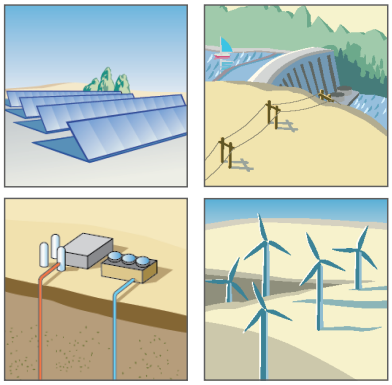
Natural resources

A **natural resource** is anything we use that comes from the earth or the sun.

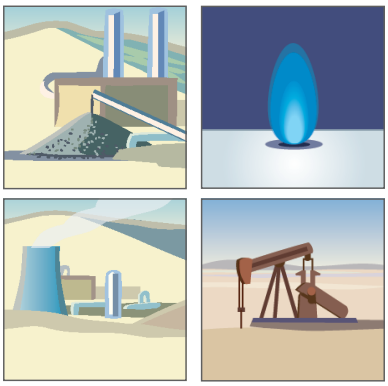
Renewable and nonrenewable resources



Renewable resources



Nonrenewable resources



Electricity

- The electricity we use is not a natural resource.
- It is made from natural resources.
- Since electricity is made from natural resources, it is called a **secondary energy source**.
- Power lines carry the electricity from where it is generated to where it is used.

Let's LINGO

Find the words on your LINGO board that match these definitions:

- The ability to do work. **Energy**
- A resource often found with oil. **Natural gas**
- A secondary energy source. **Electricity**
- Something useful from the earth or the sun. **Natural resource**

Pacific Power

Electric generation by energy source

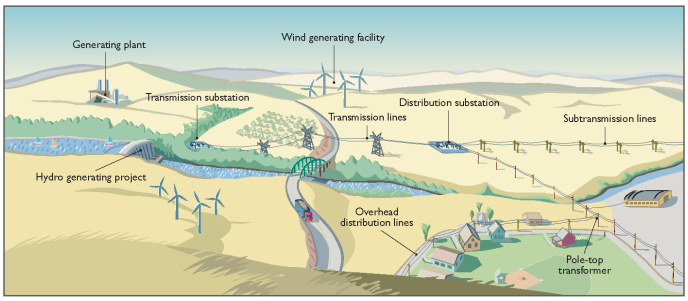
Coal 58.85%

Renewables 17.08%

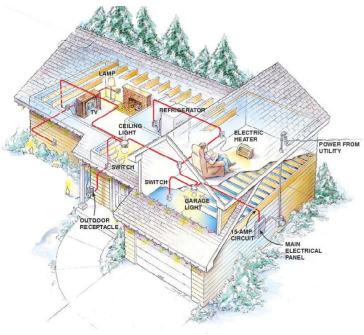
Natural gas 14.76%

Other sources 9.31%

Electric generation



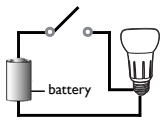
What is a circuit?



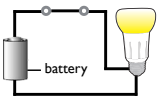
Let's make a circuit.

What things do we need to make an electrical circuit?

- An **energy source**, such as a battery.
- A **conductor** to carry electrical energy, such as wire.
- A **load** to use the energy, such as a light bulb.



Open circuit:
No electricity can flow



Closed circuit:
Electricity can flow

Energy efficiency

Energy efficiency

- Using less energy to accomplish the same amount of work.

Technology

- Install energy-efficient products, appliances and devices.

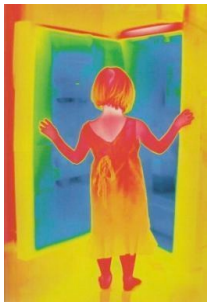
Behavior

- Use less energy through wise behaviors that conserve energy.

Know what you want before you open the refrigerator.

Refrigerators and freezers

What can you do to be ***watt***smart?



Decide what you want to eat quickly!

Use LEDs

Turn off the TV when you leave the room.

Electronics

What can you do to be ***watt***smart?

- Turn off TVs, computers and game consoles when not in use.
- Unplug the thug. Beware of **phantom loads**.

- Use advanced power strips to reduce phantom load.

Turn off the lights when you leave the room.

Lighting

What can you do to be ***watt***smart?

Turn off the lights when you leave a room.

Replace standard bulbs with **LED** (light-emitting diode) light bulbs.

Let daylight shine in.

Let's LINGO

Find the words on your LINGO board that match these definitions:

- Using less energy to accomplish the same amount of work. **Energy efficiency**
- An energy resource that is capable of being renewed or is replaceable. **Renewable**
- Fossil fuels – such as coal, natural gas and oil – are considered **Nonrenewable** resources.
- A resource used to produce gasoline. **Oil**

Home heating and cooling

What can you do to be ***watt***smart?

- Use a fan instead of an air conditioner.
- Install a smart or programmable thermostat.
- Change furnace filters.
- Insulate your home and seal air leaks.

Water heating

What can you do to be ***watt***smart?

- Install a water-efficient showerhead.
- Take shorter showers.
- Turn off the water when brushing teeth.
- Set your **water heater** to 120°F.

Dishwashers and laundry

What can you do to be ***watt***smart?

- Run these appliances only when full.
- Use low energy settings.
- Clean the lint filter on your dryer with each load.

Cooking

What can you do to be ***watt***smart?

- Use a microwave oven when possible.

- Use lids to shorten **cooking** time.

The 3 Rs

What can you do to be ***watt***smart?

- **Reduce**
  – use less of something.
- **Reuse**
  – use something again.
- **Recycle**
  – make something into another new thing.

Let's LINGO

Find the words on your LINGO board that match these definitions:

- A light that can last 25 times longer than an incandescent. **LED**
- Electricity consumed by an electronic device while it is turned off or in standby mode. **Phantom load**
- Using a toaster oven or microwave for **Cooking** is more energy-efficient than using the oven.
- Set this to 120°F for a comfortable shower. **Water heater**
- To use less of something. **Reduce**

What have we done today?

- **Learned** why energy is important.
- **Discussed** energy and where it comes from.

Engage

Review your **Be *watt*smart, Begin at home** booklet with your parent(s).

Complete the *Home Energy Worksheet* and return it to receive an energy-efficient nightlight.

Sign the *Thanks A "Watt" Card* and your teacher will mail it along with your worksheet and the teacher's *Program Evaluation*.

***YOU** can make a difference when you are **watt**smart!*

Visit **bewattsmart.com** for more energy-saving ideas.

Be ***watt***smart
Begin at home

Teacher Program Implementation Steps

1. Verify that you have received each of the following:
   - *Teacher Materials Folder*
     - Your **Be wattsmart, Begin at home** *Student Booklet*
     - Your **Be wattsmart, Begin at home** *Teacher Guide*
     - *Program Evaluation*
     - Sponsor *Thank You Card*
     - Teacher mini-grant announcement
     - Self-addressed postage-paid envelope
     - Instructional posters
   - *Home Energy Worksheets* for you and your students
   - **Be wattsmart, Begin at home** student booklets
   - Set of *Parent Letters*
   - *watt*smart nightlights (student incentive for returning the *Home Energy Worksheet*)
   - *watt*smart *Starter Kit Fliers*

2. Distribute to each student a:
   - **Be wattsmart, Begin at home** student booklet
   - *Home Energy Worksheet*
   - *Parent Letter*

3. Reward each student who returns a completed *Home Energy Worksheet* with a wattsmart nightlight.

4. Complete the *Program Evaluation* form.

5. Have each student sign the *Thank You Card* to Pacific Power.

6. Mail in the self-addressed postage-paid envelope:
   - Completed *Home Energy Worksheets*
   - The *Thank You Card*
   - The *Program Evaluation* form

To thank you for postmarking your envelope by December 1, 2017, you will receive a mini-grant for classroom use.
80% or greater return of registered students' *Home Energy Worksheets* **= $50**
50 – 79% return of registered students' *Home Energy Worksheets* **= $25**

For questions or additional information, please email Megan Hirschi at **megan@nef1.org**.

Dear Parent(s):

The **Be wattsmart, Begin at home** program assists teachers and students to learn about energy, discuss important energy topics and engage in energy efficiency actions now. Your child has participated in an assembly addressing natural resources, energy basics and energy efficiency. Your participation in this program will help you be wattsmart, enhance energy efficiency in your home and help save money on your utility bills. Here are three simple ways that you can help:

- Review this **Be wattsmart, Begin at home** booklet with your child.
- Assist your child with completing the activities on Page 7.
- Have your child return the ***Home Energy Worksheet*** to their teacher.
- Order a **wattsmart Starter Kit**

Thank you for being wattsmart and for your participation!

What's inside?

This booklet is divided into three sections that will help you:

1. Learn about sources of energy, how they get to your home and why they are important in your life.
2. Discuss wattsmart energy efficiency tips that will help you use energy wisely and save money.
3. Engage in energy efficiency by determining how energy can be saved in your home through a simple audit activity and the *Home Energy Worksheet*.

About Pacific Power

Pacific Power is committed to the delivery of reliable electric service that's safe, low-cost and increasingly from clean, renewable resources. Serving more than 700,000 customers in Washington, Oregon and California, the company is one of the lowest cost energy producers in the nation.

About the National Energy Foundation

The National Energy Foundation (NEF) is a 501 (c)(3) nonprofit organization, founded in 1976. It is dedicated to increasing energy literacy through the development, distribution and implementation of educational programs and materials. These resources relate primarily to energy, natural resources, energy efficiency, energy safety and the environment. Concepts are taught through science, math, art, technology and writing. NEF recognizes the importance of educating individuals about energy so they can make informed decisions about energy issues and use.

What does it mean to be ***watt***smart?

- Being wattsmart is all about taking steps to save energy – which in turn can help you save money.
- Pacific Power's wattsmart programs and incentives can help customers become more energy efficient in their homes and businesses and that's good for their wallets and the environment.

The importance of energy:

Energy is the ability to do work or produce change. Virtually everything we do or use at work and home uses energy.

- Heating and cooling systems
- Computers
- Electronic equipment such as gaming and entertainment systems and TVs
- Charging electronic tablets, music players and cell phones
- Appliances
- Lights
- Manufacturing
- Food storage and preparation
- Security systems

Where does energy come from?

Our energy comes from natural resources. There are two general categories of natural resources – nonrenewable and renewable. A nonrenewable resource is not capable of being renewed, replaced or takes a very long time to replace. A renewable resource is capable of being renewed or replaced.

PRIMARY NATURAL RESOURCES are used to convert energy into electricity. They can be either nonrenewable or renewable.

Nonrenewable examples are:

Coal is the most abundant nonrenewable energy source in the world. There is an estimated 129 year supply remaining.

Oil can be both refined and unrefined. Refined oil is transformed into petroleum products and unrefined oil remains as crude oil.

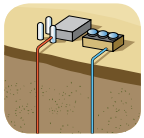
Natural Gas is usually captured alongside oil deposits and is a major source for electrical generation.

Uranium is the fuel most widely used by nuclear plants. Nuclear energy is the energy inside the nucleus (core) of the atom of uranium.

Renewable examples are:

Solar is energy from the sun.

Wind is energy from the wind captured by a group of wind turbines (generators).



Geothermal is energy derived from the heat of the earth.

Hydropower is energy from water that generates electricity.

SECONDARY ENERGY RESOURCES are created by using nonrenewable and renewable resources of energy.

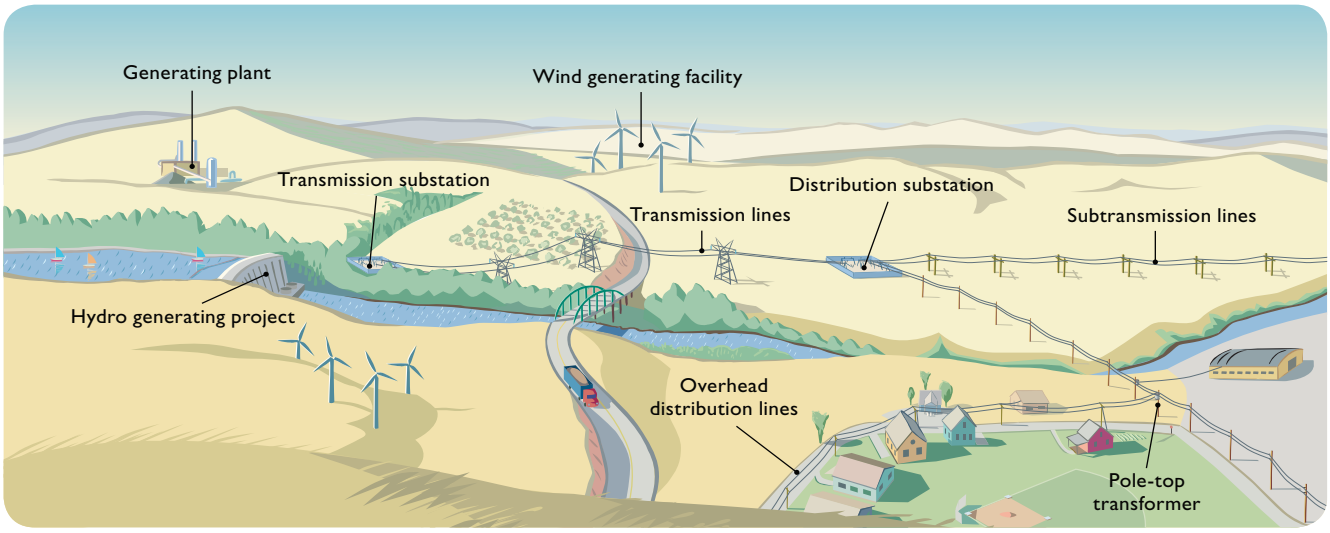
Electricity is the most abundant **secondary energy resource** used. It is the flow of electrical power or charge. It occurs in nature as lightning and static electricity. A generator uses energy resources to create mechanical energy that is then converted into electrical energy.

Energy efficiency

Energy efficiency is using less energy to accomplish the same amount of work – we call it being wattsmart. There are many technologies we can use today that decrease the amount of energy needed to do work. Good examples are ENERGY STAR® products and LED lighting.

You can save even more money if you start thinking about using energy wisely. Try turning off the lights when you leave the room, take shorter showers or turn off your electronics when you are not using them.

Using electricity



For more than 100 years, electricity has made our homes more comfortable and industries more productive. Today electricity is powering a world of electronics.

How is electricity generated? It begins with a fuel that heats water and turns it to steam. The steam drives the turbine that turns the generator motor to produce electricity.

How is electricity transmitted? Once the electricity is produced, the current flows from the generator to the power plant transformer where the voltage is increased to boost the flow of the electric current through the transmission lines. The transmission lines transport the electricity to Pacific Power's substations where the voltage is decreased. Power lines then carry the electricity from the substations to be used in our homes and businesses.

ELECTRICAL GENERATION

Energy resource	Pacific Power (2016 basic fuel mix)*	United States (U.S. EPA, 2013 data)
Coal	58.85%	39%
Natural gas	14.76%	27%
Renewables	17.08%	12%
Hydroelectric	5.58%	7%
Wind	8.97%	4%
Biomass	0.44%	1%
Geothermal	0.41%	--
Solar	1.68%	0%
Nuclear	0.00%	19%
Other/misc.	9.31%	3%
Total*	100%	100%

**This information is based on Federal Energy Regulatory Commission Form 1 data. The Pacific Power "basic fuel mix" is based on energy production and not resource capability, capacity or delivered energy. All or some of the renewable energy attributes associated with wind, solar, biomass, geothermal and qualifying hydro facilities in Pacific Power's basic fuel mix may be: (a) used in future years to comply with renewable portfolio standards or other regulatory requirements, (b) sold to third parties in the form of renewable energy credits and/or other environmental commodities or (c) excluded from energy purchased. Pacific Power's basic fuel mix includes owned resources and purchases from third parties.*

wattsmart tips to lower your energy use and help save money

Saving energy happens in two ways. First, you can use less energy through wise behaviors that conserve energy. Second, you can install energy-efficient products, appliances and devices that use less energy to accomplish the same task. Let's talk about the following areas of your home that have the largest potential to save energy.

Home heating and cooling

- Install a programmable thermostat or smart thermostat. Set your thermostat to 78°F or higher in the summer and 68°F or lower in the winter.
- Make sure your house is properly insulated. If you have less than 6 inches of insulation in your attic, you would benefit from adding more.
- You can save 10 percent or more on your energy bill by reducing the air leaks in your home with caulking and weather stripping.

- To help your furnace run more efficiently and cost-effectively, keep your air filters clean.
- For windows with direct sunlight, close your blinds in the summer to keep the heat out. Open blinds on winter days to let the warmth in.
- Small room fans are an energy-efficient alternative to air conditioning.
- Inspect and replace weather stripping and caulking in your home.
- For information about energy-saving programs and cash incentives, visit **bewattsmart.com**.

Water and water heating

- Check your faucets for leaks that can cost you hundreds of dollars each year.
- Install a water-efficient showerhead and save as much as $145 a year.
- Set the water heater at 120°F.
- Install faucet aerators to decrease water use.

Lighting

- Let the sun shine in. Use daylight and turn off lights near windows when possible.

- Replace your incandescent bulbs with LEDs (light-emitting diodes) and save $5 to $8 per year per bulb. These bulbs use up to 80 percent less energy than incandescent bulbs and last much longer.
- Use lighting controls such as motion detectors and timers.
- Turn off lights when you leave the room.
- Always use the lowest wattage bulb that still gives you the light you need.
- Keep your light bulbs clean. It increases the amount of light from the bulb and reduces the need to turn on more lights.

Safety note: Burned out CFLs, which contain a small amount of mercury, should be disposed of properly. To locate a collection site in your area, or to learn what to do if a CFL breaks, visit **earth911.com**.

Electronics

- Turn off your computer and game consoles when not in use.
- Home electronics are made to turn on and off many times. Always turn them off to save energy.
- Electronics with the ENERGY STAR® label use as much as 60 percent less energy while providing the same performance.
- Beware of phantom loads which continue to draw electricity when they are plugged in but not in use. Examples are telephone chargers, electronic games and television sets.
- Use advanced power strips for household electronics. One button will turn off multiple appliances, which conserves electricity.

Refrigerators and freezers

- When looking to replace your old refrigerator, do so with an ENERGY STAR® model, which requires approximately 40 percent less energy than conventional models and provides energy savings without sacrificing the features you want.
- The coils in the back or bottom of your refrigerator and freezer should be kept as clean as possible.

Dishwashers

- Only run dishwashers when full and use the "air dry" or "no heat dry" settings.
- ENERGY STAR® dishwashers use at least 41 percent less energy than the federal minimum standard for energy consumption.

Laundry

- Buy a moisture-sensitive dryer that automatically shuts off when clothes are dry.
- Use a clothesline whenever possible.

Cooking

- Use a microwave oven, toaster oven or crock pot instead of a conventional oven.
- Use the right-sized pan for the stove top element.
- Cover pans with lids to keep heat from escaping.

Reduce

- Use less.
- Purchase products with little packaging.

Reuse

- Use something again.
- Reuse a box or a grocery bag.

Recycle

- Make something into another new item.
- Participate in the recycling programs in your community.

Parents, be wattsmart and watch the energy savings add up.

An individual with a combined electric and heating fuel bill of $2,500 per year could save 20 percent or $42/month by using these and other energy efficiency tips. That is like getting a pay raise without having to work harder or longer.

The cost of lighting your home

Take a walk around your home with your family to learn about your lighting.

1. Count the types of bulbs in each room and record in Table 1; then total each column.
2. Transfer the total for each type of lighting into Column A on Table 2.

TABLE 1

Location	Incandescent	CFL	LED
Bedroom 1			
Bedroom 2			
Kitchen			
Dining room			
Living room			
Hallway			
Laundry room			
Family room			
Front porch			
Other			
TOTAL			

3. In Table 2, multiply the numbers in Column A by the given amounts in Column B. Place the answers in Column C.
4. Add the numbers in Column C to get the total approximate cost of electricity for lighting your home.
5. Discover how much money you will save if all the bulbs in your home were CFLs or LEDs. Add the numbers in Column A to get the total number of bulbs in your home. Transfer the total to both rows in Table 3, Column E as indicated by the arrows.

TABLE 2

	A	B	C
	Number of bulbs from Table 1	Annual cost of electricity for one bulb	Annual cost of electricity for lighting
Incandescent		× $3.84	
CFL		× $0.84	
LED		× $0.48	
TOTAL			

6. Multiply the total number of CFLs by the annual cost of electricity for one CFL provided in Column F and put your answer in Column G.
7. In the last row of Table 3, multiply the total number of LEDs in Column E by the annual cost of electricity for one LED bulb provided in Column F and put your answer in Column G.

   How do the amounts in Column G compare with your current total cost for lighting in Column C above?

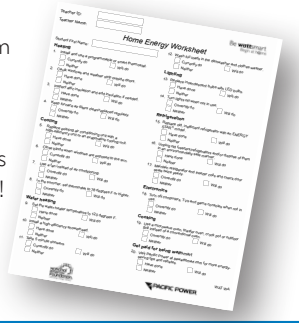
TABLE 3

	E	F	G
All CFLs		× $0.84	Annual cost of electricity with only CFLs
All LEDs		× $0.48	Annual cost of electricity with only LEDs

Cost figures are for an individual bulb (60 Watt incandescent), the lumens equivalent CFL (13 Watts) and LED (7 Watts) each used for 2 hours each day for 30 days. EEI Typical Bills and Rates Report, Winter 2016 (12 months ending 2015).

Be ***watt***smart – it's up to you

Together with your parent(s), complete the separate ***Home Energy Worksheet***. Return it to your classroom teacher and receive your wattsmart nightlight. You may find you are already practicing ways to be energy efficient but there is always room to do more.



Challenge yourself and your family to commit to practice energy efficiency by making wise energy choices and being wattsmart. You will not only help extend the life of our natural resources, but save money, too!

For other energy-saving ideas and incentives, visit **bewattsmart.com**. Congratulations to you and your family for making a difference.

Be *watt*smart

Begin at home

National Energy Foundation®
cultivating energy literacy

bewattsmart.com

PACIFIC POWER

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Be *watt*smart
Begin at home

TEACHER GUIDE

National Energy Foundation®
cultivating energy literacy

PACIFIC POWER

Welcome to Be ***watt***smart, Begin at home

This program teaches the importance of energy and assists students and their families in saving energy in their homes. For teachers, **Be *watt*smart, Begin at home** reinforces important electrical concepts from your curriculum.

This *Teacher Guide* was designed to supplement program instruction. A variety of tools have been provided to allow you to format **Be *watt*smart, Begin at home** to meet your instructional needs. These tools include:

- General guidelines and activity suggestions
- Classroom activities to further the impact of lessons
- Additional fun and interesting activities for students
- Activities containing STEM-related curriculum for your classroom

Table of Contents

About Pacific Power

Pacific Power is committed to the delivery of reliable electric service that's safe, low-cost and increasingly from clean, renewable resources. Serving more than 700,000 customers in Washington, Oregon and California, the company is one of the lowest cost energy producers in the nation.

About the National Energy Foundation

The National Energy Foundation (NEF) is a 501 (c)(3) nonprofit organization, founded in 1976. It is dedicated to increasing energy literacy through the development, distribution and implementation of educational programs and materials. These resources relate primarily to energy, natural resources, energy efficiency, energy safety and the environment. Concepts are taught through science, math, art, technology and writing. NEF recognizes the importance of educating individuals about energy so they can make informed decisions about energy issues and use.

STEM Correlations

STEM education is an approach to teaching and learning that integrates the content and skills of science, technology, engineering and mathematics. Some of the skills include: problem-solving, innovation, invention, inquiry, logical reasoning, critical thinking, technological literacy, communication tools, research tools, design and modeling, data analysis and probability, collaboration and real world connection. This chart correlates *Teacher Guid*e activities to STEM skills and behaviors.

	Science				**Technology**				**Engineering**					**Math**			
Activity	Science as Inquiry	Energy Sources, Forms and Transformations	Science and Technology	Personal and Social Perspectives	Productivity Tools	Communication Tools	Research Tools	Problem-solving and Decision-making Tools	Historical Perspective	Design and Modeling	Invention and Innovation	Test Design and Troubleshooting	Use and Maintain	Numbers and Operations	Measurement	Data Analysis and Probability	Connection to the Real World
Conservation Cookie	X			X										X	X	X	X
Pass the Sack	X	X		X													
Energy Ticket	X	X		X				X						X	X	X	X
The Search for Energy	X	X	X	X										X		X	X
Where Do Fossil Fuels Come From?	X	X	X					X						X	X		
Energy for Electricity	X	X	X	X			X										
Insulation Tests	X	X	X	X			X	X		X	X	X	X	X	X	X	X
How Bright Is Your Light?	X	X	X				X		X					X		X	X
Energy in Math														X		X	X

Section One:
Energy Efficiency

Objective: Identify and explain types of natural resources, conservation and energy efficiency.

Vocabulary:

Natural resource: A material source of wealth, such as timber, fresh water or a mineral deposit that occurs in a natural state and has economic value.

Renewable resource: A natural resource that is capable of being renewed or is replaceable such as energy from the sun or wind.

Nonrenewable resource: A natural resource that is not capable of being renewed, replaced or takes a very long time to replace, such as fossil fuels.

Fossil fuel: A combustible material created naturally beneath the earth's surface over a long period of time from the remains of plants and animals. Examples include coal, natural gas and oil.

Conservation: The protection, preservation, management, or restoration of natural resources such as forests, soil and water.

Energy efficiency: Using less energy to accomplish the same amount of work.

Classroom Activities:

- "Conservation Cookie"
- "Pass the Sack"
- "Energy Tickets"
- "The Search for Energy"

Energy Challenge

Discussion Idea: Embodied energy in a glass of milk.

Objective: Trace the energy and resources needed to make a common product.

Review the steps that it takes to produce a glass of milk and bring it to the consumer.

- Feeding and raising a cow
- Milking a cow
- Packaging
- Refrigeration
- Transportation of milk (dairy to warehouses to store to home)

Discuss with Your Class:

1. What natural resources go into making and transporting a glass of milk?
2. The energy used to make and transport a product is called **embodied energy**.
3. What embodied energy sources are involved in producing and transporting milk?
4. How can understanding embodied energy in our daily lives encourage us to be energy-efficient?

Conservation Cookie

Objective:
To demonstrate the results of conservation of a resource.

Pre-activity Discussion:
- What is conservation?
- Why is conservation so important?

Materials:
- Two cookies (or other food item) for each person
- One watch or clock with a second hand for timing
- Computer or graph paper to graph results

STEM Connection
Science
- Science as Inquiry
- Personal and Social Perspectives

Math
- Numbers and Operations
- Measurement
- Data Analysis and Probability
- Connection to the Real World

Procedure:
1. Tell students that this is the first of two rounds. In each round, they will be eating a cookie, which represents our natural resources. They are to stand at their desk and you say to eat the cookie as they normally would, then when the cookie has been completely swallowed, sit down. The activity will work better if you ask students NOT to put the entire cookie in their mouth at one time, to take at least two bites!
2. Give each student a cookie, with instructions not to eat it until you say. Start the watch and tell the students to eat the cookie as they would normally eat it. At 30 second intervals, count the number of students standing and record this data.
3. Individually or as a class, graph this data using a line graph.
4. Tell students they will now practice conservation with a second cookie. To represent conservation, students will only take a bite from their cookie when you say "BITE." Just as before, they will stand, take bites the same size they took last time, and sit after the entire cookie has been swallowed.
5. Pass out a second cookie to each student.
6. Start the watch and have everyone take a "BITE" and then wait 30 seconds. Record the number of students standing and again say "BITE." Repeat this procedure until almost everyone has finished his or her second cookie.
7. On the same graph used for the first cookie, add a second line graph for the conservation cookie.

Discussion:
- Compare the two graphs. If desired, have students calculate the slope of each graph from 0 to 30 seconds and from 30 seconds to 1 minute. How do the slopes vary over time and between graphs? What does a change in slope represent?
- Discuss the term "conservation" and its effects on our natural resources. Can we control how rapidly we use water or energy by conserving it? Water and energy are some of the most important things we use in our lives. If they are used up quickly, and all at once, we will not have enough left for the future.

Pass the Sack

Objective:
To demonstrate the difference between renewable and nonrenewable resources and the need for conservation of resources.

Materials:
- Two different kinds of candy or other objects students find desirable
- Sack to hold candy, such as a gallon size plastic bag

STEM Connection
Science
- Science as Inquiry
- Energy Sources, Forms and Transformations
- Personal and Social Perspectives

Procedure:
1. Count out enough candy so that there is one piece per student (some of each type of candy – perhaps less of one so it will run out faster). Put it in the sack or bag. Save the remaining candy. If you have a very polite class, count enough candy for half of the class. You want the candy to run out before everyone gets some!
2. Tell students you will be demonstrating how resources get used over time by playing "Pass the Sack." Show students the sack and tell them when they get the sack, they should take some energy and pass the sack to the person next to them.
3. Before passing the sack to the first student, review renewable and nonrenewable resources. Have students give examples of each as you hand the sack to a student.
4. While this discussion is taking place, allow students to pass around the bag of candy without any rules about how many pieces students may take. Occasionally, add four or five pieces of one of the types of candy you are using. (This will be your renewable resource.) The sack will be empty before it reaches all the students.
5. Ask students that did not get any candy how they might obtain energy from other students. What if each student represented a country? How do countries obtain resources? Trade? Barter (trade for goods)? Buy (trade for currency)? Invade and take (go to war)? What effect did the availability of candy have on relationships between students? What effect might the availability of natural resources have on the relationship among nations, provinces, states, people, standards of living and quality of life?
6. Explain how our resources are like the candy. Which type was nonrenewable? How could you tell? (No more was added to the bag once it was being passed around.) Which type was renewable? How could you tell? (It was added to the bag periodically.)
7. Point out that resources have limits just like the candy. Emphasize that many resources, such as fossil fuels, are nonrenewable and are being consumed faster than they are being replaced by nature. Discuss the fact that it would be more difficult for students to eat the candy if they had to search the room to find it instead of just taking it from the sack. Energy companies must seek resource deposits and obtain rights to drill or mine for them; they do not just magically appear. Point out that natural gas, coal and oil companies are looking harder for more resources as supplies dwindle.
8. Now plan to pass out the remaining candy. Should rules be established? Do oil, coal and natural gas companies have rules (regulations) that they must follow to find resources? Should there be rules and regulations on how much oil, coal and natural gas people use? How would students get resources if they could not leave their desks? How do the students' social decisions influence the availability of candy?

Energy Tickets

Objective:
See how energy decisions affect our standard of living and our quality of life. This will help students realize how important it is to use energy efficiently.

Materials Needed:
- Energy Tickets – 25 per student
- Box to collect tickets (toll box)

STEM Connection
Science
- Science as Inquiry
- Energy Sources, Forms and Transformations
- Personal and Social Perspectives

Technology
- Problem-solving and Decision-making Tools

Math
- Numbers and Operations
- Measurement
- Data Analysis and Probability
- Connection to the Real World

Procedure:
1. Before class begins, copy a page of tickets from the master on page 8 for each student. Alternatively, you may use preprinted tickets available from retail stores.
2. Introduce the game to the students by listing several places the students use energy in the school, for example, in the classroom: lights, computers and heaters.
3. Provide each student with 25 Energy Tickets, and instruct them to write their name on all of their Energy Tickets.
4. Every time a student uses energy, have them write how the Energy Ticket was used on the back and put the ticket in the toll box. If they use heated water, it will cost two tickets, because they are using both energy and water. It also costs two tickets if they waste energy unnecessarily. For example, leaving lights or a computer on when not in use wastes energy.
5. Keep a record of how many tickets the students have left each day.
6. Optional: look at how the tickets were used and create a graph of tickets used for different categories (sharpening pencils or using computers, for example) out of the tickets deposited in the box.

Discussion:
- What would happen if there was a real energy shortage in the community and families were issued a certain number of Energy Tickets?
- What if after they used them, all of their electricity and gas were shut off?
- What would they do to adjust their use of energy?
- What are other alternate sources of energy?

Language Arts Connection:
- Quick write – Describe one thing you could do to reduce your personal energy usage.
- Creative writing – Write a story about life after our nonrenewable energy sources are gone.

ENERGY TICKET This ticket allows one energy use. __________ student name	ENERGY TICKET This ticket allows one energy use. __________ student name	ENERGY TICKET This ticket allows one energy use. __________ student name	ENERGY TICKET This ticket allows one energy use. __________ student name	ENERGY TICKET This ticket allows one energy use. __________ student name
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The Search for Energy

Objective:
To learn the difference between renewable and nonrenewable resources.

Materials Needed:
- About 1/4 cup seed beads (solar energy)
- Colored beads in the following proportions: 84 percent black beads (about 250 beads) for coal; 16 percent red (about 50 beads) for uranium; 2 percent white (about 7 beads) for natural gas; 1 percent blue (about 4 beads) for oil. These proportions approximately reflect the nonrenewable energy reserves in the U.S.
- Optional: large bed sheet or tarp to place beads on for easy cleanup

STEM Connection
Science
- Science as Inquiry
- Energy Sources, Forms and Transformations
- Science and Technology
- Personal and Social Perspectives

Math
- Numbers and Operations
- Data Analysis and Probability
- Connection to the Real World

Procedure:
1. Divide the class into five equal groups. Each group will be a company going after a particular resource. The beads represent reserves of the various energy resources. Have students gather in a large circle around the sheet or other area where you will place the beads.
2. Scatter the large beads plus a spoonful of "solar" beads on the sheet so they are well spread out. Explain that this exercise shows how the amount of available resources changes over time. You may want to designate certain places as protected areas, where the resources are off limits to protect the environment.
3. Tell students you will do several trials, and look to see how the types of available resources change after each trial. Tell each group that they will have 30 seconds to pick up as many beads possible of their color, then you will stop and look at how things are changing. It is NOT a race! After checking for understanding, start timing.
4. After 30 seconds, have the groups stop and count the beads they have gathered. Record the results in a data table. If some groups have collected all of their available resource, point out that the resource is now depleted and they are unemployed. You can allow the students to join another group. Collect the beads students picked up in the first trial.
5. Scatter another spoonful of solar energy, helping students realize that since solar is a renewable resource, there is the same amount of it each time you look, whereas the fossil fuels are being depleted. Repeat the search period so students can get more beads.
6. Stop after 30 seconds and have the group count and record the beads collected again. Note that there are fewer fossil fuels found in the second round. Students have to look harder to find what is left. The solar count is slowly but surely catching up with the fossil fuels. Repeat with additional trials as needed.
7. Create a multi-line graph of the number of beads collected each trial. This can be done by individual students or as a class. Note that the nonrenewable resources decrease until they are depleted but the solar increases steadily.

Discussion:
- Why does the solar line differ from the others? Why does it go up rather than down?
- How do improvements in technology affect the extraction of resources from the earth?
- How do improvements in technology affect our usage of renewable resources?
- In the real world, can we extract ALL of one resource? Why do some deposits go unused?

Section Two:
Resources You Can Use Efficiently

Objective:
To discuss and identify various resources students use every day.

Vocabulary:
Electricity: The flow of electric charge used as power.

Green energy: Electricity produced by renewable energy sources that are nonpolluting, or that pollute very little.

Natural gas: A fossil fuel that is a mixture of gases occurring in underground deposits.

Classroom Activities:
- "Where Do Fossil Fuels Come From?"
- "Energy for Electricity"
- "Electrical Generation Poster"

Energy Challenge

Discussion Idea:
What natural resources can you save by recycling?

Optional Activity:
1. Have students keep track of each paper product that they use during one day with tally marks.
2. Compare amounts of paper used by students in the class. Ask students if they were surprised by the amount of paper they used.
3. Based on their usage of paper in one day, have students estimate how much paper they would use in a week, a month and a year.
4. Discuss the difference between reducing, reusing and recycling.
   - Reduce – using less of something
   - Reuse – using something again
   - Recycle – making something into another new item
5. Brainstorm several ways that paper use can be reduced, that paper can be reused and how paper can be recycled in your community.
6. Tell students that recycling 1 ton of paper saves the energy equivalent of 1,024 gallons of gasoline. Recycling just four aluminum cans saves enough energy to power a laptop for almost 21 hours. (EPA, 2017)

Where Do Fossil Fuels Come From?

Objective:
This activity investigates the production of natural gas and oil from ancient life. This activity models this process.

Materials per Student Group:
- A clear container to represent the ocean
- Sand or dirt
- Baking soda "plankton"
- Vinegar (20 percent) and water (80 percent) "ocean" mixture
- Cup or scoop
- Safety goggles

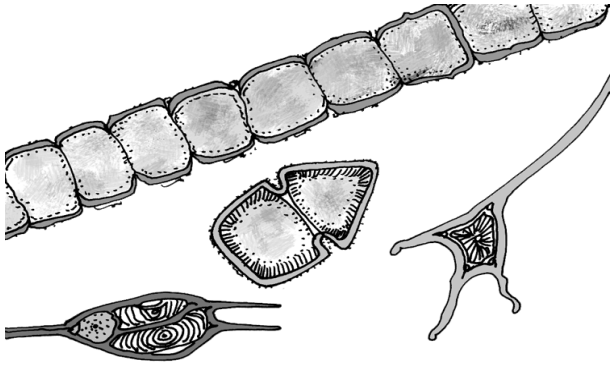
NOTE: You may do this as a demonstration, or have students do it in small groups.

STEM Connection
Science
- Science as Inquiry
- Energy Sources, Forms and Transformations
- Science and Technology

Technology
- Problem-solving and Decision-making Tools

Math
- Numbers and Operations
- Measurement

Procedure:
1. Explain to students that you will be showing them a model of how oil and natural gas form in the ocean. A very similar process takes place on land with plants to form coal.
2. Have students wear safety goggles to avoid splashing vinegar water in their eyes. It is harmless but uncomfortable.
3. Have students sprinkle a small amount of sand to cover the bottom of the container. The ocean floor is covered with sediments and the sand represents these sediments.
4. Next, have students sprinkle "plankton" over the sand, liberally covering the bottom of the container. This represents plankton (microscopic life plant and animal-like creatures called protists) that have died and settled to the bottom of the ocean.
5. Explain that over time, sediments are deposited on the ocean floor. Students should completely cover the plankton with sand. (You can gently push the sand around with your hands to simulate the pressure and weight the overlaying sediments have on the plankton.)
6. The ocean has water in it, so pour some of the vinegar/water (ocean mixture) into the container. Bubbles and foam begin to appear. You can see the bubbles bursting and can hear the gas being released to the air. Point out that this is a sign of a chemical change.



Discussion:
- Discuss with students that natural gas in the ocean is produced much in the same way as you have modeled, but that the process takes MANY years. In the ocean the plankton is buried under miles and miles of sediments which caused the weight of those sediments to "cook" the plankton under high temperature and pressure. The heat and pressure changes the plankton into oil and natural gas. Natural gas floats on top of the oil produced.
- Discuss how this model is different from real life. The gas produced in the experiment is carbon dioxide rather than natural gas, and since our container is open, the gas escapes into the air. In the ocean, there are usually impermeable layers that keep natural gas and oil trapped beneath the surface until we drill down and release it.

Energy for Electricity

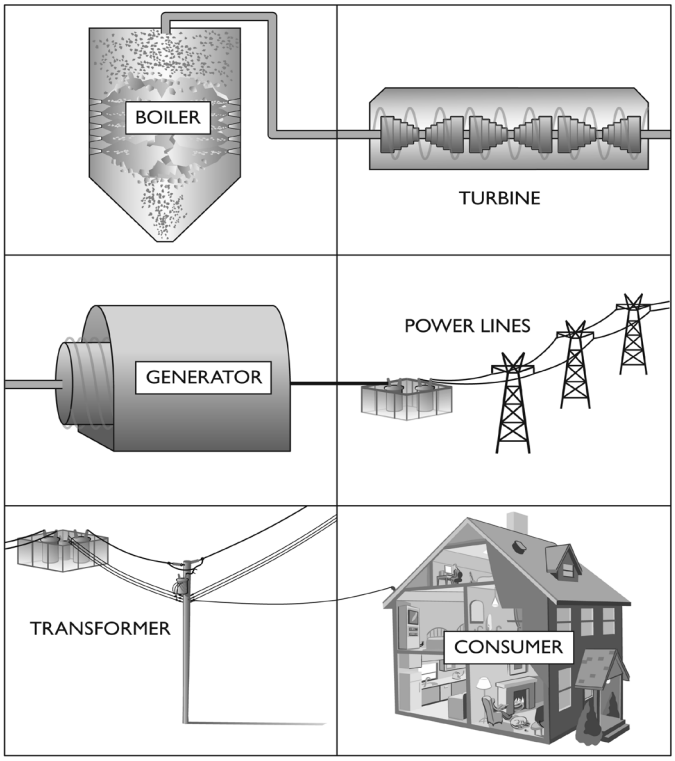
Objective:
Trace the flow of energy from a natural resource to electricity in our homes.

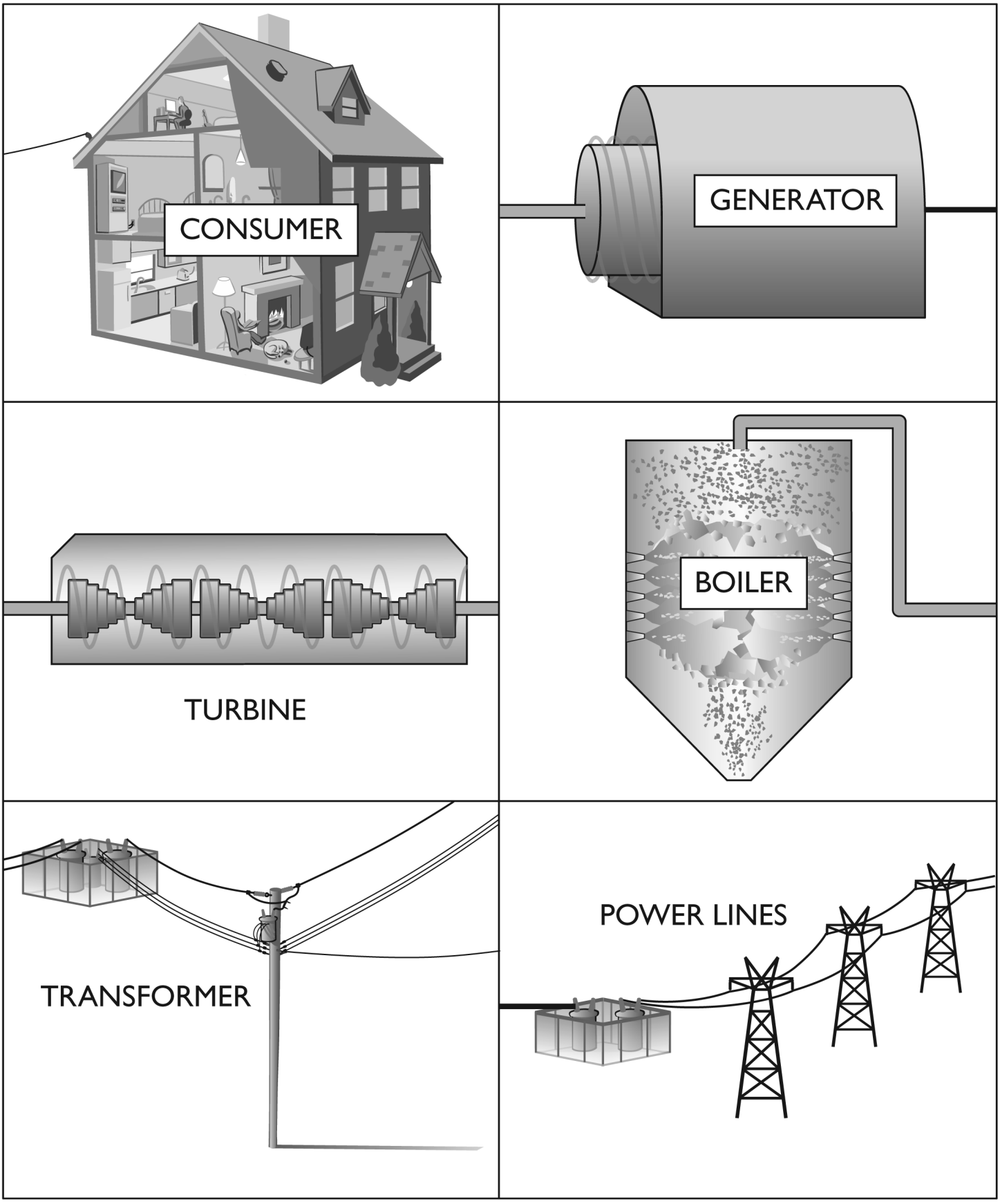
STEM Connection
Science
- Science as Inquiry
- Energy Sources, Forms and Transformations
- Science and Technology
- Personal and Social Perspectives

Technology
- Research Tools

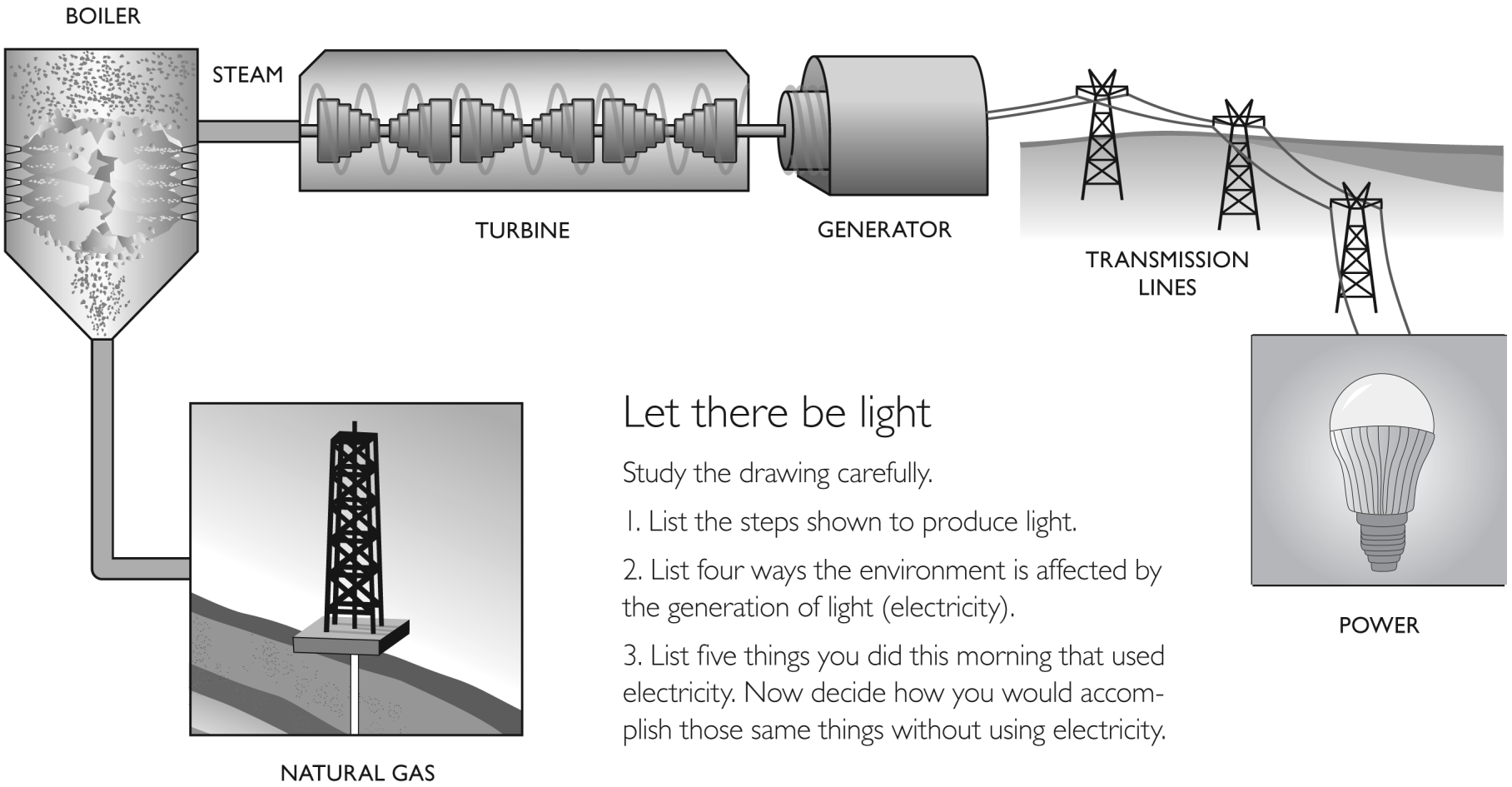
Procedure:
1. Ask students how their lives would be different without electricity. Where does electricity come from?
2. Pass out a copy of the "Electrical Generation Puzzle" found on the following page. Have students cut each part of the puzzle (transformer, turbine, generator, boiler, power lines and consumer) into separate pieces. Then, have them take a few minutes to put the puzzle pieces in order from the first to the last step of the process of electrical generation.
3. Go through each puzzle piece, explaining the process of each step:
   - Boiler – converts chemical energy from fuel (fossil fuels, biomass, hydrogen) to thermal energy, changing water to steam
   - Turbine – turned by steam, converting thermal energy to mechanical energy
   - Generator – turned by turbine, rotating coil of wire in a magnetic field, converts mechanical energy to electrical energy
   - Power lines – transmit electrical energy at several thousand Volts
   - Transformer – step-up transformers along the power lines increase voltage periodically; step-down transformers on poles or in yards reduce the voltage to a safe level for use
   - Consumer – converts electrical energy into many forms to run lighting and appliances

Completed puzzle for teacher reference





Electrical Generation



Let there be light

Study the drawing carefully.

1. List the steps shown to produce light.

2. List four ways the environment is affected by the generation of light (electricity).

3. List five things you did this morning that used electricity. Now decide how you would accomplish those same things without using electricity.

Section Three:
Be ***watt***smart, Begin at home

Objective:
To apply the principles of energy efficiency at home by changing habits.

Vocabulary:
Shell: The floors, windows, doors, walls and roof of a building that form a barrier between the indoor and outdoor environment.

Convection: Heat transfer in a gas or liquid by currents that circulate from one region to another. Convection works because heated fluids or gases expand, and since they are less dense, rise through the cooler materials around them.

Conduction: Heat transfer in a solid or liquid without any motion or flow of matter in the material. Heat is transferred by the motion of molecules and electrons. Higher speed particles from the warmer areas collide with slower ones from the cooler areas, causing a transfer of energy to the slower particles.

Radiation: Heat transfer between objects via electromagnetic waves. Photons traveling at the speed of light transfer the heat energy, so the objects do not have to be in contact with each other for heat to be transferred. Radiation can travel through space.

Insulation: A barrier that minimizes the transfer of heat energy from one material to another by reducing the effects of conduction, convection and/or radiation.

Classroom Activities:
- "Insulation Tests"
- "How Bright Is Your Light?"
- "Energy in Math"
- "Be wattsmart, Begin at home Poster"

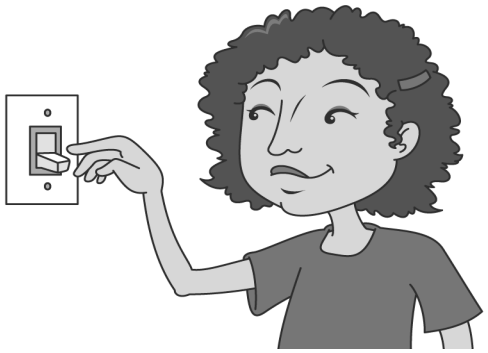
Energy Challenge

Discussion:
- What changes does your school need to make to save energy?

Optional Activity:
- Have students tour the school building to fill out the following checklist:

	Yes	No
1. Are outside doors weather stripped?	____	____
2. Are windows caulked to prevent air leaks?	____	____
3. Are lights turned off when no one needs them?	____	____
4. Is electrical equipment turned off when not in use?	____	____
5. Are faucets in bathrooms and kitchen areas free of leaks?	____	____

Discussion Idea:
- In which of the five areas does your school need the most improvement? How could students assist in making a change?



Insulation Tests

Objective:
To demonstrate the different types of materials that can be used for insulation.

Materials:
- Thermometer
- Graduated cylinder or measuring cup
- Large jug of water
- Large board or tray
- Baby food jars with lids (one for each material being tested)
- Insulation materials to test: gloves, socks of different materials, other types of clothing, plastic foam, paper, aluminum foil, leaves, etc.

STEM Connection
Science
- Science as Inquiry
- Energy Sources, Forms and Transformations
- Science and Technology
- Personal and Social Perspectives

Technology
- Research Tools
- Problem-solving and Decision-making Tools

Engineering
- Design and Modeling
- Invention and Innovation
- Test Design and Troubleshooting
- Use and Maintain

Math
- Numbers and Operations
- Measurement
- Data Analysis and Probability
- Connection to the Real World

Procedure:
1. On a piece of paper, list all of the materials being tested.
2. Using the jug of water, fill each jar with 120 mL (1/2 cup) of water.
3. Measure the temperature of the water in each jar to make sure they are the same, then put on the lids.
4. Wrap all but one of the jars with the materials being tested. Label the unwrapped jar "control."
5. Place each jar on the large board or tray.
6. Carry the board or tray outside and leave it there.
7. Create a data table to record the beginning and ending temperature of the water in each jar.
8. After a pre-determined amount of time has passed, measure the new temperature of each jar and record the ending temperatures in the data table.
9. Calculate the change in temperature for each jar and add it to the data table. Graph the temperature change for each jar in a bar graph.

Discussion:
- What materials made the best/worst insulators?
- Could you use these to keep your home warm in the winter or cool in the summer?
- What materials are used in homes for insulation? (fiberglass, blown-in insulation, polyurethane foam, etc.)
- What do good insulating materials have in common? How does insulation work? (They have large pore spaces that block conduction of heat through surfaces.)

Language Arts Connection:
Quick write – Based on the information in your data table, give recommendations for insulating a tree house.

How Bright Is Your Light?

Objective:
To demonstrate which lighting sources are the most energy efficient.

Materials:
- Various light bulbs (incandescent, CFL and LED)
- Lamp or light socket
- Thermometer

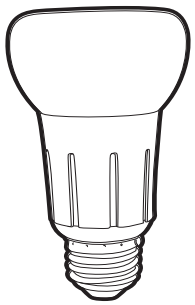
STEM Connection
Science
- Science as Inquiry
- Energy Sources, Forms and Transformations
- Science and Technology

Technology
- Research Tools

Engineering
- Historical Perspective

Math
- Numbers and Operations
- Data Analysis and Probability
- Connection to the Real World

Procedure:
1. Ask students what electrical item is used most often in any building and can also account for a lot of wasted energy (lights).
2. Put each light bulb in the lamp and leave it on for five minutes. Hold a thermometer at a distance from, not touching, the bulbs. Record the temperatures. Which bulb produces the most heat?



3. Not all light sources are created equal. Some are much more energy-efficient than others. The least efficient light bulbs are incandescents. These bulbs were invented by Thomas Edison and have changed very little in the last 100 years. Incandescent bulbs get very hot when they are turned on because about 90 percent of the energy that goes into an incandescent bulb is given off as heat instead of light.

   By contrast, the compact fluorescent light, or CFL, uses 75 percent less energy because it gives off less heat. A CFL can last up to 10 times longer. LED bulbs are even more efficient, using 75 – 85 percent less energy than traditional incandescent bulbs and can last 25 times longer.

Discussion:
- Does your family use energy-efficient CFLs or LEDs? How can heat from an incandescent bulb cause further energy waste during the summer?

Energy in Math

STEM Connection

Math

- Numbers and Operations
- Data Analysis and Probability
- Connection to the Real World

1. Jessie saved more energy than Michael. Michael saved more energy than Maggie. Maggie saved less energy than Jessie. Karen saved more energy than Jessie. List the kids' names in order of how much energy they saved, least to most:

   ☐ Jessie, Karen, Maggie, Michael
   ☐ Maggie, Michael, Jessie, Karen
   ☐ Michael, Jessie, Maggie, Karen
   ☐ Maggie, Karen, Michael, Jessie

2. The Maher family used 57,000 gallons of water a year, costing them $525 to heat it. Estimate how much money they would save in a year if they cut their hot water use by 30,820 gallons.

   ☐ $100
   ☐ $240
   ☐ $284
   ☐ $525

3. If each person in a house uses a 60 Watt bulb in their bedroom 4 hours a day, and there are three people living there, how many Watts will be used a day to light their room?

   ☐ 20 Watts
   ☐ 240 Watts
   ☐ 650 Watts
   ☐ 720 Watts

4. For every 10 degrees the water heater setting is turned down, you can save 6 percent of the energy used. If Charles turns his water heater down by 15 degrees, about what percent savings in energy will he save?

   ☐ 6%
   ☐ 9%
   ☐ 12%
   ☐ 15%

Energy in Math - Answer Key

1. Jessie saved more energy than Michael. Michael saved more energy than Maggie. Maggie saved less energy than Jessie. Karen saved more energy than Jessie. List the kids' names in order of how much energy they saved, least to most:

   ☐ Jessie, Karen, Maggie, Michael
   ■ Maggie, Michael, Jessie, Karen
   ☐ Michael, Jessie, Maggie, Karen
   ☐ Maggie, Karen, Michael, Jessie

2. The Maher family used 57,000 gallons of water a year, costing them $525 to heat it. Estimate how much money they would save in a year if they cut their hot water use by 30,820 gallons.

   ☐ $100
   ☐ $240
   ■ $284
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   ☐ 20 Watts
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   ☐ 650 Watts
   ■ 720 Watts

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   ☐ 6%
   ■ 9%
   ☐ 12%
   ☐ 15%

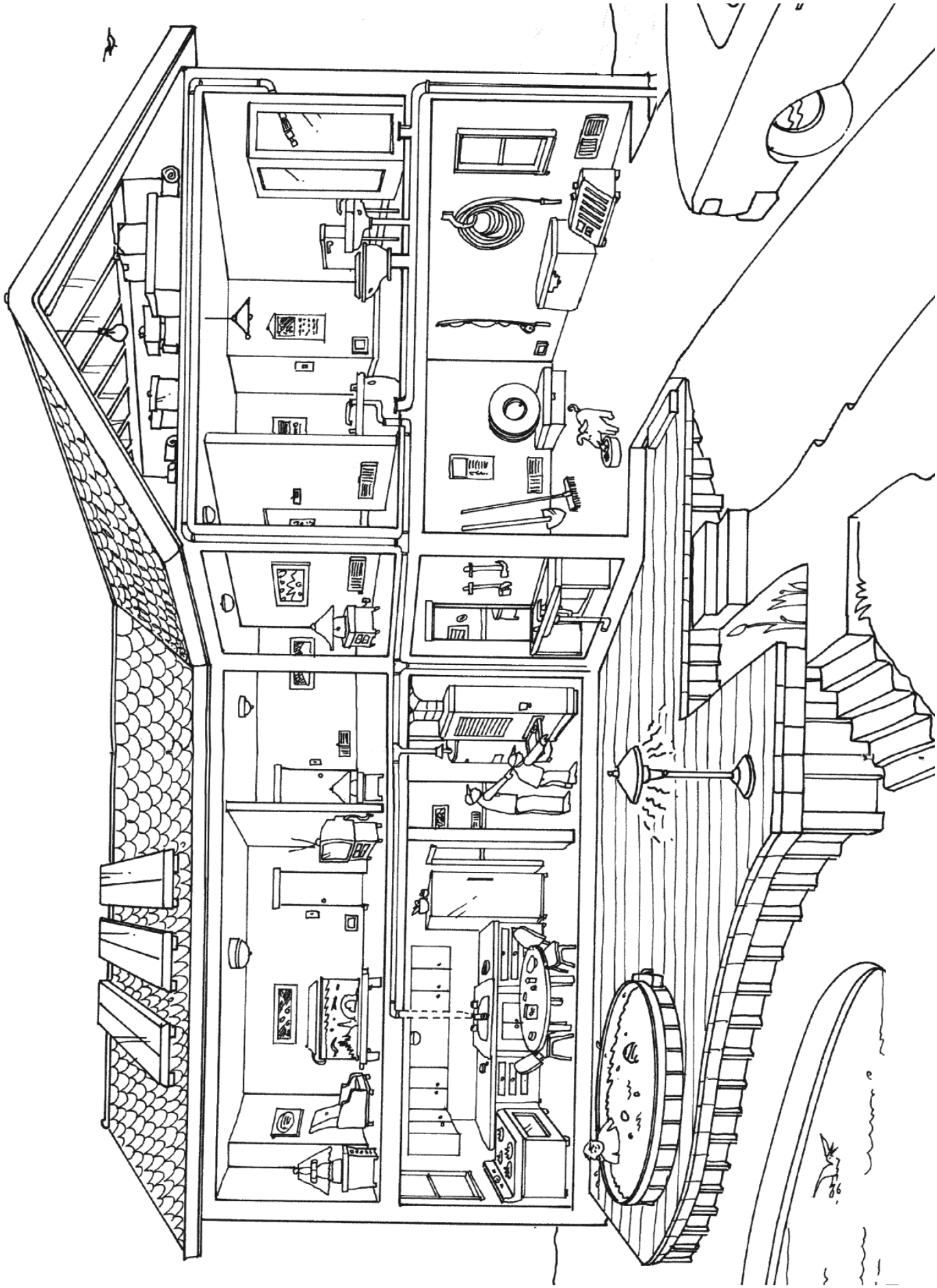
Be ***watt***smart, Begin at home Poster

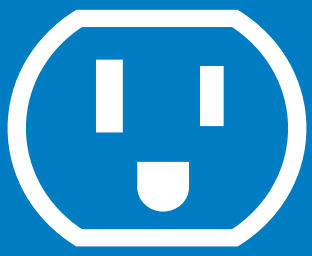
Materials:
- House poster found on the following page
- Colored markers or pens

Instructions:
- Add or color the items below. You may want to do different items each day as you cover different topics: electricity, natural gas, water, etc.
- Add a bicycle.
- Add some recycling bins in the garage.
- Add some trees to shade the house.
- Add a ceiling or floor fan to the home for cooling.
- Put a blue star (for ENERGY STAR® products) on the refrigerator, television and furnace.
- Color the energy-efficient shower head.
- Color all items that use electricity, yellow.
- Color the thermostat brown.
- Color the furnace filter that is being changed orange.
- Draw a purple water drop next to all items in the house that use water.

Language Arts Connection:
Quick write – Write a brief description of the things your family has done to improve the energy efficiency of your home. Add items that you will encourage your family to do in the future.

Social Studies Connection:
- Choose one natural resource used for energy and create a T-chart or Venn diagram comparing the positive and negative effects of the use of this resource on the physical environment.
- The more efficient your home is, the smaller your carbon footprint. Your carbon footprint is the total amount of carbon dioxide (CO_2) and other greenhouse gases you generate annually. The lower your footprint, the better!





Be *watt*smart

Begin at home

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bewattsmart.com

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Lingo Card

L	I	N	G	O
Water Heater	Natural Gas	Natural Resource	Incandescent	Reduce
Reuse	Phantom Load	Oil	Coal	ENERGY STAR®
Renewable	Energy	Be ***watt***smart Begin at home	Turn It Off!	Uranium
Energy Efficiency	LED	Recycle	68 Degrees	Embodied Energy
Cooking	78 Degrees	Solar	Programmable or Smart Thermostat	Electricity

http://print-bingo.com

L	I	N	G	O
Reuse	Natural Gas	Phantom Load	LED	78 Degrees
Cooking	Electricity	Renewable	Recycle	68 Degrees
Natural Resource	Water Heater	Be ***watt***smart Begin at home	ENERGY STAR®	Nonrenewable
Embodied Energy	Coal	Energy Efficiency	Heating	Incandescent
Programmable or Smart Thermostat	Reduce	Oil	Solar	Uranium

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L	I	N	G	O
Coal	Natural Gas	Solar	Turn It Off!	Renewable
Water Heater	Nonrenewable	Phantom Load	Electricity	Reuse
Energy	Oil	Be ***watt***smart Begin at home	68 Degrees	Cooking
Programmable or Smart Thermostat	Incandescent	Recycle	Uranium	Natural Resource
Reduce	78 Degrees	Embodied Energy	LED	Energy Efficiency

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L	I	N	G	O
Natural Resource	Water Heater	Natural Gas	Programmable or Smart Thermostat	78 Degrees
Turn It Off!	Reduce	Oil	Embodied Energy	Cooking
Phantom Load	ENERGY STAR®	Be ***watt***smart Begin at home	Uranium	Recycle
Energy	LED	68 Degrees	Energy Efficiency	Heating
Electricity	Renewable	Incandescent	Reuse	Solar

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Be wattsmart, Begin at home		Science (NextGen)		Social Studies	Math (Common Core)	Language Arts (Common Core)	
		PS3-4 Energy	ESS3-4 Earth and Human Activity	EALR 1	Number & Operations in Base Ten	Reading	Writing
Washington 4th Grade Correlations		Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat and electric currents.	Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.	Understands civic involvement.	Operations with multi-digit whole number & with decimals to hundredths.	Reading for information, speaking and listening.	Writing for effective communication.
	Activities						
Teacher Guide Activities	Energy Challenge - Embodied Energy		ESS3-4-1, ESS3-4-2, ESS3.A	1.4.1		SL.4.1	
	Conservation Cookie		ESS3-4-1, ESS3-4-2, ESS3.A	1.4.1	4.OA.A.1, 4.MD.A.2	SL.4.1	
	Pass the Sack		ESS3-4-1, ESS3-4-2, ESS3.A	1.4.1		SL.4.1	
	Energy Ticket		ESS3-4-1, ESS3-4-2, ESS3.A			SL.4.1	W.4.3
	The Search for Energy		ESS3-4-1, ESS3-4-2, ESS3.A	1.4.1	4.OA.A.1, 4.NBT.B.4-5, 4.MD.A.2	SL.4.1	
	Energy Challenge - Recycling		ESS3-4-2, ESS3.A	1.4.1		SL.4.1	
	Where Do Fossil Fuels Come From?		ESS3-4-1			SL.4.1	
	Energy for Electricity	PS3-4-1, PS3-4-2, PS3.D				SL.4.1	W.4.3
	Energy Challenge - Energy Efficient	PS3-4-2		1.4.1	4.MD.A.2	SL.4.1	
	Insulation Tests	PS3-4-2, PS3.D			4.OA.A.1, 4.MD.A.2	SL.4.1	W.4.3
	How Bright Is Your Light?	PS3-4-2, PS3.D	ESS3-4-2		4.MD.A.2	SL.4.1	
	Energy in Math		ESS3-4-2		4.OA.A.3, 4.NBT.B.4-5		
	Be ***watt*** smart, Begin at home Poster		ESS3-4-2	1.4.1		SL.4.1	W.4.3
Student Activities	**Presentation Information**		ESS3-4-1, ESS3-4-2, ESS3.A	1.4.1		RI.4.6	
	Student Booklet		ESS3-4-1, ESS3-4-2, ESS3.A	1.4.1	4.NBT.B.5	RI.4.6	
Posters	*Energy Efficiency in Action Poster*	PS1-5-3	ESS3-4-1, ESS3-4-2, ESS3.A	1.4.1		RI.4.6	
	Electricity Serves Our Community Poster		ESS3-4-1, ESS3-4-2, ESS3.A	1.4.1		RI.4.6	

Be wattsmart, Begin at home		Science (NextGen)			Social Studies	Math (Common Core)	Language Arts (Common Core)	
		PS1-5 Physical Sciences	PS3-5 Energy	ESS3-5 Earth and Human Activity	EALR 1	Number & Operations in Base Ten	Reading	Writing
Washington 5th Grade Correlations		Make observations and measurements to identify materials based on their properties.	Use models to describe that energy in animals' food was once energy from the sun.	Support, obtain and combine information about ways individual communities use science ideas to protect the earth's resources and environment.	Understands civic involvement.	Operations with multi-digit whole number & with decimals to hundredths	Reading for information, Speaking and Listening	Writing for effective communication
	Activities							
Teacher Guide Activities	Energy Challenge - Embodied Energy		PS3-5-1	ESS3-5-1, ESS3.C	1.4.1		SL.5.1	
	Conservation Cookie	PS1-5-3		ESS3-5-1, ESS3.C	1.4.1	5.G.A.2	SL.5.1	
	Pass the Sack			ESS3-5-1, ESS3.C	1.4.1		SL.5.1	
	Energy Ticket		PS3-5-1	ESS3-5-1, ESS3.C		5.G.A.2	SL.5.1	W.4.3
	The Search for Energy	PS1-5-3	PS3-5-1	ESS3-5-1, ESS3.C	1.4.1	5.G.A.2	SL.5.1	
	Energy Challenge - Recycling			ESS3-5-1, ESS3.C	1.4.1		SL.5.1	
	Where Do Fossil Fuels Come From?		PS3-5-1	ESS3-5-1, ESS3.C			SL.5.1	
	Energy for Electricity						SL.5.1	W.4.3
	Energy Challenge - Energy Efficient				1.4.1	5.G.A.2	SL.5.1	
	Insulation Tests	PS1-5-3				5.G.A.2	SL.5.1	W.4.3
	How Bright Is Your Light?	PS1-5-3				5.G.A.2	SL.5.1	
	Energy in Math					5.NBT.B.5		
	Be ***watt*** smart, Begin at home Poster			ESS3-5-1, ESS3.C	1.4.1			W.4.3
Student Activities	**Presentation Information**			ESS3-5-1, ESS3.C	1.4.1		RI.5.6	
	Student Booklet			ESS3-5-1, ESS3.C	1.4.1	5.NBT.B.5	RI.5.6	
Posters	*Energy Efficiency in Action Poster*	PS1-5-3		ESS3-5-1, ESS3.C	1.4.1		RI.5.6	
	Electricity Serves Our Community Poster			ESS3-5-1, ESS3.C	1.4.1		RI.5.6	

Be *watt*smart
Begin at home

Dear Parent(s):

Today your child participated in the **Be *watt*smart, Begin at home** program sponsored by Pacific Power. In this engaging presentation, your child learned key concepts of his or her science curriculum as well as important ways to be more efficient with energy use at home.

As part of the **Be *watt*smart, Begin at home** program, your child received a:

- **Be *watt*smart, Begin at home** booklet
- *Home Energy Worksheet*
- *watt*smart *Starter Kit Flier*

Please take a moment to read through this informative booklet with your child. Then, fill out the *Home Energy Worksheet* and return it to your child's teacher. To thank you, Pacific Power will provide your child with a *watt*smart nightlight.

We appreciate your efforts to reinforce important **Be *watt*smart, Begin at home** energy knowledge and efficiency actions in your home!

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PACIFIC POWER

bewattsmart.com

Program Evaluation

Be *watt*smart
Begin at home

Teacher Name: _____

School: _____

Sponsor: Pacific Power

In an effort to improve our program, we would like your assessment of Be ***watt***smart, Begin at home. Please take a few minutes to fill out this evaluation form. Upon completion, please return the form in the postage-paid envelope along with the student *Home Energy Worksheets* you collected and the sponsor *Thanks a "Watt!" Card*.

Please mark the box that best describes your opinion.

	Strongly Agree	Agree	Disagree	Strongly Disagree
The materials were attractive and easy to use.	☐	☐	☐	☐
The materials and activities were well-received by students.	☐	☐	☐	☐
The materials were clearly written and well-organized.	☐	☐	☐	☐
Students indicated that their parents supported the program.	☐	☐	☐	☐
Presenters were able to keep students engaged and attentive.	☐	☐	☐	☐

If you had the opportunity would you conduct this program again? ☐ Yes ☐ No

Would you recommend this program to other colleagues? ☐ Yes ☐ No

In my opinion, the thing students liked best about the materials/program was:

One thing I would change would be:

WAT WA

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*watt*smart **Pacific Power program**

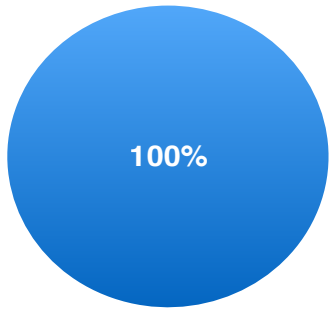
Program Evaluation Summary

Educators' impressions of the program from 87 educators.

	Strongly Agree	Agree	Disagree	Strongly Disagree	
Materials were attractive and easy to use	62	25	0	0	71% 29%
Materials/ activities were well received by students	68	19	0	0	78% 22%
Materials were clearly written and well organized	70	17	0	0	80% 20%
Students indicated that their parents supported the program	39	46	1	0	45% 53%
Presenters were able to keep the students engaged and attentive	67	20	0	0	77% 23%

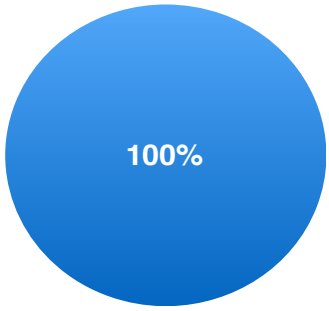
If you had the opportunity, would you conduct this program again?

	Yes	No
Mini-grant	87	0



Would you recommend this program to other colleagues?

	Yes	No
Mini-grant	87	0



In my opinion, the thing the students liked best about the materials/program was:
Being able to be actively involved in the presentation.
Being able to be part of the demonstrations model.
Being able to volunteer (being picked) to demonstrate.
Connecting the information to what they learned in their science.
Creating a human circuit by holding hands was their favorite.
Energy stick and being able to participate with their peer. They enjoyed the bing game
Everything went wonderful!
Going home and learning about all the energy they are using at home and learning about their family can be more energy efficient.
Great presenters!
Great presenters! My students like the participation activities. Thanks for coming!
Hands on activities and the LINGO game.
Hands on aspect of the presentation. The model of how energy is produced.
Hands on experiments. Thanks again! Great as always.
Human electric circuit
Interactive activities during the presentation
Kids love to participate in the activities especially the circuit!
Learned how we get power in different ways, circuit demonstration, learning how electricity travels
Learning from outside experts.
Lingo and the bulb night light
Lingo and the night lights
Lingo game
LINGO is always fun! Being a participant and part of the presentation keeps the students engaged!
Lingo, lineman slim, human circuit. I loved it! Keep it just as it is!
Love how this coincided with our electric circuit unit
My students enjoyed the program. They were really intrerested in the LED light bulb. They learned a lot of new information about energy, power, and how to conserve energy.
My students really enjoyed the presentation. The presenters did an amazing job.
Participating in the activities
Playing Lingo and the parts were you need volunteers to demonstrate
Posters and Dove Tails with up and coming science program.
Students always like the hands on demonstrations.
Students liked the LINGO game, night lights, and participation of students during the presentation.
That it was hands on - all students were engaged!
That it was interactive and it was something different than/special compared to a "normal" school day.
The activities.
The closed circuit demonstration. The Smith's are awesome presenters!
The demonstrations and the Lingo activity.
The demonstrations with props
The demonstrations with the students involved.
The electricity stick human circle/circuit. They like the energy Lingo and like the videos of the Lineman. Super good presenters. Keep up the good work! Please come back.
The engagement with the presenters.
The engaging games in the presentation.
The hands on activites like the human conductor.
The hands on activity/demonstration for how the circuit worked
The hands on learning activities.
The hands-on experiments/demonstrations! Night lights!
The human circuit example.
the human circuit was a hit! The whole presentation was awesome. I would not change any part of it.
The interactive activities like the open and closed circuit.
The interactive activities. We love this program!
The interactive parts of the presentation.
The kids enjoyed playing LINGO.
The knowledge of the presenters and the hands on activities.
The LINGO cards.
The LINGO game and actively participating and modeling.
The LINGO game and interesting facts in the presentation. They also thought it was fun to get the nighlights.
The night light.
The night lights and the human circuit.

In my opinion, the thing the students liked best about the materials/program was:

The offer of the night light.
The posters.
The presenters kept 100 4th graders engaged for an hour... not an easy thing to do. They were wonderful!
The presenters! Steve and Ariene Smith were great with the kids! They put the ideas and vocabulary in kid friendly terms so the kids could understand. They have great rapport with kids as well.
The slideshow, bingo, light stick, and hands on activites.
The student involvement!
The student-led presentation kept kids highly engaged.
The students enjoy them coming in and doing the presentation.
The students enjoyed having the opportunity to participate during the presentation! They also enjoyed the LINGO game.
The students liked the connection to what we are doing in class.
The videos the presenters showed and the energy stick.
They always like the participation parts.
They enjoyed applying the concepts learned into the Lingo game.
They enjoyed the experiments, especially the human circuit
They enjoyed the LINGO and student participation. Great information. It goes well with our science unit.
They enjoyed the powerpoint presentation and night lights. Most of all, they enjoyed participating with the presenters.
They enjoyed your activities and games during the presentation. Well connected to our learning in science class.
They liked the LINGO game, night lights, and the presentation.
They love the bingo game!
They loved being selected to complete a circuit demonstration.
They loved getting the lightbulbs and the night lights.
They loved the electric stick!
They really enjoyed Lingo and the human circuit!
understanding the concept of conductor, insulator, circuit and conserving energy
When the speaker talks about the different ways electricity comes to our homes.

In the future, one thing I would change would be:

Adding a microphone for the presenters as our acustics in our cafeteria is not the greatest.
All material provided should be in english and spanish
Enteract more with students. You don't have to stick to the script.
I don't remember the "wattsmart" name being explained. Both presenters used excellent teaching strategies. One presenter's manner was too preschoolish for grades 1-7 even though the content was level appropriate.
I think the students would have a greater science knowledge and vocabulary if the presentation was later in the school year.
I would add games to the presentation and a powerpoint demonstration.
I'm not sure how you would address this, but some parents were suspicious of free products. Thought it was a scam.
Just keep the hands on activites.
More hands on activities
More hands on presentations. The female presenter was good, but difficult to hear at times.
More interaction and examples.
More materials in Spanish like the booklet.
More student engagement or do something with lingo
More time for questions. Thank you so much!
Nothing at this time.
Nothing, it was well done! Thank you.
Nothing! It's a great program.
Nothing.
Nothing.
Nothing.
Nothing.
Nothing.
Nothing.
Nothing. I thought it was a great presentation.
Offer it more throughout the year. I would love to have this presentation during our electrical circuits unit!
Perhaps add a new feature as it seems to be the same program!
Present to smaller groups. One class at a time.
Print Spanish on the back of the surveys. Do multiple presentations in a day, so each class can have their own because three classes in one classroom doesn't work well.
Provide copies of the home energy worksheets in Spanish.
Provide us with extra surveys. Students are very poor at getting them to their parents.
Smaller group presentations - 100+ kids to watch and pay attention fo ran hour on the floor is difficult. Would love to see the presentations in class rooms or in a smaller grouping.
The more engaged the students, the better. The presenters could walk around a little more as they present. That is an easy thing that helps the kids with short attention spans keep focused.
The presentation was a little long.
The presentation was a little too much adults talking and not enough interaction for the kids.
This program is awesome!
Time of year, have it closer to our electric circuit unit/kit
We enjoyed the presentation! No change!
We need clearer instructions for the surveys in Spanish. Many students struggled to explain the sruvey to their parents. It was difficult to get them back because of this.

Home Energy Worksheet (English)

Teacher ID: _____

Teacher Name: _____

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Home Energy Worksheet

Student First Name: _____

Heating

1. Install and use a programmable or smart thermostat.
   ☐ Currently do ☐ Will do ☐ Neither
2. Caulk windows and weather strip outside doors.
   ☐ Have done ☐ Will do ☐ Neither
3. Inspect attic insulation and add insulation if needed.
   ☐ Have done ☐ Will do ☐ Neither
4. Keep furnace air filters clean/replaced regularly.
   ☐ Currently do ☐ Will do ☐ Neither

Cooling

5. Replace existing air conditioning unit with a high-efficiency unit or an evaporative cooling unit.
   ☐ Have done ☐ Will do ☐ Neither
6. Close blinds when windows are exposed to the sun.
   ☐ Currently do ☐ Will do ☐ Neither
7. Use a fan instead of air conditioning.
   ☐ Currently do ☐ Will do ☐ Neither
8. In the summer, set thermostat to 78 degrees F or higher.
   ☐ Currently do ☐ Will do ☐ Neither

Water heating

9. Set the water heater temperature to 120 degrees F.
   ☐ Have done ☐ Will do ☐ Neither
10. Install a high-efficiency showerhead.
    ☐ Have done ☐ Will do ☐ Neither
11. Take 5 minute showers.
    ☐ Currently do ☐ Will do ☐ Neither
12. Wash full loads in the dishwasher and clothes washer.
    ☐ Currently do ☐ Will do ☐ Neither

Lighting

13. Replace incandescent bulbs with LED bulbs.
    ☐ Have done ☐ Will do ☐ Neither
14. Turn lights off when not in use.
    ☐ Currently do ☐ Will do ☐ Neither

Refrigeration

15. Replace old, inefficient refrigerator with an ENERGY STAR® model.
    ☐ Have done ☐ Will do ☐ Neither
16. Unplug old freezers/refrigerators and/or dispose of them in an environmentally safe manner.
    ☐ Have done ☐ Will do ☐ Neither
17. Maintain refrigerator and freezer coils and check door seals twice yearly.
    ☐ Currently do ☐ Will do ☐ Neither

Electronics

18. Turn off computers, TVs and game consoles when not in use.
    ☐ Currently do ☐ Will do ☐ Neither

Cooking

19. Use a microwave oven, toaster oven, crock pot or outdoor grill instead of a conventional oven.
    ☐ Currently do ☐ Will do ☐ Neither

Get paid for being *watt*smart

20. Visit Pacific Power at *bewattsmart.com* for more energy-saving tips and rebates.
    ☐ Have done ☐ Will do ☐ Neither

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Ser ***watt***smart
Empieza en casa

Nombre del profesor(a): _____

Verificación de la Energía Doméstica

Nombre del estudiante: _____

Calefacción

1. Instalar y usar un termostato programable o termostato inteligente.
   ☐ Lo hago ☐ Lo haré ☐ Ninguno
2. Calafatear ventanas e instalar burletes en el exterior de puertas.
   ☐ Lo he hecho ☐ Lo haré ☐ Ninguno
3. Inspeccionar el aislamiento del ático y agregar aislamiento si es necesario.
   ☐ Lo he hecho ☐ Lo haré ☐ Ninguno
4. Mantener los filtros de aire de la calefacción limpios/ reemplezados regularmente.
   ☐ Lo hago ☐ Lo haré ☐ Ninguno

Enfriamiento

5. Reemplazar la unidad de aire acondicionado existente por una unidad de alta eficiencia o un enfriador evaporativa.
   ☐ Lo he hecho ☐ Lo haré ☐ Ninguno
6. Cerrar las persianas cuando las ventanas están expuestas al sol.
   ☐ Lo hago ☐ Lo haré ☐ Ninguno
7. Usar un ventilador en lugar del aire acondicionado.
   ☐ Lo hago ☐ Lo haré ☐ Ninguno
8. En el verano, ajustar el termostato a 78 grados F o más.
   ☐ Lo hago ☐ Lo haré ☐ Ninguno

Calentadores de agua

9. Programar el calentador de agua a 120 grados F.
   ☐ Lo he hecho ☐ Lo haré ☐ Ninguno
10. Instalar un cabezal de ducha de alta eficiencia.
    ☐ Lo he hecho ☐ Lo haré ☐ Ninguno
11. Tomar duchas de 5 minutos.
    ☐ Lo hago ☐ Lo haré ☐ Ninguno
12. Lavar cargas llenas en los lavaplatos y las lavadoras de ropa.
    ☐ Lo hago ☐ Lo haré ☐ Ninguno

Iluminación

13. Reemplazar los focos incandescentes con focos LED.
    ☐ Lo he hecho ☐ Lo haré ☐ Ninguno
14. Apagar las luces cuando no estén en uso.
    ☐ Lo hago ☐ Lo haré ☐ Ninguno

Refrigerador

15. Reemplazar refrigerador antiguo e ineficiente con modelo de ENERGY STAR®.
    ☐ Lo he hecho ☐ Lo haré ☐ Ninguno
16. Desenchufar viejos refrigeradores/congeladores y/o desecharlos de una manera ambientalmente segura.
    ☐ Lo he hecho ☐ Lo haré ☐ Ninguno
17. Mantener las bobinas del refrigerador y del congelador e inspeccionar el sello de las puertas dos veces al año.
    ☐ Lo hago ☐ Lo haré ☐ Ninguno

Electrónicos

18. Apagar computadoras, televisores y consolas de juegos cuando no estén en uso.
    ☐ Lo hago ☐ Lo haré ☐ Ninguno

Cocinar

19. Usar un horno microonda, un horno eléctrico, un olla de cocimiento lento o un parrilla de aire libre en lugar del horno convencional.
    ☐ Lo hago ☐ Lo haré ☐ Ninguno

Reciba paga siendo *watt*smart

20. Visite Pacific Power en *bewattsmart.com* para obtener más consejos y rebajas de ahorro de energía.
    ☐ Lo he hecho ☐ Lo haré ☐ Ninguno

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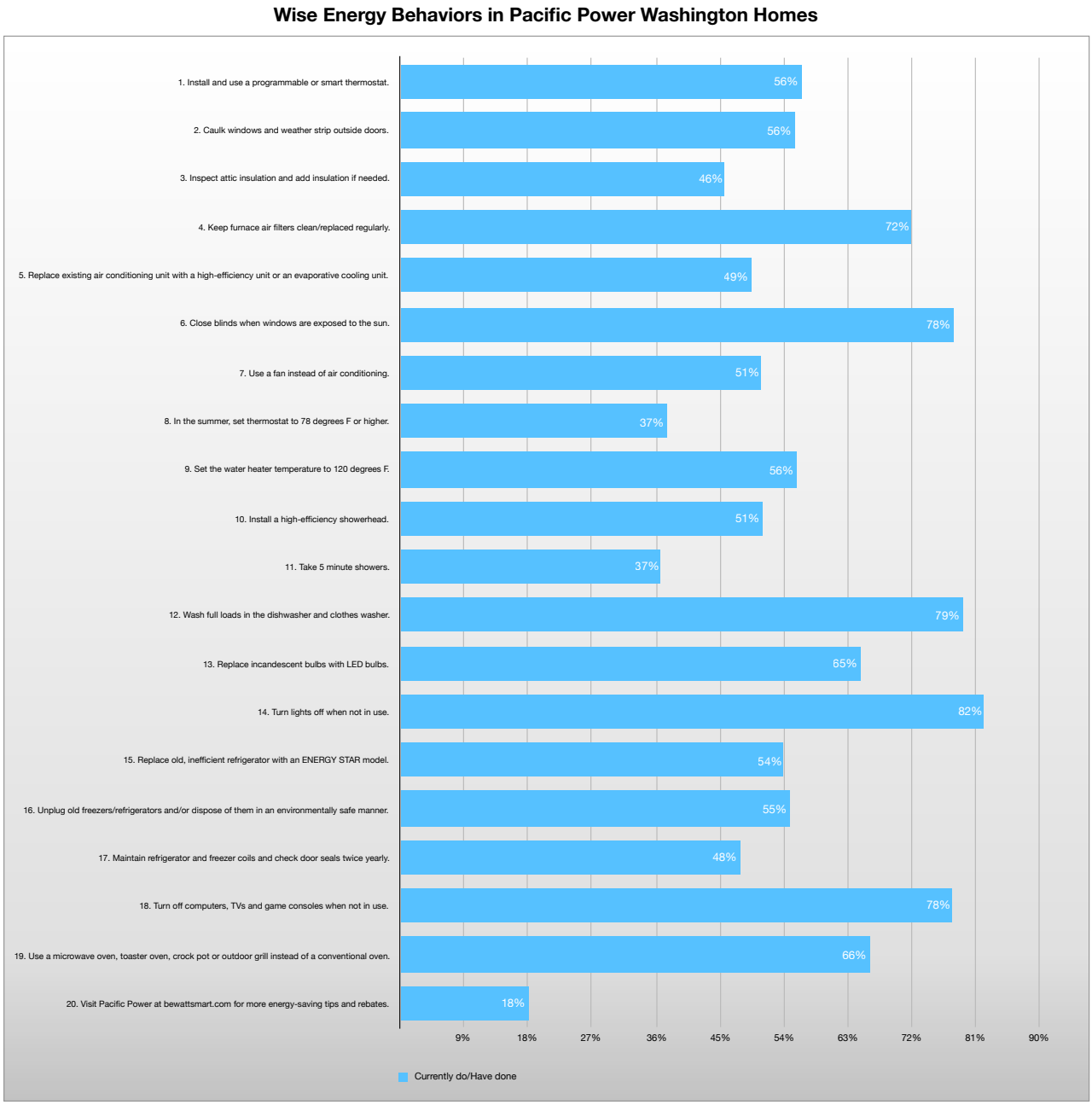
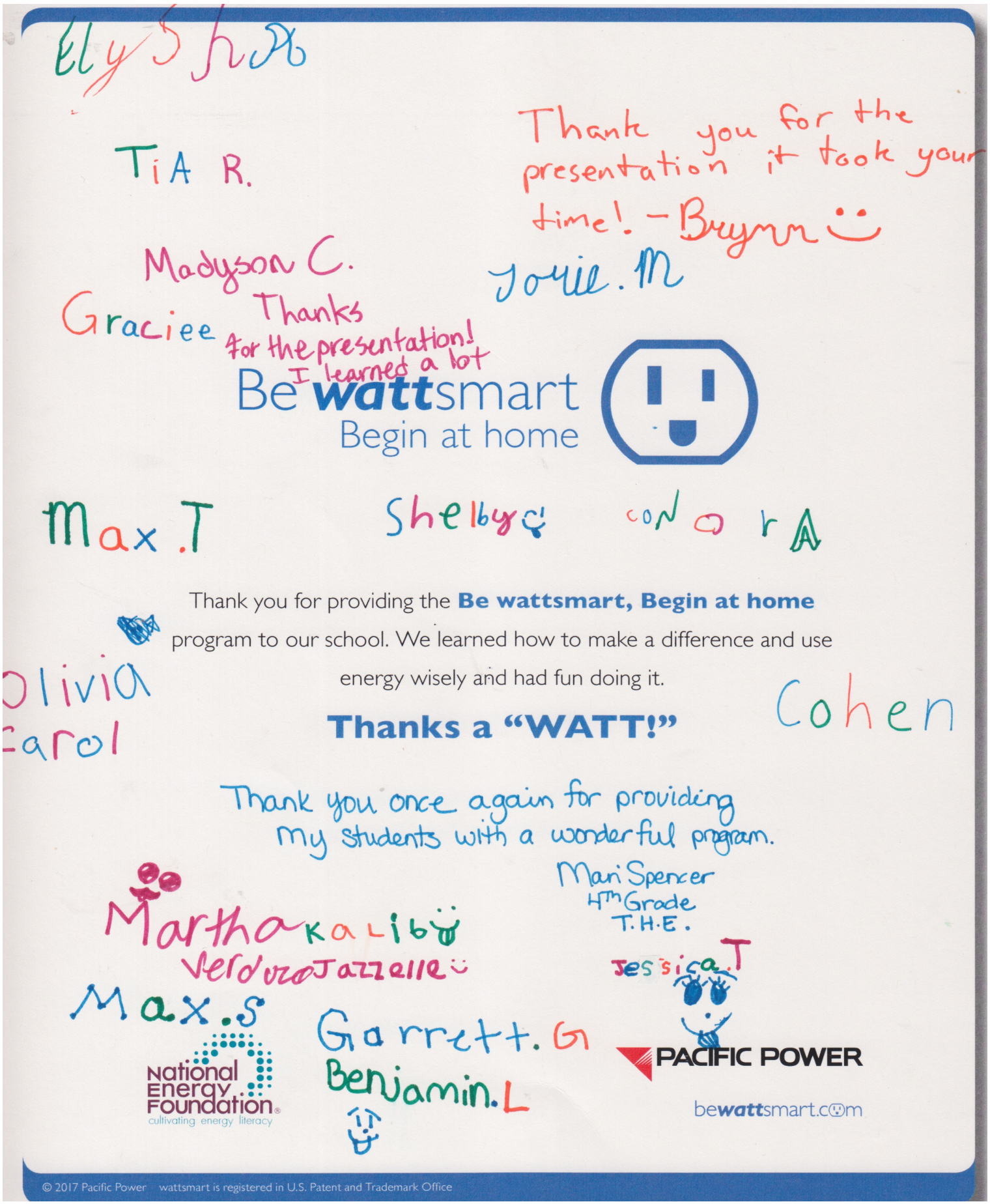
Home Energy Worksheet Summary – Pacific Power

Energy Efficient Activity	Currently do/Have done	Will do	Neither
1. Install and use a programmable or smart thermostat.	56%	18%	26%
2. Caulk windows and weather strip outside doors.	56%	26%	19%
3. Inspect attic insulation and add insulation if needed.	46%	23%	31%
4. Keep furnace air filters clean/replaced regularly.	72%	15%	13%
5. Replace existing air conditioning unit with a high-efficiency unit or an evaporative cooling unit.	49%	21%	30%
6. Close blinds when windows are exposed to the sun.	78%	13%	10%
7. Use a fan instead of air conditioning.	51%	20%	29%
8. In the summer, set thermostat to 78 degrees F or higher.	37%	24%	38%
9. Set the water heater temperature to 120 degrees F.	56%	22%	22%
10. Install a high-efficiency showerhead.	51%	26%	23%
11. Take 5 minute showers.	37%	32%	32%
12. Wash full loads in the dishwasher and clothes washer.	79%	9%	12%
13. Replace incandescent bulbs with LED bulbs.	65%	24%	11%
14. Turn lights off when not in use.	82%	14%	4%
15. Replace old, inefficient refrigerator with an ENERGY STAR model.	54%	22%	24%
16. Unplug old freezers/refrigerators and/or dispose of them in an environmentally safe manner.	55%	20%	25%
17. Maintain refrigerator and freezer coils and check door seals twice yearly.	48%	37%	15%
18. Turn off computers, TVs and game consoles when not in use.	78%	17%	6%
19. Use a microwave oven, toaster oven, crock pot or outdoor grill instead of a conventional oven.	66%	18%	16%
20. Visit Pacific Power at bewattsmart.com for more energy-saving tips and rebates.	18%	63%	19%

Wise Energy Behaviors in Pacific Power Washington Homes



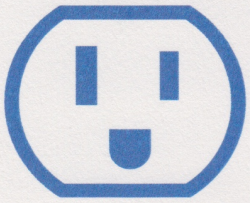
Sampling of *Thanks a "WATT" Cards*



Thank you so much for the electrifying presentation!
Ms. Krueger's Class

Efrain

Be **watt**smart
Begin at home



Jacklyn

Noah wants it!

Danica

Katherine

Thank you for providing the **Be wattsmart, Begin at home** program to our school. We learned how to make a difference and use energy wisely and had fun doing it.

Thanks a "WATT!"

PJ

Jesus

cristian

Isael

Ethan

Brianna

Ramiro

Andz

MaleyahAnn.M

Arlet.Z

Capri

Vialexis

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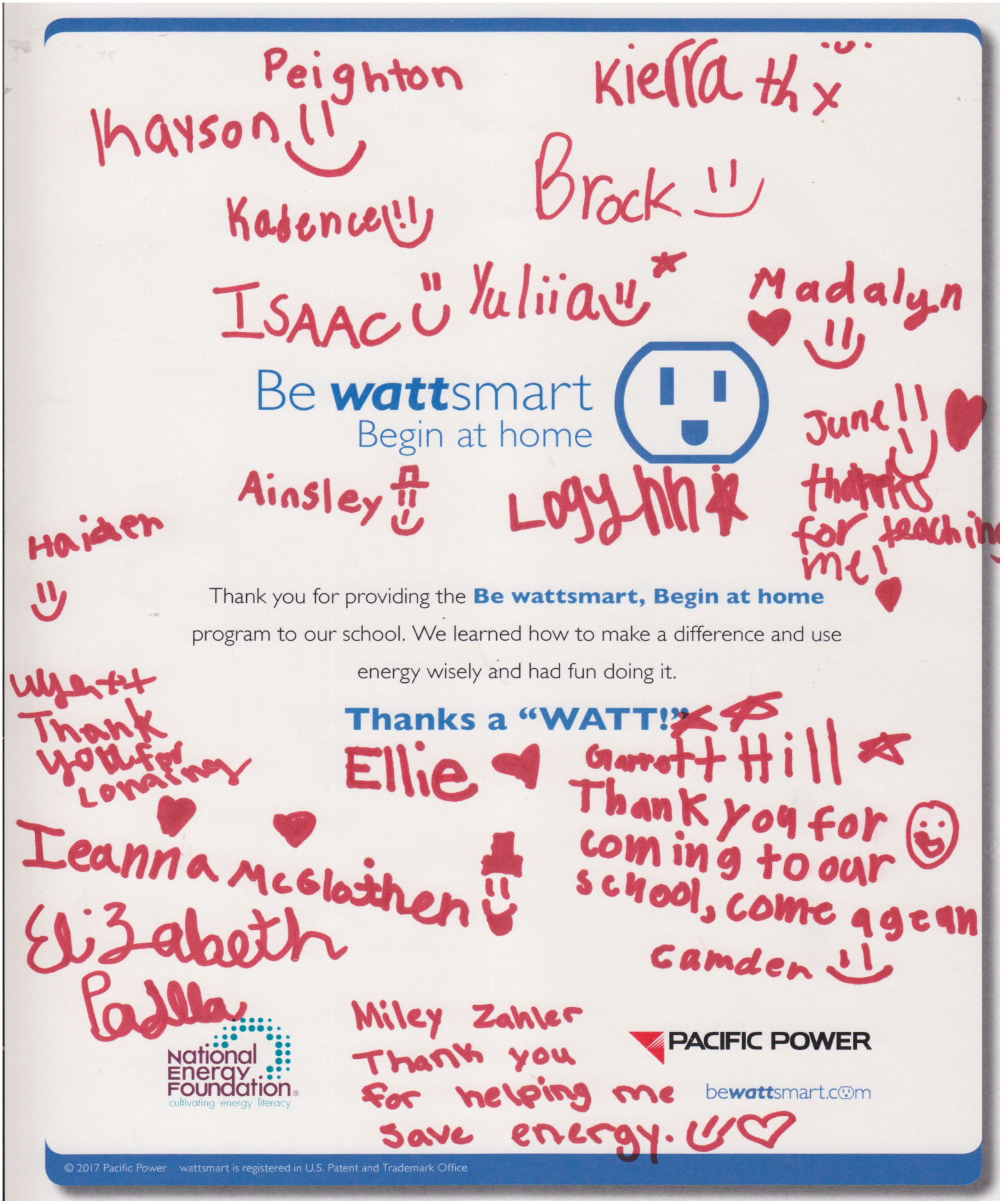
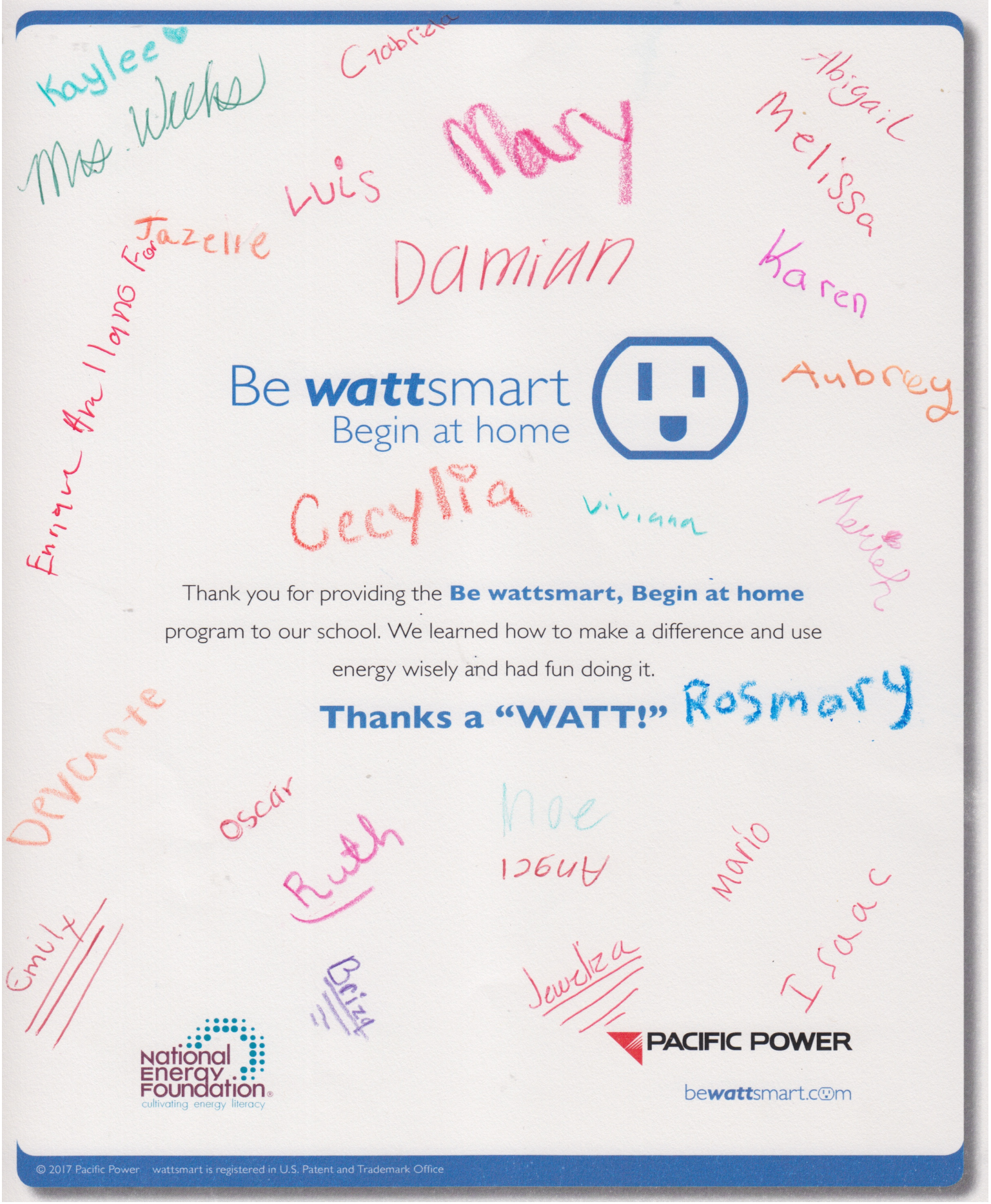
bewattsmart.com




Kaylee
Ms Weeks
Gabriela
Mary
Abigail
Melissa
Luis
Jazelle
Damian
Karen
Aubrey
Be wattsmart
Begin at home
Cecylia
Viviana
Thank you for providing the Be wattsmart, Begin at home program to our school. We learned how to make a difference and use energy wisely and had fun doing it.
Thanks a "WATT!"
Rosmary
Oscar
Ruth
Noe
Mario
Isaac
Jawdiza
Brizia
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Effen

Jaxon

Kiley
Marquisa
Natalie

Jon

Genesis

Lucas
Mason

Aaliyah

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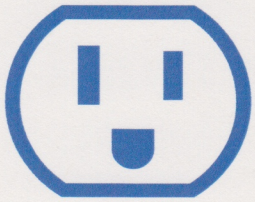

Jace

Evan
Farias

Thank you for providing the **Be wattsmart, Begin at home** program to our school. We learned how to make a difference and use energy wisely and had fun doing it.

Thanks a "WATT!"

Kaitee

Savannah
Bryan

Joaquin

Joey

Mason

Yazlyn

michelle

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