



2/23/2022

## PACIFICORP COMMUNICATIONS, OUTREACH, AND EDUCATION

### WASHINGTON Program Year 2021 Activities

#### *Preface*

The Company uses customer communications, paid media, earned media and program specific outreach to communicate the value of energy efficiency and provide information regarding low-cost and no-cost energy efficiency measures. The Company strives to educate customers on the availability of technical assistance, services and incentives with the overall goal to engage customers in reducing their energy use.

#### **CUSTOMER COMMUNICATIONS**

As part of the Company's regular communications to its customers, newsletters and bill statement communications promote energy efficiency programs and solutions. The Company uses its website and social media, such as Twitter and Facebook, to communicate and engage customers with its energy services.

#### **EARNED MEDIA**

Earned media is managed by the Company's external communications department in cooperation with the regional business managers in Washington. "Earned media" generally refers to favorable television, radio, newspaper, or internet news coverage gained through press releases, media events, opinion pieces, story pitches, or other communication with news editors and reporters.

#### **PAID MEDIA / WATTSMART CAMPAIGN**

In 2021, the Company introduced a new Wattsmart advertising campaign to inform and educate customers about the benefits energy efficiency. The campaign encourages customers to take meaningful actions to reduce energy use and lower their bills. Most campaign messages are in English and Spanish.

#### **Key strategies include:**

- Implement an integrated advertising campaign that features Wattsmart energy efficiency messaging in English and Spanish to encourage customers to reduce energy use.
- Increase customer awareness of energy efficiency and encourage participation in the Company's Wattsmart programs.
- Educate customers on how Wattsmart incentives and savings tools can help them turn a to-do item into a job well done.
- Demonstrate by example how business customers are saving energy and enjoying the benefits of being Wattsmart.

## General Key Messages:

- Using energy wisely at home and in your business saves you money so you can achieve your goals.
- Pacific Power empowers customers with meaningful energy choices.
  - We want to help you keep your costs down.
  - We offer Wattsmart programs, cash incentives and expertise to help you save money in your home or business.

To reach customers, the Company used a combination of cable TV, radio, social media, print, digital video, digital display and search engine advertising. The Wattsmart campaign features images of customers taking small steps around their homes or businesses to save energy. The messages help establish Pacific Power as an energy partner with a portfolio of programs and services built around customer needs.

Table 1 outlines the Washington media channels used and the impressions achieved.

Table 1  
2021 Media Channels

Communication Channel & Language(s)	Description	2021 Media Impressions
Cable TV (Spanish)	Cable TV ads on Spanish-language stations help reach diverse communities and audiences.	1,404 spots
Radio (English and Spanish)	Radio helps extend reach and amplify other communications channels.	520 TRPs (target rating points)
Newspaper (English and Spanish)	Newspaper is used for additional outreach in local papers.	412,075 impressions
Digital Video (English and Spanish)	Short video ads that play before feature videos on YouTube, social media or other digital platforms.	588,122 impressions
Digital Display (English)	Banner ads on local news sites and other websites.	7,258,062 impressions
OTT (English and Spanish)	OTT stands for “Over The Top” and refers to advertising on streaming services (Netflix, Hulu, Amazon Prime Video, etc).	186,831 impressions
Social Media Advertising (English and Spanish)	Advertising on Facebook and Instagram.	4,045,759 impressions
Search Engine Marketing (English)	Internet search ads focused on energy efficiency key words.	46,501 impressions
Twitter @PacificPower_WA	Tweets about energy efficiency a few times per month.	1,201 followers

Communication Channel & Language(s)	Description	2021 Media Impressions
Facebook <a href="http://www.facebook.com/pacificpower">www.facebook.com/pacificpower</a> Instagram @PacificPower	Posts about energy efficiency solutions and more.	26,693 Facebook followers 1,169 Instagram followers

The total number of advertising impressions for the campaign in 2021 was 12,127,199.

# 2021

# NEF

Be Wattsmart,  
Begin at home  
WASHINGTON

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Program Report





A DIVISION OF PACIFICORP

WATTSMART®

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March 10, 2022

# Savings

## Home Energy Worksheets

– Returned: 1,528 –

– 44% –

- Online - 53.37%

- Paper - 43.63%

Submit online at [thinkenergy.org/WattSmart](http://thinkenergy.org/WattSmart)

Teacher ID:

Teacher Name:

Student First Name:

### Home Energy Worksheet

**Heating**

1. Install and use a programmable or smart thermostat.  
 Currently do  Will do  
 Neither

2. Check 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

5. Replace existing air conditioning unit with a high-efficiency unit or an evaporative cooling unit.  
 Have done  Will do  
 Neither

6. Check 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 72°F or higher.  
 Currently do  Will do  
 Neither

**Water heating**

9. Set the water heater temperature to 120°F.  
 Have done  Will do  
 Neither

10. Install a high-efficiency shower head.  
 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 inefficient 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 fridges/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 regularly.  
 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, slow cooker or outdoor grill instead of a conventional oven.  
 Currently do  Will do  
 Neither

**Get paid for being WattSmart!**

20. Visit Pacific Power at [BullseyeSmart.com](http://BullseyeSmart.com) for more energy saving tips and rebates.  
 Have done  Will do  
 Neither

**Logos:** NATURE'S POWER FOUNDATION, PACIFIC POWER POWERING YOUR GREATNESS, WATTSMART ENERGY AT WORK

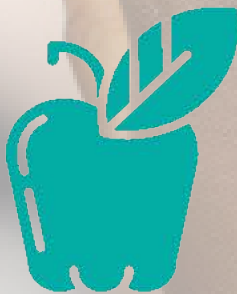
WEC 100

# Participants



**Students**

– 3,477 –



**Teachers**

– 143 –



**Schools**

– 48 –





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# Program Overview

## Program Description

*“The program is very engaging and interesting to the students. The program is also able to reach a large number of people.”*

*“The program is easy to use and easy to understand. The kids love the game that was built into the online presentation (lingo) and we are excited to use the money we receive for a fun class project.”*

*“The students really love this program! Thank you for your generosity in providing it. For some students- it is the first awareness of energy consumption and the entire energy industry. It also helps the families become aware.”*

*“Wonderful program and a great way to expose young minds to important information today, that will impact the future of our world. Thank you for the opportunity.”*

-2021 Washington Teacher Participants

The Be Wattsmart, Begin at home program is a collaborative partnership between Pacific Power and the National Energy Foundation (NEF). It encourages teachers, students and families to “BeWattsmart” with their energy use. The program objective is to build energy awareness, throughout the school year, with an engaging presentation and energy efficiency curriculum. The program also expands enthusiasm to homes via Pacific Power branded curriculum, games and online resources.



## Building Collaborations

*“It’s great for integration at the 4th grade level and the monetary incentive is the icing on the cake.”*

*“The kids really love these assemblies and learn so much!”*

*“Professional, grade-level content that kept kiddos engaged and ready to do their part.”*

*“This was the BEST WATTS SMART PRESENTATION EVER!!!”*

-2021 Washington Teacher Participants

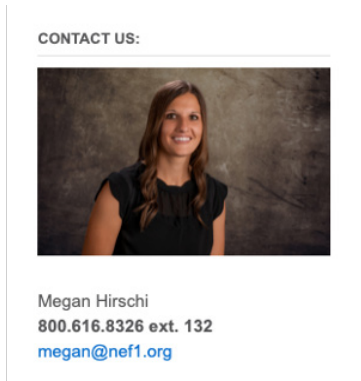


The Be Wattsmart, Begin at home program provided energy efficiency content that was custom developed to support the Washington State Office of Education’s Core Curriculum for fourth grade. Teachers appreciated the collaborative efforts to align program components to their learning standards. Curriculum correlations were provided to teacher participants in the *Teacher Guide* delivered to each teacher prior to their presentation.

NEF utilized multiple strategies to support teacher and parent participants:

- Dedicated educational service representative
- *Parent Introduction Letter*
- Spanish documents – *Home Energy Worksheet* and *Parent Introduction Letter*
- Online and hard copy *Home Energy Worksheets*
- Changed title of the student guide to family guide to support the efforts of including families in the take home information.

- Mini-grants for teachers with a qualifying *Home Energy Worksheet* return
- “Tips and Tricks” teacher training
- Automated emails to communicate program details, including submission of the *Home Energy Worksheets* and progress toward the gift card
- Online virtual presentations and live presentations to support a variety of learning situations during the pandemic



## Program Registration

NEF developed a postcard to promote the Be Wattsmart, Begin at home program to eligible new teachers and schools. Emails were also used to contact prior participating teachers.

Teachers were given three ways to enroll: calling or emailing the educational service representative, Megan Hirschi, or completing the registration online on the program website [thinkenergy.org/wattsmart-wa/](http://thinkenergy.org/wattsmart-wa/). After the registration was qualified, a series of email communications with teachers, were sent automatically by the program registration system.



## Program Implementation

*“This program is great for students! The flexibility to do it at our own pace due to COVID was super helpful. Students loved the videos and were excited to learn more.”*

*“The production quality was super, and the students were engaged. Great job!”*

*“Your presenters were excellent!”*

*“I would tell them that this program is easy to use and keeps students engaged. They are very interested in how they affect the world around them.”*

-2021 Washington Teacher Participants

Implementation was quickly adapted to provide flexibility for different learning environments made necessary by COVID-19. NEF developed a “Presentation Toolbox” of options to help teachers provide the program to their students. Teachers were able to select from a prerecorded presentation which included a Kahoot! review game to measure students’ attainment of knowledge from the presentation. Prerecorded presentations were designed as a teacher directed program when Energy Educators were not given permission to visit a school due to the pandemic.

In-person presentations were conducted with either one or two Energy Educators depending upon the schools’ pandemic protocols. NEF required all Energy Educators to be fully vaccinated, wear an N95 mask and take and report their temperature each morning to protect students and teachers.

Both presentations 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. Energy Educators



It's time to  
play Lingo!

completed demonstrations of making a human electrical circuit, during which they taught key core curriculum concepts such as insulators and conductors of electricity and electrical generation. In-person assemblies included the review game, “Lingo” at designated points throughout the presentation.

To help students remember energy efficiency tips, students viewed “Caitlynn Power” video vignettes produced by PacifiCorp. The videos are a highlight for both teachers and students. In addition, the Caitlynn

Power videos were added to the program website where teachers could access them for further energy instruction and where students could access them to share with their families.

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

*“Loved the lessons The Art of Circuits and Energy in Math.”*

*“I read the teacher guide and think every activity is good! I am slowly making my way through them! Thank you for all the help and planning materials.”*

*“The Electrical Generation poster was a great discussion tool and resource.”*

*“The Kahoot! game.”*

*“The money to produce the videos was well spent.”*

-2021 Washington Teacher Participants

A *Parent Letter* was provided to explain the importance of Be Wattsmart, Begin at home. In addition, students were given a *Family Guide* and *Home Energy Worksheet* to share with their families. Students who returned their worksheet or completed a worksheet online, received an LED nightlight featuring the Pacific Power logo as a reward.

Educators were also given helpful energy educational materials. Each teacher participant was provided a custom Be Wattsmart, 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.

A program *Implementation Steps Flier* assisted teachers in carrying out the program for students learning both at school and online. It also gave simple steps for successfully returning *Home Energy Worksheets* and the sponsor *Thanks a “Watt” Card* in the postage paid envelope. A *Rewarding Results Flier* gave information concerning the gift card teacher participants would receive for returning their student surveys. Educators received a \$50 mini-grant for an 80% return by the December 31, 2021 deadline.

## Program Website

The Be Wattsmart, Begin at home program website, [thinkenergy.org/wattsmart-wa/](http://thinkenergy.org/wattsmart-wa/), served multiple purposes for participating teachers, students and families:

### Teachers

- Program registration
- Dedicated educational service representative contact information
- Access to program presentations and documents
- Game and education page
- Links to additional resources



### Students and Families

- Access to Caitlynn Power videos
- Access to the online Home Energy Worksheets
- Energy efficiency games
- Frequently asked questions about the program
- Parent program documents posted



## Program Accomplishments

- 3,477 students and families reached
- 143 Washington teachers reached
- 48 Washington schools participated
- 79 Washington teachers returned packets
- 59 \$50 mini-grant checks delivered
- 16 \$25 mini-grant checks delivered

# Attachments

## Fall 2021 Participating Schools

School Name	School Address	City	State	Zip
Sharpstein Elementary	410 S Howard St	Walla Walla	WA	99362
Discovery Lab School	2810 Castlevale Rd	Yakima	WA	98902
Gilbert Elementary	4400 Douglas Drive	Yakima	WA	98908
Garfield Elementary - Yakima	612 North 6th Avenue	Yakima	WA	98902
Hoover Elementary	400 West Viola Avenue	Yakima	WA	98902
East Valley Elementary	1951 Beaudry Road	Yakima	WA	98901
Naches Valley Elementary	151 Bonlow Drive	Naches	WA	98937
Wide Hollow Elementary	1000 South 72nd Avenue	Yakima	WA	98908
Robertson Elementary	2807 West Lincoln Avenue	Yakima	WA	98902
Nob Hill Elementary	801 South 34th Avenue	Yakima	WA	98902
Martin Luther King	2000 South 18th Street	Union Gap	WA	98903
Green Park Elementary School	1105 East Isaacs Avenue	Walla Walla	WA	99362
Ridgeview Elementary	609 West Washington Avenue	Yakima	WA	98903
Whitney Elementary	4411 West Nob Hill Boulevard	Yakima	WA	98908
Dixie Elementary School	902 South Palouse Street	Walla Walla	WA	99362
Christ the Teacher	5508 West Chestnut Avenue	Yakima	WA	98908
Waitsburg Elementary	184 Academy Street	Waitsburg	WA	99361
Dayton Elementary - 4th	302 East Park Street	Dayton	WA	99328
Zillah Intermediate	303 2nd Avenue	Zillah	WA	98953
Outlook Elementary	3800 Van Belle Road	Outlook	WA	98938
McClure Elementary - Grandview	811 West 2nd Street	Grandview	WA	98930
Ahtanum Valley Elementary	3006 South Wiley Road	Yakima	WA	98903
Terrace Heights Elementary	101 North 41st Street	Yakima	WA	98901
Union Gap School	3201 4th Street	Union Gap	WA	98903
Montessori School of Yakima	511 North 44th Avenue	Yakima	WA	98908
Davis Elementary	31 Southeast Ash Avenue	College Place	WA	99324
Adams Elementary - Wapato	1309 South Camas Avenue	Wapato	WA	98951
Adams Elementary - Yakima	723 South 8th Street	Yakima	WA	98901
McKinley Elementary	621 South 13th Avenue	Yakima	WA	98902
Roosevelt Elementary School - Granger	405 Bailey Avenue	Granger	WA	98932
Barge Lincoln Elementary	219 East I Street	Yakima	WA	98901
Prospect Point	55 Reser Road	Walla Walla	WA	99362
Edison Elementary School	1315 East Alder Street	Walla Walla	WA	99362
Pioneer Elementary	2101 East Lincoln Avenue	Sunnyside	WA	98944
Roosevelt Elementary - Yakima	120 North 16th Avenue	Yakima	WA	98902
Lincoln Elementary	309 North Alder Street	Toppenish	WA	98948
Valley View Elementary	515 Zillah Drive	Toppenish	WA	98948
Selah Intermediate School	1401 West Fremont Avenue	Selah	WA	98942
Apple Valley Elementary School	7 North 88th Avenue	Yakima	WA	98908
Cottonwood Elementary	1041 South 96th Avenue	Yakima	WA	98908
Harriet Thompson	1105 West 2nd Street	Grandview	WA	98930
Dayton Elementary (2)	302 East Park Street	Dayton	WA	99328
Berney Elementary School	1718 Pleasant Street	Walla Walla	WA	99362
Kirkwood Elementary	403 South Juniper Street	Toppenish	WA	98948
Selah Homelink	308 West Naches Avenue	Selah	WA	98942
McClure Elementary - Yakima	1222 South 22nd Avenue	Yakima	WA	98902
Rogers Adventist School	200 Southwest Academy Way	College Place	WA	99324
Chief Kamiakin	1700 East Lincoln Avenue	Sunnyside	WA	98944



## Program Promotions



Wattsmart® is  
ready for  
*you!*

Enroll your fourth-grade science students in a free, engaging energy education program.

**BE WATTSMART, BEGIN AT HOME**



## WATTSMART® BEGIN AT HOME

The Be Wattsmart, Begin at home program reinforces electricity learning standards in an engaging presentation. Participating teachers receive free energy education posters, activities and student materials as well as the chance to receive a Visa® gift card of up to \$50, depending on participation.

Presentations begin in fall 2021.

Reserve your classroom's spot today at

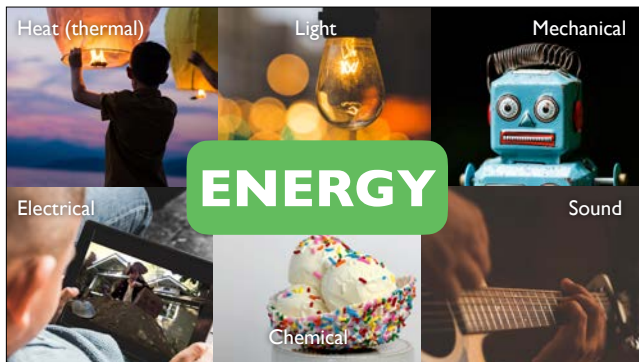
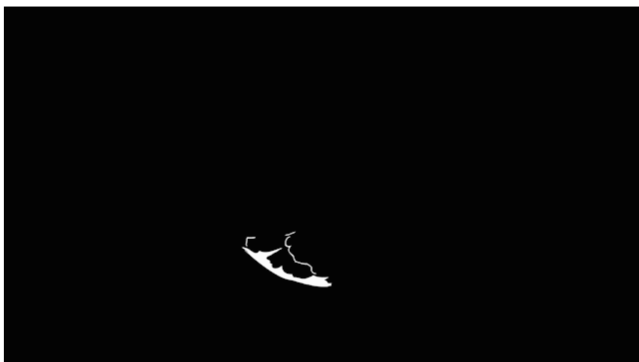
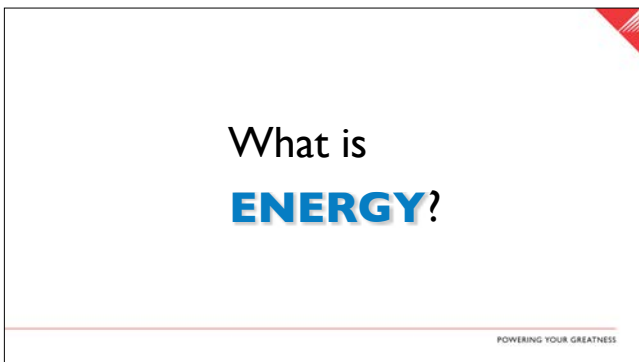
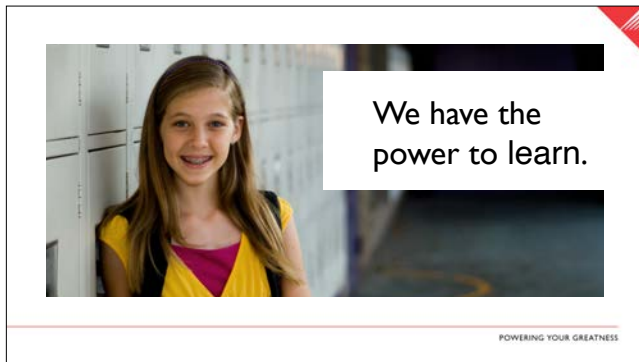
**[Wattsmart.com/begin](https://Wattsmart.com/begin)**

or email Sarah at [sarah@nefl.org](mailto:sarah@nefl.org).



# Program Documents

## Keynote Presentation



### Potential Energy



### Kinetic Energy



POWERING YOUR GREATNESS



POWERING YOUR GREATNESS

### Natural Resources



Anything we use that comes from the earth or the sun.

POWERING YOUR GREATNESS

### Renewable Resources

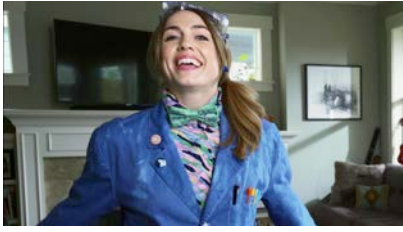


POWERING YOUR GREATNESS

### Nonrenewable Resources



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POWERING YOUR GREATNESS



It's time to play Lingo!



energy

There are many



natural gas

The blue flame of natural gas is a non-renewable resource.

natural resource

Anything we use that comes from the earth makes sense. It's a natural resource.



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## Electricity

Electricity is generated from natural resources.



POWERING YOUR GREATNESS

## Pacific Power

Electric generation by energy source



Coal 51%



Renewables 22%



Natural gas 20%

Other sources 7%

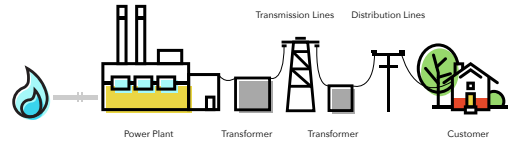
POWERING YOUR GREATNESS

How many people does it take to turn on a light bulb?



POWERING YOUR GREATNESS

## Electric Generation



POWERING YOUR GREATNESS

## Transforming Energy with Circuits



POWERING YOUR GREATNESS

## What do we need?

An energy source

example: battery or wall outlet

A conductor to carry electrical energy


example: wire

A load to use the energy

example: light bulb

# Open and Closed Circuits

## Transforming Energy



**Conductors**  
allow electricity to flow through them.

**Insulators**  
resist the flow of electricity.


POWERING YOUR GREATNESS




It's time to play Lingo!



**Renewable**  
R... naturally replaced.



**Nonrenewable**  
N... or not at all.



**Oil**  
...orce used to produce  
... E. O...



## Energy Efficiency

Using less energy to accomplish the same amount of work.



Technology

+



Behaviors

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Caitlynn Power

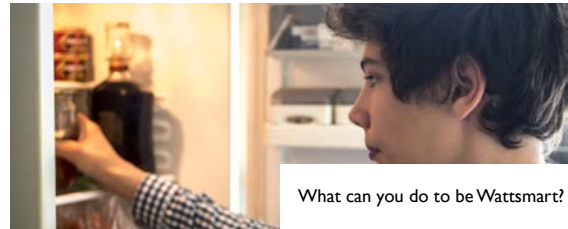
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Caitlynn Power

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## Home Efficiencies



What can you do to be Wattsmart?

POWERING YOUR GREATNESS

## Be the Energy Expert in your home.

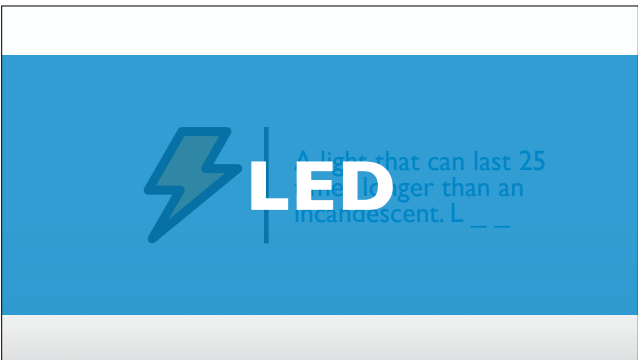
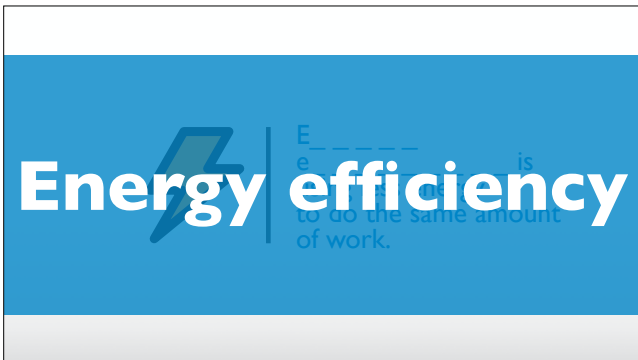
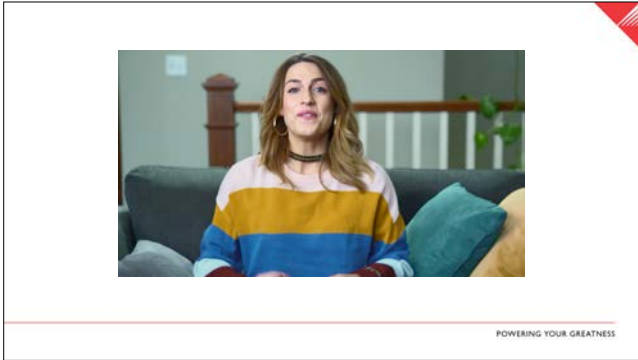


POWERING YOUR GREATNESS



Caitlynn Power

POWERING YOUR GREATNESS





# Phantom Load

Electricity consumed by an electronic device in standby mode.

# full load

Make sure you have a full load before starting your dishwasher.

# water

Turn off the water when brushing your teeth.

## What have we done today?



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

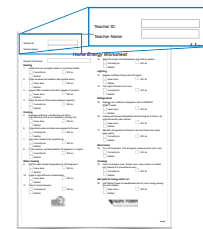
## Engage in energy efficiency

Review your **Be Wattsmart, Begin at home** booklet with your family.



## Complete the

**H**ome  
**E**nergy  
**W**orksheet



## Online Worksheet [ThinkEnergy.org/Wattsmart/](http://ThinkEnergy.org/Wattsmart/)

### Find Your Teacher ID

1 Find Your School 2 Find Your Teacher 3 Submit Your Form

Enter the keyword of your school's name. Example - Kennedy for John F Kennedy

School Name

Search for School

Don't know your Teacher ID? No problem. Use this tool to find your teacher ID.



POWERING YOUR GREATNESS

Receive your very own  
Pacific Power LED  
nightlight.



POWERING YOUR GREATNESS



POWERING YOUR GREATNESS



**YOU** have  
the *power* to  
be Wattsmart!

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POWERING YOUR GREATNESS

# Implementation Steps for Presenter Option

1

Verify you have received:

- *Teacher Materials Folder* (notice your teacher ID in the upper left corner)
- Your **Be Wattsmart, Begin at home** *Teacher Guide*
- *Home Energy Worksheets* (HEW) for you and your students
- **Be Wattsmart, Begin at home** family booklets
- *Set of Parent Letters*
- *Wattsmart nightlights* (student incentive for completing the HEW)

2

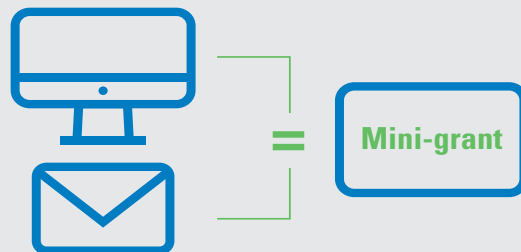
After the presentation, distribute to each student a:

- **Be Wattsmart, Begin at home** family booklet
- *Home Energy Worksheet* (Write your teacher ID on each worksheet before you send home.)
- *Parent Letter*

3

Final steps:

- Reward students with a Wattsmart nightlight when they complete their worksheet on paper or online at [thinkenergy.org/Wattsmart](http://thinkenergy.org/Wattsmart).
- *Home Energy Worksheets* submitted online can be verified through the teacher portal ([nefi.org/programs/teacher-lookup](http://nefi.org/programs/teacher-lookup)) with your teacher ID.
- Have each student sign the *Thank You Card* to Pacific Power.
- Mail any completed paper HEWs and the *Thank You Card* in the postage paid envelope (found in your materials folder) by December 17, 2021.



**WATTSMART**  
BEGIN AT HOME

National  
Energy  
Foundation  
cultivating energy literacy

**PACIFIC POWER**  
POWERING YOUR GREATNESS

# Attention Teachers

Return your student *Home Energy Worksheets* (HEWs) and receive a **\$25 – \$50** mini-grant for classroom use, depending upon participation. Students may submit worksheets online or return the completed survey to you. See the *Implementation Steps* for additional HEW online information.

80% or greater return of registered students' *Home Energy Worksheets* = \$50  
50 – 79% return of registered students' *Home Energy Worksheets* = \$25

Postmark due date:  
**December 17, 2021**

Offer open only to teachers participating in Be Wattsmart, Begin at home. Certain restrictions may apply. Good while grant funding is in place. *Home Energy Worksheets* must be completed for eligibility. For more information, contact Megan Hirschi at [megan@nef1.org](mailto:megan@nef1.org).

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# Family Guide



 **PACIFIC POWER**  
POWERING YOUR GREATNESS

## Dear Parents,

The **Be Wattsmart, Begin at home** program assists teachers and families to learn about energy, discuss important energy topics and engage in energy efficiency actions now. Your child has participated in a presentation 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 complete the **Home Energy Worksheet** online at [thinkenergy.org/Wattsmart](http://thinkenergy.org/Wattsmart) or return it to your child's teacher.

Thank you for being Wattsmart and for your participation!

## What's inside?

This booklet is divided into three sections that will give you the power to:

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. Pacific Power is moving toward a sustainable energy future that includes increased use of solar, wind and other renewable resources; and provides customers with more choices to meet their energy needs.

### 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.

## I have the *power* to be Wattsmart.

- Being Wattsmart is all about taking steps to save energy – which in turn can help you save money.
- You have the power to become more energy efficient. Pacific Power can help with Wattsmart programs and incentives for homes and businesses. Saving energy also saves money and is good for the environment.



# I have the power to learn.

## 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
- 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. The U.S. has more coal reserves than any other country in the world, but the reserves are shrinking.



**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).

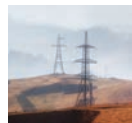


**Geothermal** is energy derived from the heat of the earth.



**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 Source	Pacific Power (2020 Basic Fuel Mix)*	United States (U.S. EPA, 2019 data)
Natural Gas	19.5%	40.3%
Coal	51.4%	19.3%
Nuclear	0.00%	19.7%
Petroleum	0.00%	.4%
Other/misc.	6.8%	.5%
Renewables (total)	22.3%	19.8%
Hydropower	5.1%	7.3%
Wind	11.3%	8.4%
Biomass	0.4%	1.4%
Solar	5.2%	2.3%
Geothermal	0.3%	0.4%

\*This information is based on Federal Energy Regulatory Commission Form 1 data. Pacific Power's "basic fuel mix" includes owned resources and purchases from third parties. It 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 hydro facilities in the fuel mix may be: (a) used 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) not acquired. The 2020 fuel mix includes energy production associated with 157 megawatts of solar resources acquired through customer partnerships supported by a customer's purchase of 100% of renewable energy attributes generated by those solar resources.



# I have the power to *discuss* energy use to 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 and appliances 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% 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 them on winter days to let the warmth in.
- Small room fans are an energy-efficient alternative to air conditioning.
- For information about energy-saving programs and cash incentives, visit [Wattsmart.com](http://Wattsmart.com).



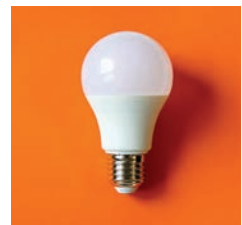
## Water and water heating

- Check your faucets for leaks that can cost you hundreds of dollars each year.
- Install a water-efficient shower head and save as much as \$50 in utility bills and more than 2,300 gallons of water per 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.
- Replace your incandescent bulbs with LEDs (light-emitting diodes) and save \$5 to \$8 per year per bulb. These bulbs use up to 80% 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.

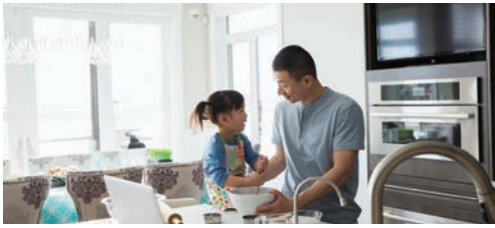


## Electronics

- 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 50% 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% less energy than conventional models and provides energy savings without sacrificing the features you want.
- Clean door gaskets with warm water or a detergent that leaves no residue.

### Dishwashers

- Only run dishwashers when full and use the air-dry or no heat dry settings.
- ENERGY STAR® dishwashers use less energy than the federal minimum standard for energy consumption.
- Try running your dishwasher before 3 p.m. or after 8 p.m. to avoid peak demand.

### Laundry

- Buy a moisture sensitive dryer that automatically shuts off when clothes are dry.
- Use a drying rack whenever possible.
- To avoid peak demand, wash and dry clothing before 3 p.m. or after 8 p.m. when possible.

### Cooking

- Use a microwave oven, toaster oven or slow cooker 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.



I have the power to *engage* in energy efficiency.

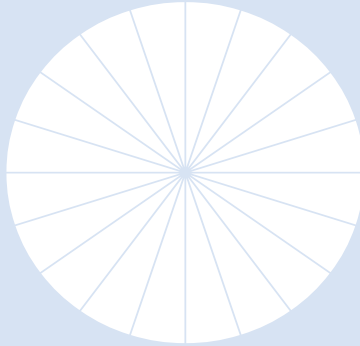
### Parents, be Wattsmart and watch the energy savings add up.

An individual with a combined electric and heating fuel bill of \$2,500 per year could save 20% 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.

### Your Home's Electricity Use

Most families in the U.S. use about 54% of their electricity for lighting and to power appliances and electronics, 32% to heat and cool their homes and 14% of their energy to heat water.

Choose three colors and create a pie chart with the percentages above. You may need to round each number. Each segment on the chart shows 5%.



Lighting, Appliances and Electronics

Heating Water

Heating and Cooling


(Source: [eia.gov/todayinenergy/detail.php?id=36412](http://eia.gov/todayinenergy/detail.php?id=36412), accessed April 2021)



### Your Home's Electricity Use

Let's go on an energy scavenger hunt! Search for each item in your home.

I FOUND IT HERE.

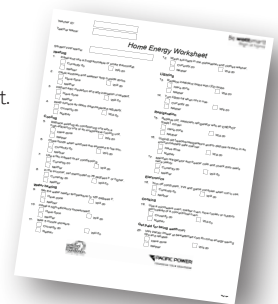
 Ceiling Fan	 Water-efficient Shower Head
 Door sweep under exterior doors	 Caulk, Foam Spray or Weather-stripping
	 Dishes or Clothes Air-drying

## I have the *power* to be Wattsmart.

Together with your parent(s), complete the separate *Home Energy Worksheet*. Return the completed *Home Energy Worksheet* to your teacher or submit it online at [thinkenergy.org/Wattsmart](http://thinkenergy.org/Wattsmart) to 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](http://BeWattsmart.com). Congratulations to you and your family for making a difference.



# WATTSMART®

BEGIN AT HOME



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**WATTSMART**<sup>®</sup>  
BEGIN AT HOME

# Teacher Guide

 **PACIFIC POWER**  
POWERING YOUR GREATNESS





# Welcome to Be Wattsmart, 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 Wattsmart, 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 Wattsmart, 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-correlated curriculum for your classroom

## About Pacific Power

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STEM Connections	Science		Technology		Engineering				Math								
	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
<b>Activity</b>																	
Pass the Sack		•		•													
The Search for Energy	•	•	•	•									•		•	•	
A Bright Idea!	•	•	•	•	•	•	•	•	•	•	•	•	•				
The Art of Circuits	•	•	•				•		•	•	•						•
Shine a Light on History		•	•	•		•	•	•	•		•						
Layered Lunch	•		•							•							
How Do You Rate?	•	•		•		•	•					•	•		•	•	
Energy in Math													•	•	•	•	
Be Wattsmart, Begin at home Poster		•		•			•	•									•

# Activity: Pass the Sack

## Objective

Students will demonstrate the difference between renewable and nonrenewable resources and the need for conservation of resources.

## Curriculum Focus

Science  
Social Studies

## Materials

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

## Key Vocabulary

Nonrenewable resource  
Renewable resource

## Next Generation Science Correlations

4-ETS1 – 2  
4-ESS3 – 1-2  
4-ESS3.A  
5-ETS1 – 2  
5-ETS1 – 1  
5-ESS3 – 1  
MS-ESS3 – 4  
MS-ESS3.A



## Introduction

Statistical research confirms world consumption of natural resources is increasing every year. Continued population growth ensures that demand will continue to increase for renewable and nonrenewable energy resources necessary to maintain our way of life. This creates problems for future availability of nonrenewable resources. Nonrenewable resources are just that, resources that cannot be renewed. For example, a resource used at our present rate might last about 100 years. Factor in population growth and increasing reliance on technology, and that resource may last only 79 years.

In this activity, two different types of candy (or other objects students would like) will represent resources. One type of candy will represent renewable resources and the other will represent nonrenewable resources.



## Procedure

1. Before class, count out enough candy so there is one piece per student (some of each type of candy, with 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 contents to run out before everyone gets candy!**
2. Tell students you will demonstrate how resources get used over time by playing “Pass the Sack.” Show students the sack and explain that 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** type 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 who 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? Do they trade, barter (trade for goods), buy (trade for currency), invade and take or 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 the 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 periodically to renew it.)
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.
8. Point out that renewable resources also have limitations. They may not generate electricity as reliably as nonrenewable sources. The amount of energy produced may vary with weather and location.
9. Plan how to pass out the remaining candy.



## Discussion

- Should rules be established to determine how the candy is distributed?
- Do oil, coal and natural gas companies have rules/regulations that must be followed to find resources?
- Should there be rules and regulations on how much oil, coal and natural gas people use?
- How do the class' social decisions influence the availability of candy?



## To Know and Do More

Go to [eia.gov/kids](https://www.eia.gov/kids) to access games, tips and facts for kids to learn about renewable energy and energy efficiency.

Discuss whether or not it is possible to run out of a renewable resource. Wood and fresh water are examples of renewable resources that can be used faster than nature can replace them.

# Activity: The Search for Energy

## Objective

Students will learn the difference between renewable and nonrenewable resources.

## Curriculum Focus

Math  
Science  
Social Studies

## Materials

- 1/2 bag popcorn or other small item to represent solar energy
- Small pieces of ripped paper to represent approximate U.S. nonrenewable energy reserves
  - 164 black - coal
  - 22 red - uranium
  - 8 green - natural gas
  - 2 blue - oil
- Large sheet or tarp to place paper and popcorn on for easy clean up (optional)
- Copies of "Data Table and Graph"

## Key Vocabulary

Nonrenewable resources  
Renewable resources

## Next Generation Science Correlations

4-ESS3-1  
4-ESS3.A  
5-ESS3 - 1  
MS-PS1 - 2  
MS-LS2 - 1  
MS-ESS3.A



## Introduction

Fossil fuels are extremely useful energy sources. Our society has adopted them because they can be readily available and economical. In the early part of the 20th century, a fledgling solar industry took root but was ultimately displaced by less expensive energy sources such as fossil fuels. Today some fossil fuels are harder to find and increasingly more costly. The sun, on the other hand, is just as plentiful as it was 100 years ago. It is a renewable resource that could become our most widely used source of energy.

The following activity is a simulation game in which students learn the difference between renewable and nonrenewable resources. The game reflects society's use and exhaustion of nonrenewable fuels and the eventual transition to renewable technologies.



## Procedure

1. Divide the class into five equal groups. Each group represents a company going after a particular resource (coal, uranium, natural gas, oil or the sun). The paper and popcorn represent reserves of the various energy resources. Pass out copies of the student sheet "Data Table and Graph" to each group or have students create their own data tables on paper.
2. Have students gather in a large circle. Scatter the papers plus a handful of "solar" popcorn so they are spread out in the center of the circle. You can do this on a sheet for easier clean up. Explain that this exercise demonstrates how the availability of 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 resources that are available change after each trial. Tell each group that they will have 30 seconds to pick up as many papers or popcorn as they can of their assigned type. Start timing.

After 30 seconds have the groups stop and count the items they have gathered. Have each group announce their results to the class and record every count in their data table. If some groups have collected all of their available resource, point out that the resource is now depleted and they are unemployed.

4. Scatter another handful of “solar energy,” helping students realize that since the sun is a renewable resource, there is the same amount of it each time you look, whereas the nonrenewable fuels are being depleted. Repeat the search period so students can get more papers or popcorn.
5. Stop after 30 seconds and have the group count and record the papers and popcorn collected again. Note that there are fewer nonrenewable fuels found in the second round. Students have to look harder to find what is left. The solar count is slowly catching up with the nonrenewable fuels. Repeat with additional trials as needed.
6. Have groups create a bar chart or, for more advanced students, a multiline graph of the number of papers and popcorn collected each trial.



## 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 a resource? Why do some deposits go unused?



## To Know and Do More

Add wind and water to the activity. Lead a discussion to be sure the students understand why you continued adding more sun, wind and/or water after each trial, but did not add more of the other papers. As a class, come up with a general outline of how to more effectively manage the resources that are available to us.

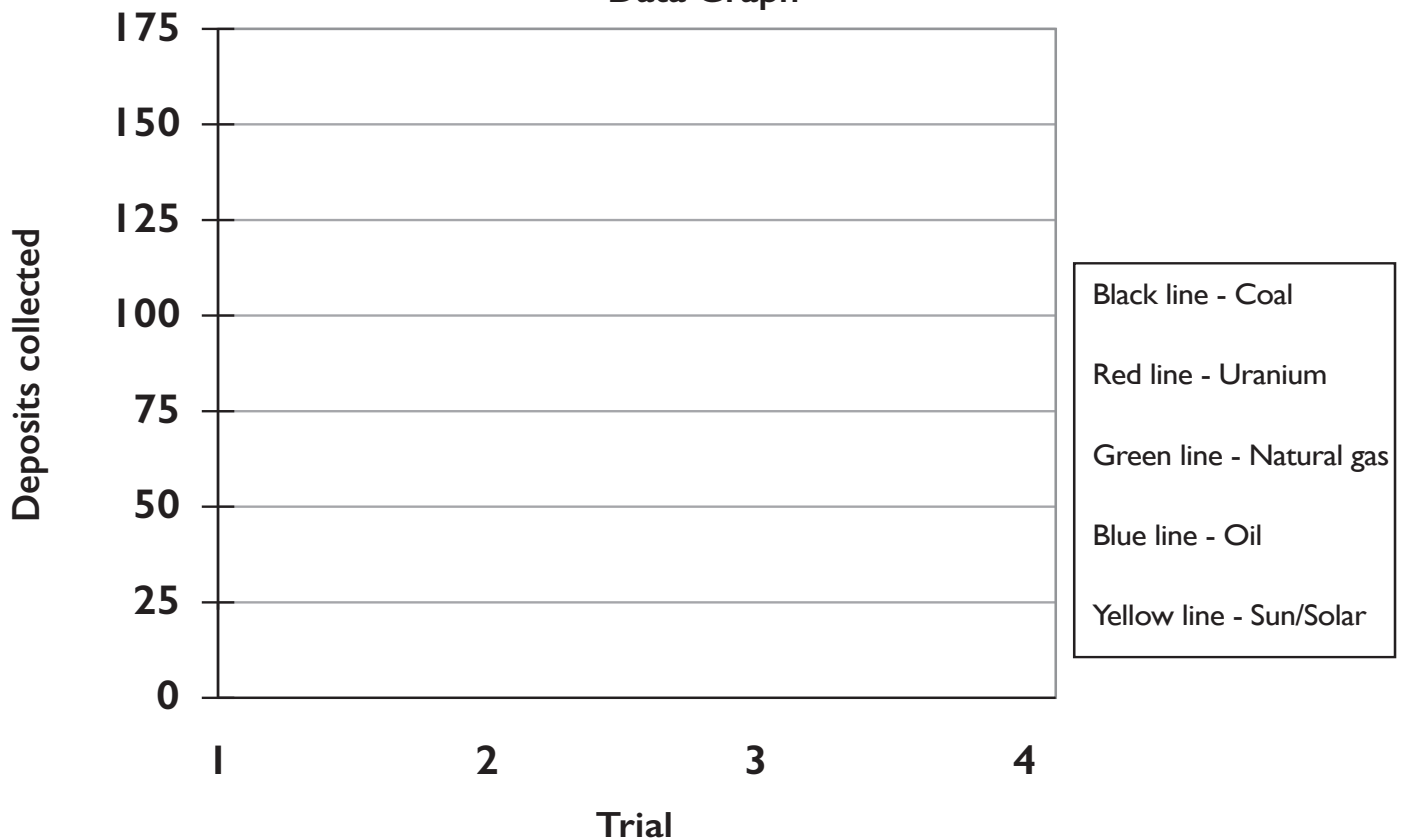


# Student Sheet: Data Table and Graph

**Data Table**

Search Period	Coal (Black)	Uranium (Red)	Natural Gas (Green)	Oil (Blue)	Sun/Solar (Popcorn)
1					
2					
3					
4					
Totals					

**Data Graph**



# Activity: A Bright Idea!

## Objective

Students will study an example of potential energy converted to energy in the forms of heat and light.

## Curriculum Focus

Science

## Materials

- Several general purpose C dry cell batteries
- A string of holiday lights, cut apart and stripped at the ends or small bulbs and sockets with wires
- Battery operated toy and batteries
- Small flashlight bulbs and sockets
- Copies of "A Bright Idea!"

## Key Vocabulary

chemical energy, circuit, closed circuit, current, electrode, electrolyte, kinetic energy, open circuit, parallel circuit, potential energy, radiant energy, series circuit, thermal energy, transformation, voltage

## Next Generation Science Correlations

4-ETS1 – 1-2  
4-PS3 – 2-4  
4-ESS3 – 1  
5-PS1.B  
5-ESS3 – 1  
5-ESS3.C  
MS-PS3 – 3  
MS-PS3.B  
MS-LS2 – 1  
MS-ESS3.A



## Introduction

Alessandro Volta, an Italian physicist, made the first battery in 1799. Volta placed two different metal electrodes in an electrolyte solution (a chemical mixture which will conduct an electrical current). The chemical reaction caused an electromotive force. A common misconception is that batteries store electrical energy. This is not really true. Batteries convert chemical energy to electrical energy. They store chemical energy that can be released during a chemical reaction. An electric current can be produced before by using metals or carbons that have different chemical properties and an acid or base that will allow the movement of electrical charges.



## Procedure

1. Demonstrate a battery operated toy with and without the battery. Explain that energy is the ability to do work or cause change, such as moving the toy or powering a light bulb.
2. Discuss:
  - How do we know the energy from the battery is working?
  - What kind of energy is the toy giving off? (possible answers include kinetic energy, mechanical, light, sound and heat)
  - The battery converts chemicals (chemical energy) to electricity (electrical energy) and the toy converts electricity to many possible forms of energy, including mechanical energy, heat (thermal energy), light and sound.
3. Have students use the materials provided to experiment with simple circuits by following the guided inquiry activity on the student sheet. As the students do the activity, have them note the light and heat energy given off.
4. Give students examples of types of potential and kinetic energy.
 

Kinetic energy: a person riding a bike, a fire in a woodburning stove, a person running

Potential energy: a lump of coal, a sandwich, a rock at the top of a hill



## Discussion

Write the word choices on the board. Read the statements to the students and have them fill in the blanks using the words.

1. A battery converts chemical energy into \_\_\_\_\_ energy.
2. Electricity is a form of \_\_\_\_\_ energy.
3. The light bulb converts electrical energy into \_\_\_\_\_ and \_\_\_\_\_ energy.
4. A battery contains \_\_\_\_\_ energy.

### Word choices:

potential      electrical      heat      kinetic      light

### Answers:

1. electrical      2. kinetic      3. light, heat      4. potential



## To Know and Do More

Ask students if they believe batteries are important to our way of life today. Have students make a list of all the items they used yesterday that contained a battery. Their list might include:

Wristwatch	Tablet
Automobile	Video game controller
Cell phone	TV remote control

To continue this, have students add to the list all of the items they can think of that use batteries. Are your students surprised at how many items today depend on batteries to operate and how many battery operated items they depend on daily?



## Career Awareness Activity

Search the internet for a company that produces batteries. Discover the various job opportunities and careers within that company. Your list might include: scientists, chemists, research analysts, accountants, purchasing agents and administrative assistants.

# Student Sheet: A Bright Idea!

Alessandro Volta, an Italian physicist, made the first battery in 1799. Volta put sheets of two different types of metal in a jar of water with a chemical that could carry electricity (an electrolyte). The chemical reaction between the electrolyte and the metal plates caused electrons to move when the plates were connected with a wire. The flow of electrons moving in a wire is called an electric current or electricity.

**Using one battery and one light, make the bulb light up. Congratulations, you have made an electrical circuit!**

1. What did you do to get the light to come on and complete the circuit? How was it touching the battery?

---



---

2. What do you have to do to make the light bulb turn off and then back on?

---



---

3. What do you think the electrical terms "open circuit" and "closed circuit" mean?

---



---

4. How do you think a light switch works?

---



---

5. What type and form of energy is in the battery?

---



---

6. The battery's energy was transformed into what other forms of energy?

---



---

**Using one battery, try to light up two lights.**

1. Sketch how the wires are connected to the battery when you light two lights.

2. Are the lights the same brightness as when you lit only one or are they dimmer?

---



---

3. A series circuit has only one path that electrons can follow as they are pushed from one side of the battery to the other. A parallel circuit has more than one path and the electrons can go more than one way to get from one end of the battery to the other. Which type of circuit did you make and draw?

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4. Experiment with multiple batteries connected together, placing the positive end of one battery touching the negative end of another battery. What effect does the number of batteries have on the brightness of the bulbs?

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5. If you leave the battery connected to a bulb long enough, you will feel the wire and the ends of the battery getting warm. What do you think is causing this?

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6. Can that heat be useful? Can it be dangerous? Give an example to prove your point.

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7. Wash your hands when you are finished.

# Activity: The Art of Circuits

## Objective

Students will learn about conservation of energy and energy transfer by experimenting with electrical circuits.

## Curriculum Focus

Science  
Social Studies  
Language Arts  
Art

## Materials

- Playdough<sup>®</sup> or homemade salt dough
- 9V batteries
- 9V battery clips with red and black cables
- 2V LED miniature light bulbs
- Insulating material: cardboard, packaging plastic or dough made from sugar, not salt (optional)

## Key Vocabulary

Energy transfer  
Electric current  
LED (light-emitting diode)  
Electric circuit  
Insulator  
Conductor

## Next Generation Science Correlations

4-PS3 - 2  
4-PS3 - 4  
4-PS3.A-B, D  
4-ETS1 - 1  
4-ETS1.A  
5-ETS1 - 1  
5-ETS1.A  
MS-PS3 - 3  
MS-PS3.A-B  
MS-ETS1 - 1  
MS-ETS1.A



## Introduction

Materials that allow a flow of electric current to pass through them more easily are called conductors. Aluminum, silver, copper and water are examples. Insulators block the flow of electricity. Nonmetallic materials, such as rubber, plastic, wood, cloth and dry air are insulators. An electrical circuit is a path of conductors through which electric current flows. Energy can be transferred from place to place by electric current.

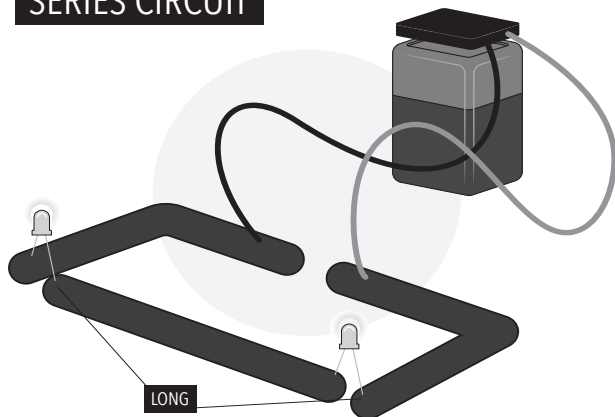
In this activity, students will use salt dough, which is a conductor, to design circuits which will transfer electrical energy. If they are successful, the electricity will be transformed to light and heat energy in a miniature LED bulb.



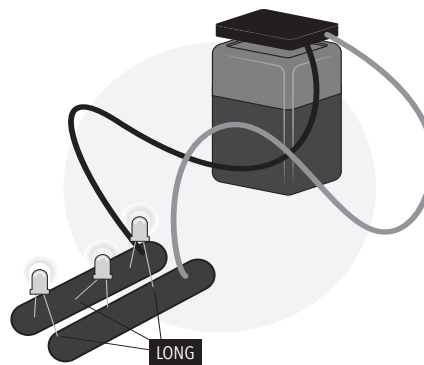
## Procedure

1. Introduce students to their materials:
  - a. Attach the battery to a battery clip with red and black cables. The red lead is the positive terminal and the black lead is the negative terminal.
  - b. Examine the LED bulb. Two wires (or legs) extend from the bulb. The longer wire is the positive side of the LED and the short wire is the negative side. The LED should only be connected to dough, never directly to the battery terminals, which will cause the bulb to burn out.
2. Tell students that electricity can only go through the circuits they will create in one way. The positive terminal of the battery (red lead on battery clip) must be nearest a positive (long) leg of the LED. A battery pushes electricity around the circuit through the positive leg and out the negative (short) leg, then repeating through the next positive leg (if there is more than one LED in the circuit).
3. Explain that electricity will take the path of least resistance. It is easier for electricity to travel through the dough than through the LED. If two pieces of dough are touching, the LED will not light.
4. Challenge students to design a simple circuit like the ones on the next page.

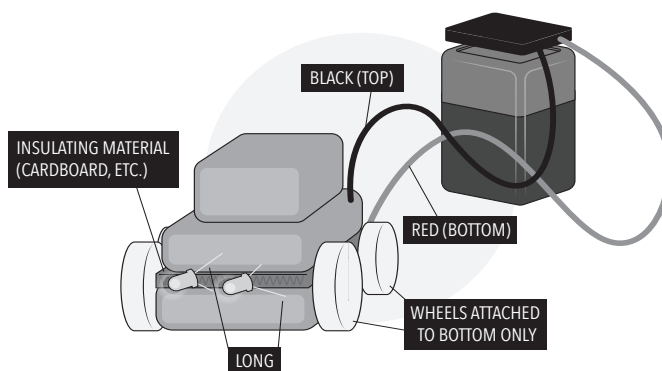
### SERIES CIRCUIT



### PARALLEL CIRCUIT



If time allows, have students create a circuit work of art like the one below. Since the conductive dough cannot touch, use insulating material between layers.



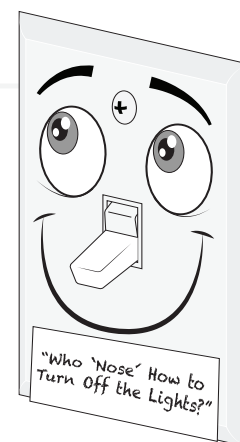
### Discussion

- How does your dough circuit light the LED compared to the circuits at your home?
- In a series circuit with multiple LEDs, what happens to the brightness of the LEDs that are further from the battery? Why?



### To Know and Do More

When a light switch is off, the electrical pathway to a bulb is not complete and electricity cannot flow to light that bulb. When you flip the switch on, you close the circuit and the light turns on. If light is not needed, it is important not to waste the natural resources used to generate the electrical power that is being transformed to light. Have students create characters without noses to put over light switches at school or home. The art should help remind them to turn lights off!





# Activity: Shine a Light on History

## Objective

Students will gather details and make inferences from text to explain historical events related to electricity. They will use their knowledge to write information text to support an opinion.

## Curriculum Focus

Language Arts  
Social Studies  
Science

## Materials per student group

- Index cards

## Key Vocabulary

LED (light-emitting diode)  
Incandescent bulb  
Filament  
Electric meter  
Inference  
Persuasive  
Lumen  
Watt

## Next Generation Science Correlations

4-PS3 - 2  
4-PS3.A-B  
MS-PS3 - 3



## Introduction

Thomas Edison and Nick Holonyak are two famous lighting inventors. They both made major contributions that changed the way people lived. Thomas Edison patented the incandescent bulb in the late 1870s. Since that time, people have enjoyed the convenience of using electricity for light. Nick Holonyak created the first practical, visible spectrum LED which revamped lighting as we know it.

In this activity, students will research the contributions of these two inventors. They will gather details to form an opinion about which man was more influential in history.



## Procedure

1. Give students time to research the famous inventors Thomas Edison and Nick Holonyak. They can use the internet or other sources to find important information.
2. Have students fill out the index cards for each inventor. Using that information, they should decide which inventor was more influential in history and write a persuasive paragraph with details from their research to support their opinion.
3. Challenge students to practice reciting their paragraph and then present it to another student(s) in an attempt to change a differing opinion.



## Discussion

- What kinds of light bulbs are used in your home? How do they affect the way you live and work?
- What do you think the next great electrical invention will be?
- Thomas Edison said, "Genius is one percent inspiration and ninety-nine percent perspiration." What did he mean? How does his quote apply to you?



## To Know and Do More

A light bulb package has a lighting facts label that contains different numbers.

- The light output in lumens.
- The power used by the bulbs, measured in Watts. The higher the wattage, the more energy the bulb uses.
- A measure of how warm or cool the light from that bulbs looks, measured in Kelvin (K). Low numbers are warmer light hues (orange or yellow). High numbers are cooler hues (blue or green).

When buying new bulbs, we should shop by lumens, not wattage. We save energy by finding bulbs with the lumens we need, then choosing the lowest wattage possible for that number of lumens.

<b>Lighting Facts</b> <small>per bulb</small>	
<b>Brightness</b>	<b>800 lumens</b>
<b>Estimated Yearly Energy Cost \$1.08</b> Based on 3 hrs/day, 11¢/kWh Cost depends on rates and use	
<b>Life</b>	Based on 3 hrs/day <b>23 years</b>
<b>Light Appearance</b>	
<p>Warm    2700 K    Cold</p>	
<b>Energy Used</b>	<b>9 Watts</b>

# Activity: Layered Lunch

## Objective

Students will understand that natural gas deposits are trapped and held by certain types of geologic formations.

## Curriculum Focus

Science  
Art

## Materials

- Slices of bread
- Almond butter or other thick spread (e.g. cream cheese)
- Honey
- Plastic wrap or wax paper
- Plastic knife

## Key Vocabulary

Permeable  
Impermeable  
Source rock

## Next Generation Science Correlations

4-ETS1 - 1  
4-ETS1.A  
5-ETS1 - 1  
5-ETS1.A  
MS-LS4 - 1  
MS-LS4.A  
MS-ESS1 - 4  
MS-ESS1.C  
MS-ETS1 - 4  
MS-ETS1.B



## Introduction

How do we find natural gas? Try this activity to get an idea of the type of rock formations and characteristics geologists look for when locating natural gas deposits.

As natural gas molecules form, they migrate from shale “source rock” into more porous areas such as sandstone. Porous or permeable layers are much like a sponge with little pockets throughout the rock. The natural gas continues to move to either the earth’s surface (where it escapes into the atmosphere) or it is trapped when nonporous or impermeable rock layers block its path.



## Procedure

Using bread, almond butter and honey, create some edible models of rock layers. (In place of almond butter you could use peanut butter, Nutella or even thick frosting depending on allergies within the classroom.)

1. Spread thick layers of almond butter then honey on a slice of bread. Top it with another slice of bread.
2. Make a second sandwich just like the first, or gently cut the sandwich in half.
3. Put one sandwich (or one half) with the almond butter layer above the honey and the other sandwich (or other half) with the honey on top of the almond butter.
4. Next spread a thick layer of only honey on a slice of bread, adding another slice on top.
5. Cover your sandwiches with wax paper or plastic wrap and gently press down on them for about three seconds, representing millions of years of pressure.
6. Cut the sandwiches in half and observe what has happened.



## Discussion

1. What do you think the honey represents?
2. Which layer do you think represents porous rock?
3. Which layer is the nonporous rock?
4. Did the honey seep into both slices of bread? Why or why not?
5. What do you predict would happen with a sandwich made with only almond butter?
6. How might the ingredients you used affect your results?
7. Draw the layers of your sandwich and use colored pencils or crayons to distinguish the different layers and write labels for each layer that includes: impermeable, permeable, natural gas, nonporous rock and porous rock.

## Answers

The honey represented natural gas or a fossil fuel. The bread was the porous rock where the honey or natural gas gets into the little pockets or air spaces. Almond butter acted like a nonporous rock layer blocking the honey from seeping into the slice of bread above the almond butter. The results may be different depending on your ingredients: denser bread allows less seepage, creamier almond butter may be less impermeable or thicker honey may not fill the little pockets as easily.



## To Know and Do More

Assign students to further investigate how natural gas is trapped in rock formations. Have them draw pictures of a formation and the trapping of oil and natural gas in the earth.

Visit a natural history museum and look for prehistoric life forms and rock formations.

# Activity: How Do You Rate?

## Objective

Students will conduct a home survey to determine how they can use energy more efficiently by changing their habits and improving conditions and thereby improve the environment in which they live.

## Curriculum Focus

Language Arts  
Science  
Social Studies

## Materials

- Copies of “How Do You Rate?”

## Key Vocabulary

Conservation  
Efficiency  
Environment  
Natural resources  
Quality of life

## Next Generation Science Correlations

4-ESS3 – 1  
5-ESS3 – 1  
5-ESS3.C  
MS-LS2 – 1  
MS-ESS3 – 3  
MS-ESS3.A



## Introduction

We use natural resources every day. Sometimes we use them just as they come from earth or the atmosphere. At other times we alter their makeup to fit our needs. For instance, we use the sun just as it is to dry clothes, but we use photovoltaic cells to capture the sun’s energy and convert it to electricity, a secondary energy source. We use coal just as it comes to us from the earth to make electricity, or we use coal to provide coke for steel manufacturing. Many natural resources we use every day are nonrenewable, once we use them they are gone. Others are renewable, they can be replaced through natural and/or human processes.

It is responsible to use all resources efficiently and wisely. When we do, we reduce energy use, save money and preserve the environment. Making wise decisions today will have a positive impact on our future.

Imagine the difference we could make if we all used energy more efficiently. We would conserve natural resources for the future and enjoy better air quality and a better life. Each one of us can truly make a difference. All it takes is knowledge and action.



## Procedure

Using energy efficiently and conserving our natural resources are responsible and easy actions that students can take today to show they respect the environment and have a desire to protect and preserve it.

1. Pass out “How Do You Rate?” Discuss the actions that may apply to the school (e.g., windows and doors have weather-stripping; drapes or blinds are open on cold, sunny days and closed on hot days; thermostats are adjusted at night; lawns are only watered early or late in the day). As you discuss each action, write a T for true or F for false on the board to see how the school rates. What can the students do to improve energy use at school?
2. Decide on several actions the students can take at school to help save energy and protect the environment. One action might be to use both sides of their paper and then recycle. If a room is empty during lunch or at other times, they can be sure lights are turned off and computers are on sleep mode.
3. Have the students take the survey home and complete it with their parent’s or guardian’s help. Explain to students that it is important to record their true energy use and not mark what they think they should be doing.
4. How did the students’ homes rate? Discuss the results of the home survey. Help students to become enthusiastic about conserving natural resources and using energy more efficiently.

5. Prepare a graph to show the results of the energy efficiency survey. Which efficiency tips are already practiced by most students? Which were least used? Graph the number of students marking true for each item.
6. Find the mean, median, mode and range of the data on the home survey.



## Discussion

Discuss the benefits of energy conservation. How will our energy use impact our future? Compare the benefits and possible inconveniences and their correlation to our quality of life.



## To Know and Do More

Why do you think people do not practice all of the energy efficiency tips on the survey? Are there false assumptions that affect people's behavior? (Believing that turning things on and off uses more energy than leaving them on, for example.)

Discuss how people in other geographic areas and cultures would rate. Does everyone have a car, dishwasher or an air conditioner?



## Career Awareness Activity

Have the students think of some careers that could have a big impact on your community's energy usage. Some areas to consider: teachers impact energy usage through education and by example; utility workers impact energy through education and incentives; government regulators have an influence through restrictions and rewards, such as financial benefits or tax breaks.

# Student Sheet: How Do You Rate?

How energy efficient is the building you live in? Together with your parents or guardians, answer the following questions to rate your home or apartment.

Circle T if the statement is true, F if the statement is false or NA if the statement does not apply to your living situation.

## Heating and Cooling

Windows and doors have good weather-stripping.	T F NA	Ducts are insulated in unheated/uncooled areas.	T F NA
Window coverings are open on cold, sunny days and closed on hot days.	T F NA	Garage is insulated.	T F NA
Window coverings are closed at night when heat is on.	T F NA	Air filters on furnace and air conditioner are cleaned and changed regularly.	T F NA
Thermostat is set at 68 F (20 C) or lower in winter.	T F NA	Thermostat is adjusted at night.	T F NA
Air-conditioning is set at 78 F (26 C) or higher in summer.	T F NA	Fireplace damper is closed when fireplace is not in use.	T F NA

## Water

A pitcher of water is kept in the refrigerator for drinking.	T F NA	Hot water heater is set at 120 F (49 C).	T F NA
Faucets and toilets do not leak.	T F NA	<ul style="list-style-type: none"> <li>If someone in your household has a compromised immune system, consult your physician.</li> </ul>	
Showers and faucets are fitted with energy-efficient shower heads and aerators.	T F NA	Hot water pipes from water heater are insulated.	T F NA
Showers last no longer than 5 minutes.	T F NA	If located in an unheated area, hot water heater is wrapped in an insulation blanket.	T F NA
Toilets are low flow, or tanks use water displacement devices.	T F NA	Broom, not hose, is used to clean driveways and sidewalks.	T F NA
		Faucet is shut off while brushing teeth and shaving.	T F NA

## Appliances

Dishwasher is usually run with a full load.	T F NA	Clothes dryer is usually run with a full load.	T F NA
Automatic air-dry is used with the dishwasher.	T F NA	Clothes are often hung up to dry.	T F NA
Washing machine is usually run with a full load.	T F NA	Refrigerator is set no lower than 37 F (3 C).	T F NA
Cold water is used in washing machine most of the time and is always used for rinses.	T F NA	Lids are usually put on pots when boiling water.	T F NA
		Oven is preheated for only 10 minutes (if at all).	T F NA

## Lighting

Lights are turned off when not in use.	T F NA	Light bulbs are kept dusted and clean.	T F NA
LED bulbs are used in at least one room.	T F NA	Sunlight is used whenever possible.	T F NA
Security and decorative lighting is powered by solar energy.	T F NA		



## Trash

Glass, cans and newspapers are recycled.	T F NA	Overpackaged products are usually avoided.	T F NA
Plastic is separated and recycled.	T F NA	Reusable bags are used for groceries, or bags are recycled.	T F NA
Old clothes are often given to charities, secondhand clothing stores, etc.	T F NA	Rechargeable batteries are used when possible.	T F NA
Food scraps and organic waste are composted.	T F NA	Food is often bought in bulk.	T F NA
		Products made of recycled materials are favored.	T F NA

## Transportation

Car is properly tuned and tires properly inflated.	T F NA	Public transportation is used when possible.	T F NA
Family drivers obey speed limit on the highway.	T F NA	Family members often walk or ride a bike for short trips.	T F NA
Family drives an electric vehicle.	T F NA	Kids and parents carpool when possible.	T F NA

## Yard and Workshop

Lawns are watered early or late in the day.	T F NA	Cutting edges on tools are kept sharp.	T F NA
Grass is mowed to a height of 2 to 3 inches (5 to 8 cm).	T F NA	Electrical tools are maintained and gas equipment is kept tuned and serviced.	T F NA
Hand tools like pruners and clippers (rather than power tools) are used whenever possible.	T F NA		

Score 1 point for True, 0 points for False and 0 points for Not Applicable (NA).

**Total Points:** \_\_\_\_\_

Discuss the results of this survey with your family.  
What can you and your family do to raise your score?

# Activity: Energy in Math

## Objective

Students will interpret and evaluate numerical expressions as they solve word problems.

## Materials

- Copies of the questions found in the “To Know and Do More” section
- Individual white boards (optional)

## Key Vocabulary

Watt

## Common Core Correlations

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



## Introduction:

In this activity, students will complete the problem set found on the bottom of page 22 within an allotted time (10 minutes). Students will solve the mathematical problems making connections to real world situations.



## Procedure:

- Instruct students on the importance of learning to solve real world problems using their math skills. You may want to review some steps to solving word problems before beginning the first problem. The following questions might be useful to review:
  - Can you draw something to help you?
  - What can you draw?
  - What conclusions can you make from your drawing?
- Copy the questions on the “To Know and Do More” section on page 22 and pass it out to students. Make sure to remove answers on the bottom of the page.
- Model the problem.
 

Have a pair of students work at the board while the others work independently or in pairs at their seats.

As students work, circulate. Reiterate the questions above. After several minutes, have the demonstrating students receive and respond to feedback and questions from their peers if necessary.
- Calculate to solve and write a statement.
 

Give everyone 2 minutes to finish work on that question, sharing their work and thinking with a peer. All should write their equations and statements of the answer:
- Assess the solution for reasonableness.
 

Give students 1 to 2 minutes to assess and explain the reasonableness of their solution.



## Discussion/Debrief

The student debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the problem set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed. Then guide students in a conversation to debrief the problem set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- What did you notice about this word problem?
- What is different in the problem?
- What are we trying to find out?
- How can we represent this part of the story? (draw, write a number; use manipulatives)
- What would help us organize our thinking and our work? (answers may vary: draw it out, act it out, write an equation, etc.)
- What strategies can we use to solve this problem?



## To Know and Do More

Have your students turn in their worksheet showing their work to solve each problem. This will help you to assess your students' understanding of the math concepts presented in the lesson.

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 own bedroom 4 hours a day, and there are three people living there, how many Watts will be used a day to light the bedrooms?
  - 20 Watts
  - 240 Watts
  - 650 Watts
  - 720 Watts
4. For every 10 degrees the water heater setting is turned down, you can save 6% 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%

Answers: 1. Maggie, Michael, Jessie, Karen; 2. \$284; 3. 720 Watts; 4. 9%

# Activity: Be Wattsmart, Begin at home Poster

## Objective

Students will make their own energy-efficient choices that can be practiced at home to help future societies.

The students will also learn how they can be part of the solution to save energy and natural resources.

## Materials

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

## Key Vocabulary

Carbon footprint  
Recycle  
Energy efficient

## Common Core Correlations

Energy Sources, Forms and Transformation  
Personal and Social Perspectives  
Research Tools  
Problem-solving and Decision-making Tools  
Connection to the Real World



## Introduction:

This is a fun project for students to create after they have studied energy, energy efficiency and renewable and nonrenewable resources. Using the poster, students will add or color the items listed below to create a house that is eco-friendly and energy efficient. You can help your students answer questions about what types of energy they can use and how it will work in the house to create efficiency and save energy.



## Procedure:

1. Add or color the items listed below. You may want to do different items each day as you cover different topics: electricity, natural gas, water; etc.
  - Add a bicycle.
  - Add small recycling bins where appropriate.
  - Add trees to shade the house.
  - Add a ceiling or floor fan to the home for cooling.
  - Put a blue star (for ENERGY STAR<sup>®</sup> products) on the television and furnace.
  - Color the energy-efficient shower head red.
  - Color all items that use electricity yellow.
  - Find and circle the smart thermostat.
  - Color the furnace filter that is being changed orange.
  - Draw a purple water drop next to all items in the house that use water.



## To Know and Do More

- Have each student write a brief description of the things their family has done to improve energy efficiency at home. Have your students add any items that will encourage their families to be energy efficient in the future.
- Choose a natural resource used for energy and create a Venn diagram comparing the positive and negative effects of the use of this resource on the physical environment.

Lingo Card

<b>L</b>	<b>I</b>	<b>N</b>	<b>G</b>	<b>O</b>
Water	Natural Gas	Natural Resource	Incandescent	Reduce
Full Load	Phantom Load	Oil	Coal	ENERGY STAR®
Renewable	Energy	Be Wattsmart, Begin at home	Turn It Off	Uranium
Energy Efficiency	LED	Recycle	68 Degrees	Embodied Energy
Cooking	78 Degrees	Solar	Programmable or Smart Thermostat	Electricity

<b>L</b>	<b>I</b>	<b>N</b>	<b>G</b>	<b>O</b>
Full Load	Natural Gas	Phantom Load	LED	78 Degrees
Cooking	Electricity	Renewable	Recycle	68 Degrees
Natural Resource	Water	Be Wattsmart, Begin at home	ENERGY STAR®	Nonrenewable
Embodied Energy	Coal	Energy Efficiency	Heating	Incandescent
Programmable or Smart Thermostat	Reduce	Oil	Solar	Uranium

<b>L</b>	<b>I</b>	<b>N</b>	<b>G</b>	<b>O</b>
Coal	Natural Gas	Solar	Turn It Off	Renewable
Water	Nonrenewable	Phantom Load	Electricity	Full Load
Energy	Oil	Be Wattsmart, Begin at home	68 Degrees	Cooking
Programmable or Smart Thermostat	Incandescent	Recycle	Uranium	Natural Resource
Reduce	78 Degrees	Embodied Energy	LED	Energy Efficiency

<b>L</b>	<b>I</b>	<b>N</b>	<b>G</b>	<b>O</b>
Natural Resource	Water	Natural Gas	Programmable or Smart Thermostat	78 Degrees
Turn It Off	Reduce	Oil	Embodied Energy	Cooking
Phantom Load	ENERGY STAR®	Be Wattsmart, Begin at home	Uranium	Recycle
Energy	LED	68 Degrees	Energy Efficiency	Heating
Electricity	Renewable	Incandescent	Full Load	Solar

# Dear Parents,

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

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

- **Be Wattsmart, Begin at home** booklet
- *Home Energy Worksheet*

Please take a moment to read through this informative booklet with your child. Then, fill out the *Home Energy Worksheet* in one of two ways:

- Visit [thinkenergy.org/Wattsmart](http://thinkenergy.org/Wattsmart) and fill out an online worksheet. You will need to enter the teacher ID found on the paper worksheet. If you do not have the teacher ID, you can find it by searching for your teacher's name on the website.
- or
- Fill out the paper worksheet and return it to your child's teacher. To thank you, Pacific Power will provide your child with a Wattsmart nightlight.

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





# Estimados padres,

Su hijo ha participado en el programa **Sea Wattsmart, Empieza en casa**, patrocinado por Pacific Power. En esta presentación atractiva, su hijo aprendió conceptos claves de su plan de estudios de ciencias, así como formas importantes para ser más eficiente con el uso de energía en el hogar.

Como parte del programa de **Sea Wattsmart, Empieza en casa**, su hijo recibirá:

- El folleto de **Sea Wattsmart, Empieza en casa**
- *Verificación de Energía Doméstica*

Tome un momento para leer el folleto informativo con su hijo. Luego, complete la *Verificación de Energía Doméstica* de una de estas maneras:

- Visite [thinkenergy.org/Wattsmart](http://thinkenergy.org/Wattsmart) para rellenar el formulario en línea. Necesitará entrar el número de identificación de su profesor que se encuentra en el formulario de papel. Si no tiene el número de identificación del maestro, se puede encontrarlo buscando el nombre de su maestro en el sitio web.
  - o
- Complete el formulario y devuélvalo al profesor de su hijo. Para agradecerle, Pacific Power le proporcionará a su hijo una luz de noche.

Apreciamos sus esfuerzos para reforzar la importancia del **Sea Wattsmart, Empieza en casa** de la energía y las acciones eficientes en el hogar.



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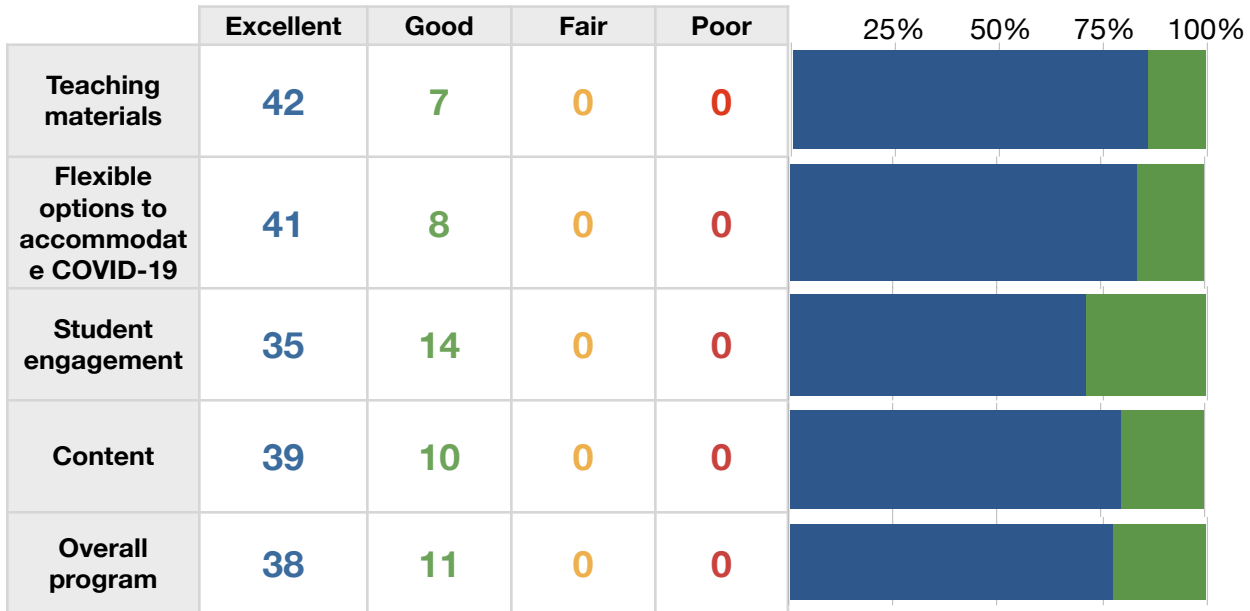
WA



# Wattsmart Pacific Power program

## Program Evaluation Summary

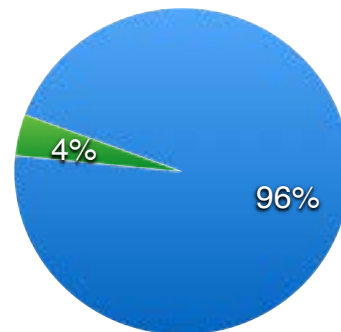
Impressions of the program from 49 educators.



Was the educational mini-grant a good incentive to participate in the program?

	Yes	No
Mini-grant	47	2

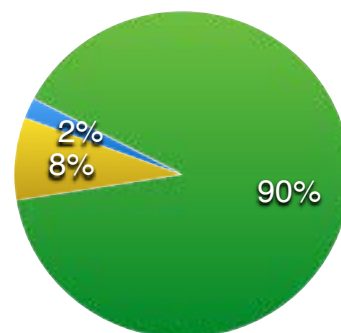
● Yes ● No



Where did your students participate with the presentation?

	Home	School	Both
Mini-grant	1	44	4

● Home ● School ● Both



Please share your experience or feedback on the electronic/online learning you used.

Awesome, flexible schedule, and good resources!
Easy to access
Helpful resource for teachers.
I enjoyed the online aspect of it.
I loved it.
I sent the survey to them via google classroom. I placed the video in the google classroom so they could rewatch with family members.
It was a little hard to find the presentation for me- but I found it! Also the kids loved professor Caitlyn.
It was easy to use and engaging for students. The interactive game was perfect!
It was easy to use and worked perfectly.
It would have been fantastic if we were virtual, but it was hard for kids to be engaged when we are watching it from class.
My class watched online from our classroom and it was hard to be actively engaged when they only could look at the screen. It still was very good and informative.
Once I found the online presentation, it was simple and engaging.
The Kahoot didn't work at first, but the students loved it when we tried a week or so later.
The kids were engaged, even though it was a video presentation.
The presentation was enjoyable and easy to use. My families with struggle with technology in the home, so I did use the paper parent surveys and not the online version.
The production quality was super, and the students were engaged. Great job!
The program is wonderful, but a little hard to find.
This was good, Thank You.
We did a Zoom presentation sending it to the other classrooms. We had a few technical difficulties but eventually got it working.
We just used the online presentation and it was easy to pull up and engaging for the students.
We use google classroom and google meet
We Zoomed in my classroom. A few glitches were had but nothing major.

## What additional activities did you or will you use from the Teacher Guide?

All of the activities during our Energy unit.
All of them
Home survey, nite lights
I am just starting a unit on Energy usage, and plan on using some of them, depending on my time. They weave well with out curriculum.
I like all of the activities and am working my way through some of them.
I love all of the activities in the teacher guide and would love to do them when we come back in person.
I read the teacher guide and think every activity is good! I am slowly making my way through them! Thank you for all the help and planning and materials.
I will use all the activities.
I will use the posters.
Information to take home and use in my science curriculum.
KAHOOT REVIEW
Kahoot!
My students loved the Lingo. They would love to see more experiments that involve electricity too.
Posters
Talked about electricity more.
talked about/ use information from the program ( water resource)
The Art of Circuits., Energy in math
The Electrical Generation poster was a great discussion tool and resource.
The posters will be great during our energy unit.
The posters, "Pass the Sack" activity and maybe more ... not sure yet.
The reading sources.
This supplements our science unit perfectly!
This went along with our science kit. It was perfect.
try to use all materials
We are actually going to be doing a whole other Energy saving unit with this.
We are talking about energy so we are working on some of the electric pieces.
We discussed hydroelectricity which is in our current unit of science - Land and Water. We also did the home usage monitoring. Students were amazed to learn how much power they use at home.
We incorporated the materials into our regular Energy unit. Students created circuits and made flashlights.
We liked to find areas where we can save power

**What additional activities did you or will you use from the Teacher Guide?**

We played LINGO
We read related articles in our science curriculum, Stemscoptes, then students did a mini research project on energy sources.
We used the posters to help us with our unit on Electric Circuits.
We used the video presentation and then we used it as a talking point between school and families about energy and how it can tie into science units.

## What would you tell other teachers about the program?

Completely worth it! It ties into our curriculum, is engaging, and you are provided with options to extend the learning.
Great for 4th grade supplemental science lessons
Great information for all of us & the kids love it!
Great material and fun activities to do with students.
Great reinforcement with the science we are learning in 4th grade.
I think the kids learned a lot.
I would tell other teachers that the program is very engaging and has valuable information for students.
I would tell other teachers that this program is fun, engaging, and aligns very well with our Next Gen Science Standards.
I would tell them that this program is easy to use and keeps students engaged. They are very interested in how they effect the world around them.
It is a good program with important information that gets kids and their families thinking.
It is a great program to create awareness about clean energy and protecting our environment
It is fun and engaging.
It is so easy to use and the kids love it!
It is very informative and had great videos and resources.
It is very worthwhile and fun.
It's a great program that introduces to the kids to energy in a fun engaging way. Presenters were good, as always.
It's an informative program that engages the kids and gets them talking about energy use!
It's great for integration at the 4th grade level and the monetary incentive is the icing on the cake.
It's great!
It's a great program.
Its a great program that teaches lots of useful information about energy sources.
Its a great program to give students an understanding how power works
Professional, grade-level content that kept kiddos engaged and ready to do their part.
Smaller group of students would be better.
Students learn alot of valuable information about electricity in the home.
That it is a great introduction to the unit on electricity. I would prefer the in class model over the virtual. I am in person but was the only person in my school that had to do virtual due to scheduling. I would love if Wattsmart
That it is a great presentation in addition to our curriculum
That it is a very fun engaging activity for the scholars
That it is engaging and educational.

**What would you tell other teachers about the program?**

That its a fun opportunity and a good way to build knowledge for our energy unit, plus cash incentive.
That the program provide use information for all students about energy sources.
The kids like it, very interactive
The materials are well thought out and engaging. Students enjoyed the presentation.
The program helps kids understand about the use of energy. Where it is located in their house and how to conserve energy.
This is a great program.
This is a great start to the Energy science standards.
This was the BEST WATTS SMART PRESENTATION EVER!!!
very good program and have used for years

## What would you like us to tell the program sponsor about the program?

I really appreciate the program that is offered to students from low income schools.

I would love if Wattsmart would be more flexible with schools that are big. We have 12 4th grade classes and as a result, we suffer. That is out of our hands.

It is a valuable topic and the students enjoy learning about energy. It really covers a lot of what we talk about and learn in science( as well as other subject areas) I like to be able to refer back to the program when discussing a topic that relates.

It was a great presentation and the kids enjoyed the video

It's a great program to give kids a basic understanding and get them thinking about energy. They love the nightlights.

Its definitely worth keeping.

Keep doing it!

Keep up the amazing work.

Keep up the good work!

Kids loved the presentation and the learning about energy around them.

Our kids seem to enjoy the information and the game

Please continue educating young minds about clean energy.

Students were engaged.

Thank you For all you do

Thank you for continuing to provide an engaging and enriching experience for my students.



What would you like us to tell the program sponsor about the program?

Thank you for education our kids. I learn a lot every year and get inspired to be WATTS SMART AT HOME!

Thank you for helping make this available to our students!

Thank you for solidifying our students' knowledge about energy.

Thank you for supporting our students!

Thank you for the opportunity and commitment to our community.

Thank you for this opportunity

Thank you so much

Thank you!

Thanks and please continue!

The kids enjoy learning about the different types of renewable energy some have seen the wind mills in and have been more conscience about trying to conserve.

The kids really love these assemblies and learn so much!

The money to produce the video was well spent.

The program is easy to use and easy to understand. The kids love the game that was built into the online presentation and we are excited to use the money we receive for a fun class project.

The program is very engaging and interesting to the students. The program is also able to reach a large number of people.

The students really love this program! Thank you for your generosity in providing it. For some students- it is the first awareness of energy consumption and the entire energy industry. It also helps the families become aware.

What would you like us to tell the program sponsor about the program?

They did Amazing.

This program is great for students! The flexibility to do it at our own pace due to COVID was super helpful. Students loved the videos and were excited to learn more.

To continue providing the program.

We can hardly wait to have in person visits, you do awesome.

Wonderful program and a great way to expose young minds to important information today, that will impact the future of our world. Thank you for the opportunity.

## Additional comments and recommendations:

Again... I would love to see more flexibility in the rules of scheduling for bigger schools.

During non-Covid times, more hands-on activities would be nice.

I hope we can be all in person next year! Thanks again for offering such a great program!

I hope we can participate next time as well.

I would like more interactive videos that go with the lessons

Is there a way to adjust class size after setting it initially?

It was a bit of a challenge with COVID and our program. I have been exposed to Wattsmart in the past with my own children and the information is very impactful especially when delivered by someone who is passionate about it. But, overall, I feel it was important to get the information out to students any way we could.

Keep doing what you are doing, look forward every year with your visits.

More flexible dates for presentations to align with our lessons in class

Thank you for educating my students, their families and me on how to be efficient !

Thank you for offering this excellent program!

Thank you for this program. The students really enjoyed the presentation.

Thank you so much!

Thanks for the opportunity to share this information with our kids.

Things were a bit confusing for me because I didn't receive all the materials listed, some of which seemed to have important information for me. For example, I still don't know if I turned all the worksheets in correctly or did all the work I was supposed to in order to receive the mini grant. I would still try it again, but missing material did complicate things.

We love BeWatt. Thanks for continuing to bring it to us.

Additional comments and recommendations:

Your presenters were excellent!

# Home Energy Worksheet (English)

Submit online at  
[thinkenergy.org/Wattsmart](http://thinkenergy.org/Wattsmart)

Teacher ID:

Teacher Name:

Student First Name:

## Home Energy Worksheet

### 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 F or higher.  
 Currently do                       Will do  
 Neither

### Water heating

9. Set the water heater temperature to 120 F.  
 Have done                       Will do  
 Neither
10. Install a high-efficiency shower head.  
 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 inefficient 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, slow cooker 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](http://BeWattsmart.com) for more energy saving tips and rebates.  
 Have done                       Will do  
 Neither



# Home Energy Worksheet (Spanish)

Enviar en línea a  
[thinkenergy.org/Wattsmart](http://thinkenergy.org/Wattsmart)

Identificación del profesor:

Nombre del profesor:

Primer nombre del estudiante:

## Verificación de Energía Doméstica

### 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 las 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/reemplazarlos regularmente.  
 Lo hago  Lo haré  
 Ninguno

### Enfriamiento

5. Reemplazar la unidad de aire acondicionado existente por una unidad de alta eficiencia o un enfriador evaporativo.  
 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 F o más.  
 Lo hago  Lo haré  
 Ninguno

### Calentadores de agua

9. Programar el calentador de agua a 120 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 ineficientes 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 el refrigerador viejo e ineficiente con un modelo de ENERGY STAR®.  
 Lo he hecho  Lo haré  
 Ninguno
16. Desenchufar refrigeradores/congeladores viejos 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 una parrilla al aire libre en lugar del horno convencional.  
 Lo hago  Lo haré  
 Ninguno

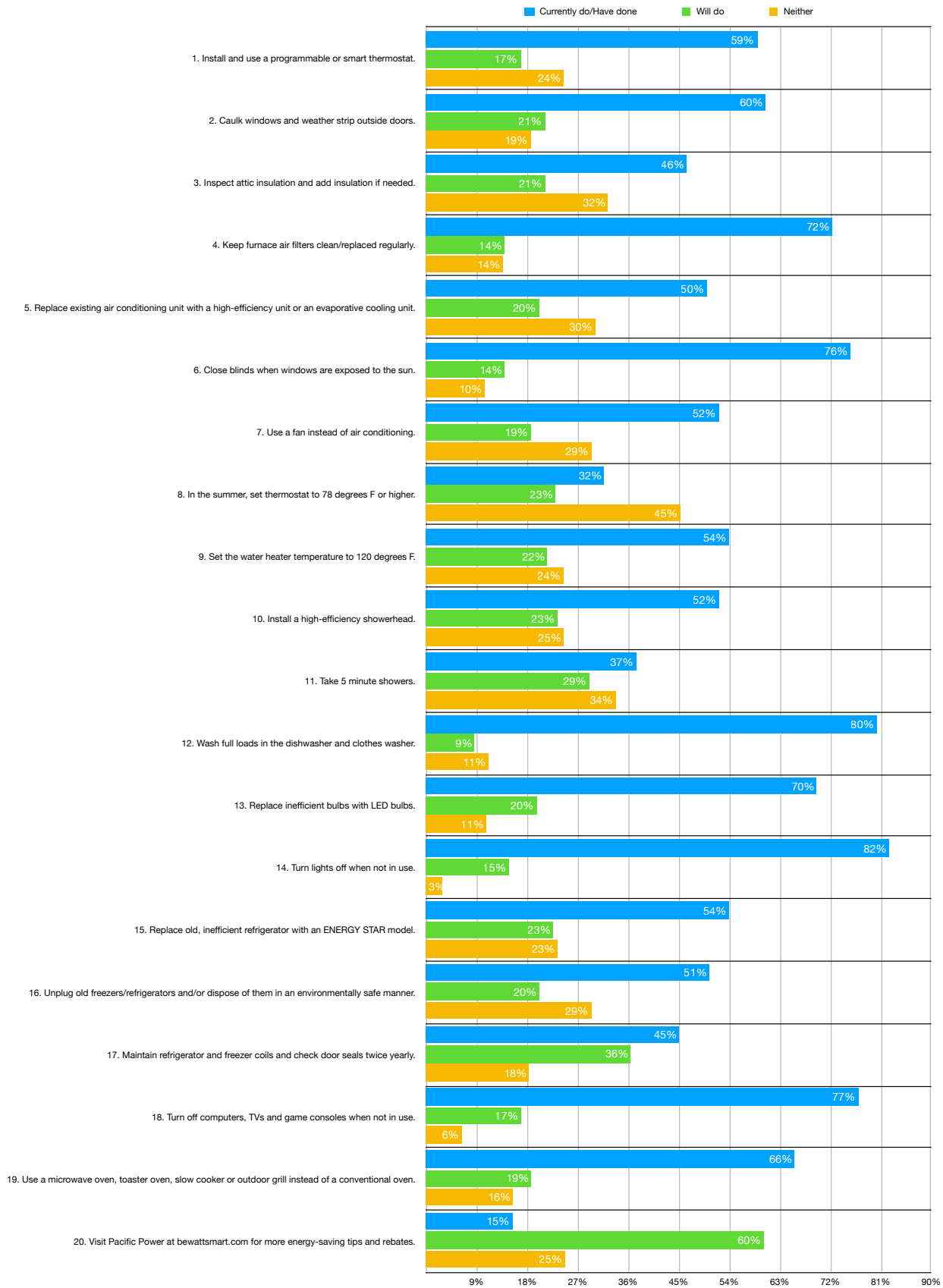
### Reciba paga siendo Wattsmart

20. Visite Pacific Power en [BeWattsmart.com](http://BeWattsmart.com) para obtener más consejos y rebajas de ahorro de energía.  
 Lo he hecho  Lo haré  
 Ninguno



## 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.	59%	17%	24%
2. Caulk windows and weather strip outside doors.	60%	21%	19%
3. Inspect attic insulation and add insulation if needed.	46%	21%	32%
4. Keep furnace air filters clean/replaced regularly.	72%	14%	14%
5. Replace existing air conditioning unit with a high-efficiency unit or an evaporative cooling unit.	50%	20%	30%
6. Close blinds when windows are exposed to the sun.	76%	14%	10%
7. Use a fan instead of air conditioning.	52%	19%	29%
8. In the summer, set thermostat to 78 degrees F or higher.	32%	23%	45%
9. Set the water heater temperature to 120 degrees F.	54%	22%	24%
10. Install a high-efficiency showerhead.	52%	23%	25%
11. Take 5 minute showers.	37%	29%	34%
12. Wash full loads in the dishwasher and clothes washer.	80%	9%	11%
13. Replace inefficient bulbs with LED bulbs.	70%	20%	11%
14. Turn lights off when not in use.	82%	15%	3%
15. Replace old, inefficient refrigerator with an ENERGY STAR model.	54%	23%	23%
16. Unplug old freezers/refrigerators and/or dispose of them in an environmentally safe manner.	51%	20%	29%
17. Maintain refrigerator and freezer coils and check door seals twice yearly.	45%	36%	18%
18. Turn off computers, TVs and game consoles when not in use.	77%	17%	6%
19. Use a microwave oven, toaster oven, slow cooker or outdoor grill instead of a conventional oven.	66%	19%	16%
20. Visit Pacific Power at <a href="http://bewattsmart.com">bewattsmart.com</a> for more energy-saving tips and rebates.	15%	60%	25%



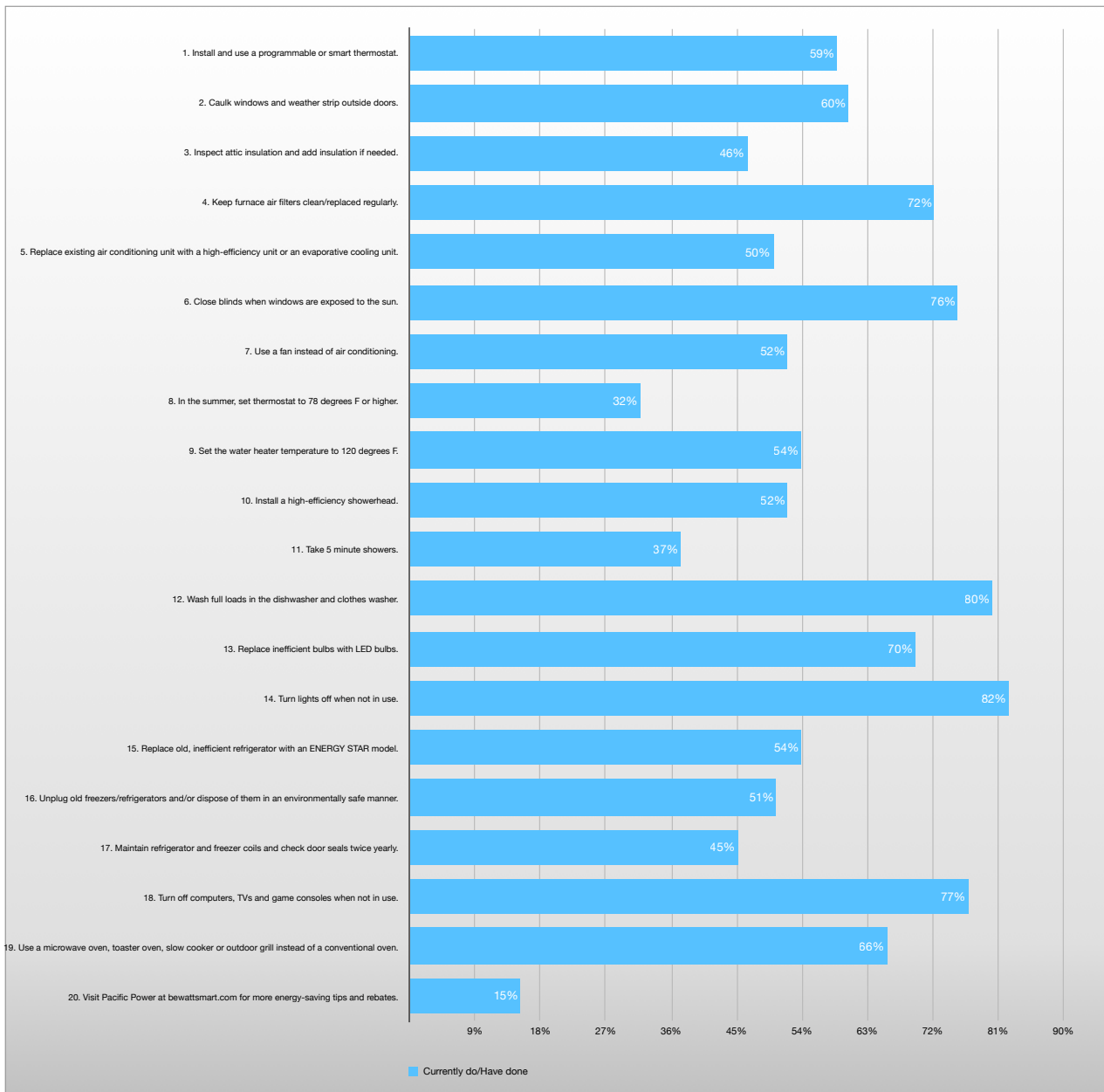


Data Numbers

Energy Efficient Activity	Currently do/Have done	Will do	Neither	Total Responses
1. Install and use a programmable or smart thermostat.	878	249	365	1492
2. Caulk windows and weather strip outside doors.	897	312	275	1484
3. Inspect attic insulation and add insulation if needed.	689	313	482	1484
4. Keep furnace air filters clean/replaced regularly.	1079	209	204	1492
5. Replace existing air conditioning unit with a high-efficiency unit or an evaporative cooling unit.	740	296	445	1481
6. Close blinds when windows are exposed to the sun.	1124	209	155	1488
7. Use a fan instead of air conditioning.	776	277	438	1491
8. In the summer, set thermostat to 78 degrees F or higher.	471	342	671	1484
9. Set the water heater temperature to 120 degrees F.	799	321	362	1482
10. Install a high-efficiency showerhead.	775	347	365	1487
11. Take 5 minute showers.	557	432	503	1492
12. Wash full loads in the dishwasher and clothes washer.	1200	130	166	1496
13. Replace inefficient bulbs with LED bulbs.	1041	293	161	1495
14. Turn lights off when not in use.	1213	216	42	1471
15. Replace old, inefficient refrigerator with an ENERGY STAR model.	802	337	348	1487
16. Unplug old freezers/refrigerators and/or dispose of them in an environmentally safe manner.	752	300	437	1489
17. Maintain refrigerator and freezer coils and check door seals twice yearly.	673	544	274	1491
18. Turn off computers, TVs and game consoles when not in use.	1150	252	94	1496
19. Use a microwave oven, toaster oven, slow cooker or outdoor grill instead of a conventional oven.	985	282	233	1500
20. Visit Pacific Power at <a href="http://bewattsmart.com">bewattsmart.com</a> for more energy-saving tips and rebates.	228	895	368	1491

# Wise Energy Behaviors in Pacific Power Washington Homes

Wise Energy Behaviors in Pacific Power Washington Homes



Sampling of Thanks a "WATT" Cards

Cristofen

Jaylyn



Angel  
Brienna  
CARLOS  
cesar b  
NAYELP

Iselack N O P  
Jonathan H

Thanks  
a "Watt!"

Yohank  
Ximena  
Benjamin  
Luis  
Sebastian

Nevaeh  
Isaac

Karen  
Andrea

Evelyn  
Angelique

Jaxi

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

Bridgette  
Ashley  
cesar

WATTSMART®  
BEGIN AT HOME

JONATHAN S

My class so enjoys this program! Thanks for making learning about how to conserve energy so much fun!

-Mrs. McCaffrey  **PACIFIC POWER**  
POWERING YOUR GREATNESS





# Thanks a "Watt!"

Gianna

Lea

Magnus

Tullia

Sabrina

Ashlyn O.

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

Reagan

William

Ethan

Curtis

**WATTSMART**  
BEGIN AT HOME

Awesome Program!  
Thank you!

Amelia

Stella

Jordan

Wade

Katie

Isiah

Dreemich

Lea

Elysia

Abigail

Lanrel

Shaylee C



Do



Abdiel

Kevin



Thank you  
Jazmine  
Ender

Elias

Kyia

Angel Medina

Ayden

Hayson  
Thank  
you

Joakin

Mia  
Thank  
you

Thanks  
Rocio

# Thanks

thank  
you  
LEO

## a "Watt!"

Joshua

thank  
you

Logan Thank  
you

Thank you for providing the **Be Wattsmart, Begin at home**

program to our school. We learned how to make a difference, use energy  
wisely and had fun doing it.

Naomi

Arthur

Debya

**WATTSMART**  
BEGIN AT HOME

Thanks a

-Sophia

Angel D.

Julissa Thank you

Joakin



We appreciate  
you coming!

Terni Dunsmore



Great Presentation!  
Thank you -  
Lillian  
Carson

Lillian



Holly

ASHLEY

la'ia

# Thanks

Madison

## a "Watt!"

Mitchell <sup>Maeci</sup>

Damian

ARROW

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

HE YOUNG

Emily

**WATTSMART**  
BEGIN AT HOME

BRAXTON

J Lynn

Audrey

Autumn

Sid

Olliver

Mitchell



Carson

Kaley  
Maggagni



Mario

Eli

# Thanks a "Watt!"

Thank you!!!  
-Gracie♥

Thank you!  
-Ashlyn♥

thankyou  
-Remy

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

Harmonie♥

Gabriel

Chiara

Devin



Sofia

Jefferson

Reñe

Thank you!

cody Matthew

Mrs. Towne's  
4th Grade Class  
Davis Elementary



Jillia



Capra





AZITH, Thank You  
for teaching  
us about all  
of the sources  
I loved the  
pres'ntation!

Florentino  
thank you

Chanel  
thank you!



Thanks

a "Watt!"

Aubree

Thanks for talking  
to us about  
energy 😊

I had a good time  
at the watt smart and learned  
a lot.

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

Zackary Tidrick  
Thank you.  
WATT SMART  
BEGIN AT HOME

Darius  
Thank you

Alan  
Thank you  
for teaching us!!

Deliah  
Thank you  
so much  
for taking  
us seeing  
things!

Cela! Thank  
you!



Michael



Wyatt  
thank you

Thank  
you

Amira Thanks  
you 😊