EVERSOURCE

Home Energy Challenge - Scavenger Hunt Edition

Families embark on an energy scavenger hunt to learn more about energy use in their home.

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Home Energy Challenge - Scavenger Hunt Edition

The *Home Energy Challenge - Scavenger Hunt Edition* engages families in assessing home energy use in a fun scavenger hunt. Families use tools like a Kill A Watt® meter to find phantom and vampire loads (eek!) of electricity used by appliances and electronics in the home and to consider ways to save energy by being more energy efficient. Using the supplies provided, families can become "Draft Detectives," using a draft detector to identify drafts around windows and doors, and even flowing in and out of the home near light switches and sockets. The accompanying insulation kits can be installed, with an adult's assistance, to reduce air flow. With the LED (light emitting diode) and a Kill A Watt® meter, families can measure the amount of electricity used by LED bulbs compared to other bulbs around the home. The scavenger hunt will help families determine how they can become more efficient, save energy, and save family resources. Families are encouraged to complete at least three (3) scavenger hunt activities using the tools and materials provided, but may complete as many of the activities as they like. Once the scavenger hunt is completed, students are invited to submit some examples of their scavenger hunt findings to Eversource.

What's in the kit

- Home Energy Challenge - Scavenger Hunt Edition Guide
- Kill A Watt® meter
- LED bulb
- Draft Detective Supplies
- Outlet/Switch Gasket Insulator Pack
- Phantom + Vampire Load Sticker Sheet

Home Energy Challenge - Scavenger Hunt Edition Background

Energy efficiency describes the equipment we select to do a certain job. For example, a 4-door sedan and pickup truck will both carry us to the store, but the sedan will probably do so using less fuel. It is more efficient. Using efficient appliances, electronics, and lighting can help reduce energy use and costs at home, while still performing the same tasks.

Energy conservation describes the behavior of those using the equipment. For example, even the most efficient refrigerator wastes energy when the door is left open unnecessarily. Conservation behaviors do not cost any money to implement, and they can help reduce the amount of money your household spends on energy.

Scavenger Hunt Item One: Rate Your Energy Use

As a household, determine which answer to each statement – either column 1, 2, 3, or 4 – best matches the situation in your home. Circle the box that corresponds to the best match. Calculate your home's initial energy consumption score.

Energy Efficiency and Conservation at Home	4	3	2	1
Appliances That Are ENERGY STAR® Rated	All	More than ½	About ½	None
Lights That Are CFL Or LED	All	Most	About ½	Almost none or none
Electronics With Phantom Loads (drawing power when turned off)	None (unplugged)	About ½	Most	All
Thermostat Setting During Heating Season	68 or lower	69-70	71-72	73 or higher
Thermostat Setting During Cooling Season	78 or higher	76-77	74-75	72 or lower
Laundry Loads Run Less Than Full	None	Less than ½	About ½	Most
Dishwasher Run Less Than Full	Never	Occasionally	About ½ the time	Usually
Hot Water Temperature/Setting (°F)	120 or less	121-130	131-140	140 +
Doors And Windows Closed When Furnace Or Air Conditioner Turned On	Always	Usually	Sometimes	Rarely
Lights Left On When Room Is Empty	Rarely	Sometimes	About ½	Usually
Fans Left On Overnight	0	1-2	3-4	5+
TVs Left On Overnight	0	1	2	3+
Game Console Or Computer Left Running	Never	Rarely	Occasionally	Frequently
Heating System Turned On When…	Temperature inside < 65	Temperature outside < 65	Temperature outside < 70	A/C not turned on
Cooling System Turned On When…	Temperature inside > 83 or Not Turned On/In Use	Temperature outside > 83	Temperature outside > 80	Heat not turned on
Programmable Or Wi-Fi Enabled Thermostat	Yes			No
Calculate Your Score – Total Boxes Shaded				
× score per box shaded	×4	×3	×2	×1
Column Score				
Total Score (add 4 column scores above)			**Initial Energy Consumption Score**	

Scavenger Hunt Item One

CONTINUED

Discussion

1. An exceptional household score is 64. What was your score? _____.

2. Discuss the choices you and your family can make now to improve your household's score based on your answers on the chart. Which changes would have the largest impact on your score? Which changes do you think would save the most energy?

3. Of the changes your family listed in question 2 above, identify which are energy efficiency choices and which are energy conservation choices by filling in the chart below.

EFFICIENCY CHOICES	CONSERVATION CHOICES

Scavenger Hunt Item Two: Draft Detectives and a Seal of Approval

Thermal energy is the energy that gives substances their warmth. Steam has more thermal energy than liquid water, and water has more thermal energy than ice. When thermal energy is transferred, it moves from higher temperature to lower temperature. Thermal energy is transferred through conduction (direct contact), convection (flowing fluid), and radiation (waves of energy). Most home heating systems use convection to transfer thermal energy and heat rooms. Heating and cooling accounts for more than 40 percent the energy used in a home, and water heating is another 16 percent.

Heating and cooling systems are controlled by a thermostat. The temperature is set so that the heating system turns on if the air temperature falls below the setting. Programmable thermostats allow the homeowner to adjust the temperature for different times of the day, or when a cooler temperature is acceptable such as when everyone is away at work or school, or everyone is asleep under warm blankets. The program can be adjusted to begin warming the home just before the first person arrives, and to reduce the temperature after the last person is asleep or has left for the day. Unlike standard programmable models, wifi controlled thermostats work by connecting to your internet connection, allowing remote access. Programmable and Wi-Fi enabled thermostats are available for all types of systems and will help you save money on your energy bill.

If you cannot install a programmable or Wi-Fi thermostat, you can adjust the temperature at night and when no one is home. If you do not set the temperature above 68 °F in the winter or below 78 °F in the summer, you will still be comfortable, yet make your energy bills more affordable.

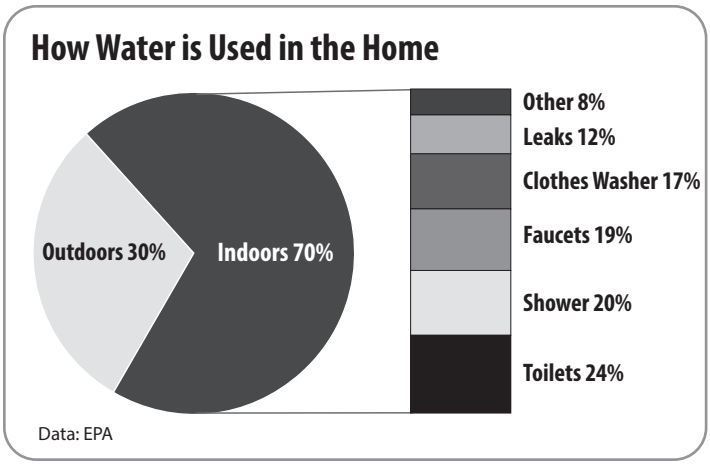
Water heating is another large energy user, so using hot water wisely will help control this expense. Setting the temperature of the water heater to 120 °F will allow for hot showers, prevent accidental scalding, and save money. In addition, using a low-flow shower head and washing clothes in cold or cool water will help use less hot water. A tankless water heater is the most efficient way to deliver hot water when you need it. It does not have a tank of water to keep hot when it's not being used, so the heater only runs when hot water is needed.

The amount of water used in your home also impacts the amount of energy used by your home. Beyond heating the water, extensive amounts of energy are put into extracting, treating, distributing, and disposing of the water you use. The average American household of four uses about 400 gallons of water every day.

Here are some great ways you can reduce the amount of water you use at home:

Turn off the water while brushing your teeth. You don't need running water to do a good job on those pearly whites!

1. Take showers instead of baths. Most showers use significantly less water than filling the tub with water. Try to limit your showers to conserve water and energy.
2. Don't use more water than needed when cooking. A box of macaroni and cheese does not need a giant stock pot full of water, and many things that are cooked on the stove in water can instead be microwaved, saving both electricity and water.
3. Use an ENERGY STAR® washing machine, which minimizes the amount of water used to clean clothes. Also, you can probably select the water level to match the amount of laundry you have placed in the machine, or even better, only run the washing machine with full loads.
4. Only run your dishwasher on pot scrubber when the dishes are really, really dirty. Instead, select "normal" for ordinary dish dirt.
5. Scrape your plates into the trash with a fork or knife instead of running them under a strong steam of water. Even better, scrape those food wastes into a bucket to use in composting or vermiculture (worm farming).
6. Keep a cover on your swimming pool or hot tub when it's not being used. Evaporating water must be replaced; this is especially important if you live in a dry climate.



Scavenger Hunt Item Two: Draft Detectives and a Seal of Approval

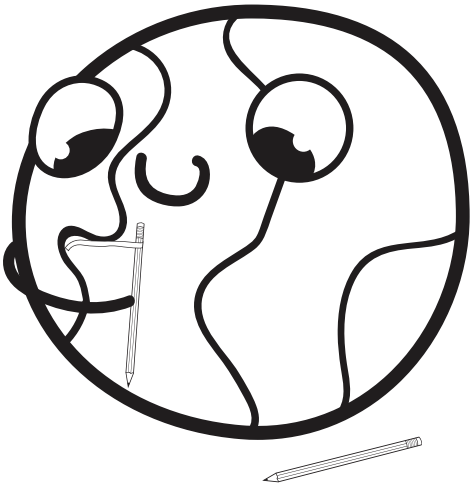
Adjusting the thermostat doesn't make your home more efficient if your home is not insulated or sealed properly. Poorly insulated attic spaces result in tremendous amount of energy lost through the roof. Air can leak or filter out through small cracks and gaps in walls and around windows and doors. This can add up to leaving a door wide open all day, every day. Sealing those gaps with caulking and weatherstripping will reduce air infiltration.

Adding insulation in the attic to achieve the recommended R-value will ensure that your energy saving behaviors are not counteracted by a leaky attic. Insulation is helpful in warm and temperate climates!

Making a Draft Detector

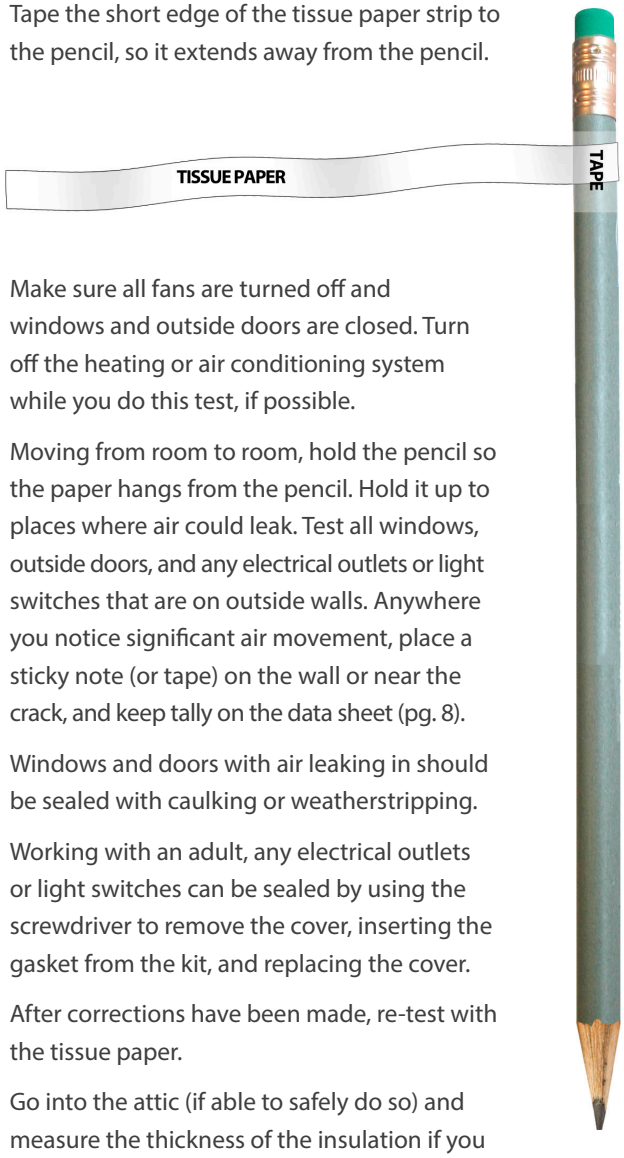
Materials

- Outlet and light switch gaskets in kit
- Tissue paper strip (in kit)
- Pencil (in kit)
- Push pin (in kit) to attach tissue to pencil
- Tape
- Sticky notes
- Ruler
- Screwdriver



Procedure

1. Tape the short edge of the tissue paper strip to the pencil, so it extends away from the pencil.

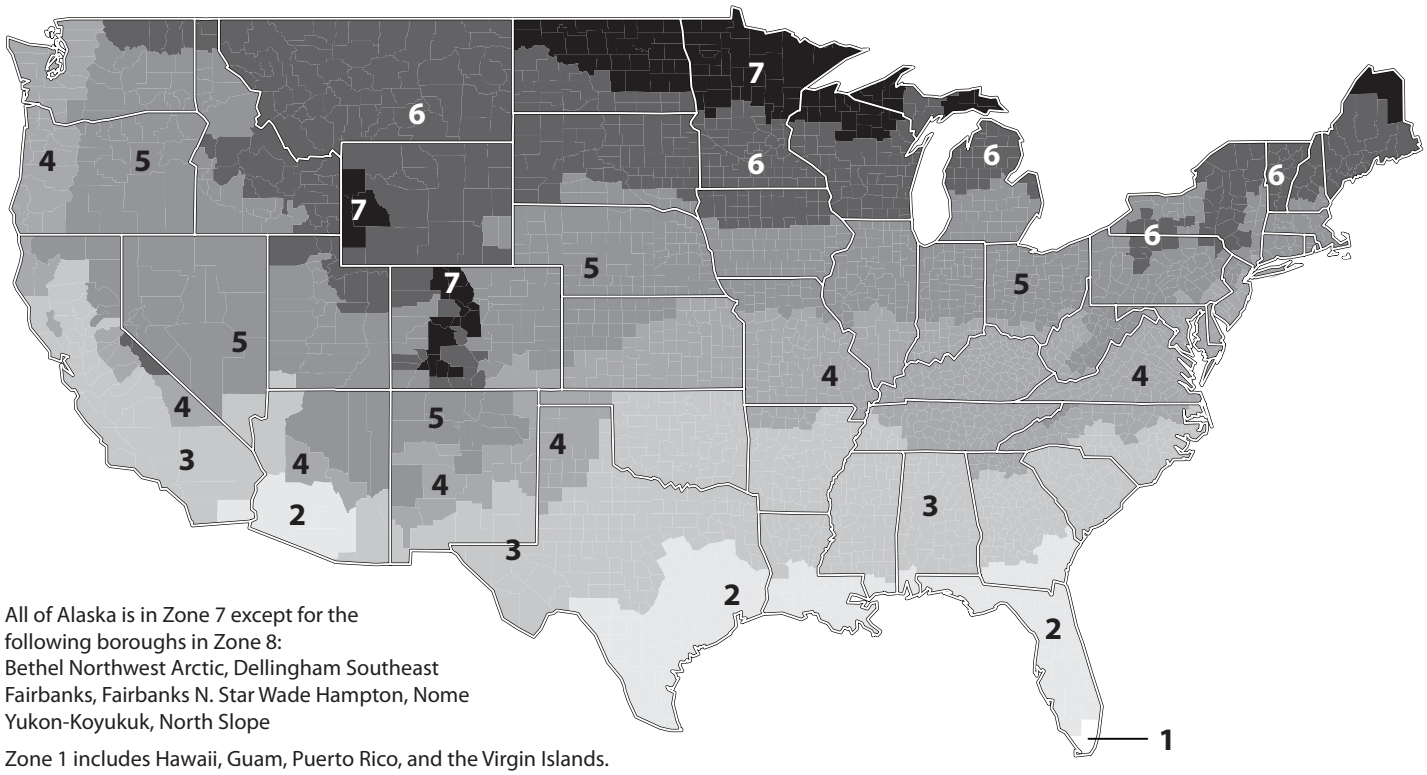


2. Make sure all fans are turned off and windows and outside doors are closed. Turn off the heating or air conditioning system while you do this test, if possible.
3. Moving from room to room, hold the pencil so the paper hangs from the pencil. Hold it up to places where air could leak. Test all windows, outside doors, and any electrical outlets or light switches that are on outside walls. Anywhere you notice significant air movement, place a sticky note (or tape) on the wall or near the crack, and keep tally on the data sheet (pg. 8).
4. Windows and doors with air leaking in should be sealed with caulking or weatherstripping.
5. Working with an adult, any electrical outlets or light switches can be sealed by using the screwdriver to remove the cover, inserting the gasket from the kit, and replacing the cover.
6. After corrections have been made, re-test with the tissue paper.
7. Go into the attic (if able to safely do so) and measure the thickness of the insulation if you see it. Record information about your insulation on the data sheet (pg.8).
8. Use the R-value graphic to determine how much insulation you should have.

***NOTE:** This activity may work best at a time of day when the temperatures inside and outside are different.

Scavenger Hunt Item Two:
Draft Detectives and a Seal of Approval *CONTINUED*

Recommended R-Values for New Wood-framed Homes



All of Alaska is in Zone 7 except for the following boroughs in Zone 8:
Bethel Northwest Arctic, Dellingham Southeast Fairbanks, Fairbanks N. Star Wade Hampton, Nome Yukon-Koyukuk, North Slope

Zone 1 includes Hawaii, Guam, Puerto Rico, and the Virgin Islands.

			WALL INSULATION		
ZONE	ATTIC	CATHEDRAL CEILING	CAVITY	INSULATION SHEATHING	FLOOR
1	R30 to R49	R22 to R38	R13 to R15	None	R13
2	R30 to R60	R22 to R38	R13 to R15	None	R13, R19 to R25
3	R30 to R60	R22 to R38	R13 to R15	R2.5 to R5	R25
4	R38 to R60	R30 to R38	R13 to R15	R2.5 to R6	R25 to R30
5	R38 to R60	R30 to R60	R13 to R21	R2.5 to R6	R25 to R30
6	R49 to R60	R30 to R60	R13 to R21	R5 to R6	R25 to R30
7	R49 to R60	R30 to R60	R13 to R21	R5 to R6	R25 to R30
8	R49 to R60	R30 to R60	R13 to R21	R5 to R6	R25 to R30

Data: U.S. Department of Energy

Scavenger Hunt Item Two:
Draft Detectives and a Seal of Approval *CONTINUED*

Data

Results of Air Infiltration Test Before Changes:

_____ windows leaked _____ doors leaked _____ electrical outlets or switches leaked

Notes:

Results of Air Infiltration Test After Changes:

_____ windows sealed _____ doors sealed _____ electrical outlets or switches sealed

Notes:

Results of Attic Insulation Inspection:

Thickness of Insulation: _____

Type of Insulation: _____

R-value of this thickness and type of insulation (see chart)
_____ inches thick × _____ R-value/inch = _____ R-value

Recommended R-value for your attic in your area: _____

What You See		What It Probably Is	R-value / inch
Loose fibers	Light-weight yellow, pink, or white	Fiberglass	2.5
	Dense gray or near-white, may have black specks	Rock wool	2.8
	Small gray flat pieces or fibers (newsprint)	Cellulose	3.7
Granules	Light-weight	Vermiculite or perlite	2.7
Batts	Light-weight yellow, pink, or white	Fiberglass	3.2

Source: Insulation Fact Sheet, Oak Ridge National Laboratory

Discussion

1. If your home is underinsulated, you can save energy costs immediately by adding insulation. The Home Energy Saver energy calculator from Lawrence Berkeley National Laboratory can help you determine what you need to add: **http://hes.lbl.gov/consumer/**. Do you need additional insulation? How much do you need?
2. Homes should not be sealed up 100% air-tight. As a household, discuss why a small amount of fresh air is needed in your home.
3. Download the Insulation Fact Sheet from Oak Ridge National Laboratory for additional information and insulation pointers. **http://web.ornl.gov/sci/buildings/docs/factSheets/Insulation-FactSheet-2008.pdf**
4. If you need additional information Eversource can help. Please visit **eversource.com** for information on our Energy Efficiency Programs.

Scavenger Hunt Item Three: Electricity

Electricity accounts for up to 70 percent or more of a home's energy use. While much of that electrical energy is used to run large appliances like refrigerators and air conditioners, the multitude of small appliances and electronics that we use every day can add up to big energy expenditures if we are not careful about how we use them.

The electric power used by a device is measured in watts, which is calculated by multiplying the current by the voltage.
Most household electrical devices run on 120 V circuits; the exceptions are big items like stoves and clothes dryers. The wattage of electrical devices and electronics can be determined by looking at the Underwriter Laboratories (UL) label on the device. It will list the maximum energy consumed, often in watts but sometimes as current and volts.

Electric utilities meter the energy we use by charging us for kilowatt-hours. A kilowatt is a thousand watts; therefore a kilowatt-hour is the energy needed to power 1,000 watts for one hour. The national average residential electricity rate is roughly $0.20 per kilowatt-hour, but your rate may be higher or lower. You can determine your electricity rate by looking at your utility bill. Determining how much it costs to run devices is easily accomplished when the power of the device and your electricity rate are known.

Some devices use electricity even when turned "off." Electronics with a remote control, such as a cable box or television, use power all the time. Microwave ovens with LED clocks, and any other device with an internal clock, also use power constantly. Items that need to start up quickly or heat quickly may also use power constantly. These are called phantom loads because while the device appears to be turned off, it is actually using energy. A smart power strip can eliminate phantom loads by turning off the power to everything plugged into it. Phantom loads are also eliminated by unplugging the device when it is not in use.

(R)Amp Up the Efficiency

There are some things that use energy that nearly all of us must do. We all wash clothes, keep perishable food cold, and cook raw foods before eating them. All of these things require energy, but we don't all use energy equally. The amount of energy used to do a task is related to the efficiency of the machine doing the task. Essentially, efficiency is the proportion of useful energy out of a machine compared to the amount of energy going in. More efficient machines do the same work as less efficient machines, but use less energy to do the work.

EnergyGuide labels are large, yellow and black stickers on devices that allow you to compare the efficiency of different appliances and electronics. Often the more efficient appliances have a higher purchase price, and this may mislead some into thinking they're more expensive overall. However, as an EnergyGuide label often shows, a more efficient appliance is less expensive to operate, and over time the difference in operating cost can more than make up for the difference in purchase price. This is called the payback period, and it is the amount of time required for the lower operating cost to make up for the higher purchase price. This is an important factor to consider when shopping for an appliance.

ENERGY STAR® rated appliances and electronics are the most efficient of their class. When you purchase an ENERGY STAR® device, you know that you are buying an efficient product.

Materials

- Internet access to an appliance retailer or a trip to an appliance store
- Calculator

Procedure

1. Decide what appliance or electronic device you want to comparison shop. Some good suggestions are refrigerators, water heaters, washing machines, televisions, and computers.
2. Find two very similar appliances to compare. Make sure they are the same size or capacity. For example, the same number of gallons for a water heater, or the same style and size of refrigerator. Make sure one is ENERGY STAR® rated, and the other is not.
3. Record the purchase price for each item.
4. Locate the EnergyGuide label for each item and record the annual energy use and operating cost for each.
5. Calculate the life cycle cost for both devices through ten years of operation.

(R)Amp Up the Efficiency

CONTINUED

Data

Appliance or Electronic Device: _____

Based on standard U.S. Government tests

ENERGYGUIDE

Appliance: Brand:

Size: Model:

Compare the Energy Use of this Appliance with Others Before You Buy.

This Model Uses

Energy Use range of all similar models

Uses Least Energy **Uses Most Energy**

Based on standard U.S. Government tests

ENERGYGUIDE

Appliance: Brand:

Size: Model:

Compare the Energy Use of this Appliance with Others Before You Buy.

This Model Uses

Energy Use range of all similar models

Uses Least Energy **Uses Most Energy**

APPLIANCE 1	EXPENSES	COST TO DATE		APPLIANCE 2	EXPENSES	COST TO DATE
Purchase Price				Purchase Price		
Year One				Year One		
Year Two				Year Two		
Year Three				Year Three		
Year Four				Year Four		
Year Five				Year Five		
Year Six				Year Six		
Year Seven				Year Seven		
Year Eight				Year Eight		
Year Nine				Year Nine		
Year Ten				Year Ten		

Scavenger Hunt Item Four: Phantom Loads and Plug Loads

Measuring Electricity Use

Question

Which appliances and machines in your home use the most energy?

Hypothesis

_____

_____

_____

Materials

- Pluggable appliances and devices
- Kill A Watt® meter (and Kill A Watt® instructions on page 13)

Procedure

Calculate how much it costs to operate the machines in your home that you looked at before. You need to know the wattage, the cost of electricity, and the number of hours a week each machine is used.

1 Estimate the number of hours per week the item is used. Enter it onto the chart. Multiply by 52 to get hours per year of use. Using the TV as an example, if it is used for ten hours each week, we can find the yearly use like this:

Yearly use = 10 hours/week x 52 weeks/year = 520 hours/year

2 Make sure you have an adult with you when doing this step. Unplug the device safely. Plug the Kill A Watt® meter into the outlet. Plug the device into the front of the Kill A Watt® meter. Press the "Watts" button on the front of the meter and record the watts the devices uses in the chart.

***NOTE:** Do not unplug a device at home without making sure it's allowable to do so. Some devices require long start-up times, and you know what happens if a computer is unplugged before work is saved. (reference pg. 13)

3 Electricity is measured in kilowatt-hours. You will need to change watts to kilowatts. One kilowatt is equal to 1,000 watts. Divide the watts by 1,000 to get kilowatts. Write this number in the chart. Using the TV as an example, divide like this:

kW = W/1,000
kW = 200/1,000 = 0.2

4 Remember, we pay for electricity by kilowatt-hours. One kilowatt-hour costs the home about 21 cents. To find the yearly cost, we multiply the hours per year by kilowatts. Then multiply this by the cost of a kilowatt-hour ($0.21). We can figure out how much it costs to run the TV for a year by using this formula:

Yearly cost = Hours used per year x Kilowatts x Cost of electricity (kWh)
Yearly cost = 520 hours/year x 0.2kW x $0.21 kWh
Yearly cost = 520 x 0.2 x 0.21 = $21.84

Measuring Electricity Use

CONTINUED

MACHINE OR APPLIANCE	HOURS PER WEEK	HOURS PER YEAR	WATTS (W)	KILOWATTS (kW)	RATE ($/kWh)	ANNUAL COST
Printer	*10*	*520 hours*	*200 W*	*0.2 kW*	*$0.21*	*$21.84*

Kill A Watt® Meter

The Kill A Watt® meter allows users to measure and monitor the power consumption of any standard electrical device. You can obtain instantaneous readings of voltage (volts), current (amps), line frequency (Hz), and electric power being used (watts). You can also obtain the actual amount of power consumed in kilowatt-hours (kWh) by any electrical device over a period of time from one minute to 9,999 hours. A kilowatt is 1,000 watts.

Operating Instructions

1. Plug the Kill A Watt® meter into any standard grounded outlet or extension cord.
2. Plug the electrical device or appliance to be tested into the AC power outlet receptacle on the front of the Kill A Watt® meter.
3. The **LCD** displays all meter readings. The unit will begin to accumulate data and powered duration time as soon as the power is applied.
4. Press the **Volt** button to display the voltage (volts) reading.
5. Press the **Amp** button to display the current (amps) reading.
6. The **Watt** and **VA** button is a toggle function key. Press the button once to display the Watt reading; press the button again to display the VA (volts x amps) reading. The Watt reading, not the VA reading, is the value used to calculate kWh consumption.
7. The **Hz** and **PF** button is a toggle function key. Press the button once to display the Frequency (Hz) reading; press the button again to display the Power Factor (PF) reading.
8. The **KWH** and **Hour** button is a toggle function key. Press the button once to display the cumulative energy consumption. Press the button again to display the cumulative time elapsed since power was applied.

Scavenger Hunt Item Five: Lighting

In 1879, Thomas Edison perfected the incandescent light. For the next 100+ years, lighting did not change much. The materials and bulb life improved, but the functionality of light bulbs in American households went largely unchanged for more than a century. However, incandescent light bulbs are exceptionally inefficient light makers, using only 10 percent of the electricity input to produce light! The other 90 percent of energy used by an incandescent is wasted as heat energy.

In 2007, the Energy Independence and Security Act was passed, and among other things it mandated improved efficiency in light bulbs sold in the United States. Today, LED lights are much more efficient and commonplace than they used to be. As technology has improved and production increased, the cost of these bulbs reduced to the point that now they are just as affordable as traditional, inefficient incandescent light bulbs.

When shopping for a light bulb, consider two important pieces of information, both of which are found on the Lighting Facts label of the bulbs. The first is how many watts of power the bulb uses to produce light. This will tell you how expensive the bulb will be to operate. The second is how many lumens of light are produced. Always compare lumens produced when comparing one bulb to another. You may also find it useful to look at color temperature, which indicates the color of the light produced. Higher temperatures are brighter, bluer light while lower color temperatures are softer, more reddish or yellow light.

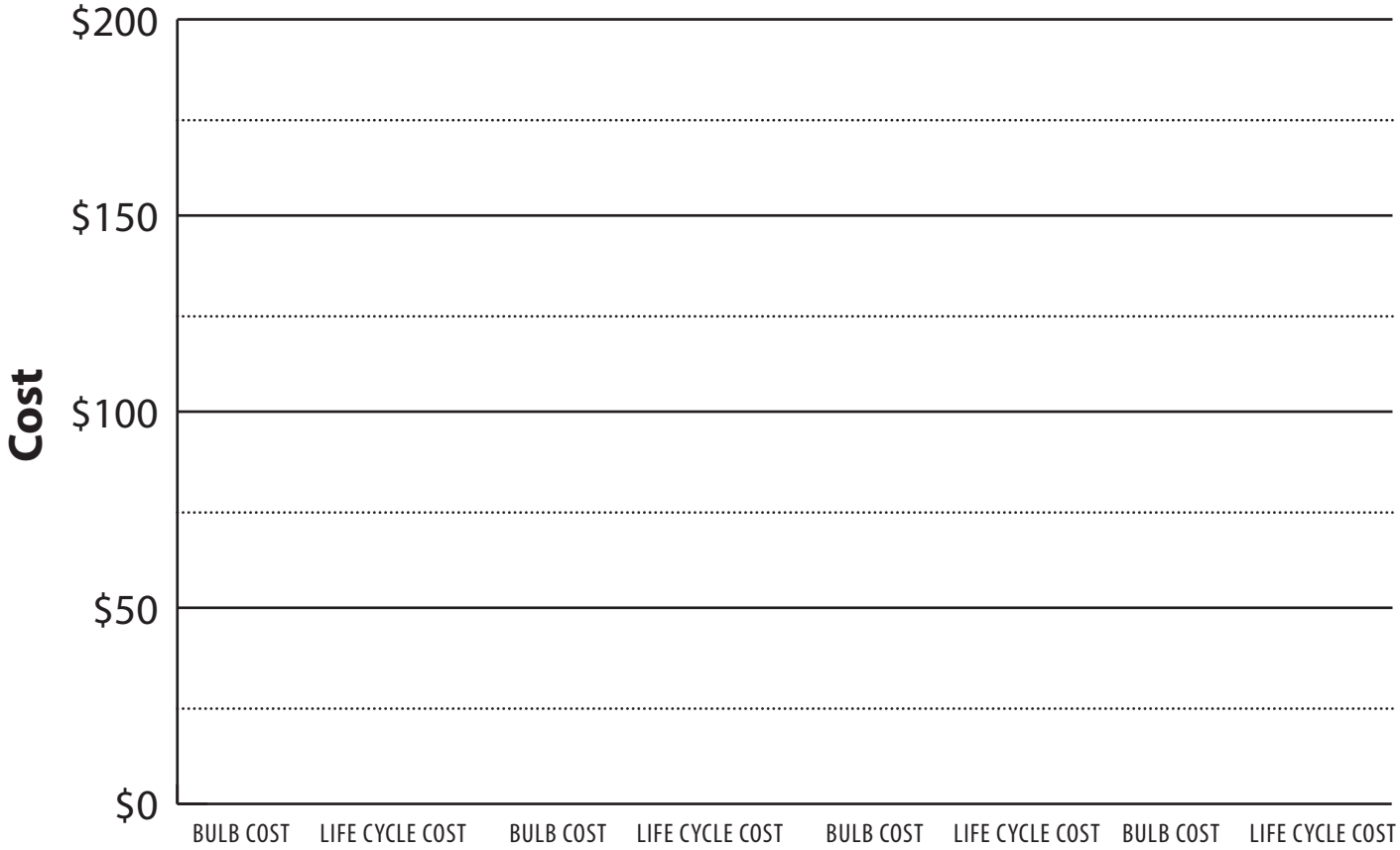
Facts Of Light




All bulbs in this example produce about 850 lumens of light.

COST OF BULB		INCANDESCENT BULB	HALOGEN	COMPACT FLUORESCENT (CFL)	LIGHT EMITTING DIODE (LED)
	Life of bulb (how long it will light)	1,000 hours	3,000 hours	10,000 hours	25,000 hours
	How many bulbs do you need to get 25,000 hours?				
x	Price per bulb	$0.50	$1.50	$1.50	$1.33
=	**Cost of bulbs for 25,000 hours of light**				
COST OF ELECTRICITY		**INCANDESCENT BULB**	**HALOGEN**	**COMPACT FLUORESCENT (CFL)**	**LIGHT EMITTING DIODE (LED)**
	Total Hours	25,000 hours	25,000 hours	25,000 hours	25,000 hours
x	Wattage	60 watts = 0.060 kW	43 watts = 0.043 kW	13 watts = 0.013 kW	12 watts = 0.012 kW
=	Total kWh consumption				
x	Price of electricity per kWh	$0.21	$0.21	$0.21	$0.21
=	**Cost of Electricity**				
LIFE CYCLE COST		**INCANDESCENT BULB**	**HALOGEN**	**COMPACT FLUORESCENT (CFL)**	**LIGHT EMITTING DIODE (LED)**
	Cost of bulbs				
+	Cost of electricity				
=	**Life cycle cost**				

Comparing Light Bulbs



	Incandescent	Halogen Incandescent	CFL	LED
Bulb Cost	$12.50	$12.45	$3.75	$1.33
Electricity Cost				
Life Cycle Cost				

NOTE: Bulb cost reflects the number of bulbs needed to produce 25,000 hours of light, which is the lifespan of one LED bulb. To produce the same amount of light, it would take 25 incandescent bulbs and 2.5 CFL bulbs.

Answer the following questions in your science notebook.

1. Draw the Comparing Light Bulbs graph. Use the data provided to create a bar graph.
2. Looking at the graph and the data table, what conclusions can you draw about the cost of each type of bulb?
3. If you were going to change all of the light bulbs in your home, which bulbs would you use and why?

Shed a Little Light on Efficiency

Using efficient lighting uses less energy, which saves money, but it also has a positive effect on the environment because efficient lighting reduces carbon dioxide emissions and landfill waste in burned-out light bulbs. Some people choose to go through their house and make a sweeping lighting change, but others are not financially able to replace all their lights at once. Additionally, some lighting applications need specialized light bulbs. For example, if your dining room has a dimmer switch, light bulbs compatible with a dimmer must be used. If the light is turned on and off several times in a day, a CFL bulb is not the best choice as turning one on and off repeatedly shortens the life span of a CFL. This activity will help your household decide where the most impact can be made by replacing inefficient light bulbs with more efficient bulbs.

Materials

- LED bulb from kit
- Additional efficient bulbs as desired
- Calculator

Procedure

1. Room-by-room, list all of the lights in your home, noting the wattage and type of each bulb. Use additional sheets of paper as necessary.
2. Estimate the number of minutes each bulb is on each day. Also note whether the light is subject to being turned on and off several times in a day, such as in a frequently used bathroom with no windows, or a closet. Put a star or check mark beside these bulbs.
3. Convert the minutes to hours, and calculate the kilowatt-hours for each bulb, as was done in *Energy Home Scavenger Hunt Item Three: Electricity*.
4. Discuss which lights would produce the greatest energy savings if changed and where the LED bulb in the kit should be placed.
5. Replace additional bulbs with LED bulbs as is practical or desired for your family.
6. Calculate the energy and monetary savings produced by replacing inefficient bulbs with efficient lights.

Data

Room	Light Bulb Location	Power (W)	Minutes used / day	Hours used / day	kWh total	Electricity rate	Cost / day

Shed a Little Light on Efficiency

CONTINUED

Room	Light Bulb Location	Power (W)	Minutes used / day	Hours used / day	kWh total	Electricity rate	Cost / day

Discussion

1. What are the top three places or rooms to upgrade the lighting to a more efficient bulb? Why do you think that is the case?

2. Are there any places where lights could be used less often, as a conserving effort, until the light can be upgraded to a more efficient bulb?

3. Which bulbs do not necessarily need to be changed right away, but can wait until the bulb burns out?

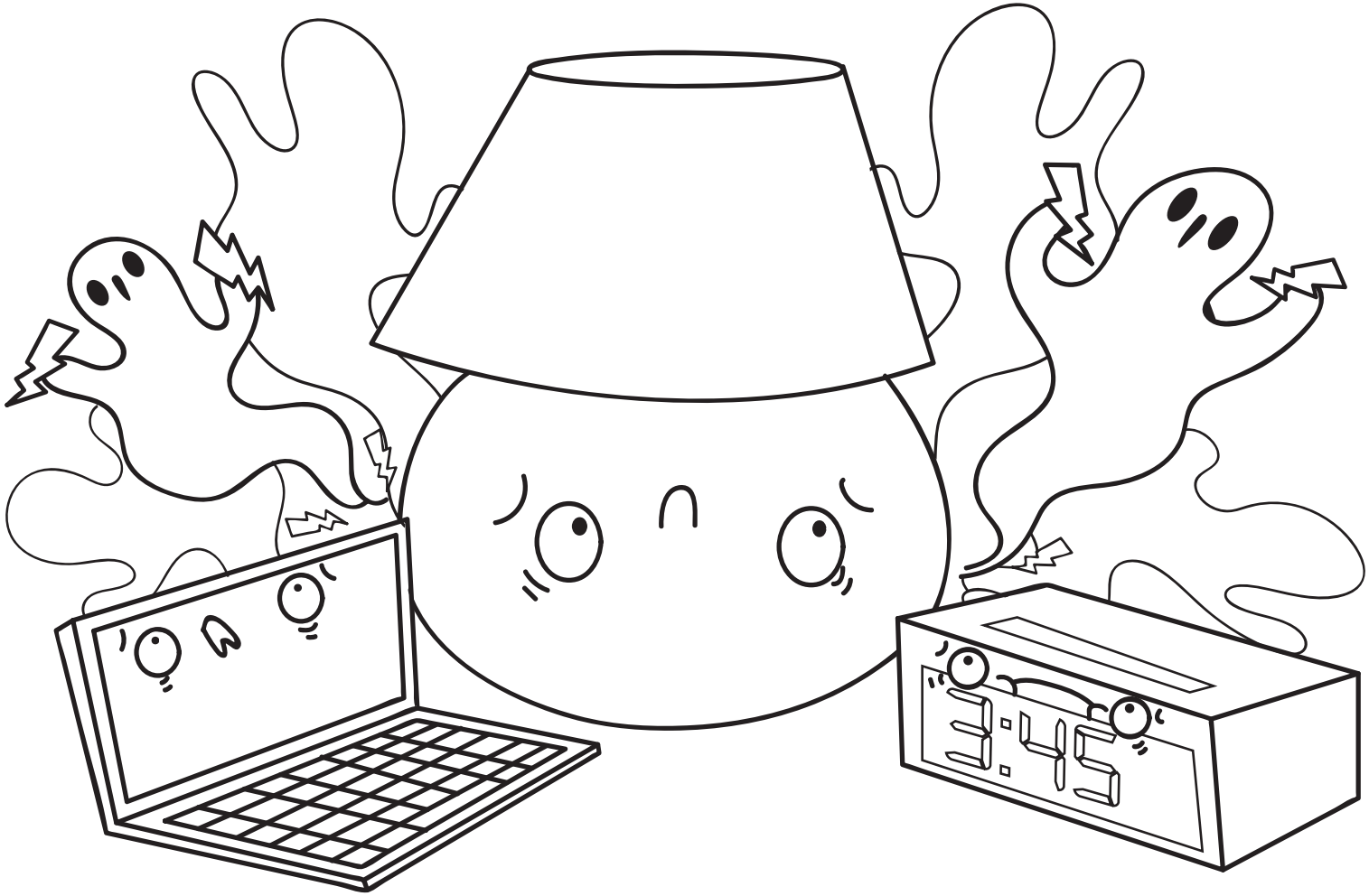
Scavenger Hunt Item Six: Re-rate Your Energy Use

At the beginning of this Scavenger Hunt, you rated your energy use. Re-evaluate how you as a household use energy and see if your rating has improved. As a family, determine which answer to each statement – either column 1, 2, 3, or 4 – best matches the situation in your home now that you have learned how to be in more control of your energy use. Shade in the box that corresponds to the best match. Then calculate your home's final energy consumption score.

Energy Efficiency and Conservation at Home	4	3	2	1
Appliances That Are ENERGY STAR® Rated	All	More than ½	About ½	None
Lights That Are CFL Or LED	All	Most	About ½	Almost none or none
Electronics With Phantom Loads (drawing power when turned off)	None (unplugged)	About ½	Most	All
Thermostat Setting During Heating Season	68 or lower	69-70	71-72	73 or higher
Thermostat Setting During Cooling Season	78 or higher	76-77	74-75	72 or lower
Laundry Loads Run Less Than Full	None	Less than ½	About ½	Most
Dishwasher Run Less Than Full	Never	Occasionally	About ½ the time	Usually
Hot Water Temperature/Setting (°F)	120 or less	121-130	131-140	140 +
Doors And Windows Closed When Furnace Or Air Conditioner Turned On	Always	Usually	Sometimes	Rarely
Lights Left On When Room Is Empty	Rarely	Sometimes	About ½	Usually
Fans Left On Overnight	0	1-2	3-4	5+
TVs Left On Overnight	0	1	2	3+
Game Console Or Computer Left Running	Never	Rarely	Occasionally	Frequently
Heating System Turned On When…	Temperature inside < 65	Temperature outside < 65	Temperature outside < 70	A/C not turned on
Cooling System Turned On When…	Temperature inside > 83 or Not Turned On/In Use	Temperature outside > 83	Temperature outside > 80	Heat not turned on
Programmable Or Wi-Fi Enabled Thermostat	Yes			No
Calculate Your Score – Total Boxes Shaded				
× score per box shaded	×4	×3	×2	×1
Column Score				
Total Score (add 4 column scores above)			**Final Energy Consumption Score**	

Discussion

1. An exceptional household score is 64. What was your initial household score (copied from Lesson 1)? _____ What is your final household score? _____ By how many points did your score improve? _____
2. Has your score improved as much as it could? Why or why not? Where else can you improve as a family and further reduce the amount of energy you are using?
3. How did the items from this kit help you to improve your score?
4. Develop a plan for improvements. List a timeline and perhaps place your plan in priority order by cost or importance, or both.



WATCH OUT FOR PHANTOM LOADS

Many computers, TVs, DVD players, and other electrical devices use electricity even when they are turned off. This type of electricity consumption is known as phantom load, because it can easily go unnoticed. Equipment with electronic clocks, timers, or remote controls, portable equipment, and office equipment with wall cubes all have phantom loads and can consume up to 40 watts when turned off, depending on the device.

NEED
National Energy Education Development

www.NEED.org

EVERSOURCE

Submission Form

How to submit this form and enter to win an iPad:

- ✓ Complete Three (3) or more activities from the scavenger hunt.
- ✓ Take photos or your family/students working on the activities.
- ✓ Complete the form below and submit it with your photos.
- ✓ Submissions due by 11/1/2022 by mail or email.

Email: **info@homeenergychallenge.com**

Mail:
Eversource Home Energy Challenge
P.O. Box 313
Rowley, MA 01969-9998
ATTN: Scott Halstead

Student Name: _____

Student Address:

_____

_____

_____

Student Grade: _____

School:_____

Parent Email: _____

Parent Phone Number:_____

Scavenger Hunt Activities Completed:

- _____
- _____
- _____
- _____
- _____
- _____

Optional: Post a photo of your family completing the Scavenger Hunt on your social media channels (Facebook, Twitter, Instagram, etc.). Use #HomeEnergyChallenge and tag Eversource in your particular state: @EversourceMA, @EversourceCT, or @EversourceNH.
**Posting on social media does not increase your chances of winning.*

x _____

By signing this form I confirm that I am a legal U.S. resident residing in one (1) of the Massachusetts, New Hampshire, and Connecticut communities listed in the Official Rules, am eighteen (18) years of age or older, and am a parent or guardian of a current student in grades K-12. Visit our website for official rules www.homeenergychallenge.com.