New York State Energy Research and Development Authority

ENERGY ACTION AT HOME

Families, learn how to make wise energy decisions and protect the environment.

Take action now!

nyserda
Energy. Innovation. Solutions.

Introduction:

TAKING ENERGY ACTION

Energy is essential in our daily lives. We use energy day and night, whether we are aware of it or not. Out of convenience, we have developed technologies that enhance our standard of living; however, the more technology we use, the more energy we need.

To live a sustainable lifestyle means the decisions we make today will affect many future generations. Sustainability is the practice of using a resource responsibly, so it is not depleted or permanently damaged.

Let's take a look at our energy use at home and how it impacts our environmental footprint. From Niagara Falls to Manhattan to the beaches of Long Island, New York is a diverse state with a variety of communities. We use energy in different ways depending on where we live. Family transportation is one way in which our energy use differs. It depends on the type of community in which you live. For example, if you live in the country or in the suburbs, you may depend on a car. If you live in a large city, you may rely more on mass transportation, bicycling, or walking.

The New York State Energy Research and Development Authority (NYSERDA) is committed to reducing our energy use and to sustainable living. The goal of this guide is to help you make wise energy choices and reduce your environmental impact without compromising your standard of living.

WHAT IS INSIDE?

This workbook, for students and their families, focuses on energy literacy and energy efficiency. It is divided into four sections: Energy Literacy, Energy Efficiency Activities, Energy Tips, and Energy Actions.

- **Energy Literacy-** This section highlights the importance of energy in our lives. You will discover interesting statistics about energy use in New York and the United States. This section also focuses on carbon footprints and how they impact the environment.

- **Energy Efficiency Activities-** You will find hands-on activities for you and your family that will encourage you to think about your personal energy use.

- **Energy Tips-** Practical behavior changes will help you save energy, use energy more efficiently, and save your family money.

- **Energy Actions-** Families can commit to save energy by completing the Energy Savings Plan and returning it to your school or NYSERDA.

ENERGY LITERACY

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, air conditioning, and ventilation
- Computers
- Entertainment systems and televisions
- Lighting
- Appliances
- Manufacturing
- Transportation
- Food storage and preparation
- Security systems

According to the Energy Information Administration (EIA), between 1990 and 2007, worldwide energy consumption rose 39%. People living in the U.S. consume approximately 21% of the energy, yet they represent less than 4% of the worldwide population.

Did you know?

New York produces more hydroelectric power than any other state east of the Rocky Mountains.

– U.S. Energy Information Administration

WHERE DOES ENERGY COME FROM?

Today, most of our energy comes from **nonrenewable energy sources**, including fossil fuels and uranium.

FOSSIL FUELS – coal, oil, and natural gas – were formed from plants and animals that lived 300 to 400 million years ago in swamps and oceans. When these living things died, they decomposed and were buried. During the millions of years that passed, different types of fossil fuels were formed depending on the combination of animals and plants present, how long the material was buried, and the temperature and pressure. All fossil fuels release carbon when they are burned. The heat content of a fuel is measured in British thermal units, abbreviated as Btu. A Btu is the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit.

- Coal is the most abundant nonrenewable energy source in the world. The EIA estimates 261 billion short tons of U.S. recoverable coal resources, which is more than a 249 year supply if no new reserves are added. Coal releases approximately 205 pounds of CO_2 per million Btu when it is burned.
- Oil use for transportation in America is increasing rapidly, which creates increased dependence on foreign countries for the needed supply. When oil is burned, it releases approximately 155 pounds of CO_2 per million Btu.
- Natural gas is a major source for electrical generation, which places heavy demands upon supply and impacts cost. Natural gas releases approximately 116 pounds of CO_2 per million Btu when it is burned.

URANIUM is the fuel most widely used by nuclear plants. **Nuclear energy** is the energy inside the nucleus (core) of an atom of uranium. The energy is released through nuclear fusion or nuclear fission. In nuclear fusion, energy is released when atoms are combined together to form a larger atom. This is how the sun produces energy. In nuclear fission, atoms are split apart to form smaller atoms, releasing energy. The energy generated by the release is used to heat water into steam, which in turn spins a turbine that generates electricity.

RENEWABLE ENERGY RESOURCES

Renewable Energy Resources can quickly be replenished through natural processes. When "green" energy alternatives such as solar, wind, biomass, or hydropower are used to generate electricity, there are fewer harmful greenhouse gases produced. Renewable energy is safe, plentiful, and shows tremendous potential to replace existing fossil fuels. In 2004, New York State adopted the goal of increasing the proportion of renewable energy used to generate electricity from the current 20% to at least 25% by 2013. To learn more about renewable energy and NYSERDA's incentives, visit ***www.nyserda.ny.gov.***

Secondary Energy Sources, such as electricity and hydrogen, are created from the conversion of other sources of energy.

- **Electricity** is the flow of electrical power or charge. It occurs in nature as lightning and as static electricity. The rate at which energy is used is measured in watts. One thousand watts equals one kilowatt. Electricity is sold in units of kilowatt hours (kWh), or 1 kilowatt of power expended for one hour. A generator converts mechanical energy into electrical energy.

- **Hydrogen** is the most abundant element in the universe. It does not occur naturally as a gas on the earth; it is combined with other elements. It is colorless, odorless, tasteless, and non-toxic. Hydrogen separates from hydrocarbons through a heating process. Currently, most hydrogen comes from natural gas and has great potential because it is high in energy and, when burned, produces almost no pollution.

Total Energy Production 2008 (Trillion Btu)

Rank	State	Total Energy
1	Texas	12,024
2	Wyoming	10,885
3	Louisiana	6,241
20	New York	903
51	District of Columbia	1.0

Source: U.S. Energy Information Administration

Fact:

Nuclear energy provides 20% of the United States' electricity and is the country's number one source of emission-free electricity.

– U.S. Energy Information Administration

Total Energy Consumption Per Capita, 2008 (Million Btu)

Rank	State	Energy Consumption
2	Alaska	946
3	Louisiana	783
51	New York	205

Source: U.S. Energy Information Administration

Did you know...

New York ranks 20th in the country in energy production and 51st in total energy consumption per capita (including Washington DC as a ranked entity). This result may be attributed to New York City's massive mass transit systems.

– U.S. Energy Information Administration

2009 Electrical Generation

U.S.	New York	Energy Source
1%	2%	Petroleum
23%	26%	Natural Gas
20%	27%	Nuclear
45%	8%	Coal
7%	18%	Hydropower
4%	19%*	Other

*19% Includes net imported electricity (16%), wind (1%), other renewables (2%)

Source: NYSERDA, Patterns and Trends, 2011

Fun Facts!

Households, businesses, industries, and electric utilities in New York rely largely on fuels produced elsewhere. In 2009, 13% of the total primary energy requirements were met from in-state resources. Hydroelectric power is produced at various locations throughout New York, including 28 large projects and approximately 340 small (less than 10 megawatt) projects. Crude oil and natural gas production are found in the western region of the state. The "Other" category primarily consists of wood, waste, landfill gas, and ethanol.

Energy and the Environment

Every energy source has both positive and negative impacts on the environment. Many of the environmental problems we face today are a result of our fossil fuel dependence. America's primary source of energy, accounting for 84%, is fossil fuels. While the fossil fuel industry continues to improve in sustainable practices, many challenges remain. Some of those challenges include:

- Air pollution
- Climate change (global warming)
- Oil spills
- Water pollution
- Toxic waste
- Acid rain

What is our carbon footprint?

The amount of CO_2 we put into the atmosphere through our energy use is our carbon footprint. If we are going to make our carbon footprint smaller, we need to look at all areas that contribute to carbon dioxide emissions – cars we drive, buildings we live and work in, and how much energy we use. Energy efficiency can provide many immediate environmental benefits. Many of these impacts and risks can be avoided. The reduced use of fossil fuels can help conserve our resources for future generations.

Did you know?

Currently, U.S. hydropower generation annually avoids

225 million metric tons

of carbon emissions, equivalent to the output of approximately 42 million passenger cars.

–National Hydropower Association

WHAT IS THE GREENHOUSE EFFECT?

The greenhouse effect is a heat-trapping process that keeps the Earth warm enough to sustain life. Earth's atmosphere acts like the glass of a greenhouse – after sunlight passes through the atmosphere and warms the Earth, the heat is then radiated back towards space. A portion becomes trapped against the Earth by "greenhouse" gases in the atmosphere. Although there are several greenhouse gases, some scientists believe CO_2 accounts for half of the climate change trend. China emits the largest amount of CO_2 in the world, closely followed by the United States. Still, the average American generates 19.3 metric tons of CO_2 per year, while the average for China is 5.0 tons per capita. What can you do to reduce your carbon footprint?

WHAT IS AIR POLLUTION?

Air pollution is caused by gases and particles released into the air. It comes from natural sources such as volcanoes and wild fires. It also is generated by man-made sources such as factories, automobiles, homes, and electricity generation.

WHY IS AIR POLLUTION A SERIOUS CONCERN?

Air pollution is a major human health and environmental issue. Particulate matter affects human health, but we are also concerned about the harmful effects of other chemical or biological materials on our environment, such as acid rain, smog, ozone depletion, and the greenhouse effect.

Country	CO_2 Emissions from consumption and burning of fossil fuel (2007) (million metric tons of CO_2)[1]	CO_2 Emissions per capita (metric tons)[1]
China	6,247	5.0
tates	6,003	19.3
Russia	1,649	10.8
dia	1,386	1.4
Japan	1,263	9.8
Germany	835	9.6
South Africa	464	9.0
Mexico	454	4.5

1. United States Census Bureau, Statistical Abstractory of the U.S.: 2011
2. CO_2 Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, TN, 2007

ENERGY EFFICIENCY ACTIVITIES

1 Discover Your Carbon Footprint

FAMILY ACTIVITY

How many pounds of CO_2 does your household produce in one month? You will need to use one month's gasoline receipts and your electric, natural gas, or oil bill to fill out this chart. Write in the total gallons of gasoline purchased by everyone in your household, the kWh and therms from your utility bills, and the size of your trash can(s) multiplied by the number of pick-ups per month. Garbage produces methane, but it is converted below to a CO_2 equivalent (eCO_2).

Household CO_2 Production

Complete this exercise in both a warm and cold month to compare.

Gas purchased	_____gallons	x 20*	=_____lbs of CO_2
kWh of electricity	_____kWh used	x .47	=_____lbs of CO_2
Therms of natural gas	_____therms used	x 12	=_____lbs of CO_2
Gallons of propane	_____gallons used	x 11	=_____lbs of CO_2
Gallons of heating oil	_____gallons used	x 22	=_____lbs of CO_2
Trash (not including recycling)	_____gallons x number of pick-ups per month	x 10	=_____lbs of CO_2
		Total	=_____lbs of monthly CO_2 emissions

**Coefficients are based on U.S. EPA data*

2 New York Energy Use Data

The following activities will help you better understand your energy use at home and will give you practice in using tabular data. Electricity rates (cents per kWh) vary across the state. To complete the word problems below, use the New York Energy Smart Data in Table 1.

1. You have two lamps in your bedroom and both use 75 watt bulbs. Your lamps are on for four hours per day. Your parents pay $0.24 per kWh. How much does it cost for your bedroom lighting for one month? For one year?

2. Your bedroom is warm and you want to cool it. Which is a more cost-efficient option, an electric room air conditioner or a window fan? Using $0.10/kWh, how much would it cost to run your room air conditioner for eight hours/day per month during the three warmest months of the year? How much would it cost to run your window fan for eight hours/day per month for three months of the year?

3. It takes energy to wash and dry your clothes. It costs $0.39 to dry your clothes for one hour in a gas dryer, if your family pays $1.75/therm. How much does it cost to dry your clothes for one hour in an electric dryer, if your family pays $0.18/kWh? Using the same rates, if your family does 10 loads/week, how much does it cost to dry them in a gas dryer? In an electric dryer? On a clothes line?

4. Using $0.24/kWh, how much does it cost per month to use your 27-inch TV, if you have it on for eight hours per day? How much would it be for a whole year? If you switched to a 42-inch HDTV, what would it cost for a month? What would it cost for a year?

5. If your parents pay $0.24/kWh, how much does it cost to leave your computer and monitor on for eight hours per day for a whole year?

(Answer key on page 17)

Table 1 - New York Energy Smart Data - Cost to Power Appliances

Electric Rates ($/kWh)	CFL Bulb (20 Watts) 4 hrs day/ per month	Incandescent Bulb (75 Watts) 4 hrs day/ per month	Room Air Conditioner 10,000 Btu/hr 1400 watts 8 hrs day/ per month	Window Fan (120 Watts) 8 hrs day/ per month	Clothes Dryer (electric) Cost for 1 hour	27 in. ENERGY STAR® TV 8 hrs day/ per month	42 in. plasma HDTV 8 hrs day/ per month	Computer and monitor (270 Watts) 8 hrs day/ per month
$0.10	$0.24	$0.90	$25.20	$2.88	$0.49	$2.71	$5.81	$6.48
$0.14	$0.34	$1.26	$35.28	$4.03	$0.69	$3.80	$8.13	$9.07
$0.18	$0.43	$1.62	$45.36	$5.18	$0.89	$4.88	$10.45	$11.66
$0.24	$0.58	$2.16	$60.48	$6.91	$1.18	$6.51	$13.94	$15.55

Table 2 - Average Wattage for Appliances

Appliance	Avg Watt
Air conditioner (window)	1200
Air conditioner (central)	3750
Fan (portable)	55-200
Fan (ceiling)	65-175
Water heater	4500-5500
Clock radio	10
Light bulb (incandescent)	75
Light bulb (CFL)	20
Vacuum cleaner	1000-1440

Appliance	Avg Watt
Kitchen	
Coffee maker	900-1200
Dishwasher	1200-2400
Microwave oven	750-1100
Stove	535
Refrigerator	725
Blender	300
Can opener	175
Toaster oven	1225
Toaster	800-1400

Appliance	Avg Watt
Laundry Room	
Washing machine	500
Clothes dryer	1800-5000
Iron	1000-1800
Home Entertainment	
Computer & monitor/asleep	270/30 or less
Laptop	50
TV (36" plasma)	240
VCR/DVD player	17-25
Bathroom & Bedroom	
Hair dryer	1200-1875
Curling iron	40
Electric toothbrush	10

Did you know

The energy used in the average home can be responsible for more than twice the greenhouse gas emissions of the average car?

www.EnergyStar.gov

3 Energy Detective Activity

Study the example below in Table 3a before completing Table 3b on page 10.

1. In your bedroom, write in all the appliances and lighting that use electricity in the far left column in Table 3b (pg 10).
2. Using Table 2 on page 8, enter the watts used by each appliance or lamp. Can't find it? Read the electrical name plate that is found on the back or bottom of the device.
3. Estimate the amount of time that the appliance or light is on per day (Column B or C).
4. Multiply watts (A) by hours (C) and enter in Column D.
5. Divide the watt hours (D) by 1,000 and enter in Column E.
6. To find out the daily cost, multiply the kWh (E) by the electricity rate, found on your electric bill. (We are using $0.173 in the example below.)
7. To find out how much it costs to run the appliance or light for an entire year, multiply the daily cost (F) by 365.
8. After you complete the Energy Detective Activity for your bedroom, you can repeat this chart for each room in your house. Keep this in mind when you complete the Household Report Card on page 19. Are there any appliances you would like to use that are not listed on the chart? You can also find the wattage on the electrical nameplate.

Table 3a – Kid's Bedroom Sample (Energy Detective Form)

	A	B	C	D	E	F	G
			B/60	AxC	D/1000	E x rate ($0.173)	F x 365
APPLIANCE	**Watts**	**Minutes of use**	**Hours of use**	**Watt hours**	**kWh**	**Daily cost**	**Yearly cost**
Clock	5		24	120	0.12	$0.02	$7.30
TV	240		5	1,200	1.20	$0.21	$76.65
VCR	50		2	100	0.10	$0.02	$7.30
Computer & Monitor	260		12	3,120	3.12	$0.54	$197.10
Stereo	55		8	440	0.44	$0.08	$29.20
TOTAL						$0.87	$317.55

Table 3b – Energy Detective Form

	A	B	C	D	E	F	G
			B/60	AxC	D/1000	E x rate	F x 365
APPLIANCE	**Watts**	**Minutes of use**	**Hours of use**	**Watt hours**	**kWh**	**Daily Cost**	**Yearly cost**
TOTAL							

4 Cost to Light Your Home

INCANDESCENT VS. COMPACT FLUORESCENT (CFL)

Not all light bulbs are created equal. Some are much more energy efficient than others. The least efficient are incandescents because almost 90% of the energy is converted to heat instead of light. A more efficient light bulb is the CFL. It uses 75% less energy and can last up to 10 times longer than an incandescent.

LOCATION	Incandescents	CFLs
Bedroom 1		
Bedroom 2		
Kitchen		
Dining room		
Living room		
Hallway		
Laundry room		
Outside front porch		
Family room		
Other		
TOTAL		

Take Action!

1. Count the bulbs in each room and record it in Table 4. Total each column. Refer to the example in Table 5a.
2. In Table 5b, enter the total number of CFLs and incandescents (from Table 4) in Column A. For the purpose of this exercise, we are using only 20 W and 75 W bulbs.
3. Using the data in Table 1 on page 8, enter the electricity cost per bulb for one month. Find the rate that most closely matches the rate that you pay and enter in Column B (Table 5b). (This assumes that a bulb is on for four hours per day, per month).
4. To calculate the annual cost of electricity, multiply Column B by 12 and enter in Column C.
5. To calculate the electricity cost for the entire year, for each type of bulb, multiply the number of bulbs (Column A) by the annual electricity cost (Column C) and record in Column D.
6. How much would it cost for electricity, per year, if all your bulbs were CFLs? Take the total number of bulbs (Column A) and multiply by the annual electricity cost (Column C) and enter in Column E. Do the same for incandescent bulbs.

FACT:

If every American replaced just one light bulb in their home with an ENERGY STAR® qualified bulb, we would save enough energy to light more than three million homes for a year, save more than $600 million in annual energy costs, and prevent greenhouse gases equivalent to the emissions of more than 800,000 cars.

–U.S. EPA

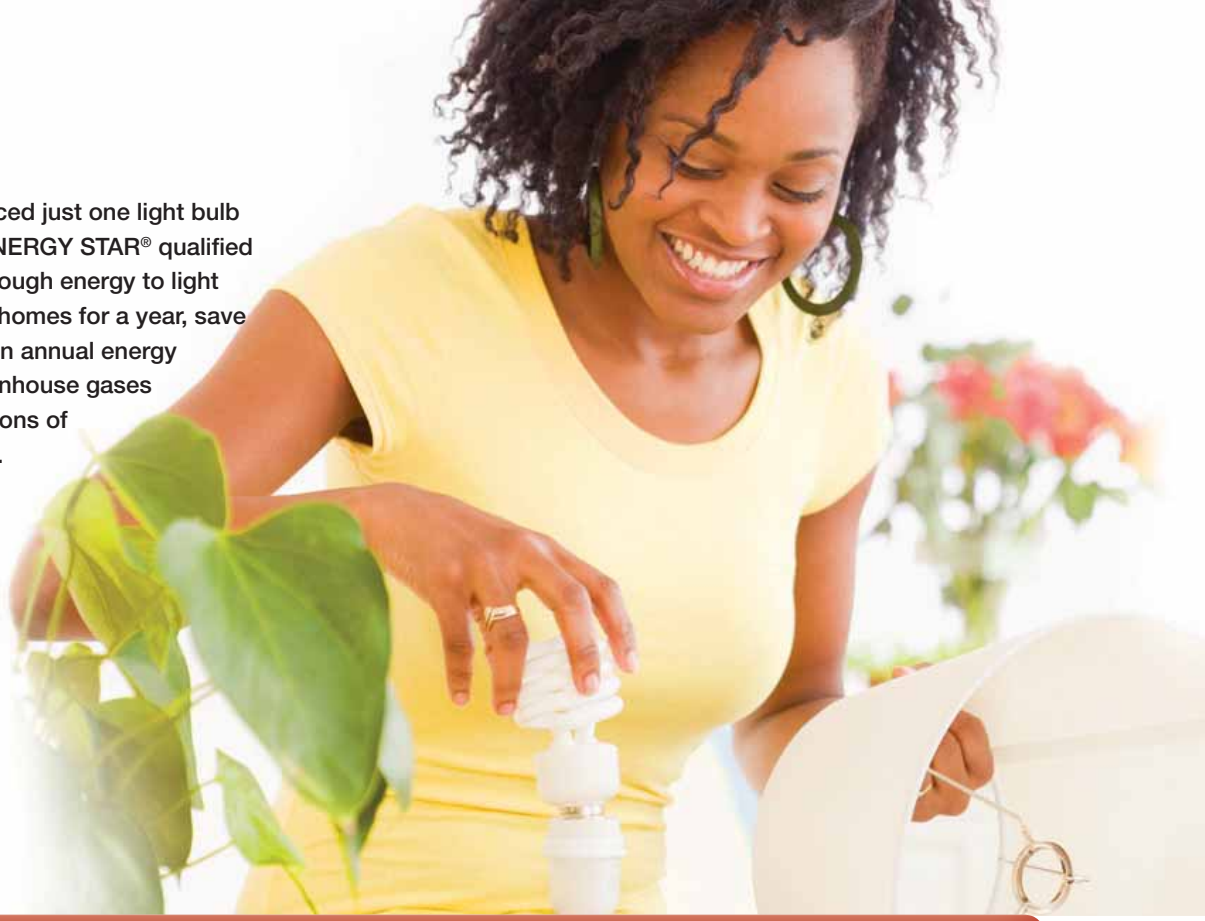

Table 5a - Cost to light your home - Example

	A	B	C	D	E
	Total number of bulbs	Monthly cost of electricity for 1 bulb*	Annual cost of electricity for 1 bulb	Total cost of electricity	Annual electricity cost if all bulbs were the same
CFL 20 Watt	10	$0.43	$5.16	$51.60	$154.80 (30 CFLs x $5.16)
Incandescent 75 Watt	20	$1.62	$19.44	$388.80	$583.20 (30 incandescents x $19.44)
TOTAL	30				

Table 5b - Cost to light your home - Exercise

	A	B	C	D	E
	Total number of bulbs (from Table 4)	Monthly cost of electricity for 1 bulb*	Annual cost of electricity for 1 bulb	Total cost of electricity	Annual electricity cost if all bulbs were the same
CFL 20 Watt					
Incandescent 75 Watt					
TOTAL					

* (based on 1 bulb, 4hrs/day per month, $0.18/kWh)

5 Energy Escape

The biggest energy users in the kitchen are your refrigerator, stove, and dishwasher. The refrigerator is the number one user of energy in your kitchen. Whenever the refrigerator door is open, energy is escaping. Decide what you would like to get or put away before you open the door.

EXPERIMENT

How many times a day is your refrigerator opened? It is not hard to find out. Cut out the box below and tape it to your refrigerator door. Ask your family members to mark down every time they open the door over a weekend.

How many times did your family open the refrigerator?

_____.

How could you cut down on the number of times it was opened? _____

STOVE

Whether your stove uses electricity or natural gas, these tips will help you save energy.

- Use lids to shorten cooking time.
- Use the lowest heat possible to maintain a boil. Most things will continue to boil on "low."
- When the oven is in use, do not open the door more than is necessary. Every time you open it, heat escapes.
- Use a microwave or toaster oven whenever possible. Both use less energy than a conventional oven.
- Use glass or ceramic pans in the oven. They absorb more heat.

6 Conserve H_2O

Pumping water from underground wells, purifying it, and delivering it to homes and businesses uses a lot of electricity. Also, one of the daily uses of energy is to heat water so we can wash dishes, wash clothes, and take showers in warm water. When you save water, you save energy, too. Reducing the temperature of your hot water tank and replacing your shower head can result in real savings. Complete the chart below to see how much you can save.

You may be amazed to learn that the average home in North America uses nearly 300 gallons of water a day. Much of this is used in the bathroom when you shower, bathe, or flush the toilet.

Fact:

Did you know that every year over 19 million trees are used to print phonebooks? If you do not want to receive phone books at home, go to ***www.yellowpagesgoesgreen.org***

7 Cost of Looking Your Best

FAMILY ACTIVITY

It takes energy to look your best. Energy is needed to shower, blow-dry your hair, brush your teeth, and wash and dry your clothes. Use the chart below to estimate the energy costs for looking your best.

HERE'S HOW

With your parents, estimate the daily and weekly activities below. Enter the number in the column labeled "Units." Then multiply the "Units" by the"Cost per Use" column; write your answer in the"Activity unit cost" column. Enter the "Activity unit cost" in the next column before the multiplication sign. Enter the number of times per month each activity is performed, and write that number in the "Times per Month" column, to the right of the multiplication sign. Multiply and enter your answer in "Monthly Cost." Multiply by 12 to calculate your annual cost.

Daily Activities – Student fills in						
Activity	Units	Cost per use*	Activity unit cost	Activity unit cost x number of times per month	Monthly cost	Yearly cost
Shower	minutes	x $0.12		x		x 12 =
Tub bath	inches	x $0.12		x		x 12 =
Hand/face wash	minutes	x $0.04		x		x 12 =
Blow dryer	minutes	x $0.04		x		x 12 =
Brushing teeth	minutes	x $0.12		x		x 12 =
Daily Student Subtotal						
Weekly Activities – Parent fills in						
Washing clothes hot water	loads	x $1.52		x		x 12=
Warm wash/ cold rinse	loads	x $0.96		x		x 12=
Cold wash/ cold rinse	loads	x $0.07		x		x 12=
Drying clothes: (natural gas)	loads	x $0.24		x		x 12=
Drying clothes: (electric)	loads	x $0.88		x		x 12=
Weekly family total					$	$
Weekly student total (Divide the "weekly family subtotal" above by the number of persons in the family)					$	$
GRAND TOTAL – Add two student subtotals together					$	$

*Estimates based on 18.9 cents per kWh and $1.33 per therm (New York State average, 4/11)

ENERGY TIPS

DO YOU KNOW...

These four common myths about energy that cost families hundreds of dollars each year?

Myth 1

"Thermostats should not be turned down at night because it takes more energy than it saves to reheat the home."

Not true- It takes less energy to reheat or recool your home than it does to leave the heat or air conditioner set to a constant temperature.

Myth 2

"You should leave your car running at a drive-through window because it takes more energy than you save to restart the car."

Not true– If you expect to be idle for more than 30 seconds, turn your car off. Every two minutes that a car idles is the same as driving it one mile.

Myth 3

"Taking a bath uses less water than taking a shower."

Not true– A typical bath uses 30 to 40 gallons of water as compared to an average shower of five to 10 minutes, using a high efficiency showerhead, which will use 2 ½ gallons per minute.

Myth 4

"Turning your computer on and off throughout the day may harm the computer."

Not true– New home electronics are made to turn off and on many times. Any time you can turn it off will save energy.

Using a programmable thermostat is an easy way to save energy and money. An ENERGY STAR® programmable thermostat offers pre-programmed settings to regulate your home's temperature in both summer and winter. Program your thermostat to automatically reduce heating and cooling in your home when possible. The recommended setting during the summer for air conditioning is 78°F or higher. Each degree above 75°F saves you 3% of the energy to cool your home. The recommended setting in the winter is 70°F or lower. Adjusting the temperature five to eight degrees (down in winter, up in summer) can help save energy if you are away from home for several hours.

Take action to lower your energy use, save money, and reduce your carbon footprint.

Saving energy happens in two ways. First, you can use less energy through conservation, such as turning off the television when you are not in the room, or second, through energy efficiency. Energy efficiency is using less energy to accomplish the same amount of work. Let's begin in the areas of your house that have the largest carbon footprint.

HOME HEATING AND COOLING

- Install a programmable thermostat.
- Make sure your house is properly insulated. If you have less than six 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 an energy audit of your entire house, consider the Home Performance with ENERGY STAR® program.

WATER HEATING

- Check your faucets for leaks that can cost you hundreds of dollars each year.
- Install a high-efficiency showerhead and save up to $50 a year.
- Install faucet aerators to decrease water use.

LIGHTING

- Let the sun shine in. Use daylight and turn off lights near windows when possible.
- Replace your frequently used incandescent bulbs with CFLs (compact fluorescent bulbs) and save from $12 to $20 per year.
- Use lighting controls such as outside motion detectors and timers.
- Turn off lights when you leave the room.
- Always use the lowest wattage bulb that still gives you the light you need.
- Keep your light bulbs clean. It increases the amount of light from the bulb and reduces the need to turn on more lights.

Safety note: Burned out CFLs, which contain a small amount of mercury, should be disposed of properly. To locate a collection site in your area, or to learn what to do if a CFL breaks, visit www.nyserda.ny.gov/teachers

REFRIGERATORS AND FREEZERS

- Replace your old refrigerator with an ENERGY STAR® model, which requires 20% less energy than conventional models and provides energy savings without sacrificing the features you want.
- The coils in the back or bottom of your refrigerator and freezer should be kept as clean as possible.
- The freezer should be kept as full as possible. When it is full, it runs more efficiently, stays cooler, and uses less energy.

ELECTRONICS

- Turn off your computer and game consoles when you are finished.
- New 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 up to 60% less energy while providing the same performance at the same price as less efficient models.
- Beware of phantom loads or energy vampires. Electronic games, DVD players, computers, printers, coffee pots, television sets, and telephone chargers continue to draw electricity when they are plugged in but not in use. Use power strips for household electronics. One button will turn off multiple appliances, which conserves energy and saves you money.

DISHWASHERS

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

LAUNDRY

- Purchase an ENERGY STAR® washer. The clothes come out nearly dry, decreasing the dryer time needed.
- Buy a moisture-sensitive dryer that automatically shuts off when clothes are dry.
- Use a clothes line whenever possible.

COOKING

- Use the right-sized pan for the burner.
- Cook multiple items at the same time in the oven.

REDUCING

- Buy less. When shopping ask yourself, "Is this something I really need or is it just something I want?"
- Recycle everything you can. Participate in the recycling program offered in your town or city.
- Reduce your carbon footprint by lessening the amount of solid waste that goes into the landfill. Every pound of solid waste generates 1.5 pounds of greenhouse gases.

PARENTS, 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 energy more efficiently. That is like getting a pay raise without having to work longer or harder.

THINK ABOUT THIS:

- $42 is the monthly payment on a 15-year, 6% interest home equity loan for $5,000 in improvements to your home.
- If you invest $42 every month into an IRA that earns 8% interest, you'll have $7,000 after ten years – nearly $63,000 after 30 years.

ENERGY ACTIONS

IT'S UP TO YOU!

By taking the energy challenge, you and your family will have fun learning together and will become energy literate. You will make wise energy choices that will provide measurable energy savings in your home and make positive impacts on the environment. You will also help your state achieve its sustainability goals. Everyone in your family can do their part to conserve energy and protect the environment. What are you committed to do?

Please complete the checklist on page 19-20, and return it to your teacher or NYSERDA.

Congratulations to you and your family for making a difference!

RESOURCES

If you would like to learn more about energy, sustainability, and using energy more efficiently, the following resources are recommended.

www.nyserda.ny.gov
www.nyserda.ny.gov/teachers
www.thinkenergy.org
www.energyforkeeps.org
www.nef1.org
www.eere.energy.gov
www.energystar.gov

ANSWER KEY - For "New York Energy Use Data" on page 8.

1) $4.32/month x 12 months = $51.84/year

2) Electric AC: $25.20/month x 3 months = $75.60 for 3 months. Window fan: $2.88/month x 3 months = $8.64 for 3 months

3) 1 hour in gas dryer @ $1.75/therm = $.39
1 hour in electric dryer @ $.18/kWh = $.89
10 loads - gas = $3.90, electric = $8.90
Clothes line = free

4)

	27-inch TV	42-inch TV
1 month	$6.51	$13.94
1 year	$78.12	$167.28

5) $15.55/month x 12 months = $186.60

About NYSERDA

NYSERDA, a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise and funding to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce their reliance on fossil fuels. NYSERDA professionals work to protect our environment and create clean-energy jobs. NYSERDA has been developing partnerships to advance innovative energy solutions in New York since 1975. To learn more about NYSERDA programs and funding opportunities, visit www.nyserda.ny.gov

About NEF

National Energy Foundation is a unique non-profit organization dedicated to the development and implementation of high quality instructional materials. The foundation's mission is to cultivate and promote an energy literate society. For more information on NEF, visit www.nef1.org

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nyserda
Energy. Innovation. Solutions.

New York State Energy Research and Development Authority

17 Columbia Circle
Albany, New York 12203-6399

toll free: 1 (866) NYSERDA
local: (518) 862-1090
fax: (518) 862-1091

info@nyserda.org
www.nyserda.ny.gov

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ENERGY ACTION AT HOME

Instructions: Using a #2 pencil, fill in the bubble completely. Return to your school or mail to NYSERDA, Attn: Energy Smart Students, 17 Columbia Circle, Albany, New York 12203-6399

Parent Name (optional) _____

Address _____

City _____ **State** _____ **Zip** _____

School _____ **Teacher** _____

This Household report card is intended to help NYSERDA define energy savings realized from the Energy Smart Students Program. If you have any questions on this survey or this program, please call Megan Hirschi at 1-800-616-8326. Thank you for participating.

Household Report Card

PART A: Because of your participation in the Energy Smart Students program, have you and your family...

	Yes	No, but we plan to	No, we don't plan to	We were already doing this	Not applicable
1. Installed a programmable thermostat?	○	○	○	○	○
2. Caulked windows and weather-stripped outside doors?	○	○	○	○	○
3. Added insulation?	○	○	○	○	○
4. Replaced your existing air conditioner unit with an ENERGY STAR® unit?	○	○	○	○	○
5. Set the temperature on your water heater at 120°F?	○	○	○	○	○
6, Insulated the hot water tank?	○	○	○	○	○
7. Replaced an existing refrigerator with an ENERGY STAR® model?	○	○	○	○	○
8. Unplugged and permanently removed a second refrigerator?	○	○	○	○	○
9. Replaced incandescent bulbs with CFLs?	○	○	○	○	○
9a. If your answer to #9 is 'yes' or 'no, but we plan to,' how many CFLs?	○ 1 ○ 2	○ 3 ○ 4	○ 5 ○ 6	○ 7 ○ 8	○ 9+
10. Installed low-flow showerheads?	○	○	○	○	○
10a. If your answer to #10 is 'yes' or 'no, but we plan to,' how many showerheads?	○ 1	○ 2	○ 3		
11. Installed sink (kitchen or bathroom) aerators?	○	○	○	○	○
11a. If your answer to #11 is 'yes' or 'no, but we plan to,' how many aerators?	○ 1	○ 2	○ 3		

More →

ENERGY ACTION AT HOME

Instructions: Using a #2 pencil, fill in the bubble completely.
Return to your school or mail to NYSERDA.

Household Report Card

PART B: Because of your participation in the Energy Smart Students program, do you and your family...

	Yes	No, but we plan to	No, we don't plan to	We were already doing this	Not applicable
12. Turn lights off when not using them?	○	○	○	○	○
13. Take shorter showers?	○	○	○	○	○
14. Wash clothes in cold water?	○	○	○	○	○
15. Use a microwave oven, toaster oven, or crock pot instead of a conventional oven?	○	○	○	○	○
16. Use the 'no heat' or 'air dry' settings on the dishwasher?	○	○	○	○	○

PART C: During the WINTER MONTHS, because of your participation in the Energy Smart Students program, do you and your family...

	Yes	No, but we plan to	No, we don't plan to	We were already doing this	Not applicable
17. Turn DOWN the thermostat at least eight hours at night?	○	○	○	○	○
17a. If your answer to #17 is 'yes' or 'no, but we plan to,' how many degrees?	○ 1 ○ 2	○ 3 ○ 4	○ 5 ○ 6	○ 7 ○ 8	○ 9+ ○
18. Turn DOWN the thermostat at least eight hours during the day?	○	○	○	○	○
18a. If your answer to #18 is 'yes' or 'no, but we plan to,' how many degrees?	○ 1 ○ 2	○ 3 ○ 4	○ 5 ○ 6	○ 7 ○ 8	○ 9+ ○

PART D: During the SUMMER MONTHS, because of your participation in the Energy Smart Students program, do you and your family...

	Yes	No, but we plan to	No, we don't plan to	We were already doing this	Not applicable
19. Turn UP the thermostat on your air conditioner for at least eight hours a day?	○	○	○	○	○
19a. If your answer to #19 is 'yes' or 'no, but we plan to,' how many degrees?	○ 1 ○ 2	○ 3 ○ 4	○ 5 ○ 6+		
20. Close blinds when windows are exposed to the sun?	○	○	○	○	○
21. Use a fan instead of air conditioning?	○	○	○	○	○

Select one: I live in a...	○ Single family home	○ Multifamily home
Select one: I currently...	○ Own	○ Rent
Select one: My water is heated by...	○ Electricity	○ Propane
	○ Natural Gas	○ Oil

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