

Home *Guide*



GREENHOUSE GASES

NATURAL GAS

OIL

ELECTRICITY

HYDRO

COAL

URANIUM

Energy

SPACE HEATING

AIR CONDITIONING

APPLIANCES

WATER HEATING

LIGHTING

COMPUTERS

TRANSPORATION

WALKING OR BIKING





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A C K N O W L E D G E M E N T S

In recognition of the many individuals who undertook the development of the DC Home Guides, thank you for your time and energy. Your efforts and accomplishments can be seen within these pages and within our member schools.

This program is dedicated to all the students and staff from across North America who, through their dedication and care for the Earth, have made Destination Conservation a success.

D C L I C E N S E D A G E N C I E S A N D D C P A R T N E R S

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Copy masters

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INTRODUCTION

The **Energy Home Guide** program is designed to recognize the personal energy conservation actions that impact carbon dioxide (CO₂) emissions. Carbon dioxide emissions are related to climate change and this environmental topic is receiving much attention from governments, industries and environmental groups.

Students and their families will be encouraged to turn off lights, computers, and other electrical items; to turn down thermostats; to walk, bike or bus; and to replace light bulbs with more efficient lights. Students will track their families' actions to determine the total number of energy conservation actions in a one week period. Students will be asked to return their tracking sheets to school so classroom totals and school totals can be recorded. This information will be posted on a wall display and recognition awards will be given to classes and schools.

Teachers will guide the above activities using the materials provided in this package (see next page for overview of materials).



MATERIAL OVERVIEW

Teacher materials

Set up

- This section provides the teacher with some guidelines for setting up the **Energy Home Guide** program in the school and enrolling other teachers.

School tally sheet, school conservation poster, recognition certificate

- This section explains the procedures for completing the school tally sheet to total the number of energy conservation activities completed by students and their families, as well as to show which classes completed the most energy conservation activities. The section also describes how to complete the school conservation poster and explains how to use the recognition certificate.

Evaluation

- An evaluation form is enclosed. Please complete the form and fax it to DC. Your comments will be used to improve the package so it may be used in schools across North America.

Copy masters

Teacher information

Classroom procedures

- Step by step procedures assist each classroom teacher in completing the program.

Classroom discussion

- Questions have been provided to guide a classroom discussion regarding energy use, energy conservation and environmental impacts related to energy use. Steps have also been provided to prepare students for completing the energy conservation activities tracking sheets.

Classroom tally sheet

- Each classroom that participates will require a tally sheet. Once students return the tracking sheets to the school, the teacher will complete the tally sheet and return it to one teacher who will coordinate the final tally from all classrooms.

Recognition certificate

- A blank recognition certificate is provided to recognize classes that complete the most energy conservation activities.

Student home package

The student home package consists of:

- Parent letter
- Background information and family worksheet
- Energy conservation activities tracking sheets to track each family's activities.
- Refrigerator display

Families are to complete the tracking sheets and return them to the school.



S E T U P

Present information about the **Energy Home Guide** program to administration and other staff to decide whether all the classes or only some classes will participate in the program. Determine the best timeline for your school to complete the program (remember walking, biking and busing will be promoted as well as turning down thermostats and turning off lights so the timeline will work best in October, November, March, April). Also, decide if outstanding participation by classes will be recognized. If schools choose to recognize classes, a recognition certificate is enclosed in this package. DC will be recognizing schools that achieve outstanding levels of energy conservation activities.

Present the teachers with the materials required for them to use the program in their class. Each teacher will need one copy of the teacher information for their own use:

- classroom procedures
- classroom tally sheet (provides space for 20 students so additional copies may be required)

The teachers will need copy masters of the components of the student home package:

- parent letter
- background information and family worksheet
- energy conservation activities tracking sheets
- refrigerator display

Use the Classroom Procedures to outline the steps required to complete the program.



COLLECTING INFORMATION

Once you have received all the classroom tally sheets, transfer the classroom name and the total number of energy conservation activities to the School Tally Sheet. Highlight the classes that completed the most energy conservation activities. Forward a copy of the School Tally Sheet to DC (contact information can be found on the inside cover page).

Wall Display

A school wall display has been included with this package. Fill in the thermometer. On the space provided, record the total number of energy conservation activities completed by the whole school. Record the classrooms that completed the most energy conservation activities. Post the display in a prominent area.

Recognition Certificate

Complete a recognition certificate for the classes that completed the most energy conservation activities. A blank recognition certificate is provided in this section. Present the certificates at a general assembly. DC will be recognizing schools that achieve outstanding levels of energy conservation activities.

Evaluation

Upon completion of the **Energy Home Guide** activities, please complete the evaluation form and fax it to DC at the number listed on the form. Your comments will help improve this program for use across North America.



**ENERGY
HOME GUIDE**

Recognition Certificate

(class)

has completed an outstanding number of energy conservation activities which has resulted in reduced carbon dioxide emissions.

Thank you for making such a great contribution in safeguarding the environment for future generations.





EVALUATION FORM

Please complete the following evaluation form. Your comments will help improve the **Energy Home Guide** program. Please forward the form to DC at:

Destination Conservation
10125-97 Avenue
Edmonton AB T5K 0B3
Fax: (780) 439-5081

1. Were the instructions easy to follow? If no, why not?

2. What did you like or dislike about the lead teacher materials?

3. How could the program be improved?

4. What portion of your school participated in the program? _____

5. Were teachers able to follow the classroom procedures? _____

If no, how could they be improved? _____

6. What grade levels used the background information and family worksheets? _____

For what grade levels would you recommend the background information and family worksheets? _____

7. What was the student participation level for completing the home tracking? _____

8. What comments (if any) did you receive from parents about the program?

9. What type of recognition would you encourage for students and schools?

10. Other comments



C CLASSROOM PROCEDURES

Preparation

- Sign the parent letter. Complete the dates on the tracking sheets. Make a copy of the parent letter, background information, family worksheet, energy conservation activities tracking sheets and refrigerator display for each student.

Classroom discussion

- Use the following questions to guide a discussion about energy use in the home:
 - What items in the school require electricity to operate?
 - Are any of these items used at home?
 - At home, what additional items require electricity to operate?
 - In Ontario, what type of energy source is used to produce electricity? *Answer:* uranium, hydro, coal, oil
 - In the winter, how do we heat our homes?
 - In Ontario, what energy source is required to provide the heat for the furnace? *Answer:* natural gas (primary), oil, electricity
 - What other activities do we do that require energy?
 - What type of energy source is required to operate cars and trucks? buses?
 - What is the category name for coal, oil and natural gas? *Answer:* fossil fuels or non-renewables
 - When we use coal, oil or natural gas is any pollution created?
 - What types of pollution are created when we use fossil fuels? *Answer:* air
 - What are some things we can do to use fewer fossil fuels and reduce air pollution?

- Review the tasks with students - take the information home, ask parents to read the letter and background information, complete the family worksheet, post the tracking sheets and ask family members to track their energy conservation activities.
- Review the tracking sheet with students - explain how to check off marks in the columns, five check marks per column, using turned off lights as an example. Review how students are to total the rows and then the last column. Review the questions on the tracking sheet indicating that students can check “yes” if their family has done this in the last year. Indicate how to calculate marks for the questions and to complete a final total.
- Hand out the student home package.
- Remind students the day before the tracking is ended to finish their tracking and return the tracking sheets to the school.

Gathering information

- Use the classroom tally sheet to complete the information for the class.
- Return the classroom tally sheet and tracking sheets to the coordinating teacher.

P A R E N T L E T T E R

Date_____

Dear Parent(s)/Guardian(s):

Our class is participating in a program to increase student awareness of the impacts their daily actions have on the environment. We are specifically encouraging students to take energy conservation actions to decrease carbon dioxide (CO₂) emissions which is a gas that affects climate change. This project is an extension of school activities we have been doing as part of the Destination Conservation (DC) program. Our school district is enrolled in the DC program. DC is a non-profit organization working with schools, teachers and students to educate about the global ecosystem and our role as guardians of our natural environment.

Enclosed is an activity for families to track their energy conservation activities. Information on energy use in the home and the relationship to climate change has also been provided. Read the information and complete the family worksheet. Please place the tracking sheet in a prominent location and ask all family members to mark any of their energy conservation activities for a one week period. Your child can review how to complete the tracking sheet. At the end of the one week period, the tracking sheet is to be returned to the school. Before the tracking sheet is returned to the school, transfer your total energy conservation activities on to the fridge display that is also provided. This poster is to act as a reminder for continuing your energy conservation activities and to recognize your family's achievements. Place the poster in a prominent location.

Once the tracking sheets have been returned to the school, the school will accumulate all the information onto a wall display totalling all the energy conservation activities performed by families in the school. Recognition will be given to classes that complete the most energy conservation activities.

We thank you for participating in this program as climate change is an environmental focus for our school this year. If you have any questions please contact a Destination Conservation Education Consultant at (780) 433-8711.

Sincerely,



ENERGY USE AND THE ENVIRONMENT

There are environmental impacts from using any type of energy source to heat our homes and water, operate appliances, light our homes, and get us to where we need to go. One environmental impact that is receiving much attention from governments, industries and environmental groups is climate change.

Climate Change

The Earth's climate is the element that sustains life on the planet. The sun provides the energy and warmth that creates the Earth's climate. The sun's rays pass through the atmosphere and are absorbed by the earth's surface, which heats up and radiates energy back into space. Some of the gases in the atmosphere capture and hold radiated energy, keeping the surface of the earth warm, much as the glass of a greenhouse keeps the plants inside warm. Without the gases that trap the sun's radiation such as carbon dioxide (CO₂), all radiated heat would be lost into space and the surface of the Earth would be cold and barren. This natural phenomenon acts like a blanket around the Earth, is essential for life, and is often referred to as the greenhouse effect.

Human activities are adding to the quantities of greenhouse gases being released into the atmosphere. The increases in greenhouse gases are trapping more of the energy radiated from earth and may lead to change in the Earth's climate. The greenhouse gases most associated with human activity include methane, carbon dioxide, nitrous oxide, ground level ozone, and chlorofluorocarbons (CFCs). Fossil fuels, such as oil, natural gas and coal, while important sources of energy are major contributors of man-made greenhouse gases.

There is much speculation as to what changes may be occurring in the Earth's climate and what the results may be. Everything from global warming to global cooling has been modelled by scientists. Global warming would melt icebergs and ice flows increasing the water levels of the oceans causing flooding of coastal areas where many of the world's largest cities are located. Global cooling would cause more cloudiness and higher levels of precipitation affecting plant growth and increases in ice build up in the polar regions and glaciers. General agreement has been reached that climate change is occurring and that effects on the environment will affect us all.

Greenhouse Gases from Human Activities

Most human activities, directly or indirectly, produce greenhouse gases. The most common greenhouse gases produced are carbon dioxide, methane, nitrous oxide, ground level ozone, and chorofluorocarbons or CFCs. Fossil fuels (oil, natural gas, and coal) are major contributors to human-caused greenhouse gases.

Canada contributes two per cent of the world's annual human-caused carbon dioxide emissions. Although this is a small portion of the global contribution it represents a very high per capita amount. Reasons given for Canada's high rate of contribution are our advanced industrial base, our cold climate and our energy-intensive lifestyle.

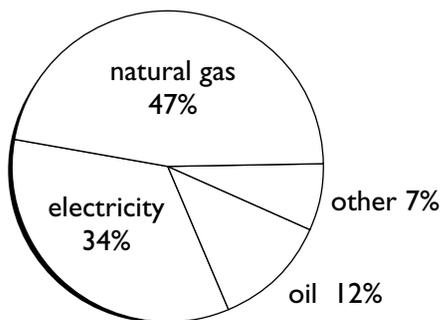
Every time that Canadians drive or ride in a vehicle, turn on a light, use a computer, watch television, listen to the stereo, take a bus, cook, wash clothes, turn up the thermostat, turn on a fan, or get something out of the refrigerator, we add to the greenhouse gases that affect the Earth's climate.



E NERGY S O U R C E S A N D E N E R G Y U S E S

Homes require energy for space heating, for heating water and to operate appliances and other equipment. In Canada, the energy sources for homes are: natural gas, oil, electricity and some other types of fuels (e.g. solar, propane, wind). Figure 1 illustrates the energy sources for home use.

Figure 1: Energy Sources (Canada)



Electricity is not an actual energy source. Electricity must be produced and many types of energy sources are used to produce electricity including coal, water, natural gas, oil, uranium (nuclear), solar, and wind. Figure 2 illustrates the energy sources used to produce electricity in Canada and in Ontario.

Figure 2A: Sources of Electricity (Canada)

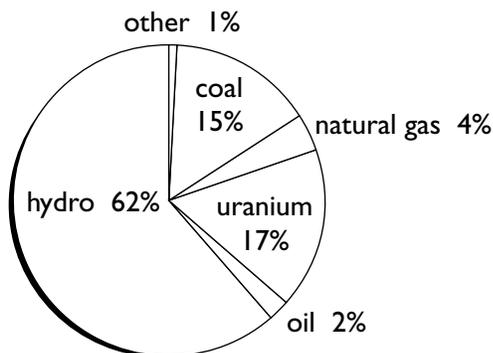
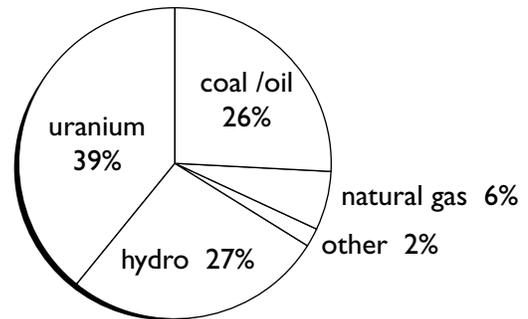
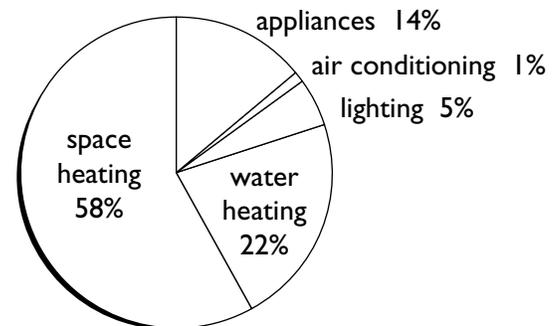


Figure 2B: Sources of Electricity (Ontario)



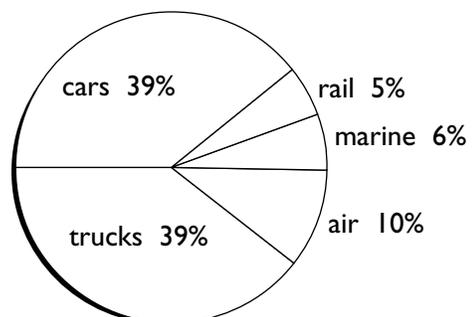
Most of the energy used in the home is required for space heating. Water heating is the second highest energy user followed by appliances. Figure 3 illustrates the energy use by category.

Figure 3: Energy Use in Homes



Another way we use energy at home is for transportation. All forms of transportation account for 25 per cent of all energy consumption. Figure 4 illustrates the amount of energy used by each transportation type. Personal vehicles account for a large portion of the energy used for transportation.

Figure 4: Energy Use by Form of Transportation





Space and Water Heating

In Canada, most homes use either natural gas, oil or electrical heating systems for space and water heating. The best way to reduce energy consumption for space and water heating is to purchase energy efficient heating systems. This is usually recommended when an existing system needs replacing or during the initial purchase for a new home.

Regular maintenance of space and water heating systems greatly increases their efficiency (e.g. replacing filters, cleaning, and lubricating). Other ways to conserve energy include:

- regular caulking and weatherstripping to reduce heat loss
- turning down thermostats (device that sets the temperature for the home) at nights and when the home is unoccupied
- ensuring the home is adequately insulated (material between outer and inner walls to reduce heat loss)
- insulating hot water tanks and hot water pipes
- taking short showers (less than 10 minutes)
- using warm or cold water washes for clothes
- using only full loads for laundry and dish washers

Appliances/Lighting

The average household uses 8,500 kilowatt hours (kW.h) of electricity per year (does not include space and water heating). If a home does not use electrical space and water heating then appliances are the main users of electricity in the home especially fridges, freezers, and stoves (ovens). The table below indicates the amount of electricity used for various purposes in the home (based on monthly consumption).

Refrigerator	22%	Small appliances	12%
Range	17%	Furnace fan	12%
Electric dryer	14%	Lights	10%
Freezer	13%		

Appliances

Appliances which operate on a continuous basis - fridges, freezers, waterbed heaters - consume large amounts of electricity and are the areas where the most savings can be achieved.

The biggest savings can be achieved by purchasing energy efficient appliances. All new appliances must have an EnerGuide label which indicates the amount of electricity used per year (kW.h per year). This makes it easy for consumers to compare the energy efficiency of various models.

Appliances also operate more efficiently when they receive regular maintenance and cleaning. Using smaller appliances for small jobs is more efficient than using a large appliance for a small job (e.g. using a microwave oven to cook a baked potato instead of using an oven).

Lighting

Fluorescent lighting is the most efficient lighting that can be used in a home. Many new homes have fluorescent light fixtures installed instead of incandescent lights (the regular light bulb type). There are also compact fluorescent lights which can be installed in incandescent light fixtures. Fluorescent lights use less electricity, produce more light and last longer. Technology used in fluorescent lighting has improved to produce better light colour, reduce noise (humming) and use less electricity.

The easiest way to use less electricity for lighting is to turn lights off either manually or with automatic timers. Automatic timers can be used to turn lights on and off when homes are unoccupied for longer periods of time (e.g. vacations). Occupancy sensors are another way to save energy. Occupancy sensors detect motion and automatically turn on lights. After a period of time, if no motion is detected the lights automatically turn off. This is a good safety feature to have in areas such as laundry rooms where people usually have their hands full when entering or exiting. Motion detectors and



photocell sensors (detect light levels so lights only turn on when it is dark) can be used for outdoor security lighting. The lights automatically turn on when motion is detected and turn off after a period of time when no motion is detected. Outdoor lights are on when required and are not left on all night. Automatic timers can also be used for outdoor Christmas lights (e.g. turn on at 6:00 p.m. and turn off at 10:00 p.m.).

Automatic timers can also be used for plugging in vehicle block heaters (used on very cold days to help vehicles to start). A block heater can use a lot of electricity and is usually plugged in overnight. The vehicle block heater only needs to be plugged in for three to four hours. An automatic timer can turn the block heater on at 3:00 a.m. so the vehicle easily starts at 7:00 a.m.

Transportation

The average car in Canada is driven about 15,000 kilometres per year and consumes 11 litres per 100 kilometres. There are over 13 million cars in Canada - that's one car for every 1.5 licensed drivers!

A big energy saver for transportation is the purchase of energy efficient vehicles. Smaller cars are usually the vehicles that are more energy efficient.

Another transportation energy saver is to walk, ride a bike, roller blade, skateboard, carpool, or use public transportation (e.g. buses, subways), especially for short trips.

Regular vehicle maintenance ensures vehicles operate at their highest efficiency level. Proper tire inflation also increases vehicle efficiency. Operating an air conditioner decreases a vehicle's energy efficiency so the air conditioner should only be used when absolutely necessary.



ENERGY WORKSHEET

Date _____

Student Name _____

With your family read the **Energy Home Guide Background Information** and then answer the following questions. The answers are provided at the end of the activity.

- In Canada, what energy source is used the most in homes?
a) natural gas b) oil c) electricity d) space heating
- What area uses the most energy in the home?
a) air conditioning b) appliances c) water heating d) space heating
- Is the following statement True or False? In Canada, water, coal and uranium are used to produce electricity.
True False
- Is the following statement True or False? In Ontario, water is used to produce most of our electricity.
True False
- What type of transportation uses the most energy?
a) air b) cars and trucks c) rail d) marine
- Which item in the home requires the most energy to operate?
a) range b) dryer c) refrigerator d) lights
- Place a check mark in front of the items that describe a benefit of using fluorescent lighting.
a) ___ produce more light d) ___ produce a very natural light
b) ___ last longer e) ___ use more electricity
c) ___ use less electricity
- What is the greenhouse effect?
a) ozone depletion b) produces the earth's climate c) smog d) air pollution



9. Place a check mark in front of the items that would conserve energy to reduce carbon dioxide emissions.

a) ___ turning down thermostats

g) ___ driving a car a few blocks

b) ___ taking a bath

h) ___ properly inflating tires

c) ___ replacing caulking and weatherstripping

i) ___ purchasing energy efficient appliances

d) ___ washing only a few dishes in a dishwasher

j) ___ using hot water for washing clothes

e) ___ turning off lights

k) ___ replacing incandescent lights with compact fluorescent lights

f) ___ using automatic timers

Answers

1. a

2. d

3. True

4. False

5. b

6. c

7. a b c

8. b

9. a c e f h i k

ENERGY CONSERVATION ACTIVITIES TRACKING SHEET

Student Name _____ Date to Start Tracking _____ Date to Return to School _____

Date to Finish Tracking _____

Answer the questions found on this page. Circle the appropriate answer - either Yes or No. Add up the total number of points you have circled and write this number on the "Total number of points" line at the bottom of the page.

number of check marks as the activity is repeated a number of times during a one week period. Total the number of check marks in the last column for each item and then total all of the activities in the last line at the bottom of the second page.

On the day indicated to start tracking, start checking off activities your family completes, using the table found on the next page. Whenever you turn a light off in an unoccupied room, place a check mark in a box starting with the "1 to 5" box. When five check marks are in a box, move onto the next box. Some activities will have a

To compile a total number of energy conservation activities, write the "Total number of points" from the questions and the "Total number of activities" from the table onto the space provided at the bottom of the next page. Add these two numbers to calculate the "Total number of energy conservation activities".

Space and Water Heating

	Yes	No
1. Has your family purchased an energy efficient furnace and/or hot water tank?	1	0
2. Has your family replaced caulking and weatherstripping around doors and windows?	1	0
3. Does your family regularly replace the furnace filter and service the furnace?	1	0
4. Has your family insulated the hot water tank and/or hot water pipes?	1	0
5. Has your family added insulation to basement, attic or walls?	1	0

Appliances/lighting

1. Has your family purchased energy efficient appliances?	1	0
2. Has your family replaced 100 W incandescent light bulbs with lower wattage bulbs?	1	0
3. Has your family replaced incandescent light bulbs with compact florescent tubes?	1	0
4. Has your family installed florescent lighting?	1	0
5. Does your family use an automatic timer or power saver cord for their vehicle(s) block heater(s)?	1	0
6. Does your family use photocells and/or motion detectors for lighting (e.g. outdoors)?	1	0
7. Does your family regularly service appliances?	1	0

Transportation

1. Does your family regularly service vehicles?	1	0
2. Does your family ensure tires on vehicles are inflated to proper levels?	1	0

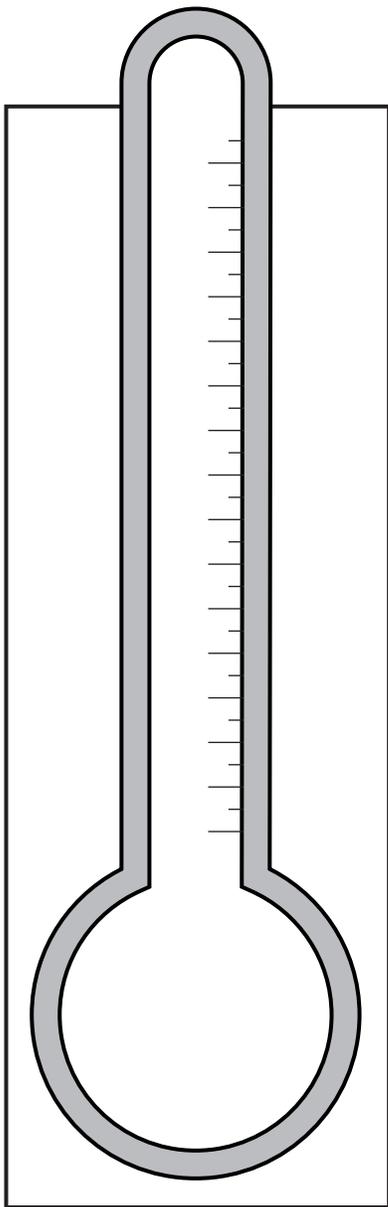
Total Number of Points

ENERGY CONSERVATION ACTIVITIES TRACKING SHEET

	1 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50	51 to 55	Total
Space and Water Heating												
Turned down the thermostat												
Used warm or cold water for washing clothes												
Showered for less than 10 minutes												
Used dishwasher only when it was full												
Washed and dried full loads of laundry												
Appliances/Lighting												
Turned off lights (in unoccupied rooms)												
Turned off TV when not required												
Turned off stereos when not required												
Turned off computers when not required												
Closed the refrigerator door quickly												
Transportation												
Walked or biked instead of driving a vehicle												
Used public transportation												
Carpooled												
Total Number of Activities												

Total Number of Points _____
 + Total Number of Activities _____
 = Total Number of Energy Conservation Activities _____

Energy Conservation Activities



We completed
_____ activities

Energy Conservation
Activities our family
completed:

