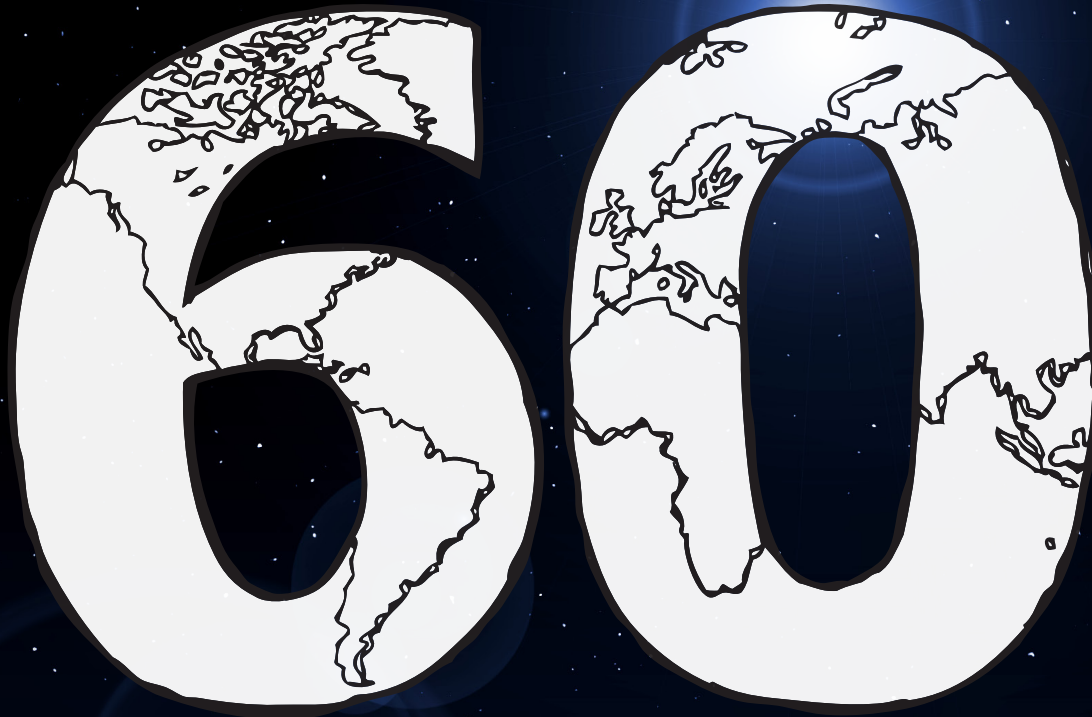


# ENVIRONMENTAL STEWARDSHIP EARTH HOUR CAMPAIGN KIT



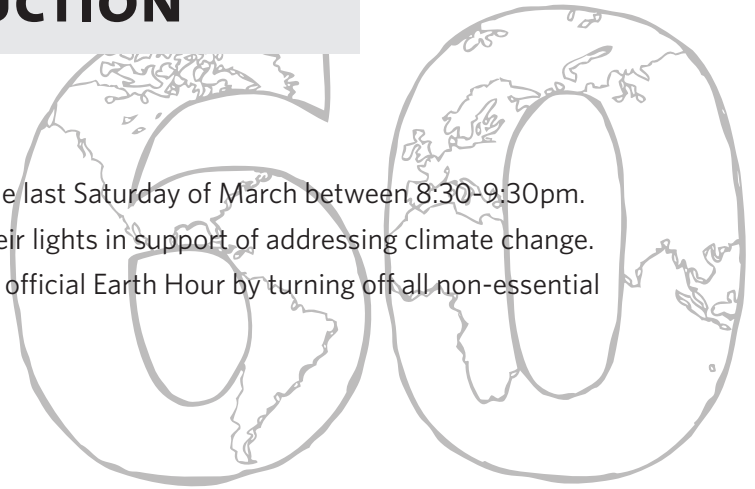
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# EARTH HOUR INTRODUCTION

## Background

Earth Hour is an international event usually held on the last Saturday of March between 8:30-9:30pm. During this hour, citizens around the world turn off their lights in support of addressing climate change. Schools typically participate on the Friday prior to the official Earth Hour by turning off all non-essential electricity for one hour during the school day.



## DESIGNING YOUR CAMPAIGN

### Plan your campaign

- Gather support and get permission to turn off all non-essential lights for one hour
- Provide an Earth Hour tip sheet to all teachers outlining suggestions for activities that can be done without the lights on (e.g, outdoor activities, share poetry, creative writing etc.)

### Communicate

- Hold a launch assembly: invite a guest speaker, watch the Earth Hour video and share information about the event and how classes can participate
- Create a bulletin board to educate students/teachers about the environmental significance of turning off the lights
- Have students create and post pledges to commit to reducing their energy consumption beyond the hour
- Inform the parent community and encourage them to participate in the weekend Earth Hour

### Implement and monitor success

- Announce the start (and end) of your school's Earth Hour over the announcements with a countdown: 5, 4, 3, 2, ...

- Monitor the meter: take an energy reading for 1 hour on a regular school day and take another reading during Earth Hour and report the difference

### Celebrate success, reflect and evaluate

- Celebrate your school's participation in Earth Hour via your newsletter, website, or blog
- Register your school's participation at [www.earthhour.org](http://www.earthhour.org)

### Tips for success

- Link this campaign with learning in every grade
- Take this campaign further! Encourage students to participate in Earth Hour at home, begin a weekly or monthly power hour, or lights off lunch campaign

## EcoSchools in ACTION!

St. Jerome Elementary School from Ottawa Catholic School Board had a candlelit Earth Hour school assembly. St. Jerome invited a volunteer bird rescuer to discuss the link between turning lights off and protecting migratory birds.

### Resources

*Earth Hour:* Watch videos, download resources and see what is going on around the world [www.earthhour.org](http://www.earthhour.org)

# LETTER TO PARENTS/GUARDIANS

[Insert Date]

Dear Parents/Guardians,

Earth Hour is an international event usually held on the last Saturday of March between 8:30-9:30pm. During this hour, people around the world turn off their lights in support of addressing climate change.

At [insert school name], we will be participating in Earth Hour on [insert date] by powering down and turning off or unplugging all non-essential lights, computers, and other electrical devices. During this hour, students will have the opportunity to participate in various activities such as [insert activities- i.e., outdoor hike, recycled crafts, storytelling, environmental festival, etc.] to learn about the importance of reducing our use of electricity. Through learning and action, we can make a difference for our planet.

In addition to our school Earth Hour event, we encourage students to take this message home and as a family, participate in Earth Hour on [insert date and time]. Some activities you could do include: stargazing, board games by candlelight, watching an eco-themed film, or make a family pledge to commit to protecting the environment. By reducing and conserving our energy use we are helping to reduce the amount of air pollution in Ontario caused by the burning of fossil fuels to generate electricity. In fact, the air quality in Ontario has improved in recent years because of these types of actions.

We look forward to hearing about all the creative ways your family participates in Earth Hour! Photos are welcome!

Thanks for your support in this worldwide movement to raise awareness about climate change and protect our planet!

Sincerely,

The EcoTeam [Insert Name]

[Insert School Name]



Fillable PDF form is available at [www.ontarioecoschools.org](http://www.ontarioecoschools.org)

# SCHOOL COMMUNICATIONS

Use this information in school newsletters, campaign posters, and morning announcements.

**About Earth Hour:** Earth Hour is the world's largest movement for action on climate change. During Earth Hour, millions of people around the world turn off their lights and electronic devices to support a future where climate change is no longer a threat. While the actual day of the event is [insert date and time], our school will celebrate Earth Hour [insert date and time]. So, for that hour we ask that you turn off lights, computers, and other electronic devices. Unplug and power down! By reducing and conserving our energy use we are helping to reduce the amount

of air pollution in Ontario caused by the burning of fossil fuels to generate electricity.

**Earth Hour Goal:** The goal of Earth Hour is to unite people around the world to raise awareness about climate change and commit to actions that will help protect our planet.

**Earth Hour Countdown:** In the days (and weeks) leading up to your school Earth Hour, have a daily countdown that incorporates some of the facts, trivia, and quotes below. Get students excited with eco-themed challenges and spirit days.

**Earth Hour Facts & Trivia:** Incorporate facts and trivia about Earth Hour and energy consumption into your daily announcements and encourage students to share their own knowledge and reflect on what they learn.

This worldwide campaign began in 2007 in Sydney, Australia. Earth Hour is now in its [insert number] year with more people joining this symbolic movement each year!

**2014 Highlights:** More than 7000 cities and towns in 162 countries and territories across the globe took part in Earth Hour 2014. 60 countries have gone beyond the hour to support other global environmental projects.<sup>1</sup>

**Climate impacts** how much energy is consumed. For example, on a very cold winter day, schools and homes may use more energy to keep buildings heated and warm. On a very hot summer day, schools and homes may use more energy to keep buildings cool. To conserve energy, celebrate National Sweater Day in February and wear a warm sweater to school instead of turning up the heat. In warmer months, close the blinds and turn off unnecessary lights instead of turning on the air conditioner.

**Energy Facts:** As of 2013, Ontario's electricity supply comes from a variety of resources:<sup>2</sup>

- Nuclear: **56%**
- Natural Gas: **10%**
- Coal: **2%**
- Hydroelectricity: **22%**
- Solar, Wind, Bioenergy: **5%**

Coal generation will be eliminated by the end of 2014 in Ontario. About a decade ago, coal-fired generation provided 25% of Ontario's energy supply, versus 2% in 2013.<sup>3</sup>

Phantom Power (or Vampire Power) is energy used from appliances and electronic devices even though we have turned them off. To reduce energy waste, remember to unplug your devices when not in use. For example, unplug laptops and computers after turning them off.

Every **energy source impacts** the environment differently and it is important to be aware of both the positive and negative impacts.

ENERGY SOURCE	BENEFIT	NEGATIVE IMPACT	RENEWABLE/ NON-RENEWABLE
<b>Coal</b>	<ul style="list-style-type: none"> <li>• Cost-efficient</li> <li>• Large supply</li> <li>• Safe and easy to store</li> <li>• Easily converted to energy</li> </ul>	<ul style="list-style-type: none"> <li>• Air pollution</li> <li>• Contributes to global warming</li> <li>• Habitat loss</li> </ul>	<ul style="list-style-type: none"> <li>• Non-renewable</li> </ul>
<b>Hydro-electricity</b>	<ul style="list-style-type: none"> <li>• Renewable</li> <li>• No emissions</li> <li>• Safe</li> <li>• Reliable</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive to produce</li> <li>• Limited resources</li> <li>• Production process changes habitats of aquatic species</li> </ul>	<ul style="list-style-type: none"> <li>• Renewable</li> </ul>
<b>Natural Gas</b>	<ul style="list-style-type: none"> <li>• Efficient</li> <li>• Instant energy</li> <li>• Fewer emissions than coal and oil</li> <li>• Versatile</li> </ul>	<ul style="list-style-type: none"> <li>• Damages natural environment</li> <li>• Leaks are toxic and highly dangerous</li> <li>• Expensive infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Non-renewable</li> </ul>
<b>Nuclear</b>	<ul style="list-style-type: none"> <li>• Efficient production</li> <li>• Carbon-free</li> <li>• Cost-effective</li> </ul>	<ul style="list-style-type: none"> <li>• Radiation</li> <li>• Radioactive waste</li> </ul>	<ul style="list-style-type: none"> <li>• Non-renewable</li> </ul>
<b>Oil (petroleum)</b>	<ul style="list-style-type: none"> <li>• Used for heat</li> <li>• Used for fuel</li> <li>• Used in making plastic &amp; medicine</li> </ul>	<ul style="list-style-type: none"> <li>• Air pollution</li> <li>• Water contamination</li> <li>• Emits carbon dioxide</li> </ul>	<ul style="list-style-type: none"> <li>• Non-renewable</li> </ul>

**Eco-themed Quotes & Reflection:** Share these eco-themed quotes with the school community and encourage both individual and class

reflection. Ask students to contribute any other quotes that they find thought provoking or inspiring.

*“Unless someone like you cares a whole awful lot, nothing is going to get better. It’s not.”*

**DR. SEUSS, FROM THE LORAX**

*“What you do to the earth, you do to yourself.”*

**JULIA BUTTERFLY HILL, ENVIRONMENTAL ACTIVIST**

*“Look deep into nature, and then you will understand everything better.”*

**ALBERT EINSTEIN, THEORETICAL PHYSICIST**

*Don’t throw anything away. There is no “away.”* **ANONYMOUS**

*“The starting point for a better world is the belief that it is possible.”*

**NORMAN COUSINS, JOURNALIST**

## EcoSchools in ACTION!

To discover how much their school knew about Earth Hour, energy conservation, and climate change, *Saugeen District SS, BWDSB* developed and implemented a school wide survey. *Roy H. Crosby PS, YRDSB* created a real time graph to illustrate the impact that their school’s Earth Hour campaign had on developing awareness about energy conservation and climate change in their community.

<sup>1</sup> www.earthhour.org

<sup>2</sup> (2013). Achieving Balance: Ontario’s Long Term Energy Plan. *Ministry of Energy: Queen’s Printer for Ontario 2013*. Pg. 1- 87

<sup>3</sup> Miller Jr., G.T. and Hackett, D. (2014). Ch. 17: Nonrenewable Energy Resources and Ch. 18: Energy Efficiency and Renewable Energy. *Living in the Environment 3rd Canadian Edition. Nelson Education Ltd: United States of America*. Pg. 382-451

# WHOLE SCHOOL ACTIVITIES

In the days and weeks leading up to Earth Hour, as well as on the day of, there are lots of opportunities to involve the whole school community in Earth Hour activities. School EcoTeams can develop and present the following events and initiatives to enhance Earth Hour:

- Whole school assembly
- Student eco-themed skits
- Student featured videos
- Talent show/coffee house
- Speaker series
- Student organized info booths
- Eco-themed spirit day

**Earth Hour Pledge:** Create a leaf, a light bulb, Earth, etc. to distribute to every student during your Earth Hour. Ask the students to write down their pledge to the environment, collect them, and display the pledges in a common area of the school.

**Monthly or Weekly Earth Hour Event:** Ask classes to designate one hour a week for their personal Earth Hour. Get creative and participate in Flashlight Fridays, Lights Out Lunches, or Turn Off Tuesdays.

**Steward of the Earth Awards:** Present students or classes who are actively engaged in positive environmental actions leading up to Earth Hour, such as turning off electronics and unplugging items at the end of the day, with “Steward of the Earth” awards.

**Earth Hour Campfire:** Create a campfire using recycled materials and flashlights. Sit around the campfire to share stories and sing campfire songs.

**Flashlight Yoga:** During, or leading up to, Earth Hour set up a yoga class and hand out flashlights to participants. Students can reflect on their Earth Hour pledges as they exercise, relax, and meditate.

**“I Will if You Will” Campaign:** Join the official Earth Hour campaign to encourage global action beyond the hour through challenges. Individuals and groups commit to do something for the planet, IF another individual or group also commits to an environmental initiative. The Earth Hour website has a collection of existing challenges that students can choose to be a part of or they can create their own challenges.

**Earth Hour Art Show:** Showcase a variety of student eco-themed art projects in one of the school’s high traffic areas. During Earth Hour, the EcoTeam can use flashlights to guide student groups through the exhibit.

## EcoSchools in ACTION!

*Holy Name (NCDSB)* has classrooms keeping a tally of every 42-minute teaching period when lights are turned off. The 42 minutes are converted to one Earth Hour, with the goal being to reach 750 Earth Hours by the end of the school year.

**Earth Hour Film Festival:** Set up a “movie theatre(s)” in your gymnasium, cafeteria, or library. Multiple films can be screened at once for different grade levels. Preview the films and provide guiding questions for student consideration. Hold follow up discussions to address central messages and themes.

### Suggested films:

**Primary/Junior** – The Lorax, FernGully:  
The Last Rainforest

**Junior/Intermediate** – Water Detectives (NFBC),  
Hoot, Climate (NFBC)

**Intermediate/Senior** – An Inconvenient Truth,  
The 11<sup>th</sup> Hour, Climate on the Edge (NFBC)

\*NFBC – National Film Board of Canada

# EARTH HOUR ELECTRICITY WALK<sup>1</sup>

Source: adapted from TDSB learning activity, *Electricity Walk*



**1** Take students on a walking tour around the school or community to learn about electricity, the electricity system or grid, and how electricity is generated. Modify this activity as appropriate for the grade of your students.

**2** Discuss the following terms: utility pole, power lines, and smart meter, to help students understand how these parts make up a larger, complex system. Reinforce safety measures for students, such as never touching power lines. While on your walk, have students identify the various terms (shown below).



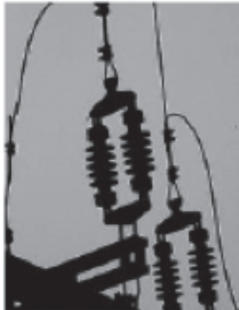





**Question: What role does each of these parts play in the electricity grid?**

**3** Discuss what natural resources are needed to build the different parts of the electricity system or grid (wood for poles, steel for transformers and conduit, copper for transformer windings and wire).

**Question: What are the impacts on nature when resources (for poles, steel, ceramics and copper) are extracted?**

**4** Discuss how we generate electricity for the grid (coal, uranium, natural gas, flowing water, wind, and sun).

**Question: What are the impacts on nature when sources of energy are used to generate electricity?**

<p><b>High voltage power lines on electricity pylon</b></p> 	<p><b>Utility pole</b></p> 	<p><b>Ceramic insulator</b></p> 	<p><b>Distribution transformer</b></p> 
<p><b>Ground transformer</b></p> 	<p><b>Weather head on building that receives service line</b></p> 	<p><b>Smart meter</b></p> 	<p><b>Circuit panel in the building</b></p> 

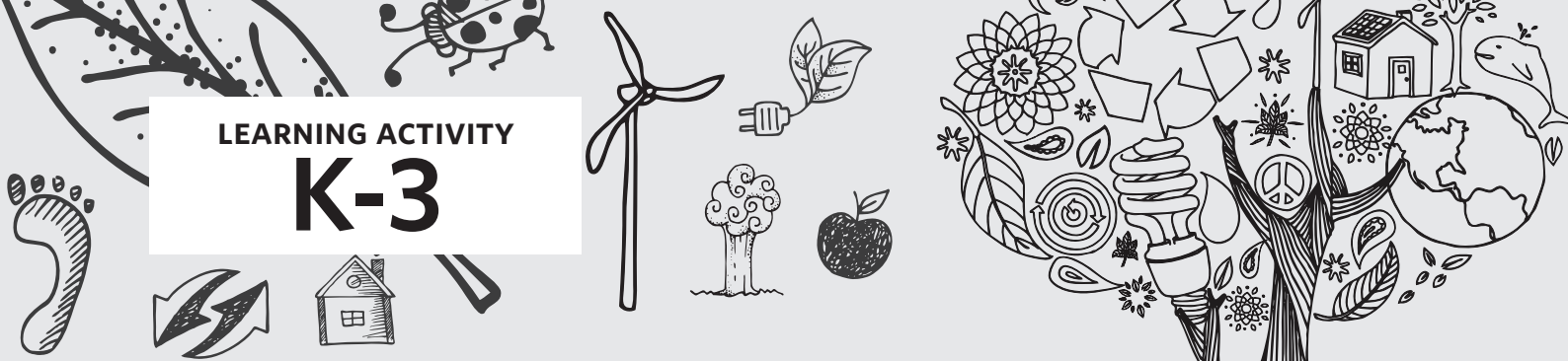
<sup>1</sup> Toronto District School Board. An Earth Hour Electricity Walk: EcoSchools. Pg. 1-2





## LEARNING ACTIVITY

# K-3



### Energy Output and Conservation

The following lesson corresponds with the Understanding Matter and Energy strand of the grade 1 Science & Technology curriculum. It can be adapted and modified to meet the curriculum requirements of other primary grades and to address appropriate learning strategies. For example, the activity's focus on hands-on inquiry meets Overall Expectation 2 in the Kindergarten Science & Technology curriculum and the conservation theme is connected to conserving water in the grade 2 Understanding Matter and Energy strand (Science & Technology).



## BIG ECOLOGICAL IDEA

**Adjusting the devices we use allows us to conserve energy.**

### LEARNING CONCEPTS

- **Use it only when we need it:** Being aware of the energy we use is very important because it allows us to use only what we need.
- **Turn it off when we don't need it:** We adjust lights and other electrical devices manually with on and off switches. Just as we can stop the flow of water running by closing the nozzle, we can stop the flow of electrical energy with a switch, or with the on/off button.
- **There are many ways to conserve energy:** When it is bright outside, enough light may enter our homes or buildings so that we can turn off lights inside to conserve energy. Before leaving school we shut off computer monitors.
- **When we save energy we help create a healthier environment** for people, plants, and animals. We also save fuel (resources) and money.

### CLUSTERING OF EXPECTATIONS

**EE SCOPE & SEQUENCE** lists environmental education opportunities in Grade 1 curriculum on pages 15 – 20.

**SCIENCE & TECHNOLOGY:** *Understanding Matter & Energy – Energy in Our Lives (2007)*

- 1.1 describe their own and their family's uses of energy; suggest ways to reduce personal energy consumption; and explain why it is important for people to make these choices
- 3.1 demonstrate an understanding that energy is what makes the things they do or see happen
- 3.4 identify everyday uses of various sources of energy
- 3.5 demonstrate an understanding that humans get the energy resources they need from the world around them and that the supply of many of these resources is limited so care needs to be taken in how we use them

## LEARNING ACTIVITIES

Source: Adapted from *Energy Output*, Mr. Collinson's Gr. 1 class website, Halton District School Board

### ENERGY OUTPUT

This lesson introduces students to the concept of energy outputs and invites students to begin to explore the electrical needs of devices used at home and the sources for that electricity.

#### Materials

- Toaster, fan
- Copies of handouts

#### Learning Skills & Work Habits

- Independent work, organization, responsibility

#### Readiness: Prior Knowledge & Skills

- Energy comes from the sun and things need energy to function.

#### Teaching/Learning Strategies

1. Gather students to look at a fan and a toaster. Discuss with students what is the source of energy for each appliance. Discuss how each has a different purpose.
2. Discuss the concept of "outputs." When you put energy into something you get an output (e.g., moving air from the fan, or heat from the toaster). What are some other examples of outputs? (TV = pictures on a screen; car = transportation; lamp = light).
3. Hand out and complete the "Output Worksheet" (p. 14) and discuss the answers.
4. Hand out the "Energy at Home" pamphlet (p. 15-16). Show students how to fold the piece of paper so it will form the pamphlet. Discuss with students the information that is needed to complete the booklet and that they will be collecting the information at home over the next week. Remind students of the importance of having an adult helper when doing this work.

## EXTENSIONS

Have students share their findings from their "energy at home" pamphlet. Brainstorm a list of ways to conserve energy at home and in the classroom.



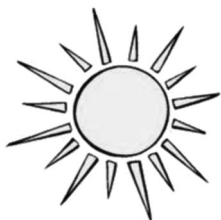
#### *Outdoor experiential learning extension*

Have students go outside and find energy inputs and energy outputs. Have students share their findings and discuss how plants and animals capture energy to survive.

# ENERGY INPUTS AND OUTPUTS

1. Draw lines to connect the energy inputs to where the energy is used.
2. Draw lines to connect where the energy is used to the energy outputs.

## ENERGY INPUTS



## ENERGY OUTPUTS

LIGHT

HEAT

MOVEMENT

SOUND

MOVEMENT

## SAVING ENERGY

After looking at all of the things that use energy in your home, the next step is to try to save energy. Saving energy helps our environment, so let's see what you can do!

What type of energy do you think your family can save?

\_\_\_\_\_

\_\_\_\_\_

How will you try to save energy at home?

\_\_\_\_\_

\_\_\_\_\_

*Draw a picture of how you can save energy at home.*



# Energy at home

NAME: \_\_\_\_\_



Some words you may find helpful:

electricity

furnace

solar

sun

light switch

faucet

wind

wires

water tank

water

outlet

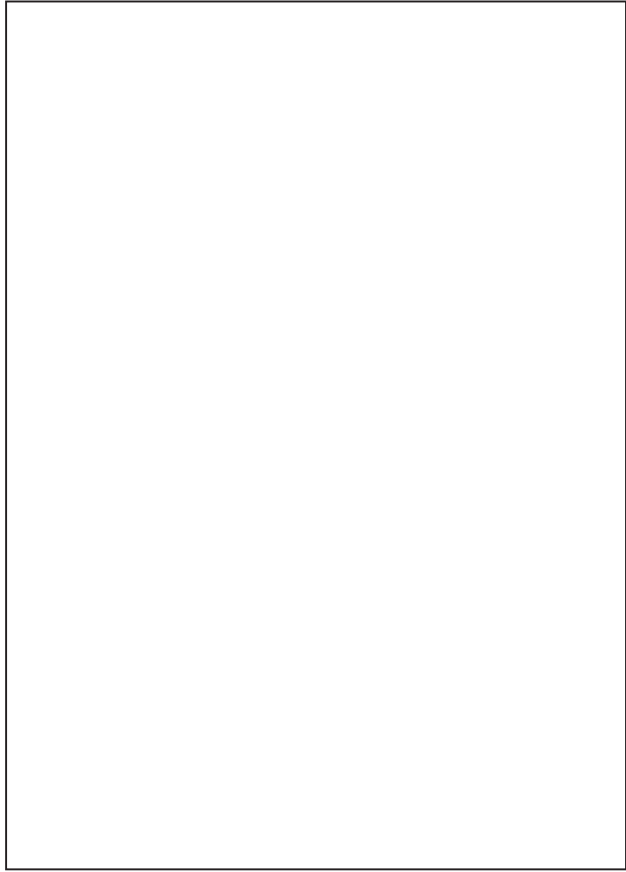
lights

## ENERGY SOURCES

Ask an adult if they can show you where the following things are in your home. Then fill in the information.

- my furnace is located \_\_\_\_\_
- my hot water tank is located \_\_\_\_\_
- electricity comes into my home from \_\_\_\_\_
- gas comes into my home from \_\_\_\_\_

*Draw a picture of one of the things mentioned above.*



## ENERGY AT HOME

*Some words you may find helpful:*

Electricity, solar, wind, water, sun, wires, furnace, water tank, light switch, outlet, faucet, lights

### Using Energy

For each of the things listed below, count how many you have in your home. Ask an adult if you need help.

<input type="checkbox"/>	Lights	<input type="checkbox"/>	Appliances	<input type="checkbox"/>	Faucets
<input type="checkbox"/>	TVs	<input type="checkbox"/>	Cars	<input type="checkbox"/>	Windows
<input type="checkbox"/>	Computers	<input type="checkbox"/>	Furnace vents	<input type="checkbox"/>	

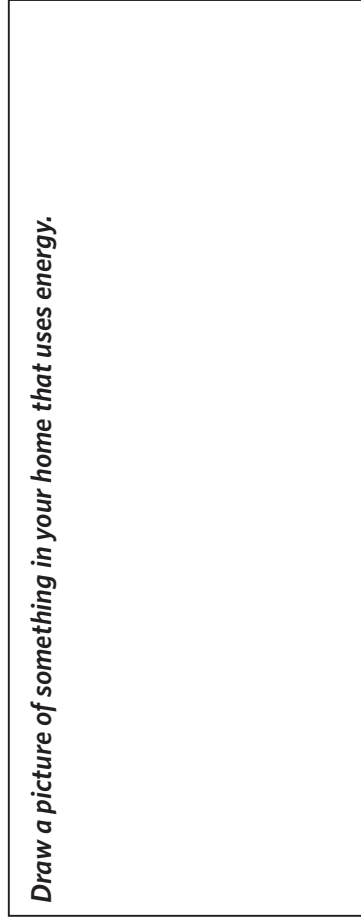
How many things in your home use gas?

How many things in your home use electricity?  
(you will probably have to guess)

How many things in your home use sun energy?  
(hint: all energy comes from the sun)

Do you have a fireplace? If so, what does it use?

*Draw a picture of something in your home that uses energy.*





## LEARNING ACTIVITY

# 4-8

### Trapping Energy: Building a Solar Oven

The following lesson corresponds with the Understanding Earth and Space Systems strand of the grade 7 Science & Technology curriculum. It can be adapted and modified to meet the curriculum requirements in grade 5's Conservation of Energy Resources in Understanding Earth and Space Systems, grade 6's Electricity and Electrical Devices in Understanding Matter and Energy and grade 8's Understanding Structures and Mechanisms (Science & Technology).

## BIG ECOLOGICAL IDEA

**Heat is a form of energy. This energy is becoming more costly, both economically and environmentally.**

### LEARNING CONCEPTS

- **Efficiency** is one of the best forms of energy conservation.
- In cold northern countries such as Canada, **conserving our heat energy is important.**
- **3 ways to lose heat:** There are three ways in which heat can escape from a building:
  - **conduction** of hot air to cool air through walls or windows (which can be reduced by insulation or double-glazing)
  - **infiltration** of cold air through cracks and holes in the building (cold air leaks in, letting warm air out – this can be reduced by caulking and weatherstripping)
  - **radiation** heat passing through a medium (which can be reduced by using an infrared reflective surface in walls and windows with an infrared reflective coating)
- Understanding the **thermal properties of heat** and the ways in which systems can be designed for maximum energy savings is important to promoting energy conservation.

### CLUSTERING OF EXPECTATIONS

**EE SCOPE & SEQUENCE** lists environmental education opportunities in Grade 7 curriculum on pages 50 – 56.

**SCIENCE AND TECHNOLOGY:** *Understanding Earth & Space Systems – Heat in the Environment (2007)*

- 1.1 assess the social and environmental benefits of technologies that reduce heat loss or transfer
- 2.3 use technological problem-solving skills to identify ways to minimize heat loss
- 2.4 use scientific inquiry/experimentation skills to investigate heat transfer through conduction, convection, and radiation

## LEARNING ACTIVITIES

Source: Adapted from *Trapping Energy: Building a Solar Oven*, Grade 7 Integrated Unit: Heat in the Environment, TDSB 2009.

### TRAPPING ENERGY: BUILDING A SOLAR OVEN

In this activity, students construct a pizza box solar oven and use it to bake a snack. The activity needs to be done on a sunny day, in a place that receives direct sunlight. The purpose is to help students understand the greenhouse effect by experiencing the basic idea of heat being trapped. The activity leads to discussion about greenhouse gases and the consequences of their increase.

#### Pizza Box Oven Construction Materials (per group)

- Clean, used pizza box
- Black construction paper
- Aluminum foil or inside-out potato chip bags
- Clear plastic (heavy plastic laminate works best)
- Non-toxic glue, tape, scissors, ruler, magic marker
- Wooden dowel or stiff straw

#### Learning Skills & Work Habits

- Initiative, collaboration, organization

#### Planning Notes

- Review the background material below and the process for making the pizza box ovens.
- Send home a letter to parents/guardians several weeks in advance so that students can bring the necessary materials to class.
- Find out about any food allergies in the class.
- Gather the materials required. Decide on the student groupings you will use, and photocopy the necessary number of handouts.

#### Prior Knowledge

- Review the key ideas about greenhouse gases and climate change.

#### Background

A common analogy to explain global warming is the greenhouse. Anyone who has ever walked into a greenhouse, or entered a car parked in the sun on a hot day has felt the greenhouse effect. Why is it hotter inside the car than outside? Because the air inside the car cannot circulate with the outside air and get dispersed, the heat inside the car increases. That's why opening all the windows cools the car. This is exactly how a greenhouse works.

A greenhouse admits the sun's energy, and then reduces or eliminates cooling by cutting off air circulation that would allow for the cooling process. As a result, the greenhouse heats up. This idea of heat being trapped is the basis for the comparison of the greenhouse to the Earth's atmosphere. Although the actual process is quite different, the analogy helps people understand the basic idea of heat being trapped, which is what building the solar oven will allow students to do.

The outputs of many human activities are gases such as carbon dioxide and methane. Once in the atmosphere, these gases (greenhouse gases) block heat from escaping into space. They are increasing the temperature on our planet. The consequences for ecosystems and societies may be severe.

### Teaching/Learning Strategies

1. Introduce the activity by asking students why a Thermos works and why car interiors get really hot in the summer. Then ask how they think a pizza box could be transformed into a solar cooker or oven.
2. Organize students into their groups and hand out copies of "How to Make Your Pizza Box Oven" (see p. 58). Review the instructions with them and then invite them to construct their ovens. Circulate to assist as required. As an alternative, consider the option outlined below.
3. Invite students to think of improvements they could make to the basic design to increase the inside temperature of the pizza box to make it more effective for baking.
4. Expect cooking times to be at least twice as long as normal cooking times. While the food is cooking, have students complete the "Pizza Box Oven Summary" (below).
5. Eating the food "fresh from the oven" is a great reward!
6. To end the activity, have a class debriefing. Invite students to discuss their oven's temperature and performance and their ideas for improving the design. Ask some questions, such as:
  - What did you learn about heat from making the pizza box oven?
  - What type of heat transmission was demonstrated?
  - Why do you think black construction paper was used? Aluminum foil?
  - What other types of heat transmission do we use to cook food?

### Alternative Option

Do not provide detailed instructions as outlined on "How to Make Your Pizza Box Oven." Instead, have students assemble and examine their materials. Provide students with questions that will be the basis for the construction project, e.g., "How could you use the materials collected to build an oven that used the sun's rays to cook food?"

Direct your students to brainstorm a solar oven design. Have them get permission before proceeding to the construction phase.

When students are testing their ovens, encourage them to use a two-column format to record their observations and questions.

#### Pizza Box Oven Summary

Have students create a sheet with the following information:

- Names of group members
- Special materials used
- A table with the columns "Observations" and "Questions." Record your findings.
- What worked well in your design?
- In what ways could you change or redesign your model to increase the temperature?



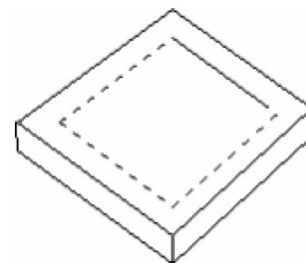
## HOW TO MAKE YOUR PIZZA BOX OVEN

### Materials

- Clean, used pizza box
- Black construction paper
- Aluminum foil or inside-out potato chip bags
- Clear plastic (heavy plastic laminate works best)
- Non-toxic glue, tape, scissors, ruler, magic marker
- Wooden dowel or stiff straw

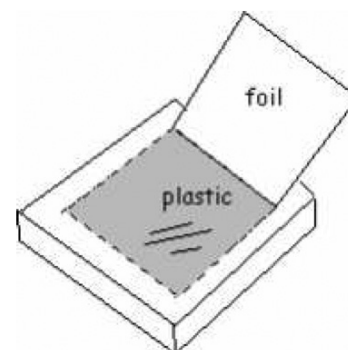
### Diagram 1

- Draw a 3-centimetre border around the sides and the top of the pizza box.
- Cut along the dotted lines shown to make a large flap. The solid line at the back of the box is uncut.
- Score the back solid line by drawing over it with a sharp pencil.



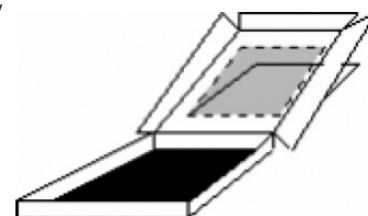
### Diagram 2

- Fold the flap back along the solid line.
- Cut a piece of aluminum foil to fit on the inside of the flap. Smooth out any wrinkles and glue into place.
- Cover the opening with transparent plastic. Tape it down so that the top of the pizza box can still be opened. The plastic cover should be tightly sealed so air cannot escape through the window when the top of the pizza box is closed.



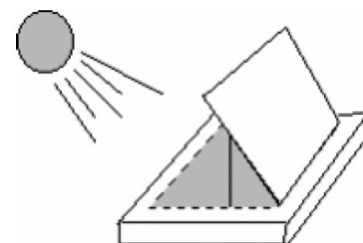
### Diagram 3

- Cut another piece of aluminum foil to line the bottom of the pizza box and carefully glue into place.
- Cover the aluminum foil with a piece of black construction paper and tape into place.



### Diagram 4

- Close the pizza box top (window), and prop open the reflecting flap of the box with a wooden dowel or straw and face towards the sun.
- Adjust the reflecting flap until the aluminum reflects the maximum sunlight through the window into the oven interior.
- Your oven is ready! You can try heating s'mores, English muffin pizzas, or hot dogs, or even baking cookies or biscuits. Test how hot your oven can get using two thermometers, one inside and one outside the pizza box.



## Resources



### **COMPARING INSULATION MATERIALS – WHAT MAKES THE BEST INSULATION?**

*Comparisons are a good way to observe what works best. In this activity, students test a variety of materials to compare their insulating properties.*

(Source: Energy Quest)

[www.energyquest.ca.gov/projects/insulation.html](http://www.energyquest.ca.gov/projects/insulation.html)



**BROKEN LINK?** Google search “Energy Quest Projects” → Science Projects → Saving Energy: Insulation

### **ENERGY CONSERVATION IN THE HOME**

*Students learn about ways to conserve energy in the home through building materials such as insulation, windows, shading techniques, and by using efficient appliances. The focus of the lesson is the significant causes of heat loss in the home.*

(Source: Infinite Power of Texas)

[www.infinitepower.org/pdf/No14%2096-813B.pdf](http://www.infinitepower.org/pdf/No14%2096-813B.pdf)



**BROKEN LINK?** Google search “Infinite Power of Texas” → Lesson Plans for Teachers → Middle School Units of Study: Energy Conservation in the Home

**PASSIVE SOLAR DESIGN FOR HOMES** *Students learn about using the right type of materials in a home to conserve energy and the importance of building orientation and window sizing.*

*Students will learn that simple measures, such as landscaping and installing thermal storage, make a big difference in energy consumption.*

(Source: Infinite Power of Texas)

[www.infinitepower.org/lessonplans.htm](http://www.infinitepower.org/lessonplans.htm)



**BROKEN LINK?** Google search “Infinite Power of Texas” → Lesson Plans for Teachers → Middle School Units of Study: Passive Solar Design for Homes



## LEARNING ACTIVITY

# 9-12

### CIVICS AND CITIZENSHIP, GRADE 10 OPEN

This learning activity can be modified and adapted to meet curriculum requirements in other grade levels and subject areas. Energy Conservation Campaigns can take place in English, Science, Social Studies & Humanities classes among others, allowing the core principals to remain the same with different learning objectives.

## ACTIVE CITIZENSHIP WITHIN THE SCHOOL COMMUNITY: ENERGY CONSERVATION CAMPAIGN

### Overview

In this learning activity, students will develop active citizenship skills by designing, implementing, and participating in an energy conservation campaign. This learning activity will focus on energy conservation as an example. Students are welcome to select a different environmental action. Students will reflect on the success of the campaign and on their role as an active citizen.

### Curriculum Links

- Overall Expectations – A1, B1, C1, C3
- Specific Expectations – A1.1, A1.5, B1.1, B1.2, B1.3, B1.4, C1.2, C1.3, C3.2, C3.3, C3.4

*Concept of Political Thinking – Stability and Change, Objectives and Results*

*Citizenship Education – Active Participation, Attributes*

### Planning Notes

#### Prior Learning

Students should be familiar with the concepts of civic action, activism, and the common good. Students should be aware of environmental issues, such as climate change, pollution, and resource depletion. Students should be comfortable working in groups.

#### Materials

- Access to a computer/laptop or other device and internet connection
- Projector and speakers
- Markers
- Chart paper
- Copies of *Planning an Environmental Action Campaign Worksheet* (Appendix 1)
- Copies of *Environmental Action Campaign Exit Card* (Appendix 2)

**Recommended Class Time: 8-9 periods**

- Planning – 2-3 periods
  - 1 period – discuss energy conservation, electricity consumption at school, explain the activity, and select an energy conservation campaign idea.
  - 1-2 periods – plan an energy conservation or environmental action campaign, assign roles, and seek permission.
- Implementation and Monitoring – 5 periods
  - 5 periods – implement an Action Plan for a Weeklong Environmental Action Campaign (table in Appendix 1), monitor the results of the campaign, check in with students regarding perceived barriers and successes, and analyze what parts of the campaign are working and why.
- Debrief – 1 period
  - 1 period – debrief the energy conservation or environmental action campaign, celebrate successes, share outcomes of the campaign with whole school community, and complete *Environmental Action Campaign Exit Card* (Appendix 2).

**Student Tasks**

1. Watch the Ontario Ministry of Energy’s video, **The Value of Conservation**. Discuss the benefits of energy conservation and draw connections between electricity consumption in homes and electricity consumption at your school. Consider asking students the following questions:
  - What is energy conservation?
  - What might be a benefit of using fewer raw materials to make electricity?
  - Why might you care about electricity consumption in your home?
  - Why might you care about electricity consumption at school?
  - How does this video connect to your experience at school?
  - What is environmental responsibility?
  - What is your responsibility?
  - What energy conservation practices do you already participate in at home? How might you extend those practices into the school environment?
2. Take a moment to reflect on your discussion. Direct students to the idea that they can initiate change at their school. Consider asking students:
  - What changes might you like see in your school’s energy conservation practices?
  - How would you go about changing your school’s current energy conservation practices?
3. Share with students that they will be planning, implementing, and participating in a weeklong energy conservation campaign. Ask students, working in groups of 4 or 5, to brainstorm energy conservation campaign ideas. Distribute chart paper and markers. Inform student groups that they should be prepared to share one or two ideas with the class.

4. If needed you can jumpstart the group discussions by suggesting that students organize a school-wide lights-off campaign; a daily power hour; or a campaign around reducing standby electricity consumption at the school. Consider finding examples of successful energy conservation campaigns in the Ontario EcoSchools online community and sharing them with your students. Circulate, answer questions, and observe students at work (Assessment For Learning).
5. Ask that a representative from each group share one or two energy conservation campaign ideas with the class. Write all student ideas down on the board.
6. Narrow down the energy conservation campaign ideas. To this end, consider asking students the following questions:
  - When you consider the various energy conservation campaign ideas listed here, how would you rank them from easiest to most difficult to carry out?
  - Which option do you think would have the greatest impact?
  - How would you communicate the goals of each campaign to the wider school community? What 'hooks' would you use to generate interest and increase participation?
  - If you were to implement this course of action, what impact might it have on the school community?
7. Once you have consensus, begin planning the energy conservation campaign. Distribute copies of *Planning an Environmental Action Campaign Worksheet* (Appendix 1). Read through the worksheet with students and answer any questions related to the activity. Complete the worksheet as a class. Discuss the goal of the campaign, your communication strategy, how you will implement the campaign, potential barriers, and how you intend to measure success. This may take a couple periods. Remind students that it is essential to get the school's administration on board before initiating any part of the campaign. **Variation:** Invite students to break into smaller groups. Each group will take on one aspect of the campaign (communication, monitoring, etc.). Assign roles to each student, such as team leader, project coordinator, scribe, etc. Come together as a class and complete the *Planning an Environmental Action Campaign Worksheet* (Appendix 1).
8. Once the *Planning an Environmental Action Campaign Worksheet* (Appendix 1) is complete, create an oversized version of the Action Plan for a Weeklong Environmental Action Campaign (table in Appendix 1). Display the Action Plan prominently in the classroom.
9. Assist student in implementing their Action Plan and in monitoring the results of their energy conservation campaign. Check in often with students regarding perceived barriers and successes. Determine what is working, what isn't, and why. Continue to adjust the campaign delivery accordingly. This process may take several periods.

10. Once your campaign has drawn to a close, debrief the activity with students. Organize student desks in a manner conducive to class discussion. Have students share in an informal way their role in the energy conservation campaign and what major learning took place (Assessment For Learning). Consider asking students the following questions to facilitate the discussion:
  - What was your contribution to the energy conservation campaign?
  - What do you feel worked well? Why?
  - What could be improved in the future?
  - Why should we engage in environmental action?
  - What are some other ways you can contribute to the school community?
  - How might engaging in environmental action contribute to the common good?
11. Celebrate the success of your campaign with your students. Consider sharing the outcome of the campaign with the whole school community (e.g. posters, announcements, open thank-you letter posted in the cafeteria, etc.).
12. Before students leave for the day, distribute copies of the *Environmental Action Campaign Exit Card* (Appendix 2). Ask students to reflect on their participation in the campaign, the campaign itself, and whether or not the campaign was a success (Assessment As Learning).

**Extension**

- Repeat the campaign at a different time during the school year to see if the results change. Consider what was discussed during the debrief and implement suggested improvements to the campaign.
- Mentor a neighbouring school in the creation, implementation, and monitoring of a similar energy conservation campaign.

**Appendices**

Appendix 1 - *Planning an Environmental Action Campaign Worksheet*

Appendix 2 - *Environmental Action Campaign Exit Card*

**NAME**

**DATE**

**PLANNING AN ENVIRONMENTAL ACTION CAMPAIGN WORKSHEET**

Environmental issue being addressed \_\_\_\_\_

Campaign objectives

How do you intend to accomplish your objectives? List specific strategies.

What changes do you anticipate will result from specific strategies in your plan?

**COMMUNICATION**

Campaign name \_\_\_\_\_

How will you communicate your environmental message? What 'hooks' will you use to engage fellow students?

How will you get the word out and inspire participation in the environmental action campaign?

**PLANNING AN ENVIRONMENTAL ACTION CAMPAIGN WORKSHEET**

**IMPLEMENTATION**

Consider all that needs to be done, make a list, and assign names to specific tasks. Complete the Action Plan for a Weeklong Environmental Action Campaign below.

<b>ACTION PLAN FOR A WEEKLONG ENVIRONMENTAL ACTION CAMPAIGN</b>					
	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
Actions (actions can be similar for multiple days)					
Indicators of success					
Who is responsible?					
Resources needed					
Results*					

*\*to be completed at the end of each day*

**PRINCIPAL'S SIGNATURE**

**MONITORING SUCCESS**

How would you know if your environmental campaign is making a positive difference?

How will you track change at the school?

How will you let the school know if change is taking place?



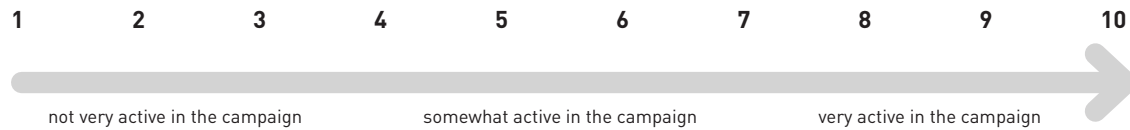
NAME

DATE

**ENVIRONMENTAL ACTION CAMPAIGN EXIT CARD**

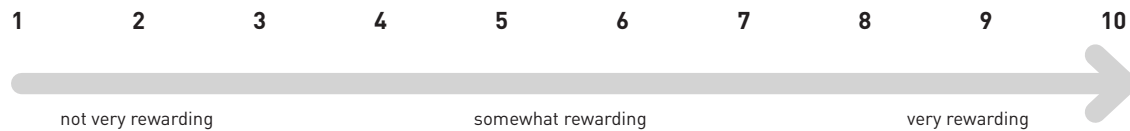


1. Circle the number that you feel best describes your participation in the campaign



In 30 words or less, name the aspects of the campaign you worked on

2. Circle the number that best describes your feelings about the overall campaign



3. Do you feel the campaign was a success?

- YES
- NO

In 30 words or less, explain your answer