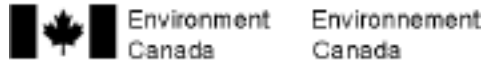


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*20/20 wishes to acknowledge
and thank its partners:*



Clean Air Champions
Clean Air Foundation
Enbridge Gas Distribution
Eneract
GO Transit
Smart Commute Association
Green Communities Association

Greenest City Environmental Organization
Residential Energy Efficiency Project
Toronto Environmental Alliance
Toronto Hydro
Toronto Transit Commission
WindFall Ecology Centre



75 Elizabeth St.
Toronto, ON M5G 1P4
Tel: 416-338-1288 or Fax: 416-338-0616
Toll Free Hotline: 1-866-583-2020
E-mail: 2020@cleanairpartnership.org
Web site: www.cleanairpartnership.org/2020

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▶ 20/20 THE WAY TO CLEAN AIR: TEACHER'S GUIDE OVERVIEW

Thank you for registering your class to participate in *20/20 The Way to Clean Air*. The 20/20 program provides you with free 20/20 Planners for your students to take home and engage their families in activities that will reduce home energy use and vehicle use by 20%.

This Teacher's Guide has been developed in response to valuable feedback from educators. It has been created to increase the success of the program by helping teachers involve students in 20/20 activities.

This guide has five components

HOW TO PARTICIPATE

1. **How to Participate** – provides instructions to the teacher for involving students and their families in the 20/20 program (page 2).
2. **Making Connections** – makes connections to the Ontario Curriculum (page 4).

ENRICHING THE 20/20 PROGRAM

3. **Developing Understanding** – outlines an in-school energy saving program designed to support the activities of the 20/20 Planner (for home use). This section includes the 20/20 School Energy Savings Checklist (page 12) and the 20/20 School Transportation Challenge (page 13).
4. **Classroom Extensions** – includes additional curriculum connected activities and ideas to complement the 20/20 program and the curriculum (page 15).
5. **Continuing the Commitment** – provides related website links and suggested classroom resources (page 22).

▶ 20/20 THE WAY TO CLEAN AIR: HOW TO PARTICIPATE

Here are the seven basic steps to facilitating this program for your students.

- 1 Read through the 20/20 Planner that you will be sending home with your students.**
(see hard copy or view it on-line at www.cleanairpartnership.org/2020)
- 2 Select the month that your classroom will be participating.**
You may want to choose a time that corresponds with a lesson plan on resource and energy use, transportation, climate change, health education topics, and/or the environment in general. It could also be used as a take-home exercise for Earth Week (April), Clean Air Day (June) or International Walk to School Day (October).
- 3 Order 20/20 Planners for each student in the classroom.**
Contact the Regional Coordinator for the 20/20 campaign at:
The Clean Air Partnership,
email: 2020@cleanairpartnership.org,
tel: 416-338-1288 or 1-866-583-2020.
Note: Hard copies are available only for schools within the Greater Toronto Area. Schools outside of this area can download the 20/20 Planner from the website and photocopy for students, or purchase them for the cost of printing.
- 4 Distribute the 20/20 Planners to each student to take home.**
Review the Planner carefully with students prior to sending home to ensure that they understand how to implement the activities at home.
- 5 Allow two weeks for participation.**
Announce the date that you want the Planner activity forms returned.
- 6 Collect completed forms from students, photocopy them and mail originals to:**
20/20 The Way to Clean Air
The Clean Air Partnership
75 Elizabeth Street
Toronto, Ontario M5G 1P4
- 7 Please leave a copy of the activity forms with the students to take home.** The forms can serve as a reminder for families to continue with their clean air actions.

Based on the completed activity forms, CAP will follow-up with 20/20 participants who indicated they are interested in helping to evaluate the 20/20 program in order to calculate the amount of air pollution and greenhouse gas emissions reduced as a result of 20/20 actions.

As well, upon return of Stage One forms classrooms will be receive a recognition certificate and each student will receive a 20/20 magnet and bookmark. 20/20 Classroom that return their Stage One forms will also be entered into a random draw for 20/20 prizes.

Enriching the 20/20 program

Using ideas and activities from this guide, initiate an energy conservation program for students at school. The school-based activities outlined in the **Developing Understanding** section will help to introduce students to the concepts and actions they will be undertaking at home. **Classroom Extensions** and **Continuing the Commitment** sections provide you with additional classroom activities and resources on energy use and active transportation.

Recognition Banner for Participating Schools in the Greater Toronto Area (48" x 29")



▶ 20/20 THE WAY TO CLEAN AIR: MAKING CONNECTIONS

The 20/20 program can help you meet curriculum expectations!

This program has direct connections to the Ontario Curriculum in several grades and subject areas, including Science and Technology, Social Studies, Mathematics and Oral Language. The strongest ties exist with the Grade 5 Conservation of Energy unit. Below are some of the expectations that can be taught through, or incorporated as part of, students' participation in *20/20 The Way to Clean Air*.

SCIENCE AND TECHNOLOGY CONNECTIONS

Grade 5 Science and Technology

Strand: Energy and Control — Conservation of Energy

Overall Expectations:

- ▶ demonstrate an understanding of the importance of conservation of energy in relation to the wise use of renewable and non-renewable energy sources;
- ▶ evaluate the reasons for conserving natural resources and identify possible ways of conserving energy.

Specific Expectations:

- ▶ formulate questions about and identify needs and problems related to protection of the natural environment, and explore possible answers and solutions (e.g., investigate how local recycling efforts help conserve energy and natural resources);
- ▶ compile data gathered through investigation in order to record and present results, using tally charts, tables, and labeled graphs produced by hand or with a computer (e.g., list the names of some devices used in the home that change energy from one form into another, and record in a table the types of energy transformations for each device);
- ▶ list various sources of energy and identify them as renewable (e.g., sun, wind, tides, wood) or non-renewable (e.g., coal, natural gas, oil);
- ▶ describe the advantages and disadvantages of using renewable energy sources as opposed to non-renewable sources;
- ▶ identify the forms of energy (e.g., mechanical, electrical) used in the home, school, and community and identify the energy source for each (e.g., wood, coal, moving water);

- ▶ describe how we use different natural resources as sources of energy and evaluate the effect of their use on natural and human-made environments (e.g., in using fossil fuels such as natural gas for heating our homes we deplete natural resources but improve our quality of life);
- ▶ explain ways in which technological innovations affect our use of natural resources and increase or decrease our ability to conserve energy (e.g., home insulation allows us to conserve heat and reduce consumption of energy from non-renewable sources);
- ▶ identify ways humans use energy, evaluate the economic and environmental costs of each, and describe ways to avoid wasting energy (e.g., lowering the thermostat during the night);
- ▶ identify design features that improve the energy efficiency of buildings, devices, and systems (e.g., double glazing).

Grade 6 Science and Technology

Strand: Energy and Control — Electricity

Overall Expectations

- ▶ identify uses of electricity in the home and community and evaluate the impact of these uses on both our quality of life and the environment.

Specific Expectations

- ▶ compile data gathered through investigation in order to record and present results, using tally charts, tables, labeled graphs, and scatter plots produced by hand or with a computer (e.g., record in a journal all daily uses of electrical energy for a week, classify the various uses, and present the findings using tables and graphs);
- ▶ identify sources of electricity and state whether the sources are renewable or non-renewable;
- ▶ describe conditions that could affect the consumption of electrical energy in the home and at school (e.g., seasonal variations in heat and light requirements);
- ▶ develop a plan for reducing electricity consumption at home or at school, and assess how this change could affect the economy (e.g., jobs) and our use of natural resources.

Grade 7 Science and Technology

Strand: Energy and Control — Heat

Specific Expectations:

- ▶ identify and describe steps that can be taken to conserve energy (e.g., using insulation) and the reasons for doing so (e.g., rising fuel costs);
- ▶ identify the components of a system that are designed to transfer heat energy (e.g., in a room, a house, or a shopping centre) and describe methods for conserving energy within that system.

SOCIAL STUDIES/GEOGRAPHY CONNECTIONS (revised 2005 expectations)

Grade 3 Social Studies

Strand: Canada and World Connections — Urban and Rural Communities

Specific Expectations:

- ▶ compare land use (e.g., housing, recreation, stores, industry) and access to natural resources (e.g., water, trees) in urban and rural communities;
- ▶ compare transportation in urban and rural communities;
- ▶ describe ways in which they and their families use the natural environment (e.g., playing in the park, growing food, drawing on nature for water and energy);
- ▶ compare the characteristics of their community to those of a different community (e.g., with respect to population density, services, recreation, modes of travel to isolated northern and First Nation communities).

Grade 7 Geography

Strand: Natural Resources

Overall Expectations:

- ▶ describe positive and negative ways in which human activity can affect resource sustainability and the health of the environment.

Specific Expectations:

- ▶ explain the concept of sustainable development and its implications for the health of the environment;
- ▶ produce a report (e.g., newspaper, television, website) on the factors that affect the future availability of natural resources (e.g., overfishing, clear-cut logging, urban sprawl, accessibility of resource deposits).

MATHEMATICS CONNECTIONS

Grade 5 Mathematics

Strand: Data Management

Specific Expectations:

- ▶ design surveys, collect data, and record the results on given spreadsheets or tally charts;
- ▶ display data on graphs (e.g., line graphs, bar graphs, pictographs, and circle graphs) by hand and by using computer applications;
- ▶ construct labelled graphs both by hand and by using computer applications;
- ▶ evaluate data presented on tables, charts, and graphs and use the information in discussion (e.g., discuss patterns in the data presented in the cells of a table that is part of a report on a science experiment).

Grade 6 Mathematics

Strand: Data Management

Specific Expectations:

- ▶ design surveys, organize the data into self-selected categories and ranges, and record the data on spreadsheets or tally charts;
- ▶ construct line graphs, bar graphs, and scatter plots both by hand and by using computer applications;
- ▶ make inferences and convincing arguments based on the analysis of tables, charts, and graphs.

Grade 7 Mathematics

Strand: Data Management

Specific Expectations:

- ▶ collect and organize data on tally charts and stem-and-leaf plots, and display data on frequency tables, using simple data collected by the students (primary data) and more complex data collected by someone else (secondary data);
- ▶ read and report information about data presented on bar graphs, pictographs, and circle graphs, and use the information to solve problems;
- ▶ describe data using calculations of mean, median, and mode; make inferences and convincing arguments that are based on data analysis (e.g., use census information to predict whether the population in Canada will increase).

Grade 8 Mathematics

Strand: Data Management

Specific Expectations:

- ▶ read and report information about data presented on line graphs, comparative bar graphs, pictographs, and circle graphs, and use the information to solve problems; construct line graphs, comparative bar graphs, circle graphs, and histograms, with and without the help of technology, and use the information to solve problems (e.g., extrapolate from a line graph to predict a future trend);
- ▶ make inferences and convincing arguments that are based on data analysis.

There are additional mathematics expectations that can be addressed through the 20/20 program, particularly in the Number Sense and Numeration strand with understanding and calculating percentages.

▶ 20/20 THE WAY TO CLEAN AIR: DEVELOPING UNDERSTANDING

We all know that students learn best by doing. This section outlines *an action-based in-school program* that introduces important concepts and supports the 20/20 Planner.

Why should I incorporate this optional component?

- ▶ Activities can easily be linked to the Mathematics, Science and Technology, Social Studies or Language curriculum.
- ▶ Through the in-school program, students will become familiar with activities of the 20/20 Planner and be able to effectively lead these activities at home.
- ▶ This in-school experience is particularly valuable for students with **low literacy levels**, or students whose primary home language is not English (**ESL students**).
- ▶ Activities in this section will support schools in conserving energy and becoming more environmentally responsible.

School-based Energy Program

1 Where are we at?

Students conduct an EcoReview to determine where energy conservation can be improved at school (see Appendix, or go to pages 7, 8 and 15 of the EcoSchools *Energy Conservation Guide*). The EcoSchools

program is online. For the TDSB version go to <http://ecoschools.tdsb.on.ca>; for the Ontario version, visit www.yorku/ecoschl. If the school has an EcoTeam in place, compare the students' results with those of the EcoTeam (assuming that the team has conducted an energy audit).

Mirrors 20/20 (home) Planner experience of students observing places around their home where it is possible to conserve energy.

2 Who can we count on?

Students hold a meeting to summarize the findings of their EcoReview. They invite the principal, caretaker, members of the school EcoTeam and other interested parties. Principals and caretakers are important contributors at this meeting. Their support and knowledge of the inner workings of the school will contribute to the success of the plan.

3 What action can we take?

The team selects several activities from the School Energy Savings Checklist (see page 12 in this guide) that can be done for a two-week period. If the school has an EcoTeam

that has started energy conservation, have the class determine where/how it can complement energy conservation actions already in place.

Mirrors 20/20 (home) Planner experience of students talking with their families to select areas for energy conservation.

4 Can we make a difference in two weeks? Students spend two weeks committed to the activities chosen from the School Energy Savings Checklist. This can be accomplished by selecting energy saving teams to undertake the actions, such as checking for “lights-out” at recess, turning computer monitors off after school, creating posters to let other students know what is happening, making morning announcements on the PA, or closing curtains at night.

Mirrors 20/20 (home) Planner experience of families spending two weeks committed to the energy saving activities that they have selected.

5 How did we do? Can we keep going? At the end of two weeks, the class and interested parties come together to review their progress and accomplishments. Is it possible to “go the distance” by extending these energy saving activities beyond two weeks, or by adding new ones? (See Classroom Extensions on page 15 in this guide for ideas).

Mirrors 20/20 (home) Planner experience of families reviewing their accomplishments after two weeks, and deciding if they would like to “go the distance” and continue with Stage 2 actions.

6 How does this link to the 20/20 Planner that goes home with students? The teacher reviews the activities outlined in the 20/20 Planner with the students. Students discuss similarities to and differences from their in-school energy conservation activities. They brainstorm potential difficulties at home and suggest possible solutions/modifications for success (particularly with students in apartments, condos and rental units).

Prepared with hands-on, practical background knowledge, students take the 20/20 Planner home to participate with their families!

Alternate Option

An option for students who are unable to participate at home is to conduct a review of the school's energy use by using the School Energy Savings Checklist (page 12 in this guide) concurrently with students conducting the 20/20 home program. Both groups can then gain an understanding of energy conservation by sharing their experiences of the successes and challenges of implementing the program at home and in school.

School-based Transportation Program

1 Where are we at?

Students conduct a survey of staff and students to determine how people travel to and from school. (See School Transportation Challenge Worksheet on page 13).

Mirrors 20/20 (home) Planner experience of students estimating and understanding their own family's vehicle use.

2 What action can we take?

Students and staff are challenged to choose an environmentally-friendly mode of transportation to and from school for two weeks.

Mirrors 20/20 (home) Planner experience of students planning to reduce family driving in several categories.

3 Who passed the test?

At the end of the two-week period, students tally the number of students and staff who successfully changed their transportation patterns to and from school. Students use basic math skills to determine the percentage of students and staff who “passed the test.”

Mirrors the 20/20 (home) Planner experience of evaluating the family's reduction achievements at the end of the two-week period.

4 How did we do? Can we keep going? Students evaluate their success using the discussion questions at the bottom of the School Transportation Challenge worksheet. Can the staff and students remain committed to reducing their transportation energy use beyond two weeks?

Mirrors the 20/20 (home) Planner experience of a family's decision to make a long-term effort to reduce driving beyond two weeks.

Launch a Challenge!

1. Propose a student vs. staff transportation challenge. Which group can have a larger percentage of people choosing more environmentally-friendly travel to and from school? This two-week challenge can be graphed/charts daily. The element of friendly competition may inspire and motivate staff and students alike to try alternative travel options.
2. Launch the School Transportation Challenge at the same time that you send 20/20 Planners home with students. The School Transportation Challenge complements the Two-week Transportation Reduction Plan outlined in the 20/20 Planner.

Stage One — Two-week Plan

School Energy Savings Checklist

School _____ Grade _____ Teacher _____

*This energy savings challenge is closely based on the EcoSchools Energy Conservation EcoReview.
(To review this form, see the Appendix.)*

Energy Savings Activity

WILL DO THIS FOR 2 WEEKS

- Turn off computer monitors each night in our classroom
- Turn off computer monitors each night in all other classrooms and/or computer lab
- Close curtains each evening to conserve heat in our classroom
- Close curtains each evening to conserve heat in all classrooms
- Turn lights off when no one is in our classroom
- Turn lights off when we have enough daylight to work with
- Turn lights off at recess/lunch/end of the day in all classrooms
- Turn lights off in gymnasium and resource centre when not in use
- Keep vents/heaters free of obstructions in our classroom
- Keep vents/heaters free of obstructions in other classrooms/resource centre/staff room
- Keep windows closed during cold weather to conserve heat in our classroom
- Keep windows closed during cold weather to conserve heat in all classrooms
- Check for and monitor taps in washrooms for drips and leaks, and report to caretaker
- Monitor outside doors during recess/lunch/dismissal to ensure that doors are not left open longer than necessary
- Monitor average temperatures in each classroom and other parts of the school (do you notice any patterns?)
- Bring “cold” lunches to school 2 times per week (or more!) to reduce use of classroom microwave

Once you have completed Stage One, decide whether you will be “going the distance” with Stage Two. Check 1. or 2. below.

- 1. We have completed Stage One but will not be continuing our actions beyond two weeks.

OR

- 2. We have completed Stage One and are going the distance by continuing our actions beyond two weeks, and/or participating in new actions outlined in the **Classroom Extensions** or **Continuing the Commitment** section of this guide. We will join other schools in our region by doing our best to reduce school energy use.

Two-week Challenge

School Transportation Challenge

School _____ Grade _____ Teacher _____

3 steps to reduce driving and save transportation energy

STEP 1 Estimate and understand how students/staff travel to school

A. Survey the students in your class/school. Tally how many students:

- _____ are driven to school
- _____ take public transit to school
- _____ take the school bus to school
- _____ walk/cycle to school
- _____ carpool to school

B. Survey the staff in your school. Tally how many staff members:

- _____ drive to school
- _____ take public transit to school
- _____ walk/cycle to school
- _____ carpool to school

STEP 2 Set a 20% reduction challenge for your school!

Challenge students to reduce driving trips to school by 20% for two weeks!

C. How many students who are driven to school each day tried another option for two weeks?

- _____ Used public transit to travel to school
- _____ Walked/cycled to school
- _____ Joined a “walking school bus” to travel to school
- _____ Carpooled with other students to travel to school

Challenge staff members to reduce driving trips to school by 20% for two weeks!

D. How many staff members who usually drive to school tried another option for two weeks?

_____ Staff members carpooled together to come to school

_____ Staff members walked/cycled to school

_____ Staff members took public transit

STEP 3 Find out if your school achieved a 20% reduction by completing the calculations below:

$$\frac{\text{Add TOTAL \# of students/staff from sections C. and D.}}{\text{Add \# of students/staff who are driven/drive to school from A. and B.}} \times 100 = \text{[]}$$

If your final calculation is greater than 20, congratulations!

Your school did it!! If it lower than 20%, what are the reasons for this?

Are there other ways for your school to meet this goal?

▶ 20/20 THE WAY TO CLEAN AIR: CLASSROOM EXTENSIONS

These activities are designed to extend and apply the concepts learned in *20/20 The Way to Clean Air*. The activities range in difficulty, preparation time and concept focus.

ACTIVITY 1

Did you know?
(Science and Technology, Language)

The 20/20 Planner is filled with interesting facts about energy conservation. Students use their experience, internet research or class notes to create their own “Did you know?” display board in the classroom.

ACTIVITY 2

Imagery and Symbolism
(Art)

The 20/20 Planner uses clever imagery on the front and back covers. What are the messages in each of these designs? How have the artists used symbolism/imagery to portray their message?

Students should design their own energy poster using symbolism or imagery. What “clever” way can they share their message? An energy saving *poster contest* would be fun and informative!

ACTIVITY 3

**Exploring the 20/20
Planner Connector Section**
(Language, Computer Skills)

Students choose an energy saving activity that they focused on with their family. Using the connector section at the back of the 20/20 Planner, students should research a listed service that takes their energy saving activity to the next level.

Example:

In a family that conserved energy by biking together to do errands (in the initial program) instead of driving the car, the student could follow up on this experience by exploring the Walk/Bike Topic section in the 20/20 Connector. The student may use the CAN-BIKE contact information to determine the content of the safety course and when/where it is being offered.

ACTIVITY 4

Linking with the School EcoTeam or Creating an EcoSchools Council (Leadership, Language)

Share the ideas in the 20/20 Planner with the whole school through your school's EcoTeam. If you don't have an EcoTeam and the conditions aren't right to assemble one, consider establishing an EcoSchools Council. Similar to a School Council, the EcoSchools Council would have interested environmental representatives from each classroom. Information and energy saving activities from the 20/20 program can be shared with the representatives. These representatives would then take the program back to their own classrooms for implementation.

The EcoSchools Council could also launch and coordinate other energy saving campaigns around the school. Some possible ideas: Anti-Idling Week, Walk-to-School Week, School Ground Naturalization project, Litterless Lunch campaign, and a Composting Program.

ACTIVITY 5

Making Energy Savings Real (Science and Technology)

Carry out a simple experiment to find out how much energy is needed to make a mug of hot chocolate, and how much energy can be saved by boiling only the amount of water needed for this drink instead of boiling a full kettle. This could be done as a demonstration or by groups of students. You will need an electric kettle, digital watch, hot chocolate and mug.

Step 1: Find the label on the kettle stating its power rating (in watts).

Step 2: Pour a mug of water into the kettle. Check to see if it covers the element, and if not, add a little more. Plug the kettle in and switch it on, and time how long it takes for the water to boil a single mug of water. Then fill the kettle completely and time how long it takes for it to boil.

Step 3: Ask the students to work out how much of a kilowatt hour was needed to boil each amount of water. To calculate kilowatts per hour, multiply the power rating (on the label) by the fraction of an hour taken to boil the water (3,600 seconds in an hour).

Step 4: Students calculate how much electricity would be wasted in a year if a full kettle was always boiled when they only needed a mug.

Step 5: To help students understand the significance of the energy waste, students could calculate the money saved by boiling only the amount needed. To calculate the money saved, students need to know that one kilowatt hour of electricity costs about 5.5 cents.

Step 6: Enjoy the hot chocolate!

Conclusion/Debrief: What did we learn from this experiment? How can we use these results to influence our choices and actions in our homes?

ACTIVITY 6

Active Transportation News Program (Language, Health, Drama)

Create a news program with segments on the benefits of active transportation to school.

Step 1: Students form into news teams. Each team develops a script related to active transportation to school. Topics could include safety tips, health benefits, environmental impacts, safe neighbourhoods, interesting routes and trails in the area, etc.

Step 2: News teams develop their script into a newsworthy presentation. This could include visuals, on-the-scene interviews, and location shots.

Step 3: Two students are chosen to be anchor people to organize and introduce the different segments.

Step 4: Students present their work as an Active Transportation News Show. If possible, videotape the performance.

Step 5: Screen the video for the class/school.

This could be used as a tool to launch a walk/cycle to school campaign.

Conclusion/Debrief: While screening the video, students evaluate their own performance and assess the development of their dramatic skills. Students discuss the role of media in influencing opinion and action. How can media be used effectively to support the campaign for clean air?

(Adapted from www.goforgreen.ca/asrts)

ACTIVITY 7

The Energy Impact of Windows (Science and Technology)

Investigate the impact of windows on the temperature in a house. Students could work in groups for this activity. Each group will need a small corrugated cardboard box (of similar sizes), clear plastic bag, scissors, tape, white paper or paint, desk light with normal bulb, watch, pen and notebook.

Step 1: Students will need to make a 'house' with a window. To do this, they will need to seal all gaps in the box and cut a window out of the side. The windows should be different sizes so the class can compare their results.

Step 2: Students seal the window with the plastic bag, make the outside of the box white and cut a small

hole in the top of the box to insert the thermometer.

Step 3: Students then need to place the model house on a flat surface with the solid back facing the lamp. They should read the thermometer immediately and record the temperature, then wait for five minutes and read and record it again.

Step 4: After the house has cooled to room temperature, students should put the house in the shade. Read and record the temperature immediately and then after five minutes.

Step 5: Students should repeat step 3, but put the window facing the lamp.

Step 6: Students graph their results and discuss the reasons for the differences.

Conclusion/Debrief: How can we apply the results of this experiment to better understand energy conservation? Since we can't change the size of the windows in our homes or schools, what other actions can we take to reduce our energy consumption in hot and cold weather? If you were to design an environmentally friendly house, how would you design the size and placement of the windows? Why?

ACTIVITY 8

The Great Energy Debate (Science and Technology, Oral Language)

Students describe the advantages and disadvantages of using renewable energy sources as opposed to non-renewable sources.

- Step 1:* Through class work and research, students become familiar with the types of renewable and non-renewable energy sources.
- Step 2:* Students are divided into two or more teams for debate. One team should debate the advantages of renewable energy sources, the other team debates the disadvantages of renewable energy sources. Alternatively, with more than 2 teams, each team could debate the merits of a particular energy source.
- Step 3:* Following the debate, the students write a comparison report summarizing the ideas of both teams and stating their personal opinion.
- Conclusion/Debrief:* Comparison reports can be sent to local newspapers or posted to renewable energy websites.

ACTIVITY 9

The Energy Jeopardy Game (Science and Technology)

A fun review activity that challenges the student's understanding of energy conservation and different energy sources.

- Step 1:* Using their notes from the unit and their experience from the 20/20 program, the class members brainstorm 4-6 Jeopardy subject headings (for example, types of renewable energy; energy conservation on the road). This activity can be completed independently or in teams.
- Step 2:* Students are responsible for developing a minimum of ten question/answer combinations to submit to the teacher.
- Step 3:* The teacher organizes the submissions into the Jeopardy game format.
- Step 4:* Student teams challenge each other to become the Jeopardy energy champion!
- Conclusion/Debrief:* Students reflect on their knowledge areas — both their strengths and their areas for further development. This activity and reflection can serve as a review prior to unit tests or quizzes.

ACTIVITY 10

Adopt-a-Class (Leadership, Oral Communication)

Students “adopt” a younger class in the school to introduce *20/20 The Way to Clean Air*. This activity will share the 20/20 experience outside their own classroom, as well as serve to solidify important knowledge for the older students.

- Step 1:** Teachers and students decide on a class (or classes) to “adopt” for energy conservation.
- Step 2:** In small groups, students develop a presentation and an interactive exercise to share their knowledge and experience of the 20/20 program.
- Step 3:** They conduct classroom presentations and activities with younger students.
- Step 4:** Presenters arrange a follow-up meeting between the classes to re-visit ideas/concepts and touch base on continuing activities.

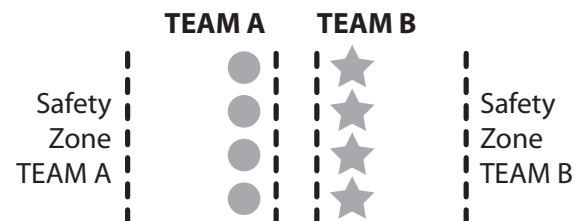
Conclusion/Debrief: Students reflect on the following: How do you feel about sharing the “energy conservation message?” How would your presentation be different if the class had adopted an older class? Why is it important to share the energy conservation message? How can you apply this activity outside of school in your everyday life?

ACTIVITY 11

Clean Air Trivia Tag

Summarize and reinforce clean air concepts through physical activity.

- Step 1:** Set up playing area in a gymnasium or outdoor field as shown in diagram below.
- Step 2:** Divide the group into two teams. Team A and Team B line up facing each other on their respective lines.
- Step 3:** The leader reads a question to which the answer is either true or false (see questions and answers supplied below). If the answer is true then Team A chases Team B and tries to tag them before they reach their safety zone. If the answer is false then Team B chases Team A and tries to tag them before they reach their safety zone. When someone is tagged by a member of the opposite team, they must join the other team.



Step 4: After each question and chase, repeat the question and discuss the correct answer while the teams return to their starting positions. The game ends when all the players are on one team or when the questions have all been asked.

The team with the most people wins. The questions can be adapted to suit specific levels of understanding; however, it is important to have an equal number of true and false answers.

Sample Questions

1. Using less energy at home will help reduce air pollution. **True**
2. Carbon monoxide smells like burnt matches. **False.**
3. Air quality can be affected by climate change. **True**
4. Riding your bike to school is good for your health. **True**
5. Children are at less risk from air pollution than the average adult. **False.**
6. Ground-level ozone is not a component of smog. **False.**
7. Ground-level ozone protects us from ultraviolet radiation. **False.**
8. People with asthma can be affected by air pollution. **True**
9. Taking public transportation regularly produces more air pollution than taking a car. **False.**
10. Soot and dust are types of particulate matter. **True**
11. Transportation emissions are not important factors in air pollution. **False.**

Conclusion/Debrief: Debrief and discussion is generally done between questions. Students could develop their own trivia questions to use in subsequent games.

source: www.cleanairchampions.ca

▶ 20/20 THE WAY TO CLEAN AIR: CONTINUING THE COMMITMENT

The following organizations and websites provide information, services and kid-friendly activities.

EcoSchools exists in two versions. For the Ontario EcoSchools program, visit www.yorku.ca/ecoschl; for the Toronto District School Board version, visit <http://ecoschools.tdsb.on.ca>.

A program designed to help school boards and schools promote environmental literacy and sustainable practices. The program offers fourteen guides and curriculum documents, and 3 multimedia presentations. These sites offer PDF versions of all guides, curriculum connections, and information about ordering CDs that include the multimedia presentations as well as the guides.

Air Pollution and Climate Change Elementary Curriculum Links

Our Changing Climate: learning How to take Charge of Climate Change at School, Home and the Community

www.torontoenvironment.org/files/occ.pdf?PHPSESSID=d6a2ad198fd14f2e40d

World Wildlife Fund's Schools for a Living Planet

www.wwf.ca/schools

Pembina Green Learning — Curriculum links for Grade 5 – 7

www.greenlearning.ca

Green Teacher Resources and Publications

www.greenteacher.com

Natural Resources Canada

http://adaptation.nrcan.gc.ca/posters/index_e.php

Sample ideas for delivering clean air and climate change issues into the classroom and some great posters on the impacts of climate change available free of charge.

Clean Air Champions

www.cleanairchampions.ca

An organization affiliated with Health Canada and supported by Olympic athletes and educators to improve air quality by motivating and educating Canadians to adopt practices and lifestyles that enhance both environmental and personal health. An Education Resource Kit is available for ordering or downloading.

Active and Safe Routes to School

www.goforgreen.ca/asrts

A national program encouraging the use of active modes of transportation to and from school. This website features an interactive “Walking Tour of Canada” program motivating and rewarding students for accumulated distance walked to and from school. Additionally, there are many curriculum based activities reinforcing active transportation to school.

Evergreen

www.evergreen.ca

An organization working to create greener, healthier schools, communities and homes.

The Otesha Project

www.otesha.ca

An inspiring Canadian grassroots youth founded organization, offering drama presentations, books, projects and dreams.

Stuff — The Secret Lives of Everyday Things

www.northwestwatch.org/publications/stuff.asp

A publication that traces the origins of consumer goods. Students will be amazed at the energy and steps that go into producing the items that they use everyday! Publication comes with teacher curriculum guide.

EYES Project — Environment, Youth, Education, Sustainability

www.eyesproject.com

A not-for-profit organization offering youth action workshops, dynamic multimedia presentations, teacher education workshops and an informative “Youth Hub” with connections to environmental programs, organizations, resources, internships and conferences.

Global Warning by Leonardo Dicaprio

www.leonardodicaprio.com

A short, high impact web-based film, narrated by Dicaprio, detailing the causes and effects of climate change.

Ecological Footprint Quiz

www.ecofootprint.org

A website offering a simple on-line quiz for students to calculate their ecological footprint.

GTA Clean Air Online

www.gtacleanaironline.ca

The one-stop website for information on clean air and climate change actions, programs and resources in the Greater Toronto Area.

David Suzuki Foundation

www.davidsuzuki.org

An excellent website by one of Canada's leading environmentalists. Website features information and activities focused on current environmental issues.

Other great youth zones to visit on the web:

Youth Action Centre

www.green-street.ca/youth_action_center

Youth Environment Network

www.yen-rej.org

Environment Canada's Website for Youth

www.ec.gc.ca/youth/index_e.cfm

Earth Day Canada EcoKids Website

www.ecokids.ca/pub/index.cfm

▶ APPENDIX

SAMPLE: ECOSCHOOLS ENERGY CONSERVATION ECOREVIEW

The following review provides an example to help you with your own school's review based on the Energy Conservation Standards/Guidelines. The comment section has been used extensively and some energy conservation actions for the school Action Plan (Step 3) were identified using the information below.

Standards	Just Beginning	Approaching Implementation	Implementing	Extensively Implementing	Comments
LIGHTS AND EQUIPMENT					
1) Lights are turned OFF when not required. Staff and students do the lights-off test.	X				<i>Some staff and students turn off lights, but this practice is not standard throughout the school.</i>
2) Computer monitors are either turned OFF or computers are put to SLEEP when not in use.		X			<i>Office PC computer monitors are often left on when not in use. Computer classes generally do put their Macs to sleep at the end of each period.</i>
3) Computer peripherals such as printers, scanners and other electronic equipment are turned OFF when not in use.	X				<i>Ne</i>
4) Only the most energy efficient equipment is purchased (e.g. Energy Star).		X			<i>Some equipment (computers) are Energy Star rated but no conscious effort has been made to buy only energy efficient machines.</i>
5) An equipment consolidation program is implemented to ensure that energy is not wasted by using more equipment than is necessary (e.g., reducing the number of computer printers through networking).	X				<i>No equipment consolidation plan has been developed or implemented. It appears that we have more computer printers than we need.</i>
HEATING AND AIR CONDITIONING					
6) Windows and curtains are closed at the end of the school day.		X			<i>Some blinds need fixing, windows and curtains are usually closed after school, but no systematic effort has been made to ensure that this happens.</i>
7) Space around vents on walls or window sills is kept free of obstruction.		X			<i>Some vents are blocked in classrooms.</i>
8) Doors to the outside of the building are not left open longer than necessary.	X				<i>Doors are left open longer than necessary during school entry times.</i>
9) The school adheres to Board standard room temperatures and makes maximum use of its computer controlled temperature system (if available).				X	<i>Yes, the Head Caretaker does ensure that standards are adhered to and the system is working. Staff and students understand that these steps save energy and reduce green house gas emissions.</i>
10) Mechanical equipment and water faucets are checked regularly and problems are reported promptly.			X		<i>Weekly inspection by head caretaker. Staff and students report problems promptly.</i>

ECOSCHOOLS ECOREVIEW: ENERGY CONSERVATION

Standards	Just Beginning	Approaching Implementation	Implementing	Extensively Implementing	Comments
Lights and Equipment					
1) Lights are turned OFF when not required. Staff and students do the lights-off test.					
2) Computer monitors are either turned OFF or computers are put to SLEEP when not in use.					
3) Computer peripherals such as printers, scanners and other electronic equipment are turned OFF when not in use.					
4) Only the most energy efficient equipment is purchased (e.g. Energy Star).					
5) An equipment consolidation program is implemented to ensure that energy is not wasted by using more equipment than is necessary (e.g., reducing the number of computer printers through networking).					
Heating and Air Conditioning					
6) Windows and curtains are closed at the end of the school day.					
7) Space around vents on walls or window sills is kept free of obstruction.					
8) Doors to the outside of the building are not left open longer than necessary.					
9) The school adheres to Board standard room temperatures and makes maximum use of its computer controlled temperature system (if available)					
10) Mechanical equipment and water faucets are checked regularly and problems are reported promptly.					

Enlarge to 11" x 17" to make this a more useful working document for your EcoTeam.



The purpose of this guide is informational only. Mention of trade names, commercial products or supplier names does not constitute endorsement or recommendations for their use by the City of Toronto - Public Health Division, the regional health units in Durham, Halton, York and Peel, or the Clean Air Partnership. In no event shall the City of Toronto, the regional municipalities in Durham, Halton, York and Peel, or the Clean Air Partnership be held liable for any injury, loss, claim or damages arising from the use of this Guide.