

Sustainable Schools

Best Practices Guide



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Introduction

In 2008, the Ministry of Education developed a Sustainability Education Framework (www.bced.gov.bc.ca/greenschools/sustainability_ed.htm) that encourages the K-12 education system to show leadership in adopting and promoting

- environmentally sustainable practices, and
- learning opportunities for students that support healthy and natural environments for current and future generations.

This vision is supported by the BC Energy Plan, which sets out a strategy to encourage British Columbians to take responsibility for our climate and environment.

The framework will help ensure that all K-12 students in BC are being educated about sustainable living. It supports a whole-school approach that includes students, teachers, support staff, administrators, and parents in addressing sustainability issues.

Greenhouse gas reduction legislation requires all Boards of Education to submit an annual Carbon Neutral Action Report (www.livesmartbc.ca/government/school_districts.html) that outlines actions they are taking to reduce their carbon output and environmental footprint.

The *Sustainable Schools Best Practices Guide* (2010) has been developed to help schools implement actions that support reduction of greenhouse gases and encourage the wise use of resources. It is intended to promote behavioural change that results in a culture of environmental sustainability.

How to use this Guide

The guide is designed to help the school community at the elementary or secondary level address sustainability issues. It outlines best practices to help green-team leaders (e.g., students, teachers, administrators, support staff, parents) lead the school community through environmental actions in the areas of energy, waste, water, school grounds, and transportation.

The guide contains ideas for school-based solutions in each of these areas, with questionnaires, checklists, and resources that are BC-specific where possible. Photocopy-ready handouts can be distributed to school teams to record changes over time. Any part of the guide may be modified to suit the needs of your school community.



INTRODUCTION

You can view projects submitted to the BC Green Games (www.bcgreengames.ca) to see how various schools have developed green initiatives in one or more sustainability areas at their schools.

The following sections provide a brief overview of how to integrate sustainable practices using a classroom, school, or district approach, with examples of success stories from districts across BC.

Steps to Creating a Sustainable School

1. Establish a school **green team** (see *Creating a School-Wide Approach to Sustainability*, page 3) with students, teachers, and staff.
2. Complete the **Green Schools: Quick Survey** (see pages 8-9) and/or more in-depth environmental audits to find out how green your school is in the areas of energy, waste, water, school grounds, and transportation.
3. Choose one or more of these areas to address: energy, water, waste, school grounds or transportation.
4. Develop short-term and long-term **goals** (see *Sustainability Goals in Schools*, page 4).
5. Create an action plan that includes educational awareness and involves the whole classroom or school.
6. Consult with other schools, districts, and community organizations for advice and support.
7. Evaluate progress regularly and at the end of the school term and year by revisiting the results of past environmental audits.
8. Celebrate successes – perhaps on key dates such as Earth Day or a school-designated Green Day – and have fun.

The Quick Survey can help engage your team in the various areas of sustainability and help you decide on which areas to focus. Complete the survey at the beginning and end of green initiatives or school terms, and track results from year to year.

More in-depth environmental audits like those provided in the following pages will help you monitor progress over time, allow comparison with other schools, and engage students and staff with making improvements at your school.



INTRODUCTION

Creating a Sustainable Classroom

Teachers at all grade levels teach environmental and sustainability concepts as part of the prescribed curriculum. A series of *Environmental Curriculum Maps* (www.bced.gov.bc.ca/environment_ed/ele_curricmaps.htm) has been developed to help teachers connect sustainability with learning outcomes in all ministry curriculum documents. In addition, a framework for integrating environmental concepts into teaching practice is found in the *Environmental Learning and Experience Guide for Teachers* (www.bced.gov.bc.ca/environment_ed/).

Many teachers work with students to embed sustainability into classroom practices. This includes everything from turning off lights and computers when not needed, to making full use of paper and materials, recycling in the classroom, and encouraging waste-free lunches.

Creating a School-wide Approach to Sustainability

Whether it's called the Green Team, the Sustainability Team, the Environmental Club, the Recycling Club, or the Eco-Team, these groups help schools reduce their environmental footprint. An effective sustainability initiative in a school requires commitment and participation from all parts of the school community. The following questions may help in forming a team at your school.

Does the team

- include students, teachers, administration, custodians, and support staff?
- meet regularly and have a staff sponsor present at meetings?
- communicate its activities and projects to all students and staff via electronic school newsletters, the school website, or school-wide assemblies?
- divide up its work so that sub-groups work on specific projects or parts of a project?
- help develop student leadership by having older students mentor younger students?
- have specific goals and a plan for meeting the goals?



INTRODUCTION

Sustainability Goals in Schools

Sustainability goals at a school should reflect what is important to the school community and be designed with the possibility of expansion in the next year. Below are a few actual goals and results as reported by BC schools.

Goal: To have 90% of students walking to school on Wednesdays.

Results: Students increased participation from 65% to almost 90% over a five-month period.

Goal: To reduce, reuse, recycle, and maintain garbage reduction at 50% or lower.

Results: The number of garbage bags went from 48 to 19 by the end of the school year.

Goal: To develop and implement a shade strategy for the school (planting of trees around the perimeter of the school).

Results: Completed the landscape design. Ready to plant trees in the school yard next fall.

Goal: To better utilize solar power at the school.

Results: Additional solar panels were purchased. A new pump run by solar power will be installed for the school pond.

Creating a District-wide Approach to Sustainability

Districts that have sustainability policies, goals, and programs can provide support to individual schools, making it easier for the schools to set up programs such as full-scale recycling and school yard greening. Districts can also provide networking opportunities between schools and help to build a community of schools dedicated to sustainability.

A number of school districts in BC have a district-wide approach to supporting sustainability initiatives. Here are a few case studies.

Abbotsford School District

The Abbotsford School District has had an environmental conservation policy for over 12 years that calls for district-wide education and initiatives to help protect the environment and conserve non-renewable resources. As a result, each school has education materials relating to recycling and preservation of the environment, school administrators encourage student environmental awareness programs, district committees identify and eliminate toxic materials on all district property, and there is an effort to purchase recycled materials.



INTRODUCTION

The district recently adopted a new energy, environment and climate change policy that requires schools to conserve energy and resources in order to reduce the district's overall carbon footprint. District operations staff have sponsored a contest that encourages all schools to reduce their electrical consumption through behavioural change. Electrical consumption was reduced by 5% to 22% and energy savings were shared with qualifying schools in the form of monetary grants. The 'Carbonator Project' was also launched as a way to help clean the air and lock away carbon dioxide on school grounds by planting trees. In the first year, 18 schools signed up to participate.

Recently, the district approved a comprehensive recycling program and made recycling mandatory at all schools. District operations staff support schools by providing equipment and assistance to ensure the success of recycling efforts.

www.sd34.bc.ca/sidebar/sustainable_schools

Powell River School District

The Powell River School District has a District Sustainable Schools Committee that oversees and funds various initiatives in the district, works with community partners to develop and implement a Community Sustainability Charter for Powell River, and produces an electronic sustainability newsletter.

Like many districts, Powell River has partnered with Destination Conservation (www.dcplanet.ca) to address energy, water, and waste issues at the school level. Teams consisting of students, teachers, and operations staff engage in multi-year conservation projects that result in a reduced environmental footprint at schools and money savings for the district.

The district has established a Sustainability and Eco-Education Department dedicated to providing students with leadership skills and course credit through educational opportunities. The Sustainability Toolbox summer program reinforces connections to the natural world and fosters sustainability learning for students from across the province.

www.outdoors.sd47.bc.ca/sustain.html



INTRODUCTION

Richmond School District

The Richmond School District has been involved in sustainability initiatives since 1998 when it adopted the Environmental Stewardship policy. The district now uses the “whole school” approach to sustainability by involving students, teachers, operations staff, support staff, and administrators in its initiatives. It organizes district-wide events for schools, including Environmental Stewardship Committee forums to evaluate the needs in various schools.

The district also hosts a monthly “sustainability café” for students, staff, parents, and community members so they can share projects and resources. As well, the district provides sustainability grants that help schools initiate projects. To celebrate success stories, the district hosted a “Green Gala” at the end of the school year, where each school green team showcased their sustainability projects.

<http://public.sd38.bc.ca/sdweb/envstew>

Rocky Mountain School District

The Rocky Mountain School District has a major focus on environmental stewardship in its five-year education plan. The goal is to reduce the environmental impact of all practices throughout the district and to develop lifelong sustainability habits in both students and staff.

The district has hired an energy manager through a BC Hydro program. While the primary focus is increasing energy efficiency in all district buildings, the energy manager also leads a district green team in developing a comprehensive sustainability plan. As a district heavily reliant on busing students, the district is working to increase the efficiency of its bus fleet. The district realizes the importance of water conservation, so it is installing low-flush toilets in all schools. Food awareness and school gardens are also part of sustainability programs at many schools.

Several schools in the district are leaders in implementing unique environmental projects. Lindsay Park Elementary in Kimberley was the first school in Canada to have a carbon neutral computer lab installed. David Thompson Secondary in Invermere has a large greenhouse on school property that serves as a learning lab for sustainability issues such as energy efficiency, water conservation, and food security.



INTRODUCTION

Vancouver School District

The Vancouver School District has hired a district sustainability coordinator who works with both teachers and students on sustainability projects and environmental issues. This includes organizing district-wide events such as one for secondary students on climate change and sustainability networking meetings for teachers. The district also encourages secondary schools to mentor and work with elementary schools on sustainability projects.

The district is developing sustainability policies related to its purchasing and is developing a food garden policy for schools that wish to start gardens. It is piloting expanded recycling and industrial composting projects at a number of schools with the aim of introducing them district-wide. It also established a Solar Schools project that is putting solar panels on school roofs and developing educational opportunities related to solar power.



Green Schools: Quick Survey

Please answer the follow questions based on a scale from 0 to 4. As a guideline, '0' is *no or not at all*, 1 is *rarely*, 2 and 3 are *sometimes*, and 4 is *yes or always*.

Green Team

Does your school have a green team? _____

Does your green team include students, teachers, and staff? _____

Energy

Does your school have an energy conservation program? _____

Does your school make an effort to reduce heating costs? _____

Do people turn off the lights when rooms are not in use? _____

Do people turn off computers and monitors when not in use? _____

Does your school use fluorescent and compact fluorescent bulbs? _____

Waste

Does your school have a recycling program that collects more than paper? _____

Does your school have a composting program? _____

Has your school ever done a waste audit? _____

Does your school have waste-free lunches? _____

Are school printers set to double side as a default? _____

Does your school use recycled paper? _____

Water

Does your school have a water conservation program? _____

Does your school have aerators or auto on/off devices on faucets? _____

Does your school have low-flow toilets? _____

Do people drink tap water instead of bottled water? _____

Does your school use environmentally friendly cleaning products? _____



School Grounds

Does your school have a garden and/or a naturalized green space (more than just a grass field)? _____

Does your school avoid using pesticides on the grass and plants? _____

Do students spend time outside playing, studying, or socializing? _____

Transportation

Does your school have an anti-idling program? _____

Do people walk, bike, or skateboard to school? _____

Do people carpool or use public transportation to get to school? _____

Does your school have secure bicycle storage? _____

Scoring for 25 questions

0-25

There are many different things you can do to make your school greener. Start off by addressing waste and energy and continue building from there.

26-50

Your school has made some changes. Keep up the momentum.

51-75

Your school is making changes to become greener – continue working on expanding programs in all areas.

76-100

Your school has made significant changes to become sustainable and is a great role model for other schools!



Energy Conservation

A shift toward more sustainable approaches to energy consumption requires increased use of renewable energy sources, more efficient fossil fuel technologies, and improved energy conservation. Given that most energy production relies on burning fossil fuels, conservation has the greatest effect on reducing our impact on climate change. Using technology to improve energy efficiency and adopting renewable energy sources such as wind, solar, and geothermal are other important steps that can be taken.

Examples of using technology include using auto on/off controls to monitor a school's mechanical system, installing more efficient heating and cooling systems, and upgrading to compact fluorescent lighting. Some schools have reduced energy use by installing solar hot water heating systems.

Heating and Cooling Systems in Schools

The heating and cooling system (HVAC) is one of the largest energy consumers in schools, and many use fossil fuels to run. Even small changes in system efficiency can yield large savings to a school's operating budget as well as a reduction of greenhouse gases. Ground source heat pumps can provide 20 to 50 % energy cost savings over traditional heating and cooling systems. The installation of solar hot water systems on school roofs can reduce water heating costs dramatically and reduce greenhouse gases.

Lighting

Lighting accounts for nearly half the electric bill in most schools. Many schools have areas of the building that are over lit or that can utilize natural lighting. Retrofitting the lighting system with energy-efficient bulbs or auto on/off technologies can reduce a large amount of a school's electrical consumption. It is important to note that incandescent bulbs produce more heat than light and can trigger cooling systems, resulting in even more energy use.



ENERGY CONSERVATION

Computers and Appliances

Computers, equipment, and appliances use a significant amount of electricity even when they are not being used. Reducing these “vampire loads” is as easy as plugging appliances into a power bar and turning off the power bar when not in use. When updating computers, equipment, and appliances, be sure to purchase ones with a high Energy Star efficiency rating. For instance, LCD monitors use one third the electricity compared to similar-sized CRT monitors.



Energy Use Questionnaire

- How much energy related to heating and cooling does your school use on a monthly and yearly basis?
- How much in greenhouse gas emissions does this equate to?
- Has your school had an energy retrofit of its HVAC system? Is there one planned for the future?
- Does your school have more efficient T-5 and T-8 fluorescent lights or less efficient T-12 fluorescent lights?
- Where traditional screw-in light bulbs are used, does your school use compact fluorescent light bulbs?
- Does your school have occupancy sensors in rooms that are not used for long periods of time?
- For rooms that have windows, does your school use multiple light switches so that lights can be kept off over naturally lit areas of the room?
- Is your school's computer equipment networked to reduce the number of printers?
- Are your school's computers situated away from heat sources such as sun and heat vents?
- Do your school's computers have an energy-saver mode?
- What percentage of your school's computers, equipment, and appliances are Energy Star rated?



ENERGY CONSERVATION



School Energy Checklist

Heating and Cooling

- Set the thermostat 1-2 degrees lower.
- Find and repair drafts and cold areas of the classroom and school.
- Install weather stripping, caulking, and insulation as needed to stop air leaks.
- Keep bookcases and other bulky items away from heating and cooling fixtures.
- Keep airflows around vents uncluttered and open.
- Minimize heating and cooling in areas that are not used throughout the day.

Lighting

- Turn off lights when not in use. Put posters near light switches reminding people to turn off the lights.
- Reduce use of lights in areas with windows.
- Use energy-efficient compact fluorescent light bulbs and light-emitting diode bulbs where appropriate.
- If a room has multiple light switches, turn on only those lights required for the task at hand.
- Install occupancy sensors to reduce lighting for rooms not in use all day.

Computers, Monitors, and Appliances

- Turn off computer monitors when not in use.
- Set controls so that computers will go into sleep mode when not in use.
- Turn off all computer equipment at the end of the day and on weekends unless your network technicians instruct otherwise.
- Use Energy Star computers, monitors, printers, copiers, and appliances.



ENERGY CONSERVATION

Resources

BC Hydro's Energy Detectives is a hands-on, interactive program designed to teach students in Grades 2 and 3, their families, and school communities to be more conscious about energy use.

www.bchydro.com/community/youth_education/energy_detectives.html

BC Hydro's Energy Ambassadors Program provides training, materials, and ongoing support for Grade 10 to 12 students and school districts to find new ways to save energy.

www.bchydro.com/community/youth_education/energy_reviews.html

Destination Conservation's Building Occupant Program trains a team (e.g., students, teachers, and staff) from each school to complete energy assessments and to design and implement conservation campaigns.

www.dcplanet.ca/index.php?s=program

Green Learning's EnerAction provides energy conservation and efficiency projects, lesson plans, and tools to Grade 4 to 7 classrooms.

www.greenlearning.ca/eneraction

Solar BC helps schools reduce water heating costs and provides solar energy lesson plans. www.solarbc.ca/install/schools



Waste Reduction

In BC, each person produces about 663 kg of solid waste per year. That's over 12 kg every week. Only 20% of our garbage is recycled with the remaining 80% going to landfills and incinerators. Programs that encourage people to buy less, compost, and reuse items reduce the amount of garbage going to landfills. Less trash results in the need for fewer landfills, less energy needed to move and process waste, and ultimately less greenhouse gas emissions.

Reduce and Reuse

Precycling is the practice of reducing waste by avoiding the use of items that generate waste. Zero Waste builds on this idea by addressing the kinds of ingredients and materials used to make and package goods that will not harm our air, water, or land, and allow for continuous reuse into other products. When buying something new, ask yourself "Do I really need that item?" If you do, does it have to be the one with all the packaging? And when you are finished with it, can you sell it or donate it so it can be reused?

Recycling

Divert garbage from the landfill by recycling paper, glass, plastics, cans, tetrapaks, and cardboard. Contact your municipality or regional district to find out what they recycle in your area. Ensure that recycled items are clean and educate people on what goes in which bin. Your school can even recycle special items such as batteries, electronics, cell phones, and computers.

Economics of Waste Reduction and Recycling

Reduction in waste removal fees is a major financial benefit associated with school-wide waste reduction. Through selective purchasing and waste reduction practices such as recycling and composting, schools can decrease the number of dumpsters being filled per month by as much as 50%. In addition, some schools have discovered that large-scale composting programs can make money through the sale of the finished compost. This money can be used to offset other recycling costs. The Cost Benefit Analysis Worksheet that follows can help with cost comparisons.



WASTE REDUCTION



Cost Benefit Analysis Worksheet

1. Current waste disposal costs \$____/month \$____/year #____/kg
2. Current recycling costs \$____/month \$____/year #____/kg
3. Estimated weight that can be diverted from garbage going to landfill #____kg/year (includes items that can be recycled and composted)
4. Amount saved through reduced disposal costs \$____/year
5. Revenue generated by selling soil made by composting \$____/year
6. Financial benefit of waste reduction programs (#4 + #5) \$____/year
7. Cost of implementing waste reduction programs \$____/year
8. Total benefit or cost of waste reduction program (#6 - #7) \$____/year

The Waste Audit

Get a snapshot of what is in your waste by doing a waste audit. Once you know what is going into the garbage, work with your school district and municipality to decide what you can “pull out” of that pile. Begin by analyzing one day’s worth of garbage collected in your school. Gather clear plastic bags for sorting, gloves, a plastic floor sheet, and a weigh scale. Use the Waste Audit Data Sheet to record information.



Waste Audit Data Sheet

	Paper	Glass/ Metal/Tin	Hard Plastics	Soft Plastics	Organics	Other	Landfill
Weight (kg)							
Percentage							
Comments							

Date of Audit _____

Total weight of garbage going to landfill each day: _____ kg.

Total weight of items that can be diverted from landfill each day: _____ kg.

Garbage going to landfill after first audit: _____ kg.

Garbage going to landfill after basic diversion: _____ kg.

Garbage going to landfill after additional waste-reduction action: _____ kg.



WASTE REDUCTION



Waste Reduction Checklist

Reduce

- Buy less and use less.
- Purchase more environmentally friendly office supplies.
- Choose to purchase items with less packaging.
- Purchase recycled paper.
- Double-side all photocopying.
- Set printer to print double sided as a default setting.
- Print notices on half-sheets.
- Email notices.
- Use emails instead of faxes.
- Post newsletters online.
- Avoid printing out emails.
- Host paper-free meetings by setting the agenda on the board.
- Use fewer paper towels in the washroom.
- Encourage waste-free lunches.
- Reduce the use of tetrapaks by using refillable containers.
- Purchase condiments, sweeteners, salt, and pepper in bulk.
- Use dispensers instead of individually packaged servings.

Reuse

- Replace disposable items with reusable items and learn to share or donate to avoid the landfill.
- Reuse the other side of used paper.
- Use reusable coffee cups and water bottles.
- Stock cafeteria with reusable or biodegradable plates, cups, and cutlery.
- Donate uneaten lunch items to a “share a lunch” program.
- Donate used computers, eyeglasses, cell phones, clothes, textbooks, and other items.
- Host a clothing swap/sale/collection.
- Host a schoolyard/garage sale-type fundraiser.

Recycle

- Divert garbage by recycling items such as paper, glass, plastics, cans, tetrapaks, and cardboard.
- Recycle special items such as batteries, electronics, cell phones, and computers.
- Compost organic waste.
- Limit contamination of recycled items by ensuring they are clean.
- Recycle ink and toner products.
- Ensure correct disposal methods are used for chemicals.



WASTE REDUCTION

Resources

Reynolds Secondary's Zero Waste Recycling showcases school and community-wide recycling programs:

<http://2009.bcgreengames.ca/component/project/?id=46>

Royal Oak Middle School's Recycling Program features an innovative method for separating recyclables at the source:

<http://2009.bcgreengames.ca/component/project/?id=88>

W.D. Ferris Elementary School presentation on how to do a waste audit:

<http://2009.bcgreengames.ca/component/project/?id=61>

Watch a waste audit: www.youtube.com/watch?v=x-JYIYOAUg0

How to pack a waste-free lunch: www.youtube.com/watch?v=LCEL358-iNI

Burnaby Mountain Secondary showcases their worm composting program:

<http://2009.bcgreengames.ca/component/project/?id=162>

Chartwell Elementary School presents their composting program:

<http://2009.bcgreengames.ca/component/project/?id=115>

The Recycling Council of BC promotes zero waste in BC by connecting people to information, services and resources, and offers a materials exchange as well as a hotline. Find out how to recycle anything anywhere in BC. www.rcbc.bc.ca

Encorp Pacific focuses on recycling containers and provides a BC-wide depot database. They also work closely with schools and communities to implement programs. www.encorp.ca

The Composting Council of Canada provides information, advice, and resources on how to get started. www.compost.org



Water Conservation

Canadians are among the world's most prolific water users, averaging 335 L per day with BC residents using 490 L of water each day. Given that only 3% of the earth's water is fresh water, and that most of this is frozen in glaciers and polar ice, we need to think of ways to conserve this precious resource. In the household, 65% of water usage takes place in the washroom. Laundry uses about 20%, and general kitchen use, including drinking water, amounts to 10%. Installing low-flow toilets and aerators to taps can make a significant long-term difference.

Wastewater

Be careful with the types of products you use and what you put down the drain. All water that we use for flushing toilets, washing clothes, and washing cars eventually ends up in our local streams, rivers, lakes, and oceans. Although some of this water gets treated, a significant amount goes directly into our waterways without treatment. Chemicals from cleaners, paint, unused medications, and gasoline can contaminate our waterways and harm aquatic life. There is a finite amount of water on the planet, and everything we put down the drain will end up somewhere in the world.



Water Use Questionnaire

- What is the source of your school's water supply?
- How much water did your school use last year? (Check water bills or water meters.)
- Does your school have low-flow toilets?
- Does your school have low-flow devices installed on the taps?
- Does your school have auto on/off devices installed on the taps?
- Does your school have low-flow devices installed on the showers?
- Does your school use appliances with a quick-wash setting?
- Does your school have any leaky taps?
- Does your school sell bottled water?
- Does your school use biodegradable cleaners?
- When does your school water the grass/shrubs?
- Does your school use automated sprinkler systems?
- Does your school plant native vegetation?
- Does your school use herbicides or pesticides?



WATER CONSERVATION

Water Audit

Complete one of the online water audits listed in the Resources section to find out how much water is used at your school on a daily basis. After implementing some changes, follow up with another audit to see how much water you are saving.

You can also encourage everyone at your school to assess their personal water use by completing the Daily Water Use Worksheet and then following up with another assessment after they have made changes.



Daily Water Use Worksheet

Activity	Frequency in minutes	Water use rate	Total volume of water used (L)
Toilet flushing		17 L / flush	
Toilet (low flow)		6 L / flush	
Hand washing		8 L	
Brushing teeth (tap running)		10 L	
Brushing teeth (tap off)		0.5 L	
Dishwasher		40 L	
Hand-washing dishes		35 L	
Washing clothes (top loading)		225 L	
Drinking water			
Other			
		TOTAL	



WATER CONSERVATION



Water Reduction Checklist

Indoors

- Repair any leaks in taps and water fountains.
- Close taps when not using water during activities such as washing dishes or paintbrushes.
- Install aerators on faucets.
- Install auto on/off devices on faucets.
- Install low-flow shower heads in the shower.
- Encourage shorter showers.
- Replace toilets with low-flow toilets.
- Replace urinals with waterless, sensed, or hand-flush options.
- Do not use toilets as garbage receptacles.
- Run school appliances only with full loads, use the quick cycle, and use the cold water cycle.
- When hand-washing dishes, do not run water continuously.
- Drink tap water instead of buying bottled water.

Outdoors

- Water lawn only at dawn or dusk.
- Plant native plants that require minimal watering.
- Reduce or avoid the use of pesticides.
- Use sand rather than salt on sidewalks and driveways to get traction on winter ice.
- Collect rainwater to be used in the gardens.
- Participate in a community river/stream/marsh/shoreline cleanup in your area.

Down the Drain

- Use environmentally friendly biodegradable cleaners.
- Ensure correct chemical disposal methods are in use.
- Avoid dumping anything down storm drains as they often link directly to streams and lakes.



WATER CONSERVATION

Resources

Bench Elementary showcases their Marsh Reclamation and Awareness project:
<http://2009.bcgreengames.ca/component/project/?id=91>

The Recycling Council of BC can advise you where to dispose of flammable liquids, paints, pesticides, etc. www.rcbc.bc.ca

Destination Conservation is a student-oriented, activity-based, multi-year school program. Areas of focus include water, energy, and waste.
www.dcplanet.ca/index.php?s=program#operator

Living Watersmart wateruse plan for BC includes a list of ways to reduce water use, and how to calibrate your water footprint (<http://goblue.zerofootprint.net/?language=en>) and the *Water Smart Home Assessment* (www.livingwatersmart.ca)

Environment Canada provides information on water conservation and efficiency, a primer on fresh water (www.ec.gc.ca/eau-water/) as well as an online water calculator (www.on.ec.gc.ca/reseau/waterCalculator)

The Labour Environmental Alliance Society publishes the *Cleaners and Toxins Guide* as well as a *School Toxins Checklist* which includes strategies for the science lab, art class and automotive shop. www.leas.ca or www.toxicfreecanada.ca

Metro Vancouver's Tap Water Campaign includes print information and fun PSA videos that encourage people to drink tap water. www.metrovancouver.org/region/tapwater/Pages/default.aspx. More educational resources can be found at www.metrovancouver.org/region/teachers/Pages/default.aspx



Sustainable School Grounds

Through strategically placed trees, the creation of food and habitat gardens, water conservation, and the elimination of pesticides, school grounds can be good places to study sustainability. Natural plantings of trees and shrubs can diminish air and noise pollution and assist in cooling classrooms. Involving students in ongoing school garden projects allows them to learn about the cycles of life and engage in fun outdoor learning.

Green school grounds also contribute to the well-being of students and the community. Transforming barren rectangles of asphalt and grass into biologically diverse outdoor spaces creates healthy areas to play and socialize. Recent studies show that naturalization of school grounds can achieve the following benefits:

- an increase in creative, unstructured play
- increased ecological diversity which provides new learning and stewardship opportunities
- increased physical activity among a wider variety of students
- increased connectedness to the school by students, staff, and community

Planting a school vegetable garden is another way to green the schoolyard. It provides a hands-on opportunity to teach students how sustainability relates to foods and how growing food locally and pesticide-free provides nutritional and environmental benefits.

What is the process for greening a school ground?

Greening a school ground creates an outdoor classroom that provides a healthy place to play, learn, and develop a respect for nature. Evergreen Learning Grounds (www.evergreenlearning.com), an organization that helps schools across Canada green their schoolyards, uses a process that includes the following elements:

1. Establish a committee.
2. Research and visit other schools to see their projects.
3. Develop a collective vision for the site.
4. Make a site map of your school ground.
5. Develop and present the project design to school staff, parents, and the community.



SUSTAINABLE SCHOOL GROUNDS

6. Establish a maintenance strategy.
7. Get approval from the principal and school district.
8. Create a budget and fundraise.
9. Organize your planting day.
10. Plant.
11. Visit the project often to observe, learn, and maintain it. Plant something new every year.



Schoolyard Naturalization Checklist

- Focus on the purpose or vision for undertaking a schoolyard greening project.
- Conduct a survey to determine how students, teachers, parents, and members of the community use the current schoolyard space.
- Set short- and long-term goals.
- Create a design that responds to your school's ecological setting and to the community.
- Include students, teachers, maintenance staff, administrators, and neighbours living adjacent to the school in the decision-making process.
- Contact local groups such as gardening clubs, landscaping companies, and naturalist organizations for donations of money, materials, and advice.
- Conduct simple tests on the soil to determine soil texture, moisture, and pH level.
- Plant native plants that require minimal watering, especially over the summer.
- Establish a maintenance plan that includes weeding, watering, replacing damaged plants, maintaining signage, seating, fencing and trails; controlling pests; mulching; and trimming and pruning.
- Communicate upcoming project work parties, timelines for completing tasks, and your wish list of materials that are needed.
- Plan celebrations such as public tours, festivals, media events, volunteer potlucks, and awards ceremonies around major project benchmarks.



SUSTAINABLE SCHOOL GROUNDS

Resources

Evergreen Learning Grounds provides online lesson plans, tips and techniques as well as funding grants to help schools with greening their schoolyards. www.evergreen.ca/en/

Canadian Biodiversity Institute offers online advice for site design, project types, and plant species information. <http://schoolgrounds.ca/home.html>

Reynolds Secondary Green Spaces Project provides a comprehensive look at a Victoria schoolyard naturalization project along with design plans and a photo gallery. www.greenspacesproject.org/index.html

Westwood Elementary's nature garden project shows a multi-year effort at creating a number of unique gardens on their school property in Prince George. <http://2009.bcgreengames.ca/component/project/?id=25>

Windermere Secondary students in Vancouver worked with a number of community organizations to develop an organic food garden and plans for a greenhouse on school property. <http://2009.bcgreengames.ca/component/project/?id=116>

Trees For Tomorrow is a provincial government initiative designed to help fund urban and rural communities in the planting of trees in schoolyards and other public spaces throughout BC. www.treesfortomorrow.gov.bc.ca

School Year Gardens is a toolkit for starting and maintaining vegetable gardens at secondary schools in the Lower Mainland of BC. www.richmondfruittree.com/Toolkit.pdf



Sustainable Transportation

Getting to school by vehicles raises issues ranging from greenhouse gases to idling on school grounds, school traffic jams, road safety, and lack of physical activity. Every 1 L of gasoline used creates 2.3 L of CO₂ emissions. Transportation contributes a full 45% of total household greenhouse gas emissions in BC. Walking, biking, or taking the bus generates less greenhouse gases than driving. One city bus can take 40 vehicles off the road and save 70,000 L of fuel.

Walk or Cycle to School

Walking or cycling to school both reduces use of fuels and provides physical activity. A number of BC schools have established walking or riding school bus programs, making predetermined stops to pick up and drop off students on the way to and from school. To help schools across BC in setting up their own walking or riding school bus programs, start-up kits can be ordered from the HASTE BC website (www.hastebc.org). The kits include:

- road safety tips
- neighbourhood maps for plotting customized walking or riding routes
- a classroom emissions-tracking program
- interactive training webinars for parents and organizers
- two reflective vests per route for the parent or community volunteers to wear
- reflective arm bands for student participants

Sustainable School Bus Transportation

In BC, over 110,000 students take the bus to school each day, removing 60,000 vehicles that would otherwise be on the road. Changes to bus emissions technology can result in substantial reductions in greenhouse gas emissions as well as operational cost savings. Many school buses now run on low sulphur diesel and have increased fuel efficiency. Diesel-electric hybrid buses are currently being piloted in several school districts. Districts are offering training to their bus drivers on how to increase fuel efficiency through changes in driving habits.



SUSTAINABLE TRANSPORTATION



Sustainable Transportation Checklist

- Encourage students and staff to walk or wheel to school (e.g., skateboard, scooter, bicycle, carpool, public transportation).
- Supply pedometers to encourage more walking activity.
- Organize a “walking school bus” to encourage safer and greener commuting.
- Encourage your district to convert to biodiesel school buses.
- Host a bike-to-school week event to promote cycling and understanding about safe bike routes.
- Ensure secure bike storage is available on the school grounds.
- Install *Idle Free* zones around the school and educate staff, parents, and PAC groups, along with students.
- Use block heaters (2 hours is all that is needed) to warm up car engines in colder climates.
- Idle only 2-3 minutes when “cold” starting cars.
- Provide incentives for carpools by granting them easier drop-off/pick-up access.

Resources

Hub for Action on School Transportation Emissions showcases sustainable transportation programs and tools for schools, including anti-idling strategies and signs, as well as an online calculator for tracking GHG emissions.
www.hastebc.org

BC Ministry of Education Healthy Schools promotes overall school health through active living and healthy diet choices. www.bced.gov.bc.ca/health

BC Air Quality provides specific information about BC air quality relating to health, climate change, Clean Air Day, along with resources for youth and teachers.
www.bcairquality.com

Clean Air Champions brings world-class athletes to schools to help inspire students to use alternative methods of transportation.
www.cleanairchampions.ca

