

Break New Ground

Diversify your Schoolyard!

A Resource Document for Schoolyard Improvement



Hastings and Prince Edward District School Board
September 1997



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An Introduction to Schoolyard Improvement

What is schoolyard improvement?

Schoolyard improvement is an umbrella term that refers primarily to the process of reintroducing the natural environment into schoolyards. Schools are encouraged to consider the entire playground by incorporating long-term needs for sports fields, playground equipment and open spaces with the need for planting areas, benches, sun shelters and other improvement items.

In a well run project, students will learn by getting actively involved. When students take the lead in developing plans for greening the schoolyard, it follows that the process will intensify their appreciation for our earth and its environment. Naturalization areas are often the focus of schoolyard improvement projects in order to replace high maintenance schoolyards with plants that are native to the region.

Why would you want to undertake this project?

To create a more educational and imaginative schoolyard for children.

To provide a positive opportunity for the school and for the community.

To provide daily contact with nature for students, teachers and the community.

To give students the opportunity to have a positive impact on their environment.

To provide an outdoor classroom for teachers and students.

A naturalized area often requires less maintenance than the traditional schoolyard.

Natural schoolyards are typically less hostile environments than fenced and surfaced schoolyards.

Who will benefit from this project?

Anyone who is involved will benefit - students, teachers, parents, the school community:

- will learn about gardening, native plants, soil types, history of the area, etc.;
- will develop a respect and understanding for our environment;
- will have an opportunity to participate in the consensus building process;
- will learn by hands-on experience and daily contact with the natural world.

Do you have a clear sense of the long term goals of the project?

What is the purpose of establishing a schoolyard improvement program?

To develop a more creative schoolyard?

To provide shade for the children?

To provide teachers with an outdoor classroom?

To bring wildlife (including insects, butterflies) into the schoolyard?

Are you aware of the amount of time and commitment that is involved?

- *once established*, naturalized areas don't normally need excessive care;
- attention needs to be given to the area's ongoing condition, particularly if structures are involved (maintenance is required to satisfy safety concerns);
- ultimately, no greening project should even be considered without thorough research, a wide body of support and a long-term plan in place.

What Are Your First Steps?

Consult The Students!! Remember that this project is for the students. Let the students create the plan. Let the students voice their opinions and ideas. Don't allow your students to miss out on the learning experiences that are a vital part of this process. The worst case scenario is to have staff create a green area that mysteriously appears overnight. Students *must* be consulted, informed, interested and eager to participate in a long-term schoolyard improvement program.

Ensure that there is internal agreement on purpose/practicality of the project

Administrative support is a necessity. Approach administration and solicit support for the concept. Next, consult staff, school council, parents and neighbours. When discussing the project with the students, remember that you are working *with* them to develop a plan. You are not simply informing your students of the transformation that is going to take place. Their input is vital! Is everyone realistic about the amount of time and effort that will need to be put into the project? Are they willing to help? Every schoolyard improvement project should be designed to fulfil some need or objective. Is there internal agreement on your school's needs or objectives as they relate to this project?

Ensure that all interested players are aware and on board

Make sure everyone involved understands what is meant by the term *schoolyard improvement* and is clear on the reasons for initiating such a process. Develop a *schoolyard improvement committee* with representation from staff, parents, students, school health and safety committee and community volunteers. Include an immediate neighbour. Let each person on the committee know what his/her responsibilities are. **Take your time.** The planning stage is the most important part of the project. Be sure that you have a clear long-term vision for the schoolyard before implementing the first stage.

Let students conduct the research, map the site and develop the initial design

Students can research topical issues. They will learn about the history of the area, research plants that are suitable to the growing conditions, test for soil type, etc. There is always some type of research that can be done by students of every age. Have the students draw pictures, site plans or scale models of their ideal schoolyard. Conduct student, parent, and teacher surveys (immediate neighbours should also be surveyed). *Sample surveys can be found at the back of this booklet.* Have the students write letters to the community, neighbours, organizations and companies explaining what the school would like to do. Ask for support. Start a binder to keep track of anything relevant to the project. Keep a list of people involved, experts in the community, research material that has been gathered, site plans, photos, etc.

Who needs to be consulted?

A lengthy consultation process is required before approval is sought from Senior Administration (see "The Approvals Process" - page 22). It is critical that all parties with an interest in the schoolyard are advised of the school's intentions and are invited to have representation in the planning process.

Internally: Students

Explain the concept of schoolyard improvement to the students and listen to their ideas.

Find out if students want to undertake a greening project. Do the majority want to get actively involved?

Parents / School Council

Parents must be consulted. Perhaps there are parents who can help out by donating time, materials or technical expertise.

Send newsletters home with the students to explain the project. Call public meetings for any interested parents. Don't forget to advertise these meetings locally. You don't want to miss out on any potential (and valuable) community volunteers.

Survey immediate neighbours. Often, they have concerns that may not be obvious from a school perspective. Any concerns from neighbours need to be addressed before the project is carried out. More often than not, neighbours are an excellent source of expertise, so keep them on your side!

All school staff

Approach the school principal with the idea. The project cannot proceed without Principal approval.

Have *all* school staff involved. One of staff's primary roles is to act as facilitators for the students, so you need their support. Call a meeting for all staff. Discuss greening options and explore opportunities to connect curriculum to the project.

Ask teachers to discuss the greening concept with their students. Have each classroom submit ideas to the committee that has been established to deal with schoolyard improvement.

Plant Department (also see "The Approvals Process - page # 22)

Approval is **required** from HPEDSB's Controller of Plant.

Notify Plant Dept. of your ideas *before* a draft plan is submitted. Plant will be able to provide you with copies of site plans and other useful information that may impact your plan.

Senior Administration (also see "The Approvals Process - page # 22)

Approval is **required** from your S.G. Superintendent.

Ensure that no aspect of the project conflicts with Board Policy. Please refer to HPEDSB Statement of Practice B7 - *Installation and Maintenance of Schoolyard Improvement Areas*.

Externally:

Community / Surrounding Neighbours

As mentioned above, it is very important to notify immediate neighbours. Always remember that these are the families who have to live with the decisions made by the school.

Obtain support from the community. Send out newsletters frequently updating community supporters on the project's progress. Point out the work that community volunteers have contributed. Promote your school as part of the community.

Have open houses to show off your progress. Be proud of your accomplishments (however small).

Invite a community representative to sit on your schoolyard improvement committee.

Consult your local By-law Enforcement Office to ensure that you are not contravening any municipal by-laws.

Organizations that can contribute technical expertise to the project

Have the students write letters to local agencies detailing your school's visions and goals. Request technical assistance and advice on how to achieve these targets.

Organizations that can contribute material/money to the project

Have the students write letters to local agencies detailing your school's visions and goals. Request contributions of money, material, advice or other contacts.

Consensus Building

Starting a consensus process requires taking the time to identify the participants. The task consists of two parts - identifying the interests and then identifying the appropriate representatives of those interests.

The Canadian National Round Table on the Environment and the Economy has developed ten principles that can be applied to consensus building and the decision making process.

PRINCIPLE #1

Purpose Driven - *People need a reason to participate in the process.*

The parties should have a common concern and believe that a consensus process offers the best opportunity for addressing it. If the parties agree consensus building offers a better option to pursue their interest, then a greater commitment to the process and its outcomes will be generated.

PRINCIPLE #2

Inclusive but not exclusive - *All parties with a significant interest in the issues should be involved.*

Care needs to be taken to identify and involve all parties with a significant interest in the outcome. This includes those parties affected by any agreement that may be reached, those who need to successfully implement it, or those who would undermine it if not included in the process.

PRINCIPLE #3

Voluntary Participation - *The parties who are affected or interested participate voluntarily.*

The strength of consensus flows from its voluntary nature. All parties must be supportive of the process and willing to invest the time necessary to make it work.

PRINCIPLE #4

Self Design - *The parties design the consensus process.*

All parties must have an equal opportunity to participate in the designing process. There is no single process. Each process is designed to meet the circumstances and need of the specific situation. Designing a consensus process enables the participants to become better acquainted before they deal with substantive issues. It is important to take the time at the beginning to:

- define the issues carefully;
- assess the suitability of this process for each issue - as opposed to other decision-making processes;
- clarify the roles and responsibilities for everyone involved;
- establish the ground rules for operating.

Communications can be helped by establishing ground rules, and by allocating time for the participants to appreciate each other's values and interests.

PRINCIPLE #5

Flexibility - *Flexibility should be designed into the process.*

It is impossible to anticipate everything in a consensus process. By designing flexibility into the process, participants can anticipate and better handle change when it faces them. A consensus process involves learning from the perspectives of all participants. Feedback must, therefore, be continually incorporated into the process.

PRINCIPLE #6

Equal Opportunity - *All parties have equal access to relevant information and the opportunity to participate effectively throughout the process.*

All parties must be able to participate effectively in the consensus process. Unless the process is open, fair and equitable, agreement may not be reached and, if reached, may not last. Not everyone starts from the same point - particularly in terms of experience, knowledge and resources.

To promote equal opportunity, consideration needs to be given to providing:

- training on consensus processes and negotiating skills;
- adequate and fair access to all relevant information and expertise;
- resources for all participants to participate meaningfully.

PRINCIPLE #7

Respect for Diverse Interests - *Acceptance for diverse values, interests and knowledge of parties involved in the consensus process is essential.*

A consensus process affords an opportunity for all participants to better understand one another's diverse values, interests and knowledge. Recognizing and addressing all relevant stakeholders' values and interests provides a basis for crafting creative solutions that are more likely to last.

PRINCIPLE #8

Accountability - *The participants are accountable both to their constituencies and to the process that they have agreed to establish.*

It is important that the participants representing groups or organizations effectively speak for the interests they represent. Mechanisms and resources for timely feedback and reporting to constituencies are crucial and need to be established. This builds understanding and commitment among the constituents and minimizes surprises.

Given significant public concern about environmental, social and economic issues, keeping the public informed on the development and outcome of any process is important.

PRINCIPLE #9

Time Limits - *Realistic deadlines are necessary throughout the process.*

Clear and reasonable time limits for working toward a conclusion and reporting on results should be established. Such milestones bring a focus to the process, marshal key resources and mark progress toward consensus. Sufficient flexibility, however, is necessary to embrace shifts or changes in timing.

PRINCIPLE #10

Implementation - *Commitment to implementation and effective monitoring are essential parts of any agreement.*

Parties must be satisfied that their agreements will be implemented. As a result, all parties should discuss the goals of the process and how results will be handled. Clarifying a commitment to implementing the outcome of the process is essential. The support and commitment of any party responsible for follow-up is critical. A post-agreement mechanism should be established to monitor implementation and to deal with any problems that may arise.

Customizing the Area to Fit the Needs of the School

Since schoolyard improvement is a long-term venture, there are many factors that must be considered before deciding on a location for a naturalized area and any accompanying improvement features.

Selecting a Site

Contact the Hastings and Prince Edward District School Board's Plant Department to obtain a site plan for your schoolyard. This will provide you with the location of all underground services.

Examine your schoolyard's features and decide how a green area can best be incorporated into the existing surroundings.

The naturalization area should be located away from roads or heavy public access.

Ensure safe accessibility for those who will use and enjoy it.

The proposed area should not interfere with playing fields, future building, utility and road expansion. (This is why it is so critical to contact Plant Department *before* developing plans).

Be inclusive. When establishing your plan, remember that any improvements have to share space with play structures, sports fields, open spaces, etc.

Study the Area - Conduct a Site Analysis

Is the ground low and wet or sloped and dry?

What is the soil type? Research the history of the property.

What is the relationship of the site to its immediate surroundings?

Where are the sunny areas? Shady areas?

Where are the underground services located? Are there overhead lines?

Where is the nearest source of water? What are the drainage patterns? Is there seasonal pooling?

What are the normal traffic patterns (pedestrian and vehicular)? Are you interfering with any normal or proposed activities? Where does the snowplow pile snow?

List any potential health and safety concerns. These **must** be resolved. Remember that the public has unsupervised access to the site during off-school hours.

The following information needs to be included in your submission to Senior Administration:

Site plan of the existing schoolyard (including buildings, playground equipment, sports fields, services, paved areas, etc.) with proposed additions marked.

Any features to be retained or removed.

New project ideas: trees, paths, benches, gardens, signs, sun shelters, etc.

Plant list identifying plants by common and botanical names (eg. Legend, X on the map means Maple tree).

Work schedule. When will the work start? Duration?

Maintenance schedule (particularly during summer/holiday periods).

Address any potential health and safety concerns.

Copy of the completed *Approvals Sheet* (page # 62).

Different Types of Naturalization Areas

Try to establish a naturalization area that complements the surroundings of the school. Since you want to be limiting your green area to native species, it often helps to take your class for a walk to a local natural area to observe the plant and animal life. If there aren't any of these types of areas near your school take a short trip to a local park or outdoor education centre. The H.R. Frink Outdoor Education Centre has woodland, wetland and meadow areas with a considerable amount of plant and animal life. Conservation Areas are listed on page 68.

MEADOW

A meadow is one of the most productive habitats that exist. It develops very quickly and within four to five seasons it will be fully established. In these type of areas the garden consists mainly of grasses and wildflowers. A sunny well drained location is ideal for this type of naturalized area. The soil does not need to be high in organic matter or nutrients, but good drainage is a must.

Here is a short list of plants suited for the Prairie/Meadow areas. Some of these are listed in further detail in the "List of Native Species" on pages 40 - 58.

GRASSES: Big Bluestem, Little Bluestem, Indian Grass, June Grass, Sideoats Grama, Needle Grass, Switch Grass, Prairie Dropseed.

EARLY-SUMMER FLOWERING WILDFLOWERS: Blue-Eyed Grass, Golden Alexanders, Spiderwort, Prairie Smoke, Canada Anemone.

SUMMER-FLOWERING WILDFLOWERS: Showy Tick Trefoil, Purple Coneflower, Evening Primrose, Culver's Root, Butterfly Milkweed, Blazing Star, Compass Plant, Gray-Headed Coneflower, Nodding Wild Onion, Black Eyed Susan, Prairie Dock, Bergamot, Cup Plant, Ironweed, Blue Verain, False Dragonhead, Lance Leaved Coreopsis, Wild Lupine.

FALL-FLOWERING WILDFLOWERS: Bottle Gentian, New England Aster, Canada Goldenrod, Smooth Aster, Gray Goldenrod.

WET MEADOW PLANTS: Joe-Pye Weed, Milkweed, Gentian, Wild Garlic, New England Aster, Cardinal Flower, Ironweed, Blue Flag, Black Snakeroot, Culver's Root, Canada Lily, Panic Grass.

WOODLAND

Woodland naturalized areas should attempt to create the feeling of a forest in the schoolyard. This is a particularly good idea if there are a number of existing trees on the property. The woodland has many species of plants from large trees and spring flowers to ground covering plants like mosses. It provides children with shelter and shade from the sun and is well used by a variety of wildlife. A woodland naturalized area does best in rich, moist soil.

There are many plants suited for the woodland areas. The following is a list of some of them. Many of these are described in further detail on pages 40 - 58.

SPRING - FLOWERING WOODLAND WILDFLOWERS: Bloodroot, Dutchman's Breeches, Trout Lily, Canada Anemone, Cut-Leaved Toothwort, Trillium, Wild Ginger, Sharp-Lobed Hepatica, Wood Poppy, Foamflower, Spring Beauty, Virginia Bluebells, Jack-in-the-Pulpit, Banebury.

WOODLAND GROUND COVERS: Foamflower, Wild Blue Phlox, Partridgeberry, Wild Ginger, Violet, Barren Strawberry., Goldthread, Wild Geranium.

SUMMER BLOOMING WOODLAND WILDFLOWERS: Black Snakeroot, Wood Lily, Canada Lily, Woodland Sunflower, Bee Balm, Heart-Leaved Aster, Wild Leek, Pale Touch-Me-Not, Jewelweed.

WETLAND

Wetland habitat, while a fantastic learning grounds, raises a number of health, safety and liability concerns. As such, on-site outdoor ponds are not normally seen as favourable. Absolutely nothing should be done in the way of creating wetland habitat on school property without approval from Senior Administration.

If you are interested in studying wetland habitat, why not adopt a pond or stream that is nearby? Talk to the landowner and discuss the possibility of accessing or maintaining the site. You may even be able to plant the area with wetland species. Some of the following plants listed can be found in more detail on pages 40 - 58.

MARGINAL PLANTS

These plants should be grown in shallow water at the edge of ponds or along the water site:

Bog Arum, Marsh Marigold, Arrow Arum, Arrowhead, Blue Flag, Pickerel weed, Cattail, Sweetflag.

MOISTURE LOVING PLANTS

These plants flourish in moist soils around wetlands. Most require sun, although some of them do well in shade.

Cardinal Flower, Jewelweed, Bee Balm, Jack-in-the-Pulpit, Swamp Milkweed, Joe-Pye-Weed, Boneset, Ostrich Fern, Sensitive Fern, Cinnamon Fern, Sedges, Bottle Gentian, Skunk Cabbage, Turtlehead, Swamp Aster, Royal Fern, Canada Lily, Ironweed, Horsetail.

THE BUTTERFLY HABITAT

The butterfly habitat consists mainly of wildflowers. These areas are often established with the express intent of improving the region's butterfly population. Butterflies are very sensitive to their environment and due to pesticide use the butterfly population has declined over the past few years. To attract a wider variety of butterflies, carefully select plants that will bloom at different times of the season. This way nectar will be available throughout the spring, summer and into September.

The following is a list of suggestions to consider:

- i) Butterflies tend to like plants that produce purple, blue, yellow, and pink blooms.
- ii) The site should receive at least six hours of full sun per day.
- iii) The site should be well drained, but accessible to moisture (rain, tap).
- iv) Gravel paths, large flat rocks and evergreens are also beneficial in butterfly gardens. An area of shrubs with leaf litter will provide much needed shelter for your butterflies.

COMMON BUTTERFLY FLOWERS

Aster, Bee Balm, Black-eyed Susan, Blazing Star, Butterfly Bush, Chrysanthemum, Columbine, Coneflower, Cosmos, Daisy, Goldenrod, Honeysuckle, Lavender, Milkweed, Phlox, Yarrow and Zinnia.

The host plants listed below provide food for the caterpillars and nectar for the butterflies. By introducing these plants into the schoolyard, children can observe the full life cycle of a butterfly.

BUTTERFLY

American Painted Lady
Black Swallowtail
Eastern Tailed Blue
Monarch
Morning Cloak
Painted Lady

Red Admiral
Silver Spotted Skipper

Silvery Blue
Spring Azure

Tiger Swallowtail
Viceroy
White Admiral

HOST PLANT

Pearly Everlasting, Forget-Me-Not
Dill, Parsley, Carrot, Fennel
Clover and other legumes
Milkweeds
Willows, Elm, Poplar
Thistle, Burdock, Sunflower, Hollyhock,
Borage, Mallow
Nettles
Black Locust, Honey Locust, Alfalfa, Wisteria,
Everlasting Peas, Vetch, Lupine
Everlasting Peas, Vetch, Lupine
Viburnum, Blueberry, Dogwood, Spirea,
Milkwood, Meadow-Sweet, Willow
Black Cherry, Poplar, Ash, Birch, Willow
Thistle, Willow
Willow, Poplar, Hawthorn, Birch, Juneberry,
Basswood

The Bird Habitat

To attract any birds there are three basic elements: food, water, and shelter. This is very simple to create. The following lists flowers, trees and shrubs that are used for food and shelter by a variety of birds. Bird feeders, bird baths and bird houses are great addition to this type of habitat.

TREES FOR BIRDS SHRUBS FOR BIRDS

Alders
Ashes
Beeches
Cherries
Chokecherries
Hawthorn trees
Hazelnuts
Phlox
Pines
Russian Olive
Serviceberry

Aubrietias
Dogwoods
Elderberries
High bush Cranberry
Honeysuckle
Raspberry
Service Berry

FLOWERS FOR BIRDS

Asters
Balsam
Candytufts
Lavenders
New England Aster
Poppies
Primroses
Snapdragon
Sunflowers
Valerians

Conditions for Plant Selection

Before specific species can be selected for planting, preferred growing conditions have to be identified. Soil type, moisture and light, all have to be plant appropriate if you are to have success in growing healthy plants. Select plants that are suited to the climate and conditions of the schoolyard.

1. The soil

There are three types of soil:

- 1/ Clay
- 2/ Loam
- 3/ Sand

Soil consists of inorganic elements (clay, silt and sand) and organic elements (humus).

Student Activity

Students can test for soil type by collecting a jar of the soil, filling it with water, shaking it and then leaving it to settle. When it settles, the soil type can easily be determined.

Clay	-	60 % clay, 30 % silt and 10 % sand	clay ≡ Top
Loam	-	20 % clay, 40 % silt and 40 % sand	silt ≡ Middle
Sand	-	5 % clay, 10 % silt and 85 % sand	sand ≡ Bottom

Acidity of the soil also needs to be tested. Soil acidity kits are usually available at your local nursery. It is a relatively simple procedure for students to carry out. A pH of 1 is extremely acidic, 7.0 is neutral and 14 is extremely alkaline. Most trees and shrubs will do well with a pH value of about 6 or 7. Most of the plants in the native species list are able to tolerate slightly acidic or slightly alkaline soil.

pH scale from 0-14

pH 8 or over	:	very alkaline soil
pH 7.4 - 8.0	:	alkaline
pH 6.6 - 7.3	:	neutral
pH 6.0 - 6.5	:	slightly acidic
pH 5.5 - 5.9	:	moderately acidic
pH 5.0 - 5.4	:	strongly acidic
pH 4.3 - 4.9	:	very strongly acidic

*For a list of plants suited to either alkaline or acidic soil, go to page 58.

There are three major soil nutrients:

- 1/ Nitrogen - promotes healthy leaves and stems
- 2/ Phosphorus - root growth, size and quantities of fruits and flowers
- 3/ Potassium - root growth

If any of these major nutrients are missing plant growth will be affected. If plants do look particularly healthy, regular additions of compost can make a big difference.

2. The amount of light or shade the plant needs

Full sun - 8 hours or more of full sunlight

Partial sun - 6 hours a day of sunlight

Partial shade - 3 hours a day of sunlight, shade remainder of day

Deep shade - no direct sun

*Foliage on shrubs and trees may need to be pruned to allow sunlight to filter to smaller plants.

3. The moisture of the soil

The moisture of the soil refers to the amount of moisture needed by the plant for adequate growth.

SOIL DRAINAGE: adequate drainage (good drainage), poor drainage

Student Activity to test soil drainage.

- 1) Dig a hole to a depth of one foot and fill with water.
- 2) Fill again until soil is saturated.
- 3) If it takes less than one hour to drain there is adequate drainage, if it takes more than two hours then there is poor drainage.

4. Growth form

Growth form is the height that the plant will achieve. This is an important factor in selecting companion plants. You need to consider the amount of sunlight and nutrients smaller plants will require to flourish. If this is ignored your larger plants may tend to push out the smaller ones.

5. Flower colour

Flower colour can be an important factor when planning for a naturalized area. In addition to attracting particular birds and butterflies, the schoolyard garden can be a fantastic display of colour for the students.

6. Flower bloom

When selecting flowering plants, try to select species that are going to bloom when the students are in school to appreciate it. If planting vegetables, to focus on those that will be ready to pick in the spring or fall.

7. Wildlife

If you are hoping to attract wildlife with your naturalization project, selecting appropriate species is critical. Depending on the location of your school, it is not unreasonable to expect small mammals to move in to your area.

Incorporating a Composting Program into the Project

If you are planning a garden area on your schoolyard, a composting program is an essential component of your plan. Composting is a valuable learning tool for students. Unlike recycling, it is a waste reduction technique that allows the students to experience the process from beginning to end. Students are able to see their food scraps being turned into a useful fertilizer for the plants and flower beds that are part of the school's greening plan.

Chemical fertilizers should never be used in naturalized areas. The health of your plants will depend substantially on the health of your soil. Compost is an excellent (and inexpensive) fertilizer. It slowly releases nutrients into the soil - creating healthier plants and improved aeration/drainage at no cost.

What is composting?

Composting is the biochemical process that occurs when organic matter is broken down by microorganisms into nutrient-rich soil conditioner call humus.

Why compost?

- ⊃ Composting in your school can substantially reduce your garbage. About 1/4 to 1/3 of a school's garbage is compostable food scraps.
- ⊃ Compost is an excellent natural fertilizer which can be used in place of chemical fertilizers for plants.
- ⊃ Compost is healthier for the environment than chemical fertilizers.

To control odour add equal amount of browns (leaves) and greens (food waste and grass) clippings)

Introduce composting into the classroom

- ⊃ Teach students about the mechanics of composting.
- ⊃ Set up pails in each classroom for the compost. These containers should have lids and should be picked up, emptied and rinsed out on a regular basis.
- ⊃ It is a good idea to use relatively small containers so that the food scraps are not given the opportunity to accumulate.
- ⊃ Have a compost bin somewhere outside in the schoolyard.
- ⊃ Set up a central compost depot inside the school and have representatives from each class empty their pails into this bin. Have older students or environmental/composting club representatives responsible for emptying this central bin into the outdoor composter.

Location of the composter

There are a number of considerations when looking for that perfect location for your composter:

- ⊃ Accessibility is the number one priority. Place the composter where it will be easy to access year-round.
- ⊃ The composter needs to receive direct sunlight and moisture (do not place in shade).
- ⊃ Choose an area with good drainage. (Try to avoid placing on cement).
- ⊃ Do not relegate composter to a back corner of the schoolyard. This will only invite vandalism and discourage use in the winter.
- ⊃ Be proud that your school is composting. Place your composter where it can be seen!
- ⊃ Place the composter in close proximity to where the finished compost is needed.
- ⊃ Do not place a composter too close to playground equipment or to school entrances and windows. (Although a well-maintained composter should not attract pests, bee allergies are a health and safety concern).
- ⊃ Consult Plant Department to determine acceptable location.

Setting up the composter

- 1/ Place the composter in direct contact with the ground.
- 2/ Place a layer of sticks on the bottom for aeration.
- 3/ Empty collected materials regularly (requires a good mix of greens and browns).
- 4/ Stir the materials in the composter bin regularly with a stick for aeration.
- 5/ Add water to the composter if it becomes drier than a moist sponge, or add leaves if it is too damp.

***COMPOSTERS ARE FOR FOOD SCRAPS NOT FOR FOOD WASTE.
UNEATEN FOOD GOES HOME WITH THE STUDENT!***

How do you know the compost is ready?

- ⊃ Within a few months (depending on the season), the soil should be dark, crumbly and earthy-smelling.
- ⊃ Most of the original materials will no longer be recognizable.

When should the compost be harvested?

- ⊃ In June right before the summer holiday.
- ⊃ In September right after the summer holiday.

How do you harvest compost?

- ⊃ Empty contents of composter.
- ⊃ Sift compost. Anything not done decomposing can go back into the composter or can be dug into the school's gardens.
- ⊃ Put the finished product into flower gardens and around trees and shrubs.

COMPOST	
Y	Ψ
<i>Fruit</i>	<i>Sandwiches</i>
<i>Vegetables</i>	<i>Bones</i>
<i>Coffee Grounds</i>	<i>Cheese</i>
<i>Coffee filters</i>	<i>Chicken</i>
<i>Tea Bags</i>	<i>Fish</i>
<i>Plants</i>	<i>Mayonnaise</i>
<i>Leafs</i>	<i>Milk</i>
<i>Straw</i>	<i>Yogurt</i>
<i>Sawdust</i>	<i>Peanut Butter</i>
<i>Soil</i>	<i>Luncheon Meat</i>

Workable Timeline

This timeline is intended to be a rough guide only. Each school will obviously work at its own pace. Progress is dependent on a number of factors, all of which will vary by situation.

The planning stage is the most important part of the process and should be completed thoroughly and slowly. Regardless of the amount of time a school takes to plan its schoolyard improvement project, there are some activities that should be ongoing. These include notification, information distribution, contact with the HPEDSB's Plant Department and record keeping.

Year 1 Planning

September - June

- Consult staff, students, parents and the community.
- Start a binder to keep track of the project such as contacts, phone numbers, photos, goals, project plans, letters, materials, donors, etc.
- Plan a community meeting and start an environmental club at the school if one does not exist. Establish a schoolyard improvement committee.
- Send newsletters home detailing the school's goals to parents.
- Visit other schoolyard projects or local natural areas.
- Conduct ongoing research and fundraising. Visualize the project.
- Consult the Board's Plant Department to ensure that you are following Board Policy and Statements of Practice.
- Begin planning for naturalization area by conducting a site analysis and creating a map of the schoolyard.

Year 2

September

- Meeting of staff members, School Council, interested students.
- Meeting of interested people from the community.
- Completion of plan.

October

- Submit proposed plan to Controller of Plant and to S.G. Superintendent.
- Take pictures of the site to be naturalized.
- Collect seeds from natural areas.

October - November or April to May - After Approval

- Work process begins (plowing stripping, roto-tilling).
- Prepare site, enriching soil etc.
- Newsletter sent home with students informing the community of the school's progress.

November - December

- Share ideas for next year's project; begin fundraising.
- Empty composters into the garden soil before winter.
- Mulch trees and perennial plants for winter.

January

- Order seeds.
- Winter visits to natural areas to look for tracks.

Fill bird feeders.
Fundraising and funding applications.

February

Order trees, trips to tree nurseries.
Fill bird feeders.
Install bird houses.

March

Clean and repair existing bird houses and feeders.
Fill bird feeders.

April - Early May

Tree and shrub planting.
Till new garden areas.
Contact neighbours.
Make pathways and cover with woodchips or crushed stone.
Take pictures of the naturalized site.
Planting of flowering plants, ferns and/or grasses in late May-early June.

June

Weed and water.
Mulch.
Install benches, bird baths etc.
Publicize your schools success.
Organize summer volunteer help.

July - August

Water if needed, watch for damage or disease.

Year 3

September - June

Staff and students continue to observe improvement area/s for any drastic changes. Garden maintenance is ongoing. During the first year the gardens will need care and attention as the plants become established. As the years go by increasingly less maintenance will be required.

Additions can be made:

- planting of more trees, grasses, flowers etc.
- new gardens, bird baths, feeders and/or houses added.

Common Problems and Realistic Solutions

Vandalism

Get everyone involved - *ownership is the key!*

Keep the improvement areas away from streets and public access, particularly if there is heavy traffic around the schoolyard.

Keep your students and the community heavily involved. If they feel that they contributed to the project they will be more likely to protect it.

Set up signs detailing the intent and the goals of the project.

Have visible paths.

Speak with the neighbours, get them involved. Ask if they mind keeping an eye on the area and if need be, report any vandalism or other problems.

Maintaining over the Summer

A naturalized garden doesn't need much long-term maintenance since it is naturalized. However, the garden should get some extra care for the first year or two so that the plants can become established. As the years go by, less maintenance will be needed since the plants will become accustomed to the area. A main problem is what will happen to the gardens over the summer. The gardens still need to be maintained and observed for any problems. Here are some tips:

Have LOTS of community support !!!

Set up a schedule for volunteers to come in during the summer (students, school staff, neighbours). This is particularly important for the first couple of years.

Try to gain the support of a gardening club. Members may be willing to train volunteers who will be working to maintain the areas for the first couple of years.

Other Considerations

Any structures such as sun shelters, benches, play structures or activity centres that are included in the school's improvement project must be inspected on a regular basis. Please advise the school's health and safety committee of this need for routine inspection.

Publicizing Your Success

Publicizing what you have done as a school and as a community is an important part of the entire improvement project. Let the community know what you have done. Perhaps you can get other schools interested and give them some ideas to start their own schoolyard improvement projects. By the same token, watch newspapers, suggested websites and community news channels to get ideas of what other schools have found successful.

Contact local newspapers.

Contact local community cable channel.

Let your local cable channel know of the work you have done to your schoolyard. Perhaps they will want to create a documentary on your school's naturalization project.

Contact local radio stations.

Contact local radio stations and let them know what you have completed. Invite the community to come take a look.

Share your school's accomplishments with others over the Internet.

Send out school newsletters with the students.

Throughout the naturalization project newsletters should be sent out to parents detailing the progress of the project. Distribute a gala brochure upon the project's completion.

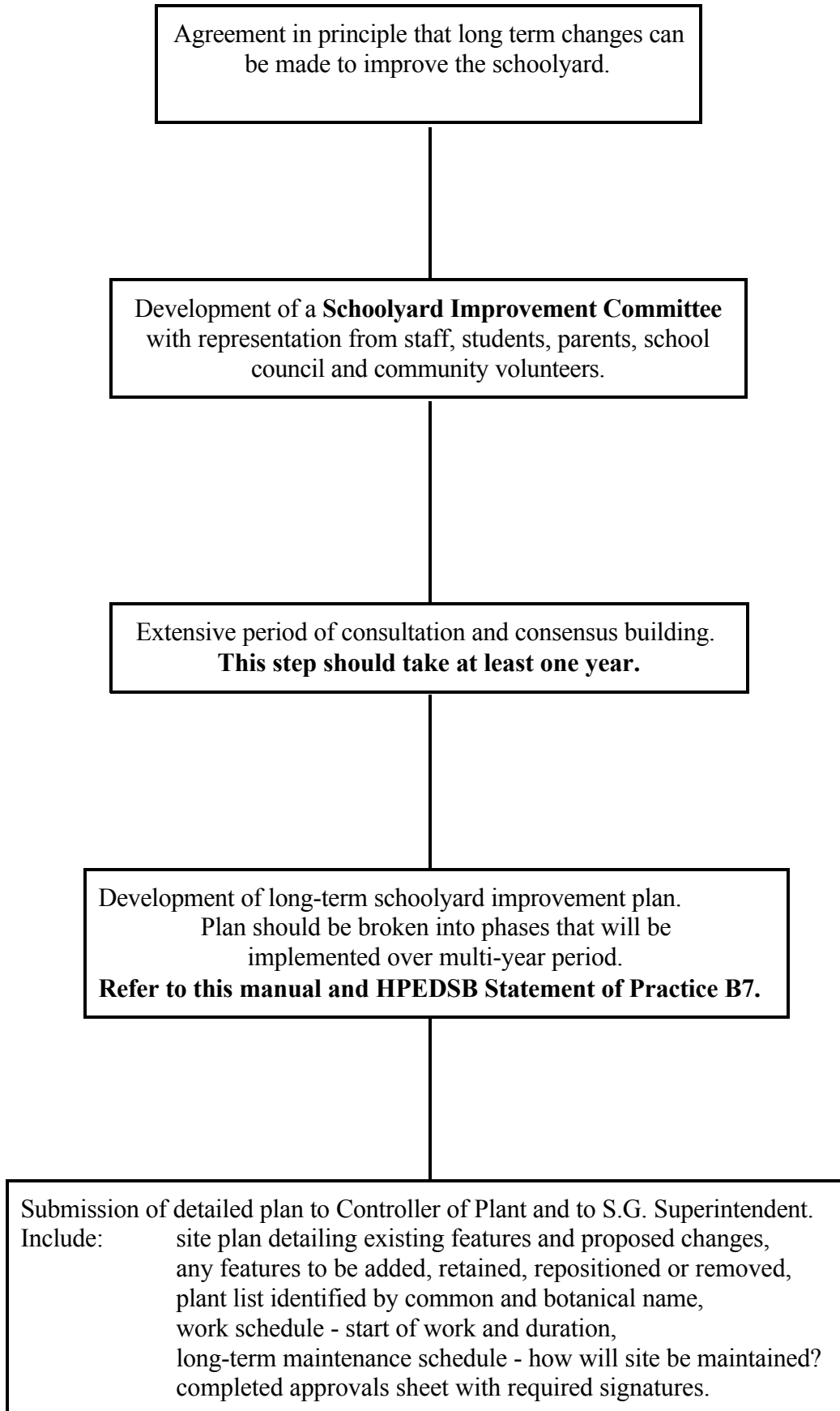
- When the project is completed have pictures of the before and after site, and of the students at work.
- Have students' poems and drawings of the naturalized area incorporated into the newsletter.
- Send copies (containing acknowledgements, of course) to agencies and people who donated time, money, material and/or expertise.
- Submit articles (and accompanying pictures) to The HPEDSB Newsletter.

Have an Open House

- Invite:
- parents,
 - the community ,
 - agencies that provided support or funding,
 - people who donated their time, materials or expertise,

Have students prepare a guided tour and a number of thank you speeches, thanking all who made the project possible. Celebrate your success and introduce plans and possibilities for the next stage of the project. Solicit support now for your future endeavours!

The Approvals Process



Application for Schoolyard Improvement Project Approvals Sheet

In accordance with the Hastings and Prince Edward District School Board's Statement of Practice (B7), any school initiating a schoolyard improvement project will be held responsible for the installation and maintenance of the area or structure, as well as any repairs that are required due to vandalism or accidental damage.

In order to ensure that the initiating group/school has undergone an extensive consultation process, signatures are required from representatives with a long-term interest in the project and its upkeep.

SUBMISSION

When the school has completed the consultation and plan development process, submission of the draft site plan must be forwarded to the Controller of Plant and to the S.G. Superintendent. This *Approvals Sheet* must be submitted with the site plan, bearing the signature of:

School Principal

SAMPLE

Chair, Schoolyard Improvement Committee

Name of School

Date of Application

HASTINGS AND PRINCE EDWARD DISTRICT SCHOOL BOARD
APPLICATION FOR APPROVAL OF SCHOOLYARD IMPROVEMENT PROJECT

SCHOOL:	DATE OF APPLICATION:
----------------	-----------------------------

PRINCIPAL:	
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SCHOOLYARD IMPROVEMENT COMMITTEE CHAIR:

<p>CONTACT NAME: _____</p> <p>ADDRESS: _____</p> <p>PHONE NUMBER: _____</p> <p>_____</p> <p>_____</p>	
--	--

How long has the school been involved in the planning process?

**Detail improvements to be made to the schoolyard (please use separate sheets if necessary).
Indicate whether the work is to be done in phases and attach:**

- i) a site plan detailing existing features and proposed changes (to scale),**
- ii) any features to be added, retained, repositioned or removed,**
- iii) a list of plants to be used, identified by common and by botanical names,**
- iv) detailed plans of any structures to be built (including benches),**
- v) projected start date and projected completion date for each phase of the project.**

SAMPLE

Has the Schoolyard Improvement Committee contacted proper authorities to ensure that no municipal or provincial regulations are being violated?

**Is the funding *currently* available to complete each phase of the project within expected time lines?
Please list sources of funding.**

Please list the equipment that will be used in the development of the schoolyard improvement area.

Please identify contractors to be used, if any.

Please refer to the "Insurance and Liability" portions of *Break New Ground ... Diversify your Schoolyard - A Resource Document for Schoolyard Improvement*. You may be required to submit additional information depending upon the type of equipment being used and the type of work being done by the contractor.

Please outline the maintenance schedule that has been developed for the schoolyard improvement area (particularly during school holidays and the summer months). Please provide the name and phone number of the contact person in charge of maintenance (and an alternate).

Signature of Principal

Signature of Schoolyard Improvement Committee Chair

Approval of S.G. Superintendent

Approval of Controller of Plant

Use of Equipment on Board Property

All persons performing work on Board property must:

- 1) be competent to use tools and equipment,
- 2) wear appropriate personal protective devices and,
- 3) use appropriate safety devices (guards, switches) as required by the Occupational Health and Safety Act.

Heavy construction equipment such as front end loaders, bulldozers, dump trucks and excavators will require a licenced, qualified and insured operator and owner. The Board requires that any contractor performing work on its property maintain a minimum of \$1,000,000 comprehensive general liability insurance.

Specific Insurance Requirements

All contractors using heavy equipment must:

Protect, indemnify and save from harm Hastings and Prince Edward District School Board (herein called the Owner) from any and all claims which may arise from the Contractor's operation or performance of work and for this purpose shall maintain insurance of limits not less than \$1,000,000 Public Liability and Property Damage for each person, each occurrence unless otherwise stated by the Owner. In addition, \$500,000 is to be carried by the Contractor for vehicle insurance and \$500,000 on non-owned vehicles. Such policies shall provide for thirty (30) days notice to be given to the Owner before such policy is suspended, cancelled or terminated by the insurer for any reason including non-payment of premium. The Contractor shall produce the said insurance policy to the Owner and deposit a copy thereof with the Owner before commencing any work. The Owner reserves the right to cancel any contract or to stop work at any time, without notice, if the Contractor fails to carry and keep in full force and effect such insurance, and shall until any and all claims for injury, death or damage are fully paid and satisfied.

Explanation:

Comprehensive general liability will protect the Board from any claims that may arise from the Contractor's operation while performing work on Board property.

Owned Automobile liability insurance will protect the Board from liability for claims against the Contractor arising out of accidents involving vehicles owned by the Contractor. Non-owned liability is to protect the Board in the event a contractor has vehicles other than his own on the job.

Schools must ensure that an insurance certificate is given to the Board's Business Office prior to start of work.

Connections to The Curriculum

*L.O. - Learning Outcomes

Kindergarten

L.O. Recognizes relationships between living things in the environment.

Plants attract wildlife

Look for signs of wildlife

- Caterpillars
- Butterflies
- Birds/nests
- tracks, tunnels, webs, food caches, eggs, etc.

L.O. Identifies and describes the simple function of a variety of materials.

Build a bird house or bird feeder out of wood and put houses or feeders into naturalized areas to observe how birds use them.

Grade 1

L.O. Identifies examples of growth and development in living things.

Sow seeds for naturalized area, transplant and provide plants with the necessities to survive. Watch for insect eggs deposited on leaves or stems and make regular checks for development of caterpillars or nymphs, pupae and adults.

Bird life cycles as well as that of amphibians and reptiles may also be observed.

L.O. Recognize how everyday activities are affected by the seasons and natural forces.

Have a weather station close to naturalized area - thermometer, rain gauge etc.

Perhaps a weather vane and barometer for air pressure.

Keep track of length of day and see the relationship between day length and:

- flowering
- change in leaf colour
- swelling of buds
- sap flow
- squirrel activity
- bird migration
- people's activities

Grade 2

L.O. Identifies how the school and community influences one's personal and group identity.

Identifies and describes roles and responsibilities within the schoolyard.

Be aware of and involved in the planning of naturalized area(s).

Take on responsibility of one or more aspects of the naturalized projects.

Recognize that the class is a partner in a unique project which is long lasting. The project involves each student in a hands-on learning experience that extends for the time that each student spends in that school.

Grade 2

L.O. Identifies change in the cycles of plants and animals.

Observe and document the development of plants and animals in the naturalized area
seed ≡ seedling ≡ tree
insect egg ≡ larva ≡ pupa ≡ butterfly

L.O. Identifies the properties of common materials.

Check the soil in naturalized areas for texture, odour, moisture content, weight and colour.
Look for different types of rocks, fossils, and/or minerals that are on the schoolyard and describe the differences.
Compare the textures, and patterns of different tree barks, leaves etc.

L.O. Identifies the relationship between change and time.

Record day length and watch for changes in environment, temperature and response of plants and animals.
Observe specific plants and/or animals in the naturalized area on a weekly basis and record changes.

Grade 3

L.O. Recognizes changes of living and non-living things in the local community.

1/ Classify things in the naturalized area under headings of:

LIVING	NON-LIVING	
butterflies	<i>(Dead)</i>	<i>(Was Never Alive)</i>
dandelions	fallen leaves	rocks, air

2/ Classify non-living as natural or man-made.

3/ Classify items as solid/liquid/gas.

4/ Classify items as hard or soft.

L.O. Identifies how to predict and measure changes in the weather.

Set up an inexpensive weather station-thermometer, rain gauge, weather vane, and barometer.
Watch for responses of plants and animals in naturalized areas .

eg. a spider retreating to a sheltered area and leaving the web unattended during a rainfall or an earthworm emerging from the ground during a heavy rainfall.

Grade 4

L.O. Identifies the relationships between living things and the environment.

research habitats of plants and animals that the school wishes to include in the naturalized area and study the relationship between them .

- eg. mulch is important to earthworms, sowbugs.....etc.
- monarch butterflies require milkweed
- walking sticks feed on certain tree leaves
- waxwings feed on juniper berries etc.
- stones are important covers for ants, millipedes etc.

L.O. Identifies ways of caring for the environment.

set up composters and get involved in recycling.
plant trees and native plants.
beautify the schoolyard by making it able to accommodate wildlife.

L.O. Identify changes in matter which occur naturally.

investigate the process of decay (eg. in a composter).
investigate erosion as a destructive but important for soil building.

L.O. Identifies rocks and minerals and/or fossils from the local community.

record the types of rocks in the schoolyard and research the history of each type.
observe soil under a magnifier and identify its component parts.

Grade 5

L.O. Identify how living things adapt to their environment.

students observe plants and animals in the naturalized area and look for special adaptations

- eg. - camouflage
- front legs of a praying mantis
- short thick beak of a cardinal cracking sunflower seeds
- evergreen's pyramidal shape prevents snow from breaking branches
- deciduous trees losing leaves in fall to prevent dehydration during the "dry" winter months

L.O. Identifies cyclical occurrences in the students' lives and in the natural world overtime.

observe and record seasonal changes.

Grade 6

L.O. Identify relationships within ecosystems.

Identify food chains and food webs in the schoolyard.

Assess the impact of students on the local ecosystem (positive and negative).

Identify and describe relationships among living things and their environment, such as interdependencies. eg.

- flowers and bees
- algae and fungus in a lichen
- ants and aphids

Observe that each living thing has its special niche in the ecosystem.

eg. a monarch caterpillar feeds only on the milkweed

Recognize the meaning and importance of *habitat*.

Observe the behaviour of different animals that help these animals to survive.

eg. animals freeze and blend in to avoid detection

L.O. Identify the nature and movement of objects in the air.

Aerodynamic features of a bird.

Flight of an insect.

How seeds travel through the air.

Grade 7 & up

L.O. Access possible sites for community ecological restoration projects and prepare and implement an action plan.

Consult experts in the community to effectively assess the schoolyard site for naturalization. Prepare an action plan and implement it.

L.O. To develop and participate in an activity related to a global and/or environmental issue and evaluate its impact.

Students get involved in site assessment development and presentation of plans for naturalization. They can also evaluate the impact that the naturalized site will have on the environment, wildlife, student education and the aesthetic quality of the schoolyard.

L.O. Recognize and describe complex patterns and relationships in natural and human made environments.

Study the ecology of the schoolyard before naturalization and compare the soil ecology of the natural area. Determine the relative complexity of one to the other and the factors that contribute to a stable and healthy ecosystem. Students can then use their findings to determine how to effectively naturalize a given site.

L.O. Explain theories about the process of change in the environment over periods of time.

Assess the effects of any conservation efforts made when naturalizing areas in the schoolyard. Collect relevant data over an extended period of time and compile it so that future classes can read about the naturalization process and add current data. The site analysis (with maps and photos, etc.) will give a clear picture of how an area changed over a period of time.

L.O. Explain some models and theories about the interactions among living organisms.

Use the schoolyard naturalization area to study:

- phototropism
- geotropism
- photosynthesis
- host/parasite relationships (eg. insect galls on leaves)
- symbiotic associations (eg. algae and fungus in a lichen; nitrogen-fixing microorganisms in légumes, flowers and pollinators)
- food chains and webs
- cycles (water, carbon, oxygen, nitrogen)
- human dependence on the natural environment

L.O. Investigate and explain ways in which matter changes.

Study erosion and soil formation

L.O. Investigate global cause-and-effect relationships and offer solutions to related environmental challenges such as the impact of pesticides/fertilizers in the food chain and the effect of forest loss on oxygen supplies.

The investigations of local environmental challenges can coincide with the implementation or nurturing of the student's own solution in creating or maintaining a naturalized area in an otherwise sterile schoolyard. Regular analysis of the ecology of the naturalized area will be an indicator of the degree of success of the project.

L.O. Demonstrate concern and care for their bio-region by acting to ensure its sustainability.

Students can:

- learn the processes by which an individual can contribute to the conservation of an area by being heavily involved in all aspects of naturalization (eg. planning, public relations, implementation, maintenance and care).

L.O. Practice reducing, reusing, recycling, refusing and rethinking and explain the implications of these activities on a local and global scale.

Students get involved in the naturalization project and minimize the cost of implementation and maintenance by finding creative ways to reuse materials.

(eg. discarded tractor tires for mini-gardens on pavement, compost for fertilizer, discarded pieces of lumber to build bird houses and feeders).

Complex Skills Learned By All Grade Levels

- Case Studies
- Predictions
- Observing and recording of data
- Classifying
- Measuring
- Decision making - by involving students in the planning of naturalized areas

Involvement in naturalization projects will give students a better understanding of the interdependencies between society and the environment. A naturalization project is a phenomenal learning experience.

Skills acquired include:

- interacting co-operatively with peers and adults,
- interacting with the outdoors in a way that preserves the environment,
- contributing to common group goals.

Values learned through a naturalization project which involves the students at all levels include:

- consideration for others,
- concern and care for the environment,
- respect for living things.

A naturalization area encourages cross-curricular activities. It can be used extensively for environmental studies and science but also for:

Math measurements, temperatures, data recording, graphing
Visual Arts sketching, painting
Language Arts poetry, writing, listening, public speaking, letter writing, research
Physical education digging, walking, carrying, seeding, planting, raking
Social Studies self-esteem, environmental issues, horticultural economy and geography
History students research the history of the site
Family Studies make natural dyes, learn about nutrition, organic and biodynamic approaches
Technology build bird houses, feeders and bird baths

STUDENT SURVEY - Part One

Imagine your schoolyard as it looks now and throughout the year.

- Where do you like to play?
- Are there quiet places to be away from rough play?
- Is the schoolyard an interesting place to be?
- Is there anything to do outside?
- Is there anywhere to sit other than on the ground?
- Are there any places where bullying takes place?
- Is there shelter from the wind or sun?
- Are there any trees in the yard? How big are they?
- Do you know what kind of trees they are?
- Do the trees provide shade in the summer?
- Do you like to sit under the trees?
- Are there any places of special interest to you in the yard?
- Do you ever see any wildlife in the yard?
- Are there any birds in the yard?
- Do you ever see any flowers growing in the yard?
- Have you ever noticed any bees or butterflies around the flowers?
- What kinds of sounds do you hear while you are playing outside?
- What does the schoolyard smell like?
- Is there any litter? What kind of litter? Is there anywhere to properly dispose of litter?
- What do you think of your school building?
- Is there anything growing around the edge of the building or climbing up the walls?
- Do you like the look of the parking lot?

Sample Survey generated by The Evergreen Foundation

STUDENT SURVEY - Part Two

Imagine what you would like to see and do in your schoolyard?

- How could you make your schoolyard a more interesting place?
- How could you make the play spaces more exciting?
- Would you like to have some games, number and letter snakes, mazes and magic circles printed on the schoolyard?
- How could you create places for quiet play, reading or just talking to friends?
- How could you make quieter and safer places for small children in the school who might be knocked down by bigger kids?
- Would you like to have something to sit on other than the ground? If so, what?
- Would you like to have some tables, benches, rocks and logs outside where you could sit and talk, think, play or read?
- Would you like to have more trees in the yard?
- Would you like to have more shady places in the summer?
- How could you attract more birds, butterflies, etc. to your schoolyard?
- How could you help feed birds in the cold winter months?
- What would you like to do about the littering problem?
- What do you think could be done to make the school building look better?
- Would you like to plant anything outside such as flowers, vegetables, trees?
Would you like to help look after them?
- Would you like to see climbing plants along the fences?
- How could you screen the parking spaces to make them less visible from the schoolyard?
- What would you like to do outside in the winter?

Sample survey generated by The Evergreen Foundation

PARENT SURVEY

A) PLAY

1. Are you satisfied with the present layout of the grounds in terms of supplying adequate incentive for play?
2. Can you identify problem areas on the grounds and explain why they are a problem?
3. Which kinds of play equipment would you like to see added to the grounds?
4. Is there anything you can think of which you believe should be considered in a site plan to enhance children's play opportunities?
5. Do you think that children should be given the opportunity to provide their own input regarding their play needs?

B) ENVIRONMENTAL ETHOS OR ATTITUDES

1. What do you find aesthetically pleasing about the grounds at present?
2. What kind of improvements would you like to see to beautify the grounds?
3. Would you be willing to volunteer time and effort to help improve the schoolyard?
4. Which aspects of environmental education should be considered when developing landscaping plans?
5. Do you know any source/s of plants, trees or landscaping materials that would be free or low-cost?
6. Do you have a skill that would be useful in the planning and development of the site plan, or in the implementation of the greening projects? (ie. surveying, research, drawing, bio-planning, architecture, carpentry, gardening, communications, volunteer co-ordination, etc.).
7. What kinds of plantings would you like to see on the grounds?
8. Have you any ideas regarding how the school might employ "creative salvaging" techniques to avoid using new materials for building raised planters, defining the edges of planting beds, making pathways around planted areas, building bird feeders, etc.?
9. Can you think of any ways in which outdoor spaces can be designed to provide for both summer and winter activities: for example, a vegetable garden in spring/summer and snow/ice sculpture garden in winter; an earth-berm amphitheatre in spring/summer and a snow slide in the winter?

Sample survey generated by The Evergreen Foundation

TEACHER SURVEY

A) FORMAL CURRICULUM

1. Which areas on the grounds do you presently use to meet the demands of the formal curriculum?
2. If you do not use any parts of the grounds, why not?
3. Which curriculum subjects do you see being reinforced by the development of the grounds?
4. When the grounds are developed following criteria set by you and the other teachers, will you be more likely to use the grounds as an outdoor classroom for a variety of subjects?
5. What are your recommendations (ie. changes, additions, deletions) in order to improve the grounds so that they may be used more fully to meet the demands of the formal curriculum?
6. How could you integrate butterfly gardens, plantings of native berry bushes, vegetable and herb plots, wildlife-friendly gardening into the curriculum?
7. How could you use outdoor spaces in the winter?

B) PLAY

1. Are you satisfied with the present layout of the grounds for the purpose of children's play?
2. Can you identify problem areas on the grounds and explain why they are a problem?
3. What would you like to see included for the site's development that would enhance the opportunities for motor play, social play, cognitive play and quiet or solitary play?

C) ENVIRONMENTAL ETHOS

1. What do you find aesthetically pleasing about the present site?
2. What improvements would you like to see in the future?
3. Would you be willing to devote class time to the maintenance of the grounds if outdoor classroom development and use were integrated into the curriculum?
4. What subjects do you think are best suited to the grounds greening process?

TEACHER SURVEY - continued

D) THE GROUNDS

1. Where are the children's favourite places on the playground?
2. Are active play spaces separated from passive play areas?
3. Is there a place on the grounds where children can sit and engage in quiet pursuits such as reading, board games, chatting, etc.?
4. Where is the noisiest place?
5. Where do children go when it is hot and sunny?
6. Where do children go when it is rainy?
7. Where do children play their most active games?
8. Where are the (i) windiest, (ii) wettest, (iii) warmest, (iv) coldest, (v) shadiest and (vi) sunniest places on the grounds?
9. Which place/s are used the most in the (i) summer, (ii) winter, (iii) throughout the year?
10. Are there any places that are out-of-bounds seasonally or year-round? Why?

LIST OF NATIVE PLANT SPECIES

The following is a list of native plants that can be looked at with the students. The plants that are agreed on should then be thoroughly researched by the students. Plants that are chosen should already be suited for the climate of the schoolyard. Take the students for a short walk to nature areas around the schoolyard to observe what plants are best suited for the area. If there are no wild areas around the school premises, a short field trip to an outdoor education centre or a park will show you what type of plants grow in the area. A list of conservation areas are listed on page 68.

REMEMBER:

Obtain the native plants from a seed, garden or nursery.

Use native plants that have originated in your community. They are best suited to the local climate, soil, pollinators and disease. Native plants will need the least maintenance.

Visit an area where students can observe the plants growing in the wild.

Only use plants suitable to the growing conditions.

Chemical fertilizer, weed and predator controls are not needed in a naturalized garden.

If needed, then find natural means of doing this. Compost material can be added to enrich the soil instead of chemical fertilizer.

Consider the purpose of the garden. Is it to attract wildlife? Provide shade for students? Create a more attractive schoolyard?

If you are collecting the seed from plants make sure you take no more than 10% of the seed crop.

Share your school's accomplishments with the community and other schools.

Flowering Plants

P = Perennial B=Biennial A = Annual

MEADOW AND PRAIRIE PLANTS

BEARDTONGUE (*Penstemon digitalis*) (P)

SOIL: Sand
MOISTURE: Tolerates dry soil, resistant to drought, well drained soil
LIGHT: Full sun to partial shade
GROWTH FORM: 4'
FLOWER COLOUR: White to white with purple and sometimes lavender
FLOWER BLOOM: May - June
WILDLIFE: Hummingbirds, honeybee, bumblebee, butterfly
* Also known as Foxglove Penstemon

BERGAMOT (*Monarda fistulosa*) (P)

SOIL: Average Fertility
MOISTURE: Moist or Dry Soil, Drought Tolerant
LIGHT: Full Sun
GROWTH FORM: 3'
FLOWER COLOUR: Lavender
FLOWER BLOOM: July-August
WILDLIFE: Bees, Butterflies, Moth

BLACK-EYED SUSAN (*Rudbeckia hirta*) (Biennial or short lived Perennial)

SOIL: Tolerant of a wide range of soil
MOISTURE: Drought Tolerant
LIGHT: Full sun to very light shade
GROWTH FORM: 2' - 3'
FLOWER COLOUR: Yellow
FLOWER BLOOM: Summer - Early Fall
WILDLIFE: Birds

BLAZING STAR (*Liatris spicata*) (A)

SOIL: Well drained humus rich soil
 MOISTURE: Evenly moist
 LIGHT: Full sun to light shade
 GROWTH FORM: 1' - 5'
 FLOWER COLOUR: Lavender
 FLOWER BLOOM: July - September
 WILDLIFE: Butterflies

BUTTERFLY MILKWEED (*Aeclepias tuberosa*) (P)

SOIL: Sandy soil
 Can cope with moderate acidic conditions.
 MOISTURE: Dry, Good drainage
 LIGHT: Full sun
 GROWTH FORM: 1' - 3'
 FLOWER COLOUR: Purple
 FLOWER BLOOM: July-September
 WILDLIFE: A wide variety of butterflies and moths, hummingbirds, bees
 Host plant to Monarch Butterflies

CANADA GOLDENRODS (*Solidago canadensis*) (P)

SOIL: Sand, broad range of tolerance,
 average to poor fertility, pH 5.5-7.0
 MOISTURE: Well drained, drought tolerant
 LIGHT: Full sun
 GROWTH FORM: up to 5'
 FLOWER COLOUR: Yellow
 FLOWER BLOOM: Late Summer - Early Fall
 WILDLIFE: Insects, Monarch Butterflies, birds, mammals

COMPASS PLANT (*Silphium laciniatum*) (P)

SOIL: Rich soil, can cope with drier sandy soil
 MOISTURE: Well drained, drought tolerant
 LIGHT: Full sun
 GROWTH FORM: up to 12'
 FLOWER COLOUR: Yellow daisy-like
 FLOWER BLOOM: July- September
 WILDLIFE: Butterflies, bees, moths

* If you are starting the compass plant from seed it may take up to 5 years to bloom.

CULVER'S ROOT (*Veronicastrum virginicum*) (P)

SOIL: Rich
 MOISTURE: Moist - average soil
 LIGHT: Full to partial sun
 GROWTH FORM: 2' - 7'
 FLOWER COLOUR: White
 FLOWER BLOOM: Late July - Early Fall

EVERLASTING (*Anaphalis margaritacea*) (B)

SOIL: Sandy, rocky, gravelly soil
 MOISTURE: Well drained, drought resistant once established
 LIGHT: Full sun
 GROWTH FORM: 2" - 6" height , 2" - 6" spread
 FLOWER COLOUR: White
 FLOWER BLOOM: Late Spring - Late Summer
 WILDLIFE: Butterflies (Painted Lady, Silvery Blue)

EVENING PRIMROSE (*Oenothera biennis*) (B)

SOIL: Loam
 MOISTURE: Dry soil, well drained
 LIGHT: Full sun
 GROWTH FORM: 1' - 5'
 FLOWER COLOUR: Yellow
 FLOWER BLOOM: July - September
 WILDLIFE: Birds, butterflies, bees and other insects

IRONWEED (*Veronia altissima*) (P)

SOIL: Rich, organic soil
 MOISTURE: Moist to average
 LIGHT: Full sun
 GROWTH FORM: 3' - 7'
 FLOWER COLOUR: purple to red
 FLOWER BLOOM: August - October

LANCE - LEAVED COREOPSIS (*Coreopsis lanceolata*) (P)

SOIL: Does well in poor soil
 MOISTURE: Tolerates drought
 LIGHT: Full sun
 GROWTH FORM: 1' - 2'
 FLOWER COLOUR: Yellow
 FLOWER BLOOM: Summer - Late Fall
 WILDLIFE: Butterflies, seed-eating birds

LUPINE (*Lupinus perennis*) (P)

SOIL: Acidic sand or clay soil
 MOISTURE: Well drained
 LIGHT: Full to partial sun
 GROWTH FORM: 1' - 2'
 FLOWER COLOUR: Blue
 FLOWER BLOOM: May - June
 WILDLIFE: Host plant for the rare and endangered
 Karner Blue Butterfly (Ontario's rarest butterfly)
 Hummingbirds

* Lupines are easy to grow from seed but do not respond well to transplanting.

NEW ENGLAND ASTER (*Aster novae-angliae*) (P)

SOIL: Rich soil
 MOISTURE: Moist to wet
 LIGHT: Full to partial sun
 GROWTH FORM: 3' - 4'
 FLOWER COLOUR: Purple
 FLOWER BLOOM: Late Summer - Fall
 WILDLIFE: Bees, butterflies, grouse, chipmunk,
 mice, rabbits, deer, sparrows

OBEDIENT PLANT (*Physostegia virginiana*) (P)

SOIL: Fertile
 MOISTURE: Moist
 LIGHT: Sun
 GROWTH FORM: 2' - 4'
 FLOWER COLOUR: Lavender, white
 FLOWER BLOOM: Late Summer - Fall
 WILDLIFE: Hummingbirds

PRAIRIE SMOKE (*Geum triflorum*) (P)

SOIL: Sandy soil, pH 6.0 - 7.0
 MOISTURE: Dry to evenly moist, well drained
 LIGHT: Full sun to partial shade
 GROWTH FORM: 6" - 8"
 FLOWER COLOUR: Red
 FLOWER BLOOM: April - June

PURPLE CONEFLOWER (*Echinacea purpurea*) (P)

SOIL: Does well in many types of soils
 MOISTURE: Average to dry soil, drought tolerant
 Prefers good drainage
 LIGHT: Full sun
 GROWTH FORM: 3'
 FLOWER COLOUR: Purple
 FLOWER BLOOM: August - September
 WILDLIFE: Butterflies, other insects

QUEEN-ANNE'S-LACE (*Daucus carota*) (B)

SOIL: Sandy loam, slightly acidic
 MOISTURE: Moist to dry, well-drained soil
 LIGHT: Full sun to partial shade
 GROWTH FORM: 2'
 FLOWER COLOUR: White
 FLOWER BLOOM: Summer
 WILDLIFE: Butterfly, caterpillar, honeybee, bumblebee
 ruffed grouse, mice

SPIDERWORT (*Tradescantia virginiana*) (P)

SOIL: Can tolerate sandy soil, pH 5.5 - 6.5
 MOISTURE: Dry soil
 LIGHT: Full sun or partial shade
 GROWTH FORM: 1' - 2'
 FLOWER COLOUR: Violet
 FLOWER BLOOM: May - July
 WILDLIFE: Hummingbirds, bees

*Spiderwort is a threatened species in Canada

SUNFLOWER (*Helianthus annuus*) (P)

SOIL: Does well in any soil
 MOISTURE: Moist or dry soil
 (dry soil will decrease height)
 LIGHT: Full sun
 GROWTH FORM: 3' - 10'
 FLOWER COLOUR: Yellow
 FLOWER BLOOM: July - October
 WILDLIFE: Insects, birds

WOODLAND PLANTS

BELLWORT (*Uvularia grandiflora*) (P)

SOIL: Humus rich soil
 MOISTURE: Moist soil
 LIGHT: Partial sun to full shade
 GROWTH FORM: up to 2'
 FLOWER COLOUR: Yellow
 FLOWER BLOOM: April and June
 *rare in Ontario

BLOODROOT (*Sanguinaria canadensis*) (P)

SOIL: Rich soil and heavy clay soil, rocky,
 pH 5.5 - 6.5
 MOISTURE: Well drained, dry soil
 LIGHT: Shade
 GROWTH FORM: 6" - 12"
 FLOWER COLOUR: White
 FLOWER BLOOM: Early Spring

BLUE COHOSH (*Caulophyllum thalictroides*) (P)

SOIL: Rich, pH 4.5 - 7.0
 MOISTURE: Moist
 LIGHT: Shade tolerant
 GROWTH FORM: 1' - 3'
 FLOWER COLOUR: Greenish yellow or brown
 Blue seeds in summer
 FLOWER BLOOM: May
 * Seeds may take a few years to germinate.

CANADA ANEMONE (*Anemone canadensis*) (P)

SOIL: Grows well in humus rich soil
pH 6.0 - 7.0
MOISTURE: Moist
LIGHT: Full sun to partial shade
GROWTH FORM: 1' - 2'
FLOWER COLOUR: White, lavender or blue
FLOWER BLOOM: Early spring

CANADA LILY (*Lilium canadense*) (P)

SOIL: Humus rich, acidic to neutral soil
MOISTURE: Moist meadows
LIGHT: Full sun to light shade
GROWTH FORM: up to 5'
FLOWER COLOUR: Orange, yellow or red
FLOWER BLOOM: July
WILDLIFE: Deer like to eat the flowers and stems

CANADA MAYFLOWER (*Maianthemum canadense*) (P)

SOIL: Humic soil slightly to strongly acidic conditions
MOISTURE: Moist or dry woods
LIGHT: Shade
GROWTH FORM: 15"
FLOWER COLOUR: White
FLOWER BLOOM: Late spring and early summer
WILDLIFE: Ruffed grouse, varying hare, chipmunk, mice

CANADA VIOLET (*Viola canadensis*) (P)

SOIL: Rich
MOISTURE: Moist
LIGHT: Shade
GROWTH FORM: 1'
FLOWER COLOUR: White with purple veins and yellow centres
FLOWER BLOOM: March - May
WILDLIFE: Insects, Butterflies, Small Bees

DUTCHMAN'S BREECHES (*Dicentra cucullaria*) (P)

SOIL: Rich or rocky, pH 6.5 - 7.0
 MOISTURE: Moist
 LIGHT: Partial shade and filtered light
 GROWTH FORM: Up to 6"
 FLOWER COLOUR: White with yellow tips
 FLOWER BLOOM: Spring
 WILDLIFE: Bumblebees, insects

EARLY MEADOW- RUE (*Thalictrum dioicum*) (P)

SOIL: Humus rich, fertile soil, pH 6.0 - 7.0
 MOISTURE: Moist
 LIGHT: Full sun to shade
 GROWTH FORM: 1' - 2'
 FLOWER COLOUR: Yellow or whitish-green
 FLOWER BLOOM: April - May

*Under deciduous trees are ideal

EASTERN COLUMBINE (*Aquilegia canadensis*) (P)

SOIL: Humus rich soil, pH 6.0 - 7.0
 MOISTURE: Dry Areas, well drained
 LIGHT: Full sun to partial shade
 GROWTH FORM: 1' - 2'
 FLOWER COLOUR: Red and yellow
 FLOWER BLOOM: April - June
 WILDLIFE: Orioles, hummingbirds, bees

GERANIUM (WILD) (*Geranium maculatum*) (P)

SOIL: Prefers humus rich soil, Tolerates acidic soil
 MOISTURE: Evenly moist
 Grows well in soil that never completely dries out
 LIGHT: Does best in light shade
 GROWTH FORM: 1' - 2'
 FLOWER COLOUR: Pink to rose purple, occasionally white
 FLOWER BLOOM: Mid-spring into early summer
 WILDLIFE: Bees, small insects, mourning dove, chipmunk, deer

GOLDTHREAD (*Coptis groenlandica*) (P)

SOIL: Acidic soil
 MOISTURE: Moist
 LIGHT: Prefers Shade
 GROWTH FORM: 3" - 6"
 FLOWER COLOUR: White
 FLOWER BLOOM: May - July

JACK-IN-THE-PULPIT (*Arisaema triphyllum*) (P)

SOIL: Humus rich, prefers slightly acidic
 pH 5.0 - 6.5
 MOISTURE: Tolerates a range of soil conditions from
 well drained to wet and nearly waterlogged.
 LIGHT: Partial sun to full shade
 GROWTH FORM: 1' - 3'
 FLOWER COLOUR: Green and brown
 FLOWER BLOOM: Mid-spring to early summer
 Red berries in late summer
 WILDLIFE: Berries eaten by wildlife
 *The richer and moister the soil, the larger the plant.

MAYAPPLE (*Podophyllum peltatum*) (P)

SOIL: Humus rich, pH 5.5 - 6.5
 MOISTURE: Evenly moist, soil that never completely dries out
 LIGHT: Full sun to light shade
 GROWTH FORM: 1' - 2'
 FLOWER COLOUR: White
 FLOWER BLOOM: Mid-spring
 WILDLIFE: Fruit eaten by wildlife, insects

MONARDA (*Monarda didyma*) (P)

SOIL: Humus rich soil
 MOISTURE: Evenly moist, well drained,
 will tolerate very wet soil
 LIGHT: Light shade or full sun
 GROWTH FORM: up to 4'
 FLOWER COLOUR: Red
 FLOWER BLOOM: Early to late summer
 WILDLIFE: Hummingbirds, bees, butterflies, other insects

SARSAPARILLA (*Aralia nudicaulis*) (P)

SOIL:	Acidic soil
MOISTURE:	Dry or moist
LIGHT:	Sun or shade
GROWTH FORM:	50 cm
FLOWER COLOUR:	Greenish-white
	Deep blue berries in Fall
FLOWER BLOOM:	May - July
WILDLIFE:	White throated sparrow, fox, skunk, chipmunk, thrushes

SHARP LOBED HEPATICA (*Hepatica acutiloba*) (P)

SOIL:	Humus rich, pH 6.0 - 7.0
MOISTURE:	Evenly moist, well drained
LIGHT:	Filtered sun to full shade
GROWTH FORM:	3" - 6"
FLOWER COLOUR:	Lavender, white or pink
FLOWER BLOOM:	Early spring

SOLOMON'S SEAL (*Polygonatum biflorum*) (P)

SOIL:	Humus rich, pH 4.5 - 5.5
MOISTURE:	Moist-average, well drained
LIGHT:	Deep shade to partial sun
GROWTH FORM:	3'
FLOWER COLOUR:	White
FLOWER BLOOM:	Mid Spring - Early Summer Red berries in summer
WILDLIFE:	Veery, grouse, thrushes, mice

SPRING BEAUTY (*Claytonia virginica*) (P)

SOIL:	Humus rich, woody soil, acidic to neutral
MOISTURE:	Evenly moist, well drained
LIGHT:	Filtered shade
GROWTH FORM:	6" - 12"
FLOWER COLOUR:	Pink
FLOWER BLOOM:	Early Spring
WILDLIFE:	White - footed mice

VIRGINIA BLUEBELLS (*Mertensia virginica*) (P)

SOIL:	Rich soil, stream sides
MOISTURE:	Moist
LIGHT:	Dappled shade or sun
GROWTH FORM:	up to 2'
FLOWER COLOUR:	Blue
FLOWER BLOOM:	Summer
WILDLIFE:	Bumblebees, other insects

*Mixes well with Wood Poppy and Bellwort.

WHITE TRILLIUM (*Trillium grandiflorum*) (P)

SOIL:	Sandy loam, pH 6.0 - 7.0
MOISTURE:	Evenly moist, soil never dries out completely
LIGHT:	Partial sun to full shade
GROWTH FORM:	1' - 2'
FLOWER COLOUR:	White
FLOWER BLOOM:	Spring
WILDLIFE:	Squirrels eat the berries

WILD BLUE PHLOX (*Phlox divaricata*) (P)

SOIL:	Rich soil
MOISTURE:	Moist
LIGHT:	Sun or shade
GROWTH FORM:	1'
FLOWER COLOUR:	Pink, blue
FLOWER BLOOM:	April - June
WILDLIFE:	Hummingbirds, Butterflies

WOOD POPPY (*Stylophorum diphyllum*) (P)

SOIL:	Rich
MOISTURE:	Moist
LIGHT:	Sun or shade
GROWTH FORM:	12" - 18"
FLOWER COLOUR:	Yellow
FLOWER BLOOM:	March to May
WILDLIFE:	Small birds

*Wood Poppy mixes well with Virginia blues and Trillium.
The wood poppy is an endangered species in Canada.

WOODLAND SUNFLOWER (*Helianthus divaricatus*) (P)

SOIL:	Fertile, well drained sandy loam
MOISTURE:	Dry woodland
LIGHT:	Full sun
GROWTH FORM:	2' - 7'
FLOWER COLOUR:	Yellow
FLOWER BLOOM:	July to October
WILDLIFE:	Insects, birds, squirrels

*Easy to grow from seed.

WETLAND AND POND PLANTS**BLUE FLAG** (*Iris versicolor*) (P)

SOIL:	Prefers acidic conditions
MOISTURE:	Moist soil, will grow in standing water
LIGHT:	Full sun, but will grow in light shade
GROWTH FORM:	1' - 3'
FLOWER COLOUR:	Blue
FLOWER BLOOM:	May - July
WILDLIFE:	Butterfly, bee, moth

BOTTLE GENTIAN (*Gentiana andrewsii*) (P)

SOIL:	Plant along stream sides and wet meadows
MOISTURE:	Moist
LIGHT:	Full sun, partial shade or full shade
GROWTH FORM:	1' - 2'
FLOWER COLOUR:	Blue
FLOWER BLOOM:	Late summer - October
WILDLIFE:	Moth nectar source, bumblebees

*Seeds germinate the best in light, sow them on the soil surface.

BROAD LEAVED ARROWHEAD (*Sagittaria latifolia*) (P)

SOIL:	Grows in shallow water at pond edges
MOISTURE:	Moist soil (shorelines)
LIGHT:	Partial shade
GROWTH FORM:	1' - 4'
FLOWER COLOUR:	White
FLOWER BLOOM:	July - September
WILDLIFE:	Ducks, shorebirds, porcupine, muskrat

CARDINAL FLOWER (*Lobelia cardinalis*) (P)

SOIL: Humus rich soil, pH 5.5 - 7.0
 MOISTURE: Moist to wet
 LIGHT: Full sun to full shade
 GROWTH FORM: 2' - 4'
 FLOWER COLOUR: Red
 FLOWER BLOOM: July - September
 WILDLIFE: Hummingbirds
 *All parts of this plant are toxic.

FORGET-ME-NOT (*Myosotis laxa*) (P)

SOIL: At pond edges
 MOISTURE: Moist areas
 LIGHT: Full sun to light shade
 GROWTH FORM: 2'
 FLOWER COLOUR: Blue
 FLOWER BLOOM: Spring - summer
 WILDLIFE: Seed is eaten by birds

FRAGRANT WATERLILY (*Nymphaea odorata*) (P)

SOIL: Fertile soil, pH 4.0 - 5.0
 MOISTURE: Must be able to float on calm water
 LIGHT: Full sun
 GROWTH FORM: 1 1/2'
 FLOWER COLOUR: White
 FLOWER BLOOM: June - September
 WILDLIFE: Beaver, muskrat, porcupine, ducks

JEWELWEED (*Impatiens capensis*) (A)

SOIL: Humus rich soil
 MOISTURE: Moist to wet, does not grow well in dry soil
 LIGHT: Full sun to full shade
 GROWTH FORM: up to 5'
 FLOWER COLOUR: Yellow-orange
 FLOWER BLOOM: Mid Summer - Fall
 WILDLIFE: Hummingbirds, bees, butterflies, mice

MARSH MARIGOLD (*Caltha palustris*) (P)

SOIL: Loam, deep, rich, organic, pH 5.0 - 7.0
 MOISTURE: Moist, damp, or wet
 LIGHT: Partial to full shade
 GROWTH FORM: 1' - 2'
 FLOWER COLOUR: Yellow
 FLOWER BLOOM: March - May
 WILDLIFE: Honeybees and bumblebees

SPOTTED JOE-PYE WEED (*Eupatorium maculatum*) (P)

SOIL: Fertile
 MOISTURE: Moist to wet sites
 LIGHT: Full sun
 GROWTH FORM: 2' - 6'
 FLOWER COLOUR: Purple, pink
 FLOWER BLOOM: Mid summer - early fall
 WILDLIFE: Butterflies, honeybees, bumblebees

SWAMP MILKWEED (*Asclepiasincarnata*) (P)

SOIL: Moist soil, tolerates regular garden soil
 MOISTURE: Does best in wet to moist sites
 LIGHT: Full sun to partial shade
 GROWTH FORM: up to 4'
 FLOWER COLOUR: Purple pink
 FLOWER BLOOM: June - August
 WILDLIFE: Monarch butterflies, caterpillars, honeybees, bumblebees

WHITE TURTLEHEAD (*Chelone glabra*) (P)

SOIL: Rich soil, edge of a pond or damp area
 MOISTURE: Wet to moist soil
 LIGHT: Sun or Partial shade
 GROWTH FORM: Up to 3'
 FLOWER COLOUR: White
 FLOWER BLOOM: July - September
 WILDLIFE: Baltimore butterfly, honeybees, bumblebees

FERNS

Ferns are beautiful to have in gardens. They thrive in conditions considered difficult for other plants (mainly deep shade). Ferns require rich humus soil. To create adequate soil for ferns, compost can be added to the soil. For best results, ferns should be transplanted into the garden in early spring or in late fall before the fronds uncoil.

FERNS FOR MOIST PLACES: Christmas Fern (*Polystichum acrostichoides*), Cinnamon Fern (*Osmunda cinnamomea*), Ostrich Fern (*Matteuccia struthiopteris*), Interrupted Fern (*Osmundia claytoniana*), Sensitive Fern (*Onoclea sensibilis*), Lady Fern (*Athyrium felix-femina*)

FERNS FOR DEEP SHADE: Marginal Fern (*Dryopteris marginalis*), Christmas Fern (*Polystichum acrostichoides*), Lady Fern (*Athyrium felix-femina*), Maidenhair Fern (*Adiantum pedatum*), Wood Fern (*Dryopteris goldiana*), Oak Fern (*Gymnocarpium dryopteris*), Cinnamon Fern (*Osmunda cinnamomea*)

FERNS FOR DRY PLACES: Hay-Scented Fern (*Dennstaedtia punctilobula*), Male Fern (*Dryopteris filix-mas*), Rock Fern (*Polypodium virginianum*), Christmas Fern (*Polystichum acrostichoides*), Marginal Fern (*Dryopteris marginalis*).

FERNS FOR SUN: Hay-Scented Fern (*Dennstaedtia punctilobula*), New York Fern (*Dryopteris novaboracensis*), Sensitive Fern (*Onoclea sensibilis*), Bracken Fern (*Pteridium aquilinum*), Lady Fern (*Athyrium felix-femina*), Ostrich Fern (*Matteuccia struthiopteris*).

GRASSES

Here are a few examples of some nice grasses for a naturalized area. They can be easily grown from seed and won't get too out of hand. ****Don't forget to consider municipal by-laws. Many prohibit grass above a certain height.***

BIG BLUESTEM (*Andropogon gerardii*): Grows 3' - 8' in full sun, drought tolerant. Thin, grassy bluish-green leaves that turn bronze in the fall, flowers in July and August.

BLUE-EYED GRASS (*Sisyrinchium montanum*): Grows 1' - 2' high, moist to average soil with high lime content, sun to partial shade, flowers in late spring-early summer.

INDIAN GRASS (*Sorghastrum nutans*): Grows 3' - 6' in full sun, flowers in summer, bronze leaves in fall.

LITTLE BLUESTEM (*Andropogon scoparium*): Grows 1.5' - 2.5', drought tolerant, tolerates poor soil.

PANIC GRASS (*Panicum virgatum*): Grows 3' - 5', in full sun, marshy to dry sites. Can be aggressive in rich moist soil, but in dry soil it doesn't spread as quickly.

PENNSYLVANIA SEDGE (*Carex pennsylvanica*): Grows to 1' in dry shady areas or sun, drought tolerant.

PLANTAIN-LEAVED SEDGE (*Carex plantaginea*): Grows to 1.5' in shady moist woodlands.

SIDEOATS GRAMA (*Bouteloua curtipendula*): Grows to 3' in sun or partial shade in moist to dry soil, drought tolerant, well drained soil.

SHRUBS

These shrubs listed are ideal for attracting all kinds of wildlife. Be sure to conduct thorough research on any plant material you are including in the naturalized area. Some berries may be poisonous to children and must be avoided.

AUTUMN OLIVE (*Elaeagnus umbellata*): Grows to 8' - 14' in sandy, loamy or clay soils, moderate to well drained, does well in full sun but it will grow in shade.

BUTTERFLY BUSH (*Buddleja davidii*): Grows up to 10', along bodies of running water and in thickets on rocky ground, blooms July - August, fruit in September. Attracts a variety of butterflies.

CHOKECHERRY (*Prunus virginiana*): Grows 20' - 35', best in rich, well-drained moist soil, pH 6.0 - 8.0, full sun is best but it will grow in open woods. Approximately 70 species of birds feed on the berries, as do small mammals.

GRAY DOGWOOD (*Cornus racemose*): Grows to 4' - 8', wide range of soil pH 4.6 - 7.8, moist sites but will tolerate dry conditions, full sun, tolerant of some shade.

NANNYBERRY (*Viburnum lentago*): Grows 20' - 30', moderately fertile soil, poorly drained sites, full sun, will grow in shade.

RASPBERRY (*Rubus spp.*): Grows up to 5', any type of soil, well drained, adequate moisture to become established, full sun but will grow in shade.

RUSSIAN OLIVE (*Elaeagnus angustifolia*): Grows 15' - 25' in any soil, does best in fertile high lime soil, adapts to wide variety of moisture conditions, full sun but tolerates some shade, mainly a nesting site for birds.

SERVICE BERRIES (*Amelanchier spp.*): Grows 3' - 10', dry soil, full sun, sunny dry steep slopes or bordering lawns, flowers from April - June, fruit in August.

TATARIAN HONEYSUCKLE (*Lonicera tatarica*): Grows to 8' - 12' , grows in any soil, pH 6.5 - 8, cannot stand drought conditions, full sun but can tolerate light shade. Blooms May-June. Poisonous seed/fruit.

VIRGINIA CREEPER (*Parthenocissus quinquefolia*): Grows 20' - 40', blooms June-July, fruit in October (mildly poisonous), for covering walls and house sides.

TREES

Here are some examples of trees that can be planted in your schoolyard fairly successfully. Have students research trees that are native to the area. Native species should always be chosen over non-native or ornamental varieties.

BALSAM POPLAR (*Populus deltoides*): Large deciduous reaching a height of 20-25m, grow in moist soil in sunny areas.

BLACK CHERRY (*Prunus serotina*): Grows 15 - 20m tall, deciduous tree, grows in wet to dry woods, full sun-partial shade, provides food for approximately 81 different types of wildlife.

BUR OAK (*Quercus macrocarpa*): Large deciduous (20m), damp to wet soil, tolerates a wide range of soil types, grows in full sun and provides both food and cover for wildlife, pH 4.6 - 8.0.

HEMLOCK (*Tsuga canadensis*): Large evergreen, best in cool moist sites, good cover for most wildlife.

NORWAY AND WHITE SPRUCE (*Picea glauca*): Large evergreen, can be planted in most sites although try to avoid frost pockets, provides excellent cover for wildlife.

SUGAR MAPLE (*Acer saccharum*): Large deciduous, dry to moist fertile soil, good drainage, tolerant of shade, grows to a height of 25 m.

TREMBLING ASPEN (*Populus tremuloides*): Grows to 10-15 m tall , grows in moist to dry open woods in full to partial shade, drought resistant, provides food and cover for wildlife, pH 7.5 - 8.0.

WHITE CEDAR (*Thuja occidentalis*): Slow growing, medium to large evergreen, best on alkaline soil, wet or dry, good for most wildlife.

WHITE OAK (*Quercus alba*): Large deciduous 30 m or more, dry to mesic soil, good drainage. Attracts squirrels.

WHITE PINE (*Pinus strobus*): Large evergreen, most areas are fine except for infertile sands, good for all wildlife.

WILD CRAB APPLE (*Pyrus coronaria*): Small deciduous tree (6-10 m), prefers rich moist soil, flowers in May and early June, apple-like fruit in late Autumn. The fruit is eaten by birds.

Plant Combinations

PLANTS FOR ALKALINE WOODLANDS

Maidenhair fern, Eastern Columbine, Goldenseal, Twinleaf, Wild ginger, Bloodroot, Sharp - lobed hepatica, Foamflower.

PLANTS FOR ACIDIC WOODLANDS

Canada Mayflower, Wintergreen, Bluehead lily, Bunchberry, Creeping snowberry, Twinflower, Partridgeberry, Winterberry, Round-lobed hepatica, Barren Strawberry.

PLANTS FOR SUNNY ACIDIC SITES

Bearberry, Cinquefoil, Swamp milkweed, Butterfly Milkweed, Canada Lily.

HASTINGS AND PRINCE EDWARD DISTRICT SCHOOL BOARD
APPLICATION FOR APPROVAL OF SCHOOLYARD IMPROVEMENT PROJECT

SCHOOL:	DATE OF APPLICATION:
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PRINCIPAL:	
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SCHOOLYARD IMPROVEMENT COMMITTEE CHAIR:

<p>CONTACT NAME: _____</p> <p>ADDRESS: _____</p> <p>PHONE NUMBER: _____</p> <p>_____</p> <p>_____</p>	
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How long has the school been involved in the planning process?

**Detail improvements to be made to the schoolyard (please use separate sheets if necessary).
Indicate whether the work is to be done in phases and attach:**

- i) a site plan detailing existing features and proposed changes (to scale),**
- ii) any features to be added, retained, repositioned or removed,**
- iii) a list of plants to be used, identified by common and by botanical names,**
- iv) detailed plans of any structures to be built (including benches),**
- v) projected start date and projected completion date for each phase of the project.**

Has the Schoolyard Improvement Committee contacted proper authorities to ensure that no municipal or provincial regulations are being violated?

**Is the funding *currently* available to complete each phase of the project within expected time lines?
Please list sources of funding.**

Please list the equipment that will be used in the development of the schoolyard improvement area.

Please identify contractors to be used, if any.

Please refer to the "Insurance and Liability" portions of *Break New Ground ... Diversify your Schoolyard - A Resource Document for Schoolyard Improvement*. You may be required to submit additional information depending upon the type of equipment being used and the type of work being done by the contractor.

Please outline the maintenance schedule that has been developed for the schoolyard improvement area (particularly during school holidays and the summer months). Please provide the name and phone number of the contact person in charge of maintenance (and an alternate).

Signature of Principal

Signature of Schoolyard Improvement Committee Chair

Approval of S.G. Superintendent

Approval of Controller of Plant

Application for Schoolyard Improvement Project Approvals Sheet

In accordance with the Hastings and Prince Edward District School Board's Statement of Practice (B7), any school initiating a schoolyard improvement project will be held responsible for the installation and maintenance of the area or structure, as well as any repairs that are required due to vandalism or accidental damage.

In order to ensure that the initiating group/school has undergone an extensive consultation process, signatures are required from representatives with a long-term interest in the project and its upkeep.

SUBMISSION

When the school has completed the consultation and plan development process, submission of the draft site plan must be forwarded to the Controller of Plant and the S.G. Superintendent. This approvals sheet must be submitted with the site plan, bearing the signature of:

School Principal

Chair, Schoolyard Improvement Committee

Name of School

Date of Application

Glossary

- ANNUAL* - A plants that lives for one year or one growing season.
- BIENNIAL* - A plant that grows from seed and produces leafy growth the first year and produces flowers in the second year, then sets seeds and dies.
- BIO-MAGNIFICATION* - Process in which toxic substances build up through the food chain and the top level consumer becomes contaminated.
- COMPOST* - The end result of the composting process. A dark rich soil conditioner (humus) is created through the biological reduction of organic material.
- COMPOSTER* - Container, usually a bin or a box that is used to hold food and yard waste while it is being composted.
- DECOMPOSITION* - Process of breaking down organic material into basic elements, including nutrients needed for plant growth.
- DROUGHT* - A long period of time with little or no rain.
- FERTILIZER* - Substance that enriches the soil and provides food for plants.
- GERMINATION* - Process by which a seed sprouts after being dormant.
- HUMUS* - The finished compost which retains and slowly releases nutrients to plants. It is formed through the breakdown of plants and animal matter.
- LOAM* - A soil mixture that is composed of equal amounts of sand, silt and clay.
- MULCH* - Layer of partially decomposed plant material which can be placed on top of garden beds and around plants and shrubs.
- NATIVE PLANT* - Plant species which originally occurred in the area.
- NATURALIZED* - Non-native plant which has been introduced to an area and now grows in the wild without human cultivation.
- NATURALIZATION* - Process of ecological restoration that encourages the natural environment to return to urban areas.
- NICHE* - A space in which a population, containing a number of different species, occurs together in one place at one time.
- NUTRIENT* - Any chemical element or compound that is essential to the growth and development of an organism.

Glossary (cont'd)

ORGANIC MATTER - Any material that is or once was living or was produced by a living organism.

ORGANIC SOIL - A soil which has 30% or more organic matter content and is at least 30 cm deep.

OUTDOOR EDUCATION - A method of learning outdoors to achieve educational goals.

PERENNIAL - A plant that lives for several years.

PESTICIDE - A chemical that is applied to kill insects or animal pests.

pH - A chemical symbol used to identify the level of acidity or alkalinity in the soil (refers to the concentration of hydronium or hydrogenions in a solution).

SAND - Soil particles between 0.05 - 2.0 mm in diameter. Sand feels gritty to the touch.

SHRUB - A woody plant that typically branches near the ground.

SILT - Soil particles which range in size from 0.002 to 0.05 mm in diameter. Silt is smooth to the touch and becomes slick and sticky when wet.

WEED - A plant that is out of place.

WILDFLOWER - A herbaceous (non-woody) plant that has not been genetically modified by humans.

References

BOOKS

- A Guide to School Ground Naturalization: Welcoming Back the Wilderness*, The Evergreen Foundation, 1994.
- Cox, Jeff, *Landscaping with nature: using nature's design to plan your yard*, USA, Rodale Press, c 1991.
- Cheskey, Edward D, *Habitat Restoration: A Guide for Proactive Schools*, Waterloo County Board of Education, 1993.
- Composting Goes to School: Teacher's Guide*, The Composting Council of Canada, 1995.
- Ernst, Ruth Shaw, *The Naturalist's Garden: How to Garden with Plants to Attract Birds, Butterflies and Other Wildlife*, USA, The Globe Pequot Press, c 1996.
- Henderson, Carrol, *Landscaping for Wildlife*, Minnesota, Department of Natural Resources, c 1987.
- Johnson, Lorraine, *The Naturalized Garden*, Vancouver/Toronto, Whitecap Books Ltd. c 1995.
- Lipkis, Andy and Katie Lipkis, *The Simple Act of Planting a Tree*, Los Angeles, Jeremy P. Tarcher, Inc., c 1990.
- Loewer, Peter, *Wildflowers and Native Plants*, Des Moines/Iowa., Merideth Corp., c 1995.
- Mckay, Sheila and Paul Catling, *Trees, Shrubs and Flowers to Know in Ontario*, Canada, Alger Press Ltd., c 1979.
- Newcomb, Lawrence, *Newcomb's Wildflower Guide*, Toronto/Canada, Little Brown and Company Ltd., c 1977.
- Our Earth To Share, Integrated Unit for Grades 5 and 6*, The Hastings County Board of Education, 1995.
- Peterson, Roger and Margaret McKenny. *A field guide to Wildflowers of Northeastern and North-Central North America*. Boston Houghton Mifflin Company, c 1979.
- Schneck, Marcus, *Your Backyard Wildlife Garden: How to Attract and Identify Wildlife in Your Yard*, Pennsylvania, Rodale Press, c 1992.
- Schoolyard Magic: A Green-up Guide for Outdoor Classrooms in Peterborough County*, Peterborough Green-up, 1993.
- Sibley, Hi, *102 Bird Houses, Feeders You Can Make*, South Holland, Illinois, The Goodheart-Willcox Co., Inc., c 1980.
- Snyder, Jane, *School Composting Guide: Set up and Maintain a Composting System*, Recycling Council of Ontario.
- Soil and water conservation society, *Soil Conservation*, Federation of Ontario Naturalists, Ontario chapter.
- The Green School: A Resource Guide for Environmental Education*, Educational Services, 1991.
- Zichmanis Zile, and James Hodgins, *Flowers of the Wild: Ontario and the Great Lakes Region*, Toronto/Canada, Oxford University Press, c 1982.

ENERGY AND ENVIRONMENTAL TECHNOLOGIST

Hastings and Prince Edward District School Board

Check with the Board's Energy and Environmental Technologist for research material, promotional ideas, slides, and updated information on improvement ideas around the county.

MAGAZINES

Green Teacher

- an excellent issue to look at is Issue 47: *Transforming School Grounds*

Seasons

- excellent for plant selection

Harrowsmith

- excellent for gardening tips

WEB SITES

Be sure to check the Hastings and Prince Edward District School Board web site for links to environmental resource sites.

Evergreen Foundation

www.evergreen.ca/home.html

EE Link - Environmental Education on the Internet

- classroom resources, contacts, references

www.evergreen.ca/home.html

Environmental Organizations on-line with the Envirolink Network

www.envirolink.org/orgs/index.old.html

The Green Brick Road

www.gbr.org

School Gardens

www.cityfarmer.org/schgard15.html

Composting in Schools

www.cfe.cornell.edu/compost/schools.html

Planning a School Garden

<http://aggie-horticulture.tamu.edu/kinder/consid.html>

VIDEOS

Grounds for change: School Ground Naturalization, The Evergreen Foundation, 1995

CONSERVATION AREAS

QUINTE CONSERVATION - 968-3434

H.R. Frink Outdoor Education Centre (Plainfield Conservation Area) 477-2828

- woodland, wetland and meadow/prairie land, all with excellent native plant species.
- 6th Concession of Thurlow.

O'Hara Mill Conservation Area

- for more information contact the main office at 968-3434.

Quinte Conservation Area

- native wildflowers, shrubs and trees.
- in Belleville, corner of Highway # 2 and Wallbridge Loyalist Road
- for more information, contact the main office at 968-3434.

Sidney Conservation Area

- Frankford area, for more information contact the main office at 968-3434.

Vanderwater Conservation Area

- for more information contact the main office at 968-3434.

CROWE VALLEY CONSERVATION AUTHORITY - (613) 472-3137

Callaghan's Rapids Conservation Area

- Marmora area .
- for more information contact Crowe Valley Conservation Authority.

McGeachie Conservation Area

- 20-30 minutes south of Bancroft, south east of Coe Hill.
- for more information contact the Crowe Valley Conservation Authority.

The Gut Conservation Area

- Southwest of Apsley.
- for more information contact Crowe Valley Conservation Authority.