

# Introduction to Growing Up Organic

*Welcome to Growing Up Organic. In this introduction you will find an overview and a history of the project, a step-by-step guide to starting your school gardens, and calendar to reference for school garden activities.*



# What is Growing Up Organic?

## Growing Up Organic - History

History and original purpose of the program:

Canadian Organic Grower's (COG) mission is to lead local and national communities towards sustainable organic stewardship of land, food and fibre while respecting nature, upholding social justice and protecting natural resources. COG serves: both farmers and market gardeners; consumers; National and Regional organic organizations through representation, networking and sharing resources; and government by informing and advocating for an organic perspective.

In 2007, COG began their three year pilot program, Growing Up Organic (GUO). This project focused on the development of farm-to-institution programs based on local organic food systems. There were three main reasons why the project focused on this. Firstly, farm-to-institution programs help build relationships between farmers and institutions making them active participants in the local food system and direct contributors to local food security. Secondly, since there are no middle-men in this type of program, farmers are more likely to receive a greater portion of the institution's food dollar thereby increasing their annual farm income and securing their livelihood. Finally, institutions, as opposed to individual consumers, have enormous purchasing power and the potential to bring about large scale positive change in production and consumption patterns in a relatively short time frame. Additionally, organic farm-to-institution programs provide an opportunity to address some of the broader social health issues related to poor nutrition and exposure to agricultural chemicals.

The motivation for focusing on youth, is that children are at particular risk of chemicals through their diets because they consume more food per kilogram of body mass than adults and because their diets are rich in foods with higher levels of pesticide residues such as juices, fruits and vegetables. Children are more vulnerable to the effects of these chemicals because of their developing nervous systems and because they have a longer lifespan over which to accumulate toxins. Farm-to-institution programs, by providing access to fresh, organic and local produce, create an opportunity for children to learn about healthy foods and healthy eating behaviors.

GUO aims to increase youths' awareness and access of local organic foods, while encouraging increased organic production for the local community. We do this by running organic farm-gate cafes, building school food gardens, delivering curriculum connected garden-based workshops, developing summer camp programming, and organizing field trips to organic farms.

### **The Farm-Gate Cafe**

GUO increases youths' access to fresh, organic foods by creating school meal and snack alternatives. A cafe provides schools with a flexible way to supply their students with a

wide variety of fruits and vegetables that are sourced locally when seasonally available. It can run on a regular basis, be a one-time event, or run in conjunction with special events. By creating alternative meal programs, Growing Up Organic (GUO) hopes to:

- Provide a variety of fresh, healthy food choices, focusing on increasing consumption of fresh, organic fruits and vegetables
- Purchase these fresh fruits and vegetables locally where possible and where practical
- Give students often limited by cultural, social and financial limitations an opportunity to experience new, fresh foods
- Provide the opportunity for students to make healthy choices by choosing their own lunch

### **Farm Field Trip**

Growing Up Organic helps organize school field trips to local organic farms where students, teachers, parents and food services staff have the opportunity to tour a farm and harvest produce which they could use for their school's farm-gate cafe. The farm field trip will provide the participants with a unique opportunity to meet farmers, learn where their food comes from, and how it's grown.

### **The School Food Gardens**

Since 2007, GUO has helped 15 schools build their own School Food Garden. Over these years, we have watched the gardens blossom into a school and community resource for programming around such diverse topics as: nutrition; environmentalism; botany; composting; community development; food systems & food sovereignty; and food preparation. A garden is an ideal place for children to witness the process of food growing, and to create a tangible link to the food system. An edible garden creates a dynamic element to school grounds, a teaching tool, and a community hub for positive inter-generational and multicultural activities.

For more information on the Growing Up Organic Project and our programs please contact Torry Reid, Growing Up Organic Project Manager at 613.627.6343 or [torry@cog.ca](mailto:torry@cog.ca) or visit our blog at [growinguporganic.blogspot.com](http://growinguporganic.blogspot.com).

## **Steps to Establishing a School Garden**

1. **Acquire Permission** for food gardens on the school grounds from the schools' administration. Growing Up Organic is available to present to groups of teachers, parents, administration, students and community members about the how-to's, funding opportunities and the benefits of school gardens.
2. **Choose a site** that will be accessible to students. With GUO's guidance you should choose a site that is visible to the students, but keep in mind where students play sports and snow removal patterns. Choose a site where vegetables will get lots of

sun (most vegetables do best in full sun). And keep in mind your water source. A nearby community centre/church could help out if there is no place for the school to run a hose/rain barrel. Also look into city water taps at/near the school.

- 3. Build the gardens** using recycled and donated materials where possible. See the resources section for sourcing recycled wood and soil.

## School Garden Calendar

**March** - Plan the garden (what will you plant? What needs to be started indoors? When? Plan for a harvest in May/June, and Sept/Oct when the students are around. Use CGN garden guide for planting/harvest times) \*See lesson plan for Planning the Garden

**April** - Construct garden beds (for new gardens or to expand)

**April** - Have soil delivered for garden beds (a mix of organic soil & compost works best)

\*After soil is in the Gardens, do a soil discover lesson with the kids (see lesson plans)

**1st/2nd week of April** - Seed Starting. Introduce seeds to a class & start transplants for your gardens \*See lesson plan for Seed Starting

**Last week of March/First Week of April** - If you choose to do cold frames to help extend your growing season, build/put them up. At this time a few things can be planted. It is best to sow seeds directly into soil. If putting transplants out, be sure that they are frost hardy - such as onions, broccoli, radish, carrots, etc. Also, transplants need to be hardened off - which means they need to be slowly and gradually exposed to natural sunlight and cool conditions. The other thing to remember with cold frames is that they need to be vented. When the sun is shining it will get very hot inside, so the lids need to be opened a couple of inches to let hot air out.

**Last week of May** - Transplanting & Planting Seeds outdoors. \*See lesson plan.

**May-Oct** - regular Weeding & Watering. Create a maintenance schedule that includes student participation and look to your community for help. Who will be in charge? \*See lesson plan for weeding/mulching

**June** - create a summer maintenance plan. Start to think about what you'd like to do with the garden when the students are on holidays. It's a great time for the gardens, with lots to harvest and enjoy - and someone needs to take care of the watering, weeding, and eating. Some ideas include: make a maintenance schedule where families from the school can sign up for a week of watering/weeding, high school students can help in order to fulfill their

mandatory volunteer hours, or connect with a local community group, daycare, church group, summer camp or restaurant.

**June-** Harvest! Cook, bake, have picnics, fundraisers and other harvest based events

**Mid-June-September** - Re-seed (plant things that will be ready for students to harvest in September to October if possible.)

**Throughout summer-October** Harvest! \*see lesson plans or have a chef or nutritionist visit a class

**End of October** – Put the gardens to bed.

**Other activities:**

Get students involved. See Growing Up Organic Lesson Plans for ideas about lessons and other activities that can be done with kids in the garden.

**Gardening Guide:**

The Community Garden Guide is a guide to planning, planting and maintaining an organic garden. It is specific to Ottawa and includes guides to individual vegetables, organic methods of pest control, and planting/harvest times.

[http://www.justfood.ca/downloads/CGN Garden Guide 2010 English.pdf](http://www.justfood.ca/downloads/CGN_Garden_Guide_2010_English.pdf)

[http://www.justfood.ca/Guide du jardinier 2008.pdf](http://www.justfood.ca/Guide_du_jardinier_2008.pdf)

# Lessons for Growing and Living Organic

*These lesson plans compliment the Ontario Curriculum and guide teachers & students through growing organic food. The opportunities for learning in the garden are endless...*



# **Lesson Plans**

*(control + click to go directly to any lesson)*

**[Planning the Garden: Three Sisters Garden – Before April 1st \(Grade 3\)](#)**

**[Planning the Garden - Before April 1st \(gr.8, 9, 10, 11\)](#)**

**[The Mystery Garden – March, April, Anytime \(Kindergarten\)](#)**

**[The Mystery Garden – March, April, Anytime \(Grade 1\)](#)**

**[Soil Investigation - When ground is thawed, before planting \(Grade 1, 3\)](#)**

**[Seed Starting – First Week of April \(Grade 1, 3\)](#)**

**[Seed Starting – First Week of April \(Grade 6\)](#)**

**[Seed Starting – First Week of April \(Grade 11\)](#)**

**[Transplanting and Planting – Earliest Mid-April \(Grade 4\)](#)**

**[Weeding and Mulching - any time! \(Grade 1, 3, 5, 6, 9\)](#)**

**[Composting: Create a Composter – when ground is dry \(Grade 7,8, Design/Shop class\)](#)**

**[Composting: Get Composting – any time \(Grade 5,7,8,9,10,\(11\)\)](#)**

**[Harvesting \(grade 2, High school: Food & Nutrition courses\)](#)**

**[Seed Saving \(gr.3,6\)](#)**

**\*\*Some of the lesson plans repeat with modifications for different grades.**

**[More Activities – Additional activities for gardening learning and fun](#)**

**[Websites – Garden Activities](#)**

## Planning the Garden: 3 Sisters Garden (Grade 3)

Unit	Growth and Changes in Plants, Early Settlements Additional Connections/Cross Curricular: Mathematics
Activity/Lesson Title	<b>Planning the Garden</b>
Strands	<p>Overall Expectations</p> <ul style="list-style-type: none"> <li>• Assess ways in which plants have an impact on society and the environment, and ways in which human activity has an impact on plants and plant habitats;</li> <li>• Investigate similarities and differences in the characteristics of various plants, and ways in which the characteristics of plants relate to the environment in which they grow;</li> <li>• Demonstrate an understanding that plants grow and change and have distinct characteristics.</li> </ul> <p>Specific Expectations</p> <ul style="list-style-type: none"> <li>• Describe the basic needs of plants, including air, water, light, warmth, and space</li> <li>• Assess the impact of different human activities on plants, and list personal actions they can engage in to minimize harmful effects and enhance good effects</li> <li>• Describe the different ways in which plants are grown for food (<i>e.g., on farms, in orchards, greenhouses, home gardens</i>), and explain the advantages and disadvantages of locally grown and organically produced food, including environmental benefits</li> </ul> <p>For Three Sisters Garden:</p> <p>Overall Expectations</p> <ul style="list-style-type: none"> <li>• use a variety of resources and tools to gather, process, and communicate information about interactions between new settlers and existing communities, including First Nation peoples, and the impact of factors such as heritage, natural resources, and climate on the development of early settler communities;</li> <li>• compare aspects of life in early settler communities and present-day communities.</li> </ul> <p>Specific Expectations</p> <ul style="list-style-type: none"> <li>• Identify factors that helped shape the development of early settlements (e.g., lakes and rivers for trade and transportation; origins of early settlers, climate, natural resources);</li> <li>• Explain how the early settlers valued, used, and looked after natural resources (e.g., water, forests, land);</li> <li>• Describe what early settlers learned from First Nation peoples that helped them adapt to their new environment (e.g., knowledge about medicine, food, farming, transportation)</li> </ul> <p>Cross Curricular: Math – mapping out the gardens,</p>

	measurements, maximizing space.
Planning Notes	The best time to plan the garden is in March (right before the growing season begins). Seeds for the garden can be started indoors as early as March, and outdoors as soon as the soil can be worked.
Materials	Graph paper for plotting out the gardens. Could be large sized graph paper (ideal for groups) or standard paper sized graph paper for individual use. Use chalkboard/whiteboard to do a rough plan, then have students draw to scale. CGN Gardening Guide: print copies of relevant sections onto overhead slides, or ability to project from computer onto overhead.
Teaching and Learning Strategies	<p>1. Introduction</p> <p>Watch the Story of Food (5 minute animated video about where food comes from/how food system is changing produced by USC).</p> <p>Use PowerPoint Lesson: Introduction to Organics &amp; Planning the Garden (available on Resource CD)</p> <p>What is the value of growing our own vegetable gardens? Why organic?</p> <p>2. Planning the Garden</p> <p>Discuss important factors to planning a garden: The needs of plants – warmth (see planting times for Ottawa growing season – CGN Garden Guide), space (see specific vegetable descriptions for spacing directions-CGN Garden Guide) Companion planting Planning for the harvest (what do we want to eat?), Show sample garden plots.</p> <p>As a class, come up with a garden plan: choose plants, draw garden layout with spacing/measurements. Make a calendar for planting: what needs to be planted when?</p> <p>Have students submit their drawing of the garden layout, and write reasons for plant selection and plant layout. What factors were important to consider?</p> <p>3. Three Sisters Garden</p> <p>See attached resource for Three Sisters Garden for additional information about the traditional garden.</p> <p>Heritage plants, early methods of growing food, organic practices. What is a Three Sisters Garden? (Bean, corn, squash) How do the plants work together? Explain that the way plants work together is an organic alternative</p>

	to chemical fertilizers and pest control (Companion Planting).
Assessment/Evaluative Techniques	Ability to think critically, participation in group planning activity. Evaluate final garden plans and conclusions.
Resources	PowerPoint Lesson Introduction to Organic & Planning the Garden CGN Garden Guide: Companion Planting (p.5), Garden Layout (p.6), Planting Guide (p.7), Planting Calendar (p.22), Vegetable specifics (p.23-47) Three Sisters Garden: <a href="http://www.kidsgardening.com/growingideas/PROJECTS/MARCH02/mar02-pg1.htm">www.kidsgardening.com/growingideas/PROJECTS/MARCH02/mar02-pg1.htm</a>
Accommodations/Modifications	Follow-up Lesson: Soils (Test for nutrients, pH before planting and one month after planting, how do the plants affect the soil and how does the soil affect the plant?)

### Planning the Garden – Before April 1st (Grade 8)

Unit	Understanding Life Systems-Cells Additional Connections/Cross Curricular: Mathematics
Activity/Lesson Title	<b>Planning the Garden</b>
Strands	<p>Overall Expectations:</p> <ul style="list-style-type: none"> <li>Assess the impact of cell biology on individuals, society, and the environment;</li> <li>Investigate functions and processes of plant and animal cells;</li> <li>Demonstrate an understanding of the basic structure and function of plant and animal cells and cell processes.</li> </ul> <p>• Assess the personal, social, and/or environmental impacts of a system, and evaluate improvements to a system and/or alternative ways of meeting the same needs;</p> <p>Specific</p> <ul style="list-style-type: none"> <li>Identify social factors that influence the evolution of a system (e.g., growing concern over the amount of waste creates a need for recycling centers, and the recycling center must grow as population and waste increase; the desire to make tasks easier creates a need for pulley systems, gear systems, and hydraulic and pneumatic systems; changes in traditional work hours created by technological advances can influence changes in a child care system)</li> <li>Identify the purpose, inputs, and outputs of various systems (e.g., a garden – purpose: to grow things; input: seeds, water, organic matter; output: flowers, food)</li> </ul> <p>Specific Expectations:</p>

	<p>(b) Scientists can develop pest-resistant crops that reduce the need for chemical pesticides. But there are some concerns that these crops may cross-pollinate with native plants and disrupt natural populations and balances.</p> <p>assess the potential that our understanding of cells and cell processes has for both beneficial and harmful effects on human health and the environment, taking different perspectives into account (<i>e.g., the perspectives of farmers, pesticide manufacturers, people with lifethreatening illnesses</i>)</p>
Planning Notes	
Materials	<p>Graph paper for plotting out the gardens. Could be large sized graph paper (ideal for groups) or standard paper sized graph paper for individual use. If working as a class, use a chalkboard to do a rough plan then have students draw to scale.</p> <p>This could be a research project using internet and library, or resources could be given to the class. Students could work in groups, and the plans could then be discussed and evaluated by the class. Alternately, it could be done as a class discussion.</p>
Teaching and Learning Strategies	<p>How has the food system changed? What are the effects of importing food from other countries, buying from large conventional mono-crop farms? What effects are there on our economy? On our environment? On our society? How does it lead to the use of synthetic pesticides? Synthetic fertilizers? GMOS? How does this affect our health? Why grow our own organic food?</p> <p>Watch The Story of Food, a 5 minute animated educational video produced by USC.</p> <p>Identify modern agriculture practices. How does monoculture affect the land? What affect do synthetic fertilizers have on soil? On other terrestrial ecosystems? Why is diversity in ecosystems important?</p> <p>What are organic alternatives to pest control and soil fertility? Monoculture?</p> <p>Present Companion Planting. What plants work well together? Benefits for pest control and improved soil nutrients. Show examples of garden plots. What is Crop Rotation? Cover crops? Green manure?</p> <p>What to consider:</p>

	<p>Garden size/space, Ottawa growing season, yield of vegetables: what vegetables have high yield? Maintenance required, Harvest: what do you like to eat and what would you like to make from your harvest?</p> <p>Provide students with resources: Types of plants that work well in Ottawa, needs for sun/shade/water, planting times, and harvesting times.</p> <p>Give students resources for companion planting: examples of “giver” plants and ideal soil conditions for each plant.</p> <p>If working in groups, provide each group with CGN Gardening Guide (or access to Gardening Guide online). If working as a class, it would be useful to have Gardening Guide important parts on slides, or ability to project from internet onto screen.</p> <p>Split class into groups or work as a class. Have groups come up with a garden plan: choose plants, draw garden layout with spacing/measurements. Have groups present to the class their garden plan, and discuss which would work best.</p> <p>Homework assignment: After presentations, have students modify their designs based on advice from teacher/classmates (on graph paper or electronically) Submit final garden plans + Conclusions &amp; Justifications for plan (factors in decision).</p> <p>Choose a garden plan for one, two or three of your school garden beds. Make the plan known to groups/classes involved in planting, so that they know what seeds to start!</p>
Assessment/Evaluative Techniques	Evaluate presentations. Ability to present ideas to the class, to respond to comments/criticisms, ability to think critically when evaluating others’ ideas, participation in group planning activity. Evaluate final garden plans and conclusions.
Resources	CGN Gardening Guide: Companion Planting (p.5), Garden Layout (p.6), Planting Guide (p.7), Planting Calendar (p.22), Vegetable specifics (p.23-47)
Accommodations/Modifications	Follow-up Lesson: Soils (Test for nutrients, pH before planting and one month after planting, how do the plants affect the soil?)

## Planning the Garden – Before April 1st (Grade 9, 11)

Unit	Sustainable Ecosystems (gr.9), Diversity of Living Things (gr.11), Additional Connections: Math (mapping, spacing out plants)
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Activity/Lesson Title	Planning the Garden
Strands	<p><b>Overall Expectations:</b></p> <ul style="list-style-type: none"> <li>• Assess the impact of human activities on the sustainability of terrestrial and/or aquatic ecosystems, and evaluate the effectiveness of courses of action intended to remedy or mitigate negative impacts(gr.9)</li> <li>• Investigate factors related to human activity that affect terrestrial and aquatic ecosystems, and explain how they affect the sustainability of these ecosystems (gr.9)</li> <li>• Demonstrate an understanding of the dynamic nature of ecosystems, particularly in terms of ecological balance and the impact of human activity on the sustainability of terrestrial and aquatic ecosystems.(gr.9)</li> </ul> <ul style="list-style-type: none"> <li>• Analyze the effects of various human activities on the diversity of living things (gr.11)</li> <li>• Investigate, through laboratory and/or field activities or through simulations, the principles of scientific classification, using appropriate sampling and classification techniques;</li> <li>• Demonstrate an understanding of the diversity of living organisms in terms of the principles of taxonomy and phylogeny.</li> </ul> <p><b>Specific Expectations:</b>  Is our food system sustainable? What are the effects of modern agriculture on ecosystems? What is the effect of synthetic inputs (pesticides, fungicides &amp; fertilizers) on water systems? On other plants? On soil? On humans? What alternatives are there to synthetic inputs? What organic practices enrich the land while producing food? (gr.9)</p> <p><b>Diversity of Living Things (gr.11)</b></p> <ul style="list-style-type: none"> <li>• Analyze the effects of various human activities on the diversity of living things;</li> </ul> <p><b>Specific:</b></p> <ul style="list-style-type: none"> <li>• Monoculture: how does it affect the land? How does it affect the food we eat? What are the alternatives?  ***statistics: soil tests</li> <li>• Synthetic inputs: What is the effect on biodiversity of aquatic or terrestrial ecosystems?</li> <li>• What is biodiversity?</li> </ul>

	<p>Including, but not limited to: <i>genetic diversity, species diversity, structural diversity, protists, bacteria, fungi, binomial nomenclature, and morphology</i></p> <p>explain why biodiversity is important to maintaining viable ecosystems (e.g., biodiversity helps increase resilience to stress and resistance to diseases or invading species)</p> <p>Use proper sampling techniques to collect various organisms from a marsh, pond, field, or other ecosystem, and classify the organisms</p>
Planning Notes	
Materials	<p>Graph paper for plotting out the gardens. Could be large sized graph paper (ideal for groups) or standard paper sized graph paper for individual use. If working as a class, use a chalkboard to do a rough plan then have students draw to scale.</p> <p>This could be a research project using internet, library, or resources could be given to the class.</p> <p>Students could work in groups, and the plans could then be discussed and evaluated by the class.</p> <p>Alternately, it could be done as a class discussion</p>
Teaching and Learning Strategies	<p>How has the food system changed? What are the effects of importing food from other countries? Buying from mono-crop conventional farms? What effects are there on our economy? On our environment? On our society? How does it lead to the use of synthetic inputs? GMOS? How does this affect our health? Why grow our own organic food?</p> <p>Identify modern agriculture practices. How does monoculture affect the land? What affect do synthetic inputs have on soil fertility? On other terrestrial ecosystems? Why is diversity in ecosystems important?</p> <p>What are organic alternatives to pest control? Monoculture?</p> <p>Present Companion Planting. What plants work well together? Show examples of garden plots. What is Crop Rotation? Green manure? Cover crops?</p> <p>What to consider: Garden size/space, Ottawa growing season, yield of vegetables: what vegetables have high yield? Maintenance required, Harvest: what do we plan to do with the vegetables grown?</p> <p>Provide students with resources: Types of plants that work well in Ottawa, needs for sun/shade/water, planting times, and harvesting</p>

	<p>times.</p> <p>Give students resources for companion planting: examples of “giver” plants and ideal soil conditions for each plant.</p> <p>If working in groups, provide each group with CGN Gardening Guide (or access to Gardening Guide online). If working as a class, it would be useful to have Gardening Guide important parts on slides, or ability to project from internet onto screen.</p> <p>Split class into groups (OR work as a class). Have groups come up with a garden plan: choose plants, draw garden layout with spacing/measurements. Have groups present to the class their garden plan, and discuss which would work best.</p> <p>Homework assignment: After presentations, have students modify their designs based on advice from teacher/classmates (on graph paper or electronically) Submit final garden plans + Conclusions &amp; Justifications for plan (factors in decision).</p> <p>Choose a garden plan for one, two or three of your school garden beds! Make the plan known to groups/classes involved in planting, so that they know what seeds to start!</p>
Assessment/Evaluative Techniques	Evaluate presentations. Ability to present ideas to the class, to respond to comments/criticisms, ability to think critically when evaluating others’ ideas, participation in group planning activity. Evaluate final garden plans and conclusions.
Resources	CGN GARDENING GUIDE: Companion Planting (p.5), Garden Layout (p.6), Planting Guide (p.7), Planting Calendar (p.22), Vegetable specifics (p.23-47)
Accommodations/Modifications	Follow-up Lesson: Soils (Test for nutrients, pH before planting and one month after planting, how do the plants affect the soil?)

## The Mystery Garden - March, April, Anytime (Kindergarten)

*This lesson was adapted from Evergreen*

**Activity: Students plant unidentified seeds and make observations in their investigation to discover what each plant is.**

Unit	Science & Technology (Kindergarten)
Activity/Lesson Title	<b>The Mystery Garden</b>
Strands	Overall Expectations: Demonstrate an awareness of the natural and human-made environment through hands-on investigations, observation, questioning, and sharing of their findings;

	<p>Conduct simple investigations through free exploration, focused exploration, and guided activity, using inquiry skills (observing, questioning, planning an investigation, carrying out the investigation, and communicating findings); Demonstrate an understanding of and care for the natural world</p> <p>Specific Expectations:          What do seeds feel like? Look Like? How are they different? What do seeds need to grow? How do plants grow? What do plants look like? Taste like? Feel like? How are plants different? Using the senses: How can we discover what the plant is? What clues do we have?</p>
<p>Planning Notes</p>	<p>Teachers will need to know all food allergies in the class prior to conducting this experiment.</p> <p>In this experiment, students will plant ‘mystery’ seeds, and make observations using touch, seeing, smelling and tasting to identify each plant.</p> <p>Children today are disconnected from where their food comes from. Providing youngsters with the opportunity to see first hand how vegetables grow will foster a sense of wonder and respect for the natural world. At the same time, students will be tasting and getting excited about healthy food.</p> <p>Vocabulary: Mystery, Clues, Senses</p>
<p>Materials</p>	<ul style="list-style-type: none"> <li>• beet, radish and lettuce seeds (preferably organic and heritage)</li> <li>• 1 bag of triple mix or potting soil</li> <li>• magnifying glasses</li> <li>• a sunny windowsill</li> <li>• beets, radishes and lettuce</li> <li>• a sheet for making daily observations and predictions</li> <li>• pots (small yogurt containers or peat pots)</li> </ul>
<p>Teaching and Learning Strategies</p>	<p>Before: place seeds in small glass or transparent plastic jars and discard the packages so as not to divulge the identity of the seeds</p> <p>Who has eaten plants today? Do we eat leaves? Do we eat roots? Do we eat stems?          Write down plants and then sort by parts of plants.</p> <ul style="list-style-type: none"> <li>• have the students examine the three different kinds of seeds with magnifying glasses</li> <li>• discuss with the group what the differences are (eg. this</li> </ul>

	<p>one is larger or this one is bumpy and that one is smooth)</p> <ul style="list-style-type: none"> <li>• prepare small containers such as yogurt containers, peat pots, or home-made newspaper pots—have students fill the pots 2/3 full with soil</li> <li>• demonstrate to students how to sprinkle seeds on top of the soil and then sprinkle soil to just cover the seeds (can discuss with the class why one should not push the tiny seeds deeply into the soil)</li> <li>• using a spray bottle generously wet the soil and place them by a sunny window; keep the pots moist and watch them grow!</li> <li>• you should have good sprouts by the end of one week</li> <li>• examine one of each of the three types of seedlings (they will look quite different from each other at this point)</li> <li>• discuss with the class which of the five senses they could use to differentiate the plants: do they smell different, do they look different, do they taste different?</li> <li>• show the students the beets, radishes and lettuce you have brought in and challenge them to match each sprouted plant with one of the vegetables</li> <li>• celebrate your gardening success with a small snack of cut up beets, radish and sprouts from your seedlings on lettuce leaf wraps!</li> <li>• do not try to transplant the seedlings in the outdoor garden but do sow your leftover seeds directly into the soil as soon as the last risk of frost has passed.</li> </ul>
Assessment/Evaluative Techniques	Which type of plant is which? How did you discover this?
Accommodations/Modifications	<p>Use different seeds in case of allergies</p> <p>Could use newspaper to create pots (environment: recycling material, and plant unknown seeds. Then they would make observations as the seeds started to sprout (characteristics of living things, stages and growth of plants)</p>

\*\*\*This lesson was adapted from Evergreen: [www.evergreen.ca/en/lg/lessons/MysteryGarden.html](http://www.evergreen.ca/en/lg/lessons/MysteryGarden.html)

## The Mystery Garden - March, April, Anytime (Gr.1)

*This lesson was adapted from Evergreen.*

**Activity: Students plant unidentified seeds and make observations in their investigation to discover what each plant is.**

Unit	Needs and Characteristics of Living Things Grade 1
Activity/Lesson Title	<b>The Mystery Garden &amp; Construct a Plant</b>
Strands	Overall Expectations: Investigate needs and characteristics of plants

	<p>Demonstrate an understanding of the basic needs and characteristics of plants</p> <p>Specific Expectations:          What are the parts of the plants? What is the function of roots? Stems? Leaves? How do they help the plant meet their basic needs? What part of a plant do we eat?</p> <p>What do seeds need to grow? How do they grow? How are plants different? How can we discover what the plant is? What clues are there in our investigation?</p>
<p>Planning Notes</p>	<p>Teachers will need to know all food allergies in the class prior to conducting this experiment.</p> <p>In this experiment, students will plant ‘mystery’ seeds, and make observations using touch, seeing, smelling and tasting to identify each plant.</p> <p>Children today are disconnected from where their food comes from. Providing youngsters with the opportunity to see first hand how vegetables grow will foster a sense of wonder and respect for the natural world. At the same time, students will be tasting and getting excited about healthy food.</p> <p>Vocabulary: Investigation, explore</p>
<p>Materials</p>	<ul style="list-style-type: none"> <li>• beet, radish and lettuce seeds (preferably organic and heritage)</li> <li>• 1 bag of triple mix or potting soil</li> <li>• magnifying glasses</li> <li>• a sunny windowsill</li> <li>• beets, radishes and lettuce</li> <li>• a sheet for making daily observations and predictions</li> <li>• pots (small yogurt containers or peat pots)</li> </ul>
<p>Teaching and Learning Strategies</p>	<p>Before: place seeds in small glass or transparent plastic jars and discard the packages so as not to divulge the identity of the seeds</p> <p>“Who has eaten plants today?” “do we eat leaves?” “do we eat roots?” “do we eat stems?”</p> <p>Write down plants and then sort by parts of plants. Examine the adult radish, lettuce and beet plants. Identify the parts of the plants. What are the characteristics/function of leaves, stems, roots? How will this help us to identify our mystery plants?</p> <ul style="list-style-type: none"> <li>• have the students examine the three different kinds of seeds with magnifying glasses</li> <li>• discuss with the group what the differences are (eg. this one is larger or this one is bumpy and that one is smooth)</li> </ul>

	<ul style="list-style-type: none"> <li>• prepare small containers such as yogurt pots—have students fill the pots 2/3 full with soil</li> <li>• demonstrate to students how to sprinkle seeds on top of the soil and then sprinkle soil to just cover the seeds (can discuss with the class why one should not push the tiny seeds deeply into the soil)</li> <li>• using a spray bottle generously wet the pots and place them by a sunny window; keep the pots moist and watch them grow!</li> <li>• you should have good sprouts by the end of one week</li> <li>• examine one of each of the three types of seedlings (they will look quite different from each other at this point)</li> <li>• discuss with the class which of the five senses they could use to differentiate the plants: do they smell different, do they look different, do they taste different?</li> <li>• show the students the beets, radishes and lettuce you have brought in and challenge them to match each sprouted plant with one of the vegetables</li> <li>• celebrate your gardening success with a small snack of cut up beets, radish and sprouts from your seedlings on lettuce leaf wraps!</li> <li>• do not try to transplant the seedlings in the outdoor garden but do sow your leftover seeds directly into the soil as soon as the last risk of frost has passed.</li> </ul> <p>Additional Activity: Construct a Plant  Materials: different vegetable parts, toothpicks  Divide students into groups.  Have parts of plants (roots, stems, leaves, flowers) on table  Students will construct a plant using roots, stems, leaves to create silly plants such as carrot-occoli. Put them together with toothpicks. Take pictures of the new varieties of plants.</p>
Assessment/Evaluative Techniques	Which type of plant is which? How did you discover this?
Accommodations/Modifications	Use different seeds in case of allergies, use recycled containers/cups instead of eggshells in case of egg allergy (environment: recycling material, and plant unknown seeds. Then they would make observations as the seeds started to sprout (characteristics of living things, stages and growth of plants)

\*\*\*This lesson was adapted from Evergreen: [www.evergreen.ca/en/lg/lessons/MysteryGarden.html](http://www.evergreen.ca/en/lg/lessons/MysteryGarden.html)

### Soil Investigation - When ground is thawed, before planting (Grade 1,3)

Activity: Students explore soil, experiment with different types of soil, and discover soil components through observation and soil testing.

Unit	Characteristics and Needs of Living Things (gr.1), Soils in the environment (gr.3)
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Activity/Lesson Title	<b>Soil Investigation</b>
Strands	<p>Overall Expectations:            Investigate the composition and characteristics of different soils (gr.3)            Assess the impact of soils on society and the environment, and of society and the environment on soils (gr.3)            Demonstrate an understanding of the composition of soils, the types of soils, and the relationship between soils and other living things (gr.3)</p> <p>What is in soil? Minerals, organic matter, critters? How do critters affect our garden? Positively, negatively? How does soil help plants grow? What can we add to the soil to help plants grow better? What is the pH balance of the soil in our garden? Is it ideal? If not, what can we do to balance the pH? What is the difference between different kinds of soil? How do they feel different? How does each retain water? How can we make soil richer for our plants to grow? (composting)</p>
Planning Notes	Children must wear appropriate clothing
Materials	<p><i>Part 1: (In class or outdoors)</i>  <i>Clay, silt, sand (enough for students to manipulate/pass around to make observations), draining pots (yogurt containers with holes in the bottom)</i></p> <p><i>shovels for digging, magnifying glasses to observe small components of soil, compost if adding to soil before planting...</i>  <i>- garden beds with soil, ideally right before planting</i>  <i>- a sheet for identifying pests, with space for additional observations to be recorded</i></p>
Teaching and Learning Strategies	<p><i>Part One:</i></p> <ol style="list-style-type: none"> <li><i>1. Talk about dirt. Is all soil the same? How does it differ?</i></li> <li><i>2. Introduce three types of soil: Clay, silt, sand.</i></li> <li><i>3. Allow students to see and touch each type of soil. Discuss the differences.</i></li> <li><i>4. Fill 3 small draining pots with equal amounts of each kind of soil</i></li> <li><i>5. Pour equal amounts of water into each, starting small, and noticing the drainage from each pot. What does this tell about the soil? Which would be better for plants?</i></li> </ol> <p><i>Part Two: In the garden</i></p> <ol style="list-style-type: none"> <li><i>1. Ask children what they expect to find in the soil? Discuss what makes plants grow, and what they require from the soil.</i></li> <li><i>2. Give children observation sheets and go over the critters they may find</i></li> <li><i>3. Split children into groups if possible, explore soils in garden bed, under grass, and in the sandbox.</i></li> <li><i>4. Get digging. Record Observations.</i></li> </ol> <p><i>Apply compost, and move to planting if planting also that day.</i></p>
Assessment/Evalua	Students will write conclusions: Which type of soil they would choose to grow

tive Techniques	plants, what would be in the soil, and could plants grow without soil?
Resources	Soil Type/Structure: Building the soil CGN Garden Guide (p.1), Guide to living things in soil: <a href="http://www.fieldmuseum.org/undergroundadventure/teachers/pdfs/Soil_Critter_Field_Guide.pdf">http://www.fieldmuseum.org/undergroundadventure/teachers/pdfs/Soil_Critter_Field_Guide.pdf</a>

## Seed Starting – First Week of April (Grade 1,3)

Activity: Through a series of stations, students explore seeds and seed germination. Seeds are sprouted for snacks later in the week, and seedlings are planted for later use in the garden.

Unit	Characteristics and Needs of Living Things (gr.1), Growth and Changes in Plants (gr.3)
Activity/Lesson Title	<b>Seed Starting</b>
Strands	<p>Overall expectations:</p> <p>Demonstrate an understanding of the basic needs of plants (gr.1)</p> <p>Investigate the characteristics and needs of plants(gr.1)</p> <p>Demonstrate awareness that plants depend on their environment to meet their basic needs(gr.1)</p> <p>Investigate similarities and differences in the characteristics of various plants, and ways in which the characteristics of plants relate to the environment in which they grow; (gr.3)</p> <p>Demonstrate an understanding that plants grow and change and have distinct characteristics. (gr.3)</p> <p>Specific Expectations</p> <p>What are the basic needs of plants? What does a seed need to grow? How do plants grow? How are seeds different? How can we help plants to meet their needs in the classroom?</p> <p>Vocabulary: Germination, roots, sprout, seeds</p> <p>Cross Curricular: Journal of Stations (Language Arts, gr.1,3)</p> <p>Cross Curricular: Settlers (gr.3) – heritage seeds, value land</p> <p>Cross Curricular: Healthy Living (gr.3) – where does food come from?</p>
Planning Notes	<p>Need to know all allergies in class: seeds, eggs.</p> <p>This lesson is best done in stations, and requires one adult volunteer or teacher for each station.</p> <p>When making eggshell cups, plan in advance what to do with the eggs. Cook scrambled eggs for brunch?</p> <p>This lesson is best done on a Monday. Bean sprouts will take about 4-5 days and need to be rinsed quickly at least once every day. If you start on a Monday/Tuesday, plan to eat sprouts on Friday!</p>

Materials	<p><i>Station one: cotton, eggs, thumb tack, bowl for eggs, construction paper, tape</i></p> <p><i>Station two: Different seeds that students can eat (beans, peas, sunflower seeds, sesame seeds...)</i></p> <p><i>Station three: soil (use a kind of soil that is good for seed starting, with peat...), pots (yogurt containers, peat pots, newspaper pots) , different seeds (use seeds that you would like to eventually transplant into the garden)</i></p> <p><i>Station four: clear cup or ziplock bag, bean (use a bean that will grow! Not a baked bean), paper towels, water</i></p>
Teaching and Learning Strategies	<p><i>See Grade 3 Classroom Activities, developed by garden volunteer Anne Marie Korba (on Workbook CD). The lesson includes four interactive seed-based activities.</i></p> <p><i>Follow up with the following sprouting activity-an easy way to grow food at home or in school all year long.</i></p> <p><i>Additional Sprouting Activity: Jar Method</i></p> <p><i>Sprout beans/seeds to eat:</i></p> <p><i>Bean sprouts will grow in about a week with not much effort.</i></p> <ol style="list-style-type: none"> <li><i>1. Place ½ cup of beans (lentils, mung beans, or a few tablespoons of alfalfa seeds...) in a jar (about the size of a peanut butter jar).</i></li> <li><i>2. Fill with water. Soak overnight.</i></li> <li><i>3. Drain and rinse the seeds in the morning.</i></li> <li><i>4. Cover with a piece of nylon stocking secured on top with an elastic band (or a screen lid-can be purchased at healthfood stores).</i></li> <li><i>5. Keep tilted down in a bowl so that the water can drain.</i></li> <li><i>6. Rinse twice daily, set tilted down to drain.</i></li> <li><i>7. In 4-5 days, you should have delicious bean sprouts to eat.</i></li> </ol> <p><i>*Buy seeds that are meant for sprouting from the healthfood store. See specific instructions &amp; grow times for each seed.</i></p>
Assessment/Evaluative Techniques	Evaluate observations in journal.
Accommodations/Modifications	Use small pots instead of egg shells in case of allergies.

## Seed Starting – First Week of April (Grade 6)

Activity: Through a series of stations, students explore seeds, germination, and discuss seed diversity. Seeds are sprouted for snacks later in the week, and seedlings are planted for later use in the garden.

Unit	Biodiversity (gr.6)
Activity/Lesson Title	<b>Seed Starting</b>
Strands	<p>Overall expectations:</p> <p>Assess human impacts on biodiversity, and identify ways of preserving biodiversity;</p> <p>Investigate the characteristics of living things, and classify diverse organisms according to specific characteristics;</p> <p>Demonstrate an understanding of biodiversity, its contributions to</p>

	<p>the stability of natural systems, and its benefits to humans.(gr.6)</p> <p>Specific Expectations:          Analyse a local issue related to biodiversity          Assess the benefits that human societies derive from biodiversity (e.g., thousands of products such as food, clothing, medicine, and building materials come from plants and animals) and the problems that occur when biodiversity is diminished (e.g., monocultures are more vulnerable to pests and diseases)          Describe ways in which biodiversity within and among communities is important for maintaining the resilience of these communities (e.g., having a variety of species of wheat allows for some part of the crop to survive adverse conditions)</p>
<p>Planning Notes</p>	<p>Need to know all allergies in class. Choose seeds accordingly.          Have students bring in jars for sprouting (recycled glass jars with label removed)          This lesson is best done on a Monday. Bean sprouts will take about 4-5 days and need to be rinsed quickly at least once every day. If you start on a Monday, plan to eat sprouts on Friday!          Planning for the garden: has there been a plan created for the school garden by another class or garden club? If so, ask them what seeds to start now for later transplanting into the garden.          Alternately, plants could be kept in containers.</p>
<p>Materials</p>	<p>Seeds:          Packs of seeds to plant and compare. Purchase some from the grocery/hardware store and others from an organic seed supplier such as Greta’s Organics or at the Ottawa Organic Farmers Market. Try to get a variety of heritage/heirloom seeds, and varieties of vegetables not generally found in the store (purple carrots, romenesca cauliflower, sorrel – local organic seed suppliers can help you identify different varieties of vegetables that would grow well in your gardens...).</p> <p>Choose some seeds that you would like to transplant into the school gardens.</p> <p>Organic seed starting mix, peat pots or small trays for seed starting.</p> <p>For sprouting: elastic bands, nylon stocking, jars, seeds for sprouting : lentils, mung beans, alfalfa seeds – buy seeds that are meant for sprouting. They can be found at a health food store.</p> <p>As an experiment, try sprouting mung beans that are not sold for sprouting, and compare with mung beans for sprouting. Compare the yield. Do not consume sprouts of seeds that were not meant for sprouting, they may contain toxins.</p>
<p>Teaching and Learning Strategies</p>	<p><b>Process:</b>          How many types of seeds exist? How do humans affect seed</p>

	<p>diversity? Why save &amp; start seeds? Is it difficult to save and start seeds? Heritage seeds vs. GMO?  Vocabulary: Germination, roots, sprout, Heritage seeds, GMO, biodiversity.</p> <p>Discuss diversity of seeds. What are the effects of modern agriculture on biodiversity? What problems arise from diminishing biodiversity? How can we help to conserve seed diversity? How do we grow organic, diverse foods without pesticides?</p> <p>Watch <a href="#">The Story of Food</a> (5 minute animated educational video), USC videos <a href="#">Banking Diversity</a> and <a href="#">Saving the Seed</a> are also both relevant and appropriate.</p> <p>Split into groups, or supply students with the material to participate at their desks or in groups of 2, 3.</p> <p>Part 1  <i>Explore and identify seeds.  What part of the plant did each seed come from? Provide examples of seeds that students can see, touch and eat.</i></p> <p>Part 2 Planting seeds:  <i>What are heritage seeds? GMOs? How do we find heritage seeds? What's in soil? Choosing soil: organic vs. fertilized soil. Why organic practices?  Plant heritage seeds to later transplant into the garden. See resources for schedule of when to start seeds indoors.</i></p> <p>Part 3: Bean in Cup  <i>Discuss germination. Discuss the parts of the plant and their function, how they develop. Set up experiment, and as the bean grows have students identify parts of plant.  Experiment:  Fill clear cup or ziplock bag with paper towels.  Place a beans on each side of the cup, between the paper towel and the cup, about 1 inch deep. Wet the paper towel. Store in a moist area. Check progress daily and keep paper towel moist. Students can write down observations. When the bean is has begun to sprout (about one week), move to small pot and watch them grow.</i></p> <p><i>Sprout beans/seeds to eat:  Bean sprouts will grow in about a week with not much effort.</i></p> <ol style="list-style-type: none"> <li><i>1. Place ½ cup of beans (lentils, mung beans, or a few tablespoons of alfalfa seeds...) in a jar (about the size of a peanut butter jar).</i></li> <li><i>2. Fill with water. Soak overnight.</i></li> <li><i>3. Drain and rinse the seeds in the morning.</i></li> </ol>
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	<p>4. Cover with a piece of nylon stocking secured on top with an elastic band (or a screen lid-can be purchased at healthfood stores).</p> <p>5. Keep tilted down in a bowl so that the water can drain.</p> <p>6. Rinse twice daily, set tilted down to drain.</p> <p>7. In 4-5 days, you should have delicious bean sprouts to eat.</p> <p><i>*Buy seeds that are meant for sprouting from the healthfood store. See specific instructions &amp; grow times for each seed.</i></p> <p><i>Sprout cress seeds (do not need to soak overnight):</i>  <i>Add about 1 mL (¼ teaspoon) of cress seeds in small container, on top of soaked cotton balls/paper towel.</i></p>
Assessment/Evaluative Techniques	Evaluate observations in journal.
Accommodations/Modifications	These experiments can be done as a whole class or in stations.

## Seed Starting – First Week of April (Grade 11)

Unit	Diversity of Living Things (gr.11), Nutrition Gr.11
Activity/Lesson Title	<b>Seed Starting</b>
Strands	<p>Overall expectations:  Analyze the effects of various human activities on the diversity of living things</p> <p>Nutrition: Is eating healthy expensive? How can we eat healthy on a budget? Eg. Sprouting – what is the nutritional value of sprouts? What are advantages of growing organic vegetables and fruits at home/school?</p>
Planning Notes	<p>Need to know allergies in class.</p> <p>Have students bring in jars for sprouting (recycled glass jars with label removed – mason jars, salsa jars, etc.)</p> <p>This lesson is best done on a Monday. Sprouts will take about 4-5 days and need to be rinsed quickly twice every day. If you start on a Monday, plan to eat sprouts on Friday!</p> <p>Planning for the garden: has there been a plan created for the school garden by another class or garden club? If so, ask them what seeds to start now for later transplanting into the garden. Alternately, plants could be transplanted in larger containers if there is not a school garden.</p>
Materials	<p>Seeds – Heritage or Heirloom seeds from an organic seed provider</p> <p>Organic garlic for planting, grocery store-bought garlic</p> <p>Seeds for sprouting (alfalfa or mung beans or another type of seed)</p>

	meant for sprouting-purchase at a healthfood/natural food store)
Teaching and Learning Strategies	<p><b>Process:</b>  <i>Discuss diversity of seeds. What are the effects of modern agriculture on biodiversity? What problems arise from diminishing biodiversity? How can we help to conserve seed diversity? How do we grow organic, diverse foods without synthetic inputs?</i></p> <p><i>Watch: The Story of Food (5 minute animated educational video), Watch: Banking Diversity (8.5 minutes)</i>  <i>Use power point presentation to guide discussions about Organic growing practices (see resource CD)</i></p> <p><b>Activities:</b></p> <p><b>1. Sprouting</b>  <i>Discuss the value of growing food/sprouting. What is the nutritional value? Economic value: personal – is it expensive to grow/sprout? How does eating local &amp; organic food benefit our economy? Our environment?</i></p> <p><i>Sprout beans/seeds to eat:</i>  <i>Bean sprouts will grow in about a week with not much effort.</i></p> <ol style="list-style-type: none"> <li><i>1. Place ½ cup of beans (lentils, mung beans, or a few tablespoons of alfalfa seeds...) in a jar (about the size of a peanut butter jar).</i></li> <li><i>2. Fill with water. Soak overnight.</i></li> <li><i>3. Drain and rinse the seeds in the morning.</i></li> <li><i>4. Cover with a piece of nylon stocking secured on top with an elastic band (or a screen lid-can be purchased at healthfood stores).</i></li> <li><i>5. Keep tilted down in a bowl so that the water can drain.</i></li> <li><i>6. Rinse twice daily, set tilted down to drain.</i></li> <li><i>7. In 4-5 days, you should have delicious bean sprouts to eat.</i></li> </ol> <p><i>*Buy seeds that are meant for sprouting from the healthfood store. See specific instructions &amp; grow times for each seed.</i></p> <p><b>2. Planting Heritage Seeds</b>  <i>Help to conserve seed diversity by planting Heritage seeds. Discuss: Heirloom &amp; heritage seeds. Where did these seeds come from and what are good/bad sources to obtain seeds for growing? What's in soil? Choosing soil: organic vs. fertilized soil. Why organic practices? (soil erosion, pollution in water, soil, air, nutrition)</i>  <i>Plant heritage seeds to take home or for the school garden.</i>  <i>*Many plants can be grown in pots if students do not have gardens at school or at home. See Community Garden Network Gardening Guide for Container Growing.</i></p> <p><b>3. Garlic Experiment:</b>  <i>Will a clove of garlic from the grocery store grow?</i></p>

	<i>Plant a clove of garlic from an organic grower (can be found at a farmers market). Plant a clove of garlic from the grocery store. **Most garlic that we purchase to eat is sprayed with sprout inhibitor, and will not grow.</i>
Resources	PowerPoint lesson (resource CD) Videos: The Story of Food, Banking Diversity (resource CD or available online at usc-canada.org) Biodiversity Fact Sheet: English: usc-canada.org/UserFiles/File/Biodiversity-Fact-Sheet(sm).pdf French: usc-canada.org/UserFiles/File/Biodiversity-Fact-Sheet-Fr(sm).pdf

## Transplanting and Planting – Earliest Mid-April (Grade 4)

Activity: Students take seedlings and plant them in the garden. Experiments are done on weaker seedlings that don't make it to the garden.

Unit	Habitats and Communities (gr.4)
Activity/Lesson Title	<b>Transplanting &amp; Planting</b>
Strands	Overall Expectations: Analyze the effects of human activities on habitats and communities; Investigate the interdependence of plants and animals within specific habitats and communities; Demonstrate an understanding of habitats and communities and the relationships among the plants and animals that live in them.  Specific Expectations: Why do all habitats have limits to the number of plants and animals they can support? What factors (e.g., availability of water or food, amount of light, type of weather) affect the ability of plants and animals to survive in a specific habitat?
Planning Notes	Start seedlings 2-3 weeks in advance. See basic resources for seed starting. *Discuss why we start a few seeds per cup, even though we'll only use the strongest seedlings. Students must wear appropriate clothing for the garden
Materials	Mature seedlings, before weaning out the smaller ones Garden gloves if desired, small hoes/digging tools Seeds for sowing (plan for your garden size, conditions, and harvest *Has a plan for the school garden been made? See resources for planting times)
Teaching and Learning Strategies	Transplant & Planting  Discuss planting. What seeds will we plant? What vegetables will

	<p>work well in our garden? What plants should be planted at this time of year What are the conditions of our garden? When do we want to harvest?</p> <p>*Does a garden plan for the school garden exist?</p> <p>In the garden:</p> <p>Transplant seedlings and sow seeds.</p> <p>Why space out plants instead of planting more seeds, more seedlings into garden?</p> <p>Experiment: (use seedlings that didn't make selection for transplant to the garden)</p> <p>What happens to the seedlings we didn't use when we: deprive them of sunlight? Water? Soil? Space?</p> <p>Plant seedlings in a variety of conditions. Put one in a dark place. Remove the soil from one pot. Put one in a very tiny pot. Keep one or two in ideal conditions as a control group. Have students record their hypotheses, observations and conclusions in a journal.</p>
Resources	CGN Gardening Guide: Ottawa Planting Calendar p.7, 21

## Weeding and Mulching - any time! (Grade 1,3,5,6,9)

Activity: Students discover weeds, weed the garden and conduct a mulch experiment.

Unit	Characteristics and Needs of Living Things (gr.1), Growth and Characteristics of Plants (gr.3) Other connections to seek out: Gr.6 classification of plants, gr.5/9 water conservation
Activity/Lesson Title	<b>Weeding and Mulching</b>
Strands	<p>Overall expectations:</p> <p>demonstrate an understanding of the basic needs of animals and plants (gr.1)</p> <p>Investigate the characteristics and needs of animals and plants(gr.1)</p> <p>Demonstrate awareness that animals and plants depend on their environment to meet their basic needs(gr.1)</p> <p>Assess ways in which human activity has an impact on plants and plant habitat(gr.3)</p> <p>Investigate the requirements of plants and the effects of changes in environmental conditions on plants(gr.3)</p>

	What are the basic needs of plants? What are weeds? Why is it important to limit growth of weeds? What happens when we apply mulch to a garden? How does it affect plants' growth? Need for water, weeding?
Planning Notes	Students will need to wear appropriate clothing
Materials	Small tool for weeding Garden gloves A garden with plants and weeds Mulch: newspaper, woodchips or straw, or all three
Teaching and Learning Strategies	<p>1. Discuss weeds. What are weeds? Good/bad weeds. Why is weeding important? Weeds fight for nutrients in the soil, space in the garden. Learn to identify weeds. (handout)</p> <p>2. Weed the garden – students pull weeds, trying to get as much of the roots as possible (why is it important to get the root?) Experiment: weed half the garden by cutting weeds at ground level, and half by removing weeds with roots. After one week, observe.</p> <p>3. Mulching experiment –students apply one type of mulch to half the garden, or different kinds of mulch to different parts. Leave one part of the garden un-mulched as a control group.</p> <p>4. In the classroom, discuss the effects that the mulch could have on the garden. Have students prepare an observation sheet to record the difference in the un-mulched garden and the different types of mulches. Students write predictions as to what they will find.</p> <p>5. Take the children out to water and weed the garden once or twice a week, and record observations. Observe the soil: moist, dry? Observe the amount of weeds in each garden. Observe the growth of the plants.</p>
Assessment/Evaluative Techniques	Have students write conclusions. What proof/techniques did they use to come to these conclusions?

### **Composting: Create a Composter - When ground is dry (Grade 5,7,8)**

Activity: Students design/build a composter.

Unit	Understanding earth and space systems – conservation of energy and resources (gr.5), Interactions in the Environment (gr.7) Form and Function (gr.7)
Activity/Lesson Title	<b>Create a Composter</b>
Strands	<b>Grade 5</b>

	<p>Overall Expectations: Analyse the immediate and long-term effects of energy and resource use on society and the environment, and evaluate options for conserving energy and resources</p> <p>Specific Expectations: How much waste do the school lunches/snacks produce? How much of that is organic waste? Can we create a composter to divert that waste? Can we reduce use of resources by finding used materials? Where can we find things like scrap wood to build our composter?</p> <p><b>Grade 8</b> Assess the personal, social, and/or environmental impacts of a system, and evaluate improvements to a system and/or alternative ways of meeting the same needs;</p> <p>Specific Expectations Identify social factors that influence the evolution of a system (<i>e.g., growing concern over the amount of waste creates a need for recycling centres, and the recycling centres must grow as population and waste increase; the desire to make tasks easier creates a need for pulley systems, gear systems, and hydraulic and pneumatic systems; changes in traditional work hours created by technological advances can influence changes in a child care system</i>)</p> <p><b>3.2</b> identify the purpose, inputs, and outputs of various systems (<i>e.g., a garden – purpose: to grow things; input: seeds, water, organic matter; output: flowers, food</i>)</p> <p><b>Grade 7</b> Interactions in the Environment: Assess the impacts of human activities and technologies on the environment, and evaluate ways of controlling these impacts; Investigate interactions within the environment, and identify factors that affect the balance between different components of an ecosystem; Demonstrate an understanding of interactions between and among biotic and abiotic elements in the environment. Form and Function: Analyse personal, social, economic, and environmental factors that need to be considered in designing and building structures and devices; Design and construct a variety of structures, and investigate the relationship between the design and function of these structures and the forces that act on them; Demonstrate an understanding of the relationship between structural forms and the forces that act on and within them.</p>
Planning Notes	<p>Students must be prepped on tool safety and closely monitored Students must wear appropriate clothing Is there a design/tech teacher interested in making plans and building bin?</p>

	Are resources available to do it without a shop (tools, expertise?)
Materials	Recycled wood Hammer & nails/Drill & long screws Hand Saw, circular saw, whatever is available Safety - appropriate supervision & knowledge of tools
Teaching and Learning Strategies	Discuss in class: How much waste is created each week in the world, by country, in schools and at home? What are the effects of landfills on water systems? Soil? Ecosystems? How much waste can be diverted by composting? What does compost do for the garden? How does composting work? What goes in the composter? What maintenance needs to be done?  See designs for an easy to build compost system.
Resources	Plans for a simple composter are on the Resource CD. See sample designs: 3 bin system: <a href="http://www.metrovancouver.org/about/publications/Publications/CompostBinConstructionPlan-ThreeBin.pdf">www.metrovancouver.org/about/publications/Publications/CompostBinConstructionPlan-ThreeBin.pdf</a>
Accommodations/Modifications	Could pre-cut wood if tools/safety are a concern. Could make plans for the compost (where to put it, how big it should be,...) and ask a shop class or group to build it. Based on what resources are available, could have students budget costs of materials, use different tools, research which ready made bins are more efficient

## Composting: Get Composting - *When ground is dry* (Grade 5,7,8,9,10,11)

Activity: Students design a composting system at their school, and teach other students about compost.

Unit	Understanding Earth and Space Systems: Conservation of energy and resources (gr.5), Interactions in the Environment (gr.7), Sustainable Ecosystems (gr.9), Earth and space Science: Climate Change (gr.10), Abiotic & Biotic Systems (gr.11)
Activity/Lesson Title	<b>Get Composting</b>
Strands	Analyze the immediate and long-term effects of energy and resource use on society and the environment, and evaluate options for conserving energy and resources (gr.5)  Assess the impacts of human activities and technologies on the environment, and evaluate ways of controlling these impacts (gr.7) Investigate interactions within the environment, and identify factors that affect the balance between different components of an ecosystem (gr.7) Demonstrate an understanding of interactions between and among biotic and abiotic elements in the environment(gr.7)

	<p>Assess the impact of human activities on the sustainability of terrestrial and/or aquatic ecosystems, and evaluate the effectiveness of courses of action intended to remedy or mitigate negative impacts; (gr.9)</p> <p>Investigate factors related to human activity that affect terrestrial and aquatic ecosystems, and explain how they affect the sustainability of these ecosystems;(gr9)</p> <p>Demonstrate an understanding of the dynamic nature of ecosystems, particularly in terms of ecological balance and the impact of human activity on the sustainability of terrestrial and aquatic ecosystems. (gr.9)</p> <p>Analyze some of the effects of climate change around the world, and assess the effectiveness of initiatives that attempt to address the issue of climate change;(gr.10)</p> <p>D2. investigate various natural and human factors that influence Earth’s climate and climate change;(gr.10)</p> <p>D3. demonstrate an understanding of natural and human factors, including the greenhouse effect, that influence Earth’s climate and contribute to climate change.(gr.10)</p> <p>Specific Expectations</p> <p>What is the effect of landfills on nearby ecosystems? On water? How much waste is created each day at school, in Ottawa, in Canada? Are initiatives such as composting effective in reducing negative human impact? How can they be improved? (gr.5)</p> <p>What type of composting programs are in place in your community? In your school? What proportion of locally generated garbage do they divert from landfill sites? How could they be improved? What is the purpose of carbon offset credits? Do they achieve that purpose? Why or why not? (gr.10)</p> <p>Cross Curricular: Language, Arts – oral presentation skills, group work/communication, create a visual</p>
Planning Notes	For this activity, students will learn about composting as a class, work in small groups, present ideas to a class. There are two options for group activities. Choose one or both to do with your class.
Materials	Supplies to create visual: eg. bristle board, glue, tape, old food/gardening magazines, or have students create a presentation on a computer, overhead slides, or using media of their choice
Teaching and Learning Strategies	Discuss current system of composting at school, at home. Who composts? How much organic waste is produced from one lunch? How many students are in the school? How much waste is created at home (1 garbage bag per week? 2?) How much of this waste could be composted into healthy soil? (more than half). What can

	<p>be put into a composter? (provide a list as a handout to students, or create a list on the board-see resources) How can we use compost in the garden (organic compost vs. fertilizer) After group discussion, split class into small groups.</p> <p>Option: Have each group create a visual to show what can be composted, and what cannot. Have groups present to other classes, and teach them why composting is important.</p> <p>Option: Have students design a composting system. In their groups, students discuss how to create a composting system in the school. At the end, discuss composting systems as a class and decide which one/combination would work best. Implement system.</p> <p>Follow up: Students can measure how much waste is diverted by school composter every day. Measure levels.</p>
Resources	CGN GARDENING GUIDE: Composting (p.2-3)

## Harvesting (grade 2, High school: Food & Nutrition courses, any grade)

Activity: Students follow or create a recipe that uses garden produce.

Unit	Making Healthy Choices (gr.1,2), High school: Food and Nutrition, following instructions, measurements, teamwork, healthy living (any grade)
Activity/Lesson Title	<b>A healthy meal/snack from the garden</b>
Strands	<p>Identify healthy eating habits (gr.1)</p> <p>Identify healthy eating practices and use a decision-making model to make healthy food choices (gr.2)</p> <p>Cross Curricular: Languages, math - Follow simple recipes, use measurements</p>
Planning Notes	<p>Plan recipes ahead in order to be prepared with extra ingredients and pots/pans/utensils required.</p> <p>Option: Compliment harvest lessons by having a chef come in to do a cooking lesson for kids. Chefs can share their expertise and will have creative ideas about making the most out of the garden's produce.</p> <p>Option: have students hold a bake sale – bake zucchini bread, pumpkin muffins, top cupcakes with edible flowers. This could be a way to fundraise for garden supplies.</p> <p>Recipes can be found on the Workbook CD. Ideas include gazpacho (can be made right in the garden), salsa, pesto, salad, pita wraps,</p>

	pizza, rice paper rolls, greek salad, a traditional native feast, spaghetti sauce, zucchini sticks
Materials	A garden with food ready to be harvested. Cooking utensils, eating utensils, extra ingredients depending on recipes. Does your recipe require a stove? Oven? Hot plate?
Teaching and Learning Strategies	<p>Watch The Story of Food. Discuss how students have created real, healthy food in their own schoolyard, and now can eat it. What makes this food healthy?</p> <p>Discuss which vegetables may be ready, and how to use them.</p> <p>Consult simple garden recipes, or create something that goes along with your garden's harvest. Ideas can be simple such as creating veggie wraps with pita or rice paper wraps. Recipes could be more difficult, with need to follow instructions and measure ingredients.</p> <p>Look at recipe ingredients and compare with Ontario Food Guide. Is this a balanced meal? What could we add?</p> <p>Get out there and harvest. Divide students into groups. Show groups of students how to identify vegetables that are ready for harvest, and let them harvest their own vegetables.</p> <p>Rinse vegetables, prepare meal, enjoy! Could do the whole lesson in the garden if the weather permits. Have a picnic!</p> <p>For a nutrition unit/course: Talk about health/nutrition as it relates to each course. Talk about the value of eating organic and knowing where your food comes from. Talk about organic vs. conventional foods: How can one eat a healthy diet of organic foods without spending too much money?</p>
Resources	Canada Food Guide, Power Point Presentation available on CD, Harvest recipes available on CD

### Seed Saving (gr.3,6)

Unit	Growth and Changes in Plants (gr.3), Biodiversity (gr.6), Biology (gr.11)
Activity/Lesson Title	<b>Seed Saving</b>
Strands	<p>Overall expectations:</p> <p>Investigate similarities and differences in the characteristics of various plants, and ways in which the characteristics of plants relate to the environment in which they grow; (gr.3)</p>

	<p>Demonstrate an understanding that plants grow and change and have distinct characteristics. (gr.3)</p> <p>Assess human impacts on biodiversity, and identify ways of preserving biodiversity (gr.6)</p> <p>Analyze the effects of various human activities on the diversity of living things (gr.11)</p>
Planning Notes	<p>Wait for plants to go to seed in the garden. This is a good lesson for September-November. Plants have seeds that are ready to save after the plant/fruit/flower has reached maturity. To prepare for seed saving, avoid picking all of the vegetables when they are ripe. Allow a few squash and a few beans to stay on the plant and get very large, and let the beans dry out.</p> <p>Lettuce and basil seeds are very easy to save. Simply wait for the lettuce/basil to flower and dry up. The plant will be dry and brittle. Simply collect the dried up branches, and rub the flowers between your fingers to release the seeds.</p> <p>See the instructions for beginner seed saving for more information.</p>
Materials	<p>Plants that are ready for seed saving. Small envelopes or ziplock bags to keep seeds in. Make sure to label your seeds. Large containers/bowls to collect and sort seeds from plant scraps. Depending on which seeds you are saving, a variety of materials may be required such as a knife, a jar, trays for drying, etc. See the instructions for beginner seed saving for more information.</p>
Teaching and Learning Strategies	<p>Grade 3</p> <p>Discuss plant reproduction as it relates to curriculum material. Identify parts of the plant involved in reproduction. Have the students guess which part of the lettuce, squash, beans the seeds will come from.</p> <p>Grade 6/Grade 11</p> <p>Watch USC's Saving the Seed and/or Banking Diversity. Discuss social and environmental reasons for saving seeds and for preserving seed diversity.</p> <p>Save seeds from the garden, using beginner seed saving instructions.</p> <p>Discuss:</p> <p>How many seeds came from just one plant? Are seeds expensive? Why? Do all plants produce seeds that can be saved? Why not? Many GM seeds/plants will not produce seeds that can be saved.</p> <p>Keep some seeds for the garden next year, have students take some home to plant in their own garden, or share them with</p>

	friends or family.
Resources	<p>Beginner Seed Saving Instructions  <a href="http://www.seedsave.org/issi/904/beginner.html">www.seedsave.org/issi/904/beginner.html</a></p> <p>USC videos The Story of Food, Banking Diversity and Saving the Seed are available on the Workbook CD or at <a href="http://usc-canada.org">usc-canada.org</a>.</p> <p>Find a fact sheet about the importance of Biodiversity on USC Canada's website.  <a href="http://usc-canada.org/UserFiles/File/Biodiversity-Fact-Sheet(sm).pdf">usc-canada.org/UserFiles/File/Biodiversity-Fact-Sheet(sm).pdf</a></p>

## More Activities

*The lesson plans are focused on tasks that need to be done for your garden. The learning doesn't end there – here are some more activities that promote healthy people, healthy food and a healthy planet.*

### Learn

Farming as a career - have a farmer visit the classroom or go on a farm field trip & talk about life on a farm, why and how they became a farmer, and how they sell their products. Great for a high school business class, a careers class, environment class.

Nutrition – have a nutritionist come in & talk about the benefits of going organic. Think about what we are putting into our bodies.

Nutrition – have students create a food diary for 1 week: list everything they ate for each meal, snack. Have them note whether the food was organic, and where it came from (what country, farm, etc). Discuss the benefits of eating fresh, local & organic veggies.

Cooking – have a chef visit the classroom, follow a recipe, or create your own recipes using produce

### Create

Make a Root Window:

Take a milk carton and cut a large window on one of the long sides. Use clear plastic (cellophane or a clear plastic bag) to cover. Use tape to seal around the window. Add soil, and plant seeds near the window. Cover the window with black construction paper and secure with tape or a rubber band. Remove construction paper after a few days to observe of how roots grow.

<http://www.kidsgardening.com/growingideas/projects/july04/pg1.html>

### Garden Labels Craft:

Create garden labels using small clear fish tank pebbles, a stick (bamboo or from the garden), raffia, and rubber/cement/glass glue.

<http://www.craftjr.com/garden-craft-plant-markers-free-pattern-download/>

### Pop-Bottle Composter

Make an indoor composter out of recycled materials. Observe decomposition & make great compost for your houseplants all winter long!

Plans for the composter are available on the Workbook CD, or find simple instructions on the blog at <http://growinguporganic.blogspot.com/2010/03/earthcare-spring-training.html>

### Worm bin

Get some Red Wiggler worms and watch how fast they turn organic waste into rich compost!

Make your own worm bin: <http://www.youtube.com/watch?v=JjuYNilM60> OR

Call the worm factory to have a workshop in your class:

<http://static2.shopify.com/s/files/1/0010/3662/assets/wormenglish.pdf>

Order your own Red Wigglers from Arbour Environmental Shoppe in the Glebe. (613) 567-3168

### Pickling/Salsa making/preserving

Pickling green tomatoes is a great way to use up green tomatoes at the end of the season.

### Indoor/patio/windowsill gardening

Don't have a garden at school? No yard at home? There's lots you can grow in recycled containers! See p. 16 of the Garden Guide: Bucket Gardening.

[http://www.justfood.ca/downloads/CGN\\_Garden\\_Guide\\_2010\\_English.pdf](http://www.justfood.ca/downloads/CGN_Garden_Guide_2010_English.pdf)

### Construction

Build simple structures: a trellis to support plants, a cold frame to extend the growing season, a mesh screen to prevent pest damage. Be creative! Use recycled materials.

### Water

Conserve water by getting a rain barrel, OR Experiment how much water can be collected in pails when it rains

### Enjoy

Outdoor art – Take the kids outside on a nice day and let them enjoy nature & the beauty of the garden: draw, paint, or write poems about their favourite plants, creatures. Paint the fence, paint a nice welcome sign for the garden.

Harvest-themed events – Have the students plan a picnic/bakesale, etc. Bake zucchini bread, carrot cake, pumpkin cupcakes..topped with edible flowers.

#### *Websites – Garden Activities*

[www.kidsgardening.com/Dig/dig.asp?act=t](http://www.kidsgardening.com/Dig/dig.asp?act=t) - Fun activities for children in and out of the garden

[www.evergreen.ca/en/resources/schools/curriculum.sn](http://www.evergreen.ca/en/resources/schools/curriculum.sn) - lesson plans, many resources and teaching tools

<http://apps.rhs.org.uk/Schoolgardening> - an established school garden project in England, lots of information, activities and ideas (more than 10,000 schools involved!)

<http://www.healthy-kid-recipes.com/gardening.html> - healthy kid recipes

[howstuffworks.com/science-projects-for-kids-soil-experiments.htm](http://howstuffworks.com/science-projects-for-kids-soil-experiments.htm) - soil experiments

[mgonline.com/articles/experimentsforkids.aspx](http://mgonline.com/articles/experimentsforkids.aspx) - more plant experiments