This book is made with water-resistant paper — take it outside!

# ROOTED IN PLACE

## Gardens as Year-Round Learning Grounds

Vancouver School Board

This resource was developed by the Vancouver School Board to support Elementary School Teachers in effectively starting and/or maintaining outdoor school food gardens as year-round learning grounds.

We live and work on the traditional, ancestral, unceded territories of the xʷməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and Sə̓lílwətaʔ/Selilwitulh (Tsleil-Waututh) Nations. We endeavor to honor the land and its inhabitants by strengthening our relationships and responsibilities to them.



Vancouver School Board

Written by Matthew Kemshaw

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This guide would not exist without leadership, collaboration and support from:

EYA Environmental Youth Alliance
Farm to School BC Vancouver Region Hub
Fresh Roots
The Intergenerational Landed Learning Project
Society Promoting Environmental Conservation
Vancouver Coastal Health
UBC Land and Food Systems
Grandview Woodland Food Connection

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# INTRODUCTION & BACKGROUND

This guide is written by non-indigenous members of the community to enrich the understandings of all learners. We hope that through school gardens, teachers and students can deepen their relationships of reciprocity with this land, and learn to reconcile and overcome on-going acts of colonization.

School gardens can be living laboratories where students learn and connect competencies and content across disciplines. Time spent outside has been shown to improve learner concentration while reducing anxiety, and is important for healthy human development. Growing, preparing and sharing food also improves food, nutrition and health literacy.

## About This Guide

In the past decade, gardens have become a common part of the Vancouver schoolyard. In 2015, UBC's Think&EatGreen@School research project[1] found that 84 of the 112 schools in the Vancouver School Board (VSB) had a food garden.

Of 32 participating "Think and Eat Green Schools" with food gardens in the VSB, only 31% reported that their garden was "used regularly" or was "a big part of their school community." Most reported their garden was either "not very well maintained" or was "up and running, but had a long way to go to reach its full potential."

This guide is to help you create a healthy school garden during the school year, so it may become an integrated part of your school community.

1 For more information, visit **www.thinkeatgreen.ca**

Photo by Samuel MacTavish



## This is a Garden Guide, Not a Teaching Guide

We have focused on helping you plan, plant and maintain a diverse and interesting garden in Vancouver's climate. We have tailored the guide specifically to the school year to help you create a garden that is flourishing and productive while classes are in session. This guide is written for beginner gardeners with little to no experience, but may also be of interest to more seasoned green thumbs.

We do not detail activities, lessons or curriculum that you might use to engage students in regular outdoor learning in your school garden classroom. We know that many resources currently exist to support this, and believe that teachers are the experts here. If you're stuck for ideas in a particular season, you might find inspiration in the ideas listed in this guide. We encourage you to be creative in the ways you use and explore your school garden with students.

We hope this guide might also help schools interested in starting a garden. The VSB reviews garden applications twice annually, in December and June. You will have success starting a garden if you gather a team and have your administrator champion your project and lead communications with Grounds.

# CONNECTING TO PLACE

## Glaciers and Soil

At the height of the last glaciation (14,500 years ago), ice stood as high as 2km over much of this land. During this time, our entire region was etched by massive glaciers. As that ice melted, glacial rock deposits mixed with marine and river sediments to create an interesting diversity of soil types (to learn more, visit: www.vancouversoils.ca).

## Adaptation and Evolution

As glaciers receded, local variations in aspect, elevation, and exposure to the ocean created many micro climates. A wide diversity of plants began to grow and evolve in order to suit the climate and ecology of our region. In this **temperate rainforest**, enormous trees sheltered a wide diversity of organisms. In bogs, meadows, mountains, coastlines and many more niches, a rich diversity of plants evolved.

These plants have grown alongside the animals that live here. Native **pollinators** and bird species have relied upon the food and shelter provided by certain native plants for thousands of years. Today, native plants continue to act as essential threads in the fabric of this place.

Photo by Samuel MacTavish



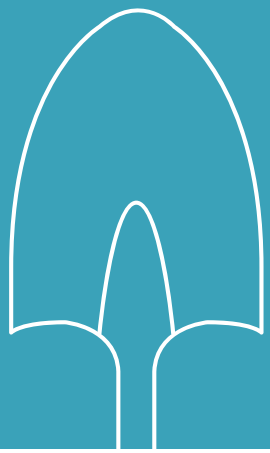
## History and Culture

Here on the **Salish Sea**, people have long understood "That their actions are critical to maintaining their land and resources."

*The productivity of the land and the sea have never been passively accepted by Aboriginal Communities. Far from it: In carefully monitoring and looking after the resources that sustain them, people have long participated in and contributed to the health and well-being of: their place, all other life forms and their own societies. Giving back to Nature is a critical notion. It is a theme that constantly recurs in conversations with indigenous elders.*[2]

Schoolyard gardens are spaces to show students how humans can give back. Much environmental learning portrays humans as a plague upon the earth. In the garden, children can be shown that we are a part of the larger ecosystem. Through simple, everyday actions we can bring health and wellness to the earth and all its inhabitants.

2 Text quoted and adapted from: Turner, N. (2005). *The Earth's blanket: Traditional teachings for sustainable living*. Vancouver: Douglas & McIntyre, p. 174.



# GARDEN PLANNING

## Think about developing a school garden program for your existing space.

### 1 Establish Goals

Why a school garden? What do you want to achieve?

### 2 Find Help

Build a team, get support from school administration, and invite community participation. Successful school gardens are built by many hands. Discuss and develop your goals and plans collaboratively. See Appendix A–C for ideas about funding and community organization support. Involve Aboriginal Community members early.

### 3 Start Small

Don't try to do everything at once. Create a comprehensive plan and consider developing your garden slowly, piece-by-piece, over several years. Build on your success.

### 4 Consider Safety

While gardening is a low risk activity, it's always important to consider safety for staff and students. Review VSB safety guidelines and resources for taking students outside. Consider safe equipment use and appropriate attire, store fertilizers and tools out of reach of students, and account for any possible hazards such as insect allergies, potentially toxic fungi and plants, glass, needles, cigarettes, condoms and other hazardous items. Note that school staff and students working in school gardens are to use hand tools only.

Photo by Samuel MacTavish



## Key things to consider when planning what and where to plant:

### 1 Sun Light

Plant shade tolerant **perennials** in places with lower light. Vegetables are best placed in areas with lots of sun.

### 2 Traffic and Play Patterns

Plants in busy play areas may get in the way, or risk being damaged. Plants far away from the life of the schoolyard may get neglected, or risk not being visited by inquiring minds.

### 3 Water

Easy access to water is important for success with any garden.

### 4 Interest

Most school gardens are designed with the hope that students will want to spend time there. Planting some garden beds with evergreen perennial plants can help keep the garden interesting through the winter.

Photo by Samuel MacTavish

This guide provides information on how to plant and care for a school garden. **In this work, it's important to also think about nourishing and sustaining student and community interest in the garden.** The following things may support you in this:

## 1 Teach in the Garden

You don't need to always be gardening in the garden. You can gather your class and teach any subject outside.

## 2 Celebrate in the Garden

Gather community and use your garden as a space to celebrate and connect. Share food together in the garden.

## 3 Find Novel Uses for the Garden

Think outside the box and support others in making your garden relevant and interesting to your school community.

## 4 Understand that the Best School Gardener is often a Poor Gardener

School gardens are spaces for exploration and discovery. You do not have to be a good gardener to support effective outdoor learning. In fact, the best outdoor teachers are often very poor gardeners.

# *What You Need and Where to Get It*



## SOIL

- Bags of **SEA SOIL** are available at Home Depot, Home Hardware and local garden stores.
- **Organic fertilizers** are available at local garden stores. Google "Vancouver Garden Store" for options near you.
- **Bulk garden soil** can be purchased from and delivered by the VSB Grounds Department (place a School Dude request).
- The City will sometimes offer **free compost** for community projects. To make requests contact **greenstreets@vancouver.ca**.

## SEEDS

- For locally grown seeds suited to our climate, order on-line from **BC Eco-Seeds Coop** **www.bcecoseedcoop.com**.
- **West Coast Seeds** often offers last year's seed for free to school projects. Contact 604-952-8820.

## PLANTS

- **Transplants of vegetables, herbs and shrubs** are available at many places, including: farmers markets, local green grocers, garden stores and hardware stores. See our suggestions below for one-stop-shops that can provide all your gardening needs.
- **Fresh Roots** offers vegetable starts to schools at cost – contact **food@freshroots.ca**.
- **The Environmental Youth Alliance** has a Native Plant Nuresery that distributes native plants for community projects – visit **www.eya.ca** for more information.
- **Nats Nursery** and **Linnaea Nursery** are the two most reliable large suppliers of Native Plants in the Lower Mainland. They tend to prefer (and may require) larger bulk orders.

# What You Need and Where to Get It *(cont.)*

## TOOLS

Consider creating a school set of tools that can be shared in common by all classes. Below is our suggestion for handy tools. You don't need all these tools to get started:

- **Spade shovel**
- **Hand trowels**
- **Garden gloves**
- **Digging fork**
- **Leaf rake**
- **Hard rake**
- **Wheelbarrow**
- **Garden Hoe**

## ONE-STOP-SHOPS

- **Figaro's Garden** at 1896 Victoria Drive
- **Garden Works** 6250 Lougheed Hwy and 4746 Marine Drive

## VSB MAINTENANCE / GROUNDS DEPARTMENT COMMUNICATION

At time of writing, **Jonn Epplette** is the **Grounds Supervisor**. He receives and reviews all garden proposals in December and June (as outlined in the VSB's Garden How to Guide available at **www.vsb.bc.ca**). Contact Jonn at: **604-713-5661** or **jepplette@vsb.bc.ca** before you begin adding to or planning to build a school garden. It's best to get your administration to lead this communication.

# *School Garden Year-in-Review*

A list of garden tasks through the school year



| SEPTEMBER | OCTOBER |
|---|---|
| • Plant Season #1 Vegetables (p. 35)<br>• Mulch (p. 15)<br>• Plant perennials (p. 19) | • Plant Garlic (p. 36)<br>• Plant perennials (p. 19)<br>• Mulch (p. 15) |
| **NOVEMBER** | **DECEMBER** |
| • Plant perennials (p. 19)<br>• Mulch (p. 15) | • Mulch (p. 15) |
| **JANUARY** | **FEBRUARY** |
| • Order your seeds (p. 11) | • Plant peas (p. 37, p. 47)<br>• Plant perennials (p. 19)<br>• Add Compost and Amendments (p. 16-17) |
| **MARCH** | **APRIL** |
| • Plant Season #2 Vegetables (p. 37)<br>• Plant perennials (p. 19)<br>• Add Compost and Amendments (p. 16-17) | • Plant Season #2 Vegetables (p. 37)<br>• Plant perennials (p. 19)<br>• Add Compost and Amendments (p. 16-17) |
| **MAY** | **JUNE** |
| • Plant Season #3 Vegetables (p. 41)<br>• Add Compost and Amendments (p. 16-17) | • Plant Season #3 Vegetables (p. 41)<br>• Add Compost and Amendments (p. 16-17) |

**Don't forget to harvest your food crops!**

# SOIL CARE

In **organic gardening**[3], soil care is key. Much of the nutrition stored in plant bodies is mined from the soil by a tremendous ecology of organisms who live there. **Fungi**, **Bacteria**, and a wide diversity of **Invertebrates** (the FBI) break down complex compounds into simpler nutrients that plants can easily absorb through their roots.

**CULTIVATE INQUIRY**

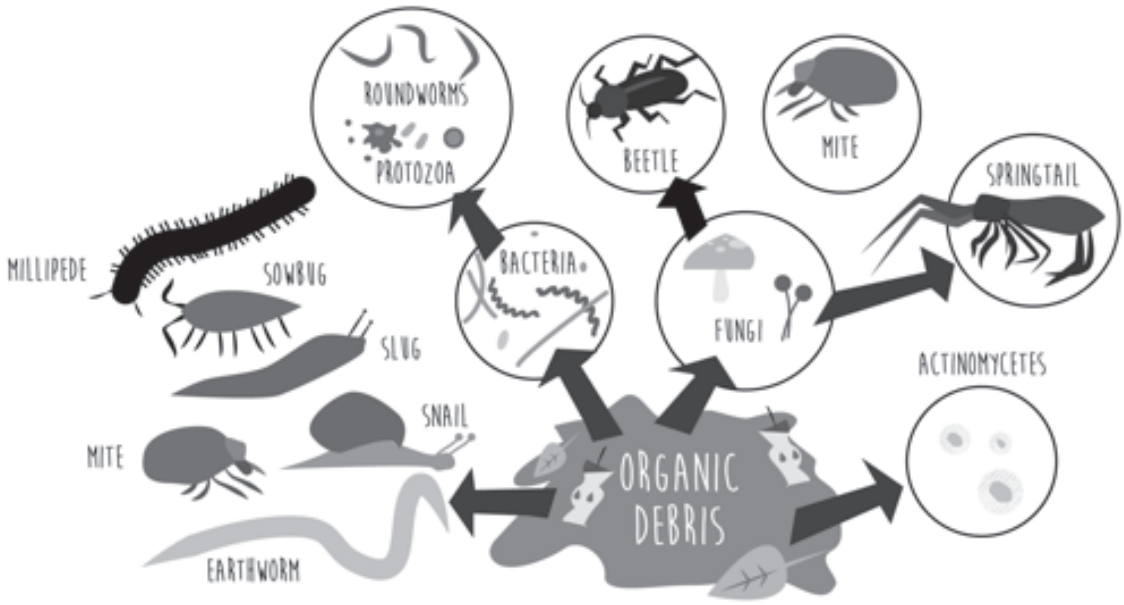
## SOIL LIFE IS AMAZING!

Get excited about the incredible diversity and sheer number of animals that live in the soil. Decomposition and the return of matter and energy to the earth is what makes life possible. For more ideas check out "Decomposition" in the Ideas for Action section.

When we harvest food from the garden, we are harvesting nutrients from the soil. Our heavy winter rains further deplete soil nutrients, washing them away. For these reasons, it is important to regularly return nutrients back to the garden, to feed the soil organisms who in turn feed our plants. The following three practices will help you keep your school garden healthy. Implementing at least two of them each year should be enough to feed a rich and diverse soil ecology. Implementing all three is even better.

For native plants, these practices are good to implement at time of planting. After planting, most native species are able to survive without further additions of soil fertility from the gardener. Fruiting shrubs will benefit from additions of nutrients each year, and are particularly supported by a small application of soil amendment in the early spring.

3 All school food gardens in the VSB are required to use organic practices. This means that you cannot use pesticides or fertilizers unless they are certified organic.






## Soil Care Practice #1 | Mulch

Mulch is a layer of organic material spread over bare soil. Fallen leaves are the most common mulch used in Vancouver's school gardens. Spread leaves in the fall (Sept-Dec) over any bare soil, to a depth of ~5-10cm. This mulch will prevent heavy rains from **leaching** your soil's vitality. Mulch also acts as a blanket over the soil, helping to moderate cold temperatures and hold moisture in the soil, making it a helpful companion for both winter and summer vegetables. The mulch will slowly break down and add nutrients and organic matter to your soil. Straw, compost, sea weed and chopped up plants are also commonly used as mulch in Vancouver's vegetable gardens. Before planting, remove remaining mulch and compost it. Do not use chestnut leaves as mulch, as they contain a toxin that inhibits plant growth.

*BEWARE mulching with Chestnut Leaf (usually ~15-20cm in length). ometimes individual chestnut leaves fall to the ground, and sometimes they fall as a they are clustered on the tree.*

### RECYCLING IN NATURE – RETURNING TO THE EARTH

Gathering leaves in the fall for use in the garden presents a unique opportunity to teach about the sustainable cycling of matter and energy in the environment (in fact, all soil care practices present this opportunity). You can use mulch to discuss how leaves break down into soil, which is then eaten by plants. The leaves also act as a blanket, protecting the soil and the plant roots beneath. Nature sure is smart!

**CULTIVATE INQUIRY**

## Soil Care Practice #2 | Compost

Compost is organic material that has decayed into **humus**. Humus is the pantry of the soil, holding nutrients and water, making them available to plants. Before planting seeds, spread good **finished compost** (i.e. not slimy or stinky) ~3cm thick over the area to be planted and gently work it in to the top few inches of garden soil using a digging fork, hand trowel or shovel. Break up all clumps of dirt before planting. If you are transplanting plants from pots into your garden, they will appreciate you filling each planting hole with 1-2 handfuls of compost before planting (twice that for trees and large shrubs). To give plants an extra boost as they grow, spread compost around their base.

**GARDENING TIP!**

### NOT ALL COMPOST IS CREATED EQUAL

Compost made from dried leaves has far fewer plant nutrients than compost made from a diversity of food scraps. Compost you make yourself can be far better than anything you can buy (see resources listed in Appendix A for how-to guides). It may be easiest to purchase bags of compost; SEA SOIL's Original Mix is a good, widely available product on the market.



## Soil Care Practice #3 | Soil Amendments (i.e. Organic Fertilizer)

There are many different kinds of **soil amendments**. Here, we consider amendments as nutrient dense powders that can be applied in small volumes to add nutrients to your garden soil. There are several different kinds of organic soil amendments.

We recommend all-purpose organic fertilizers, which can be purchased at most garden stores in Vancouver. These fertilizers have clear and simple descriptions of how to use them, and are probably the easiest way to feed your soil. Organic fertilizers are often made with seed meal, rock phosphate, kelp meal and other powdered mineral nutrients. While they seem expensive at first, even a small bucket of fertilizer can last an average sized garden several years (just be sure to keep it dry).

Another cheap and effective amendment is **lime** (dolomitic limestone). This is commonly purchased as the product Dolopril in garden or hardware stores. Lime is known for balancing acidic soils, but in our climate it's often more useful for restoring magnesium levels. Magnesium is among the most water soluble plant nutrients, so in rainy Vancouver it is often deficient in garden soils. Adding a small amount of lime to the soil can be very helpful. Just make sure not to over-do it with the lime, as too much can kill your soil for a very long time. Be warned that some organic fertilizers contain lime – so if you plan to use both, check your fertilizer label before applying lime. Always apply amendments in quantities recommended on the package. Amendments are best added to soils before planting in the early spring. Lime should be added no more than once per year. You can feed organic fertilizers to plants as they grow; again, follow instructions on the label.

### FOR INTERMEDIATE GROWERS

**Green Manures**

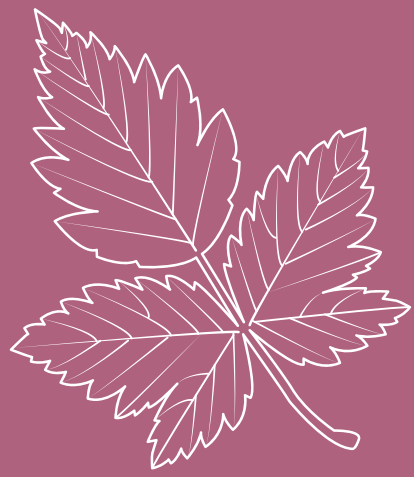
**Cover cropping** is a fourth way that organic gardeners protect and improve soil health. Cover crops enhance soil nutrients, add **organic matter**, and protect bare soils from erosion in winter months. We recommend using **leguminous** cover crops such as crimson clover, fava beans and field peas and staying away from cover crops like fall rye, which need to be tilled into your soil to add nutrients. We recommend the previous three soil care practices first – consider cover cropping as an intermediate garden activity to try once you're experienced with the basics. For detailed information about cover crops, check out West Coast Seeds' Annual Garden Guide, available for free at most garden stores and online at **www.westcoastseeds.com**; there's a section on cover crops near the back.

**CULTIVATE INQUIRY**

## TAKE TIME TO PREPARE YOUR GARDEN BED

Most of the work in planting your garden bed comes before the planting. Take time with your students to pull weeds from the garden, level the soil bed, and then add fertilizer and/or compost to the garden. Mix these things in and break up any clumps of soil. Discard big pieces of wood or stones from the garden. Get students involved in bed preparation before planting – this is often 9/10 of the work!

# PLANTING & CARING FOR PERENNIALS



## Planting

We recommend mid-September to mid-November, and mid-February to mid-April as the two best times to plant **perennials**, though it's true that people have had success with planting perennials in almost any month.

By planting around October, you place the plant in the ground just as it enters **dormancy**. Your transplant will be watered by the winter rains and require little care for its first 6-8 months of life. Around March, the plant will become active in its new home and will have time to grow roots in its new place.

By planting around March, you avoid planting during the hotter months of the year, and give the plant a chance to establish some roots before the summer holidays. If you wait until May or June to plant, the days are getting hotter and water is not as readily available in the environment. These hotter, drier conditions can severely stress a plant.

## How to Plant a Shrub

1 **Dig a shallow, broad planting hole.** Ideally, the hole will be 2-3 times wider than the root ball, and just as deep as the root ball. Digging a broad planting pit breaks up the surrounding soil and provides newly emerging roots room to expand.

2 **Remove the shrub from its container.** Inspect the root ball for circling roots. Straighten, cut, or remove them.

3 **Place the shrub at the proper height.** Take care to dig the hole to the proper depth, so that the soil of your shrub's root ball lines up with the soil level in your garden.

Photo by Samuel MacTavish

## How to Plant a Shrub *(continued)*

**4** **Fill the hole gently, but firmly.** Pack soil around the root ball to stabilize the shrub.

**5** **Mulch around the base.** Mulch is organic matter spread around the base of a plant to hold moisture, moderate soil temperatures, and reduce grass and weed competition.

CULTIVATE INQUIRY

### DON'T STRANGLE YOUR PLANT

When transplanting anything from a pot to the ground, avoid grabbing the plant by the main stem and pulling it out of its pot. That main stem is like the neck of your little plant; damaging it cuts off communication between the roots and leaves and can kill your plant. Instead, carefully place your fingers over the bare soil, then flip the plant over and shake it out of its pot, catching it by the roots and soil when it falls. Plants that have grown for a long time in their pot may need to have their roots separated and pulled apart (sometimes quite forcefully – it's ok to break some roots). If you do not pull apart the roots of "root bound" plants, they may continue to grow roots in a tight circle, eventually "strangling" themselves.

Photo by Samuel MacTavish



## Care

After planting, perennial plants will require:

1 **Adequate soil nutrients** – add some compost and consider adding 1-2 cups of complete organic fertilizer around the plant during its first spring. See Soil Care on pages 14-18.

2 **Room to grow** – give plants space to grow into. Avoid planting plants too close to others. Weed competition can also inhibit plant growth; make sure the area around a new planting is kept weeded, especially during the young plants' early years.

3 **Water** – almost all perennials will require weekly watering through their first two summers in order to thrive. Fruiting shrubs may require water their entire lives. Water perennials so that water penetrates deep into the soil, once per week during hot summer months.

### SHEET MULCHING

One popular strategy for controlling weeds underneath perennial shrubs and trees is sheet mulching. This involves laying two or more layers of cardboard beneath your perennial, and then covering the cardboard with leaves, soil, or some other kind of mulch. The cardboard smothers and kills the weeds, whose nutrients are recycled back into the soil to feed your plant. Be warned: the common weed often called morning glory (aka bindweed) will not be killed by this approach – its roots love growing underneath cardboard and the shoots will sprout up at the edges of your sheet mulch.

**GARDENING TIP!**

Photo by Samuel MacTavish

## Introduction to Native Herbs, Shrubs and Trees

Having evolved in this place, native plants are finely adapted to growing in our region, making them relatively easy to care for (once established).

Schoolyard gardeners often emphasize vegetable plantings and forget the species best suited to our climate.

CULTIVATE INQUIRY

### SO MUCH LEARNING POTENTIAL

By incorporating native plants into your school garden, you provide habitat for local animals and create a biodiverse outdoor classroom where inquiry and learning can grow. Plants and animals are very good teachers. This is also a great opportunity to integrate Aboriginal perspectives and knowledge.

Schoolyards are usually sites that have been heavily modified by urban development. In order to restore native plant communities, we often need to work to improve soil quality, and ensure young plants are well watered and weeded as they grow into their new (old) home.

The section on soil care (p. 14) provides useful tips that are valuable to implement when planting native species. For best results, many plantings require the incorporation of only a few handfuls of compost at time of planting.

All of the native plants recommended on the following page are perennials. Follow the instructions listed on page 19-20 for planting perennials.

# *Native Plants for Vancouver Schoolyards*



## Flowers and Groundcovers

| English Name | Hən̓q̓əmin̓əm̓ Name (see p. 26) | Moisture Preference | Light Preference | Cultural Uses |
|---|---|---|---|---|
| Douglas Aster | | Dry-Moist | Sun-Shade | Pollinator plant |
| Nodding Onion | | Dry | Sun | Food; Pollinator plant |
| Yarrow | | Dry | Sun-Partial | Medicine; Pollinator plant |
| Trailing Blackberry | Sqwiƛmuxw | Dry-Moist | Sun-Partial | Food |
| False Lily of the Valley | | Moist-Wet | Shade | |
| Vanilla Leaf | | Moist | Shade | |
| Wild Ginger | | Moist | Shade | Medicine |
| Pacific Bleeding Heart | | Moist | Shade | |
| Coastal Strawberry | Sƫiluḵwulhp | Dry-Moist | Sun-Partial | Food |
| False Soloman Seal | | Moist | Partial-Shade | |
| Goldenrod | | Dry-Moist | Sun | Pollinator plant |
| Lupin | | Dry-Moist | Sun | Pollinator plant |
| Indian Consump-tion Plant | Q̓uẍmín | Dry | Sun | Medicine; Food |
| Common Camas | Spe:nxw | Dry-Moist | Sun-Partial | Food; Pollinator plant |
| Bracken Fern | Suqé:n | Moist | Partial-Shade | |
| Deer Fern | | Moist-Wet | Partial-Shade | |
| Sword Fern | | Dry-Moist | Partial-Shade | |
| Licorice Fern | Ƭlusíp | Dry-Moist | Partial-Shade | |
| Skunk Cabbage | Ćaqwa’ | Wet | Partial | Medicine |
| Kinnikinnick | | Dry | Shade | Medicine |
| Pearly Everlasting | | Dry | Sun-Partial | Pollinator plant |

# Native Plants for Vancouver Schoolyards

PERENNIALS

## Shrubs

| English Name | Hən̓q̓əmin̓əm̓ Name (see p. 26) | Moisture Preference | Light Preference | Cultural Uses |
|---|---|---|---|---|
| Salal | Ƭeqe’ | Dry-Wet | Partial-Shade | Food |
| Red Flowering Current | Spe’eƭ́h | Dry-Moist | Sun-Partial | Pollinator plant |
| Indian Plum / Osoberry | | Dry-Moist | Sun-Shade | Pollinator plant |
| Red Osier Dogwood | | Moist-Wet | Sun-Partial | |
| Serviceberry | Tushnéculhp | Dry-Moist | Sun-Partial | Food |
| Thimbleberry | Ƭuqwuḿ | Dry-Moist | Sun-Partial | Food |
| Trumpet Honeysuckle | Q̓iƛ̓a’ulhp | Dry-Moist | Sun-Partial | Pollinator plant |
| Dull Oregon Grape | Lulućulhp | Dry | Partial-Shade | Food; Pollinator plant |
| Tall Oregon Grape | Sunni’ulhp | Dry | Sun | Food; Pollinator plant |
| Nootka Rose | Qeĺqulhp | Dry | Sun | Food; Pollinator plant |
| Mock Orange | | Dry-Moist | Sun | Pollinator Plant |
| Snowberry | P̓i’p̓q̓i’ás | Dry-Moist | Sun-Partial | |
| Evergreen Huckleberry | | Dry-Moist | Partial-Shade | |
| Red Huckleberry | Sq̓wuqwcus | Dry-Moist | Sun-Partial | Food |
| Alaskan Blueberry | | Dry-Moist | Sun-Partial | Food |
| Hardhack (Spirea) | Ƭećulhp | Moist-Wet | Sun-Partial | |
| Salmonberry | Lila’ulhp | Moist-Wet | Partial | Food |
| Oceanspray | Qethulhp | Moist | Partial-Shade | |
| Pacific Ninebark | | Moist | Partial-Shade | |
| Pacific Rhododendron | | Moist | Partial-Shade | |

# *Native Plants for Vancouver Schoolyards*



## Trees

| English Name | Hən̓q̓əmin̓əm̓ Name (see p. 26) | Moisture Preference | Light Preference | Cultural Uses |
|---|---|---|---|---|
| Red Alder | Kwulála'ulhp | Moist | Sun-Partial | |
| Red Elderberry | Ƭhiwuq | Moist | Sun-Partial | |
| Western Red Cedar | X̌peýulhp | Moist | Sun-Partial | |
| Sitka Spruce | | Dry-Moist | Sun-Partial | |
| Douglas Fir | Ćseý | Dry | Sun | |
| Pacific Dogwood | Kwi'tx̌ulhp | Dry-Moist | Partial-Shade | |
| Arbutus | Qa:nlhp | Dry | Sun-Partial | |
| Cottonwood | | Moist | Sun-Partial | |
| Pacific Willow | | Moist-Wet | Partial-Shade | |
| Pacific Crabapple | Qwa'upulhp | Moist-Wet | Sun-Partial | Food |
| Bitter Cherry | Ƭuluḿulhp | Moist | Sun-Partial | |
| Paper Birch | | Moist | Sun-Partial | |
| Bigleaf Maple | Q̓umuĺulhp | Dry-Moist | Sun-Partial | |
| Western White Pine | | Moist-Dry | Sun-Partial | |
| Western Hemlock | Ƭhqinlhp | Dry-Moist | Sun-Partial | |
| Vine Maple | Pene'ulhp | Dry-Wet | Partial-Shade | |
| Shore Pine | | Dry-Most | Sun-Partial | |
| Ash | | Dry-Moist | Sun-Partial | |
| Aspen | Qwuyulushulhp | Dry-Moist | Sun-Partial | |

Photo by Samuel MacTavish



## About Həńq̓əmiṅəm̓

Həńq̓əmiṅəm̓ is the language of the Musqueam people, who have descended from the cultural group known as the Coast Salish. The Həńq̓əmiṅəm̓ words in this guide were drawn from ***Hul̓q̓umínum̓ Words: An English-to-Hul̓q̓umínum̓ and Hul̓q̓umínum̓-to-English Dictionary*** Prepared for the Chemainus, Nanaimo, and Nanoose First Nations and Nanaimo School District No. 68. (1997). The Musqueam dialect differs from that spoken on Vancouver Island.

Some other useful Həńq̓əmiṅəm̓ words:

- **flowers** sp̓el̓uq̓um
- **flower** sp̓eq’um
- **leaf** sc̓alha’
- **peas** t̓lik̓wuń
- **seed, something planted** spuńum
- **tree** thqet

## Introduction to Cultivated Herbs and Shrubs

There are many different types of **domesticated** (or **cultivated**) plants beyond vegetables (for more on this, see following page). Most of the street trees and a majority of the planted shrubs in Vancouver yards are domesticated **varietals** that have been cultivated by human plant breeders. These breeders have bred for qualities such as beauty, size, and hardiness in specific settings.

In this guide we focus on cultivated herbs and shrubs that have been bred for the purpose of providing abundant food for humans. This includes many easy-to-grow culinary herbs, as well as a wide selection of fruiting shrubs.

## Common Perennial Food Plants in Vancouver

| Culinary Herbs | Fruiting Shrubs | Fruit Trees |
|---|---|---|
| Rosemary | Raspberry* | Apple** |
| Oregano | Blueberry** | Pear** |
| Thyme | Currant | Quince** |
| Sage | Gooseberry | Plum** |
| Lavender | Haskap (aka Honey Berry)* | Cherry |
| Bay Laurel | Goumi* | Mulberry |
| Mint | Blackberry (hybrids: tayberry, boysenberry, loganberry)** | Fig** |
| | Kiwi (vine)** | Hazelnut** |
| | Grape (vine) | Medlar** |
| | Strawberry (groundcover)* | |

*may produce fruit before summer break
**may produce fruit after summer break

These perennial food plants can add depth, character, and diversity to the garden. The culinary herbs listed are relatively easy to grow and many can be harvested over a wide window during the school year. When selecting fruiting shrubs and trees, consider selecting varieties that are disease resistant and fruit during the school year. Ask your nursery provider for more detail about when certain varieties produce fruit – for instance, there are many varieties of blueberry, strawberry and raspberry, most of which produce during summer break.

### TASTE THE DIVERSITY

It's fun to bring a diversity of fruit varietals into the class to taste. You can do this easily with apples, though there are many varietals of almost all of the common perennials listed above. Create a judging rubric with categories like: sweet, sour, tart, crisp, overall and let students try a number of types of apple, then get them to rate each using a 5 point scale for each category.

CULTIVATE INQUIRY

# PLANTING, CARING FOR & HARVESTING VEGETABLE CROPS

## Introduction to Vegetables

All vegetables are **domesticated plants** that, like dogs, have been bred from **wild relatives** into an incredible diversity of forms. The origins of these vegetables and their many cultural stories are fascinating (for some fun facts, see: **www.vegetablefacts.net**). None of the vegetables we grow are native to this region.

Many of our favorite vegetables grow as **annual plants** in Vancouver, meaning they complete their entire lifecycle in one year (per annum). Some vegetables, such as broccoli, beets, carrots, chard and kale are **bi-annuals**, which means in suitable conditions they will take 2 years to produce flowers, fruits and seeds (though most gardeners harvest and eat them in their first year). There are a few vegetables, such as rhubarb, asparagus and artichokes, that are perennial plants, meaning they live year after year; in their life they will flower, fruit and make seeds multiple times in good conditions.

Often we do not let vegetables complete their entire lifecycle. If we are interested in eating the leaves, roots, stems or very early flowers of a plant, we prefer to eat them before they "**bolt**" and "**set seed**." Like puberty, "bolting" is triggered by (plant) hormones, and cannot be stopped. You can identify plants that are about to bolt because the length of the stem between the leaf nodes begins to lengthen. At this stage plants put much energy (sugars) into reproduction (flowers & seeds). This makes their leaves, roots and stems very bitter.

There are some "vegetables" whose fruit is actually our prize (i.e. tomatoes, squash, peas and beans). For these, we are happy to see mature, healthy plants begin to produce flowers, and eventually fruits.



When vegetable plants get stressed, they may "bolt" prematurely and try to make flowers and seeds. These stressed plants essentially think they are dying, and act drastically to create offspring (seeds) before they meet an early death. The most common causes of plant stress are: weed competition, lack of soil nutrients, lack of water, lack of light, extreme temperatures or temperature changes.

## PLANT LIFE CYCLE DISCOVERY

Use vegetables to teach students about plant life cycles in a way they can see, touch and taste. Read this page for more information about vegetable life cycles.

**CULTIVATE INQUIRY**

We grow vegetables for many reasons. Most of all, because they are delicious, nutritionally dense, and highly productive. They are also beautiful, provide pollen and nectar to wildlife, and inspire a sense of connection and care for the earth. Not least of all is the unique sense of accomplishment and joy that comes from growing, harvesting and eating food you helped grow.

Vegetable gardening, like all complex activities, requires practice to get good at. The best teacher is always the garden itself. Learn from your plants, pay attention to how they're growing and you'll get better. If at first you don't succeed, try again. The best fertilizer is the gardener's shadow. Every gardener learns through failure and mistakes, and every gardener is always learning!

## Planting a Vegetable Garden You Can Enjoy During the School Year

One of the most common complaints of school gardeners in Vancouver is summer break. How do you maintain a garden through the summer? How do you plant a garden to maximize the harvest while students are around to enjoy it? We're happy to say that in Vancouver, you can do it!

Certainly summer maintenance is a challenge for school vegetable gardens. Dedicated teachers, parents, daycares, camps, community organizations and summer school groups are the most common helpers in Vancouver schools. Water stress is the biggest threat through the hot summer, when many vegetables prefer to be watered 3 times per week.

But even if everything dies in your school veggie garden over the summer, there are still many things you can plant and enjoy while students are around. In this section, we describe three planting seasons for Vancouver school gardens, explaining what, when and how to plant and harvest for in-school-season success.



## FOOD SAFETY

A school garden is a generally safe and enjoyable environment, however, it is still important to reduce the risk of foodborne illness. You can practice food safety at all stages of growing and preparing produce: consider the conditions that food is grown in prior to harvest, the storage conditions of food between harvest and preparation, and sanitizing utensils and surfaces in your food preparation environment. Washing your hands before handling food and harvesting is one of the easiest ways to reduce risk. Rinse all produce under cold running water before food preparation and eating. For more information on food safety, see Appendix A.

**CULTIVATE INQUIRY**

## VANDALISM

One important way to avoid vandalism is keeping your garden looking maintained. Signage and artwork is also shown to reduce vandalism. Handmade signage can be very effective. Gardens that look ragged attract negative attention and may promote vandalism. Vandalism to gardens can provide a great lesson to students about understanding complex human behaviours and communities. It may also provide a great opportunity for staff and students to brainstorm solutions together.

**GARDENING TIP!**

# *Vegetable Planting Chart (Fall)*

## Plant in September

| Vegetable | Harvest | Spacing | Notes |
|---|---|---|---|
| Radish | Nov | 20 cm | Fastest vegetable to mature – as quick as 50 days. |
| Mesclun Greens | Nov - Apr | 20 cm | Can plant seeds as close as 3 cm for baby greens |
| Arugula | Nov - Apr | 20 cm | Can plant seeds as close as 3 cm for baby greens |
| Pac Choi / Choi Sum | Nov - Apr | 20 cm | Can plant seeds as close as 3 cm for baby greens |
| Spinach | Nov - Apr | 30 cm | |
| Cilantro | Oct - Dec | 20 cm | May grow through winter if covered in hoop house |
| Lettuce | Nov - Dec | 30 cm | May grow through winter if covered in hoop house |
| Kale | Nov - Nov | 45 cm | |
| Field Peas | n/a | 15 cm | **Cover crop** |
| Clover | n/a | 15 cm | **Cover crop** |
| Fava Beans | May - June | 15 cm | **Cover crop** - can leave to produce edible beans |

## Plant in October

| Vegetable | Harvest | Spacing | Notes |
|---|---|---|---|
| Garlic | June - July | 30 cm | See page 36 |
| Fava Beans | May - June | 15 cm | **Cover crop** - can leave to produce edible beans |

# *Vegetable Planting Chart (Early Spring)*



| Plant in March | | | |
|---|---|---|---|
| **Vegetable** | **Harvest** | **Spacing** | **Notes** |
| Peas | June | 15 cm | See care notes on page 47 |
| Radish | May - June | 20 cm | Plant every 2 weeks for longer harvest window |
| Mesclun Greens | May - June | 20 cm | Can plant seeds as close as 3 cm for baby greens |
| Arugula | May - June | 20 cm | Can plant seeds as close as 3 cm for baby greens |
| Pac Choi / Choi Sum | May - June | 20 cm | Can plant seeds as close as 3 cm for baby greens |
| Spinach | May - June | 30 cm | |
| Cilantro | May - June | 20 cm | |
| Lettuce | May - June | 30 cm | Plant heat resistant varieties for summer growing |
| Kale | May - May | 45 cm | |
| Carrots | June - Oct | 30 cm | |
| Beets | June - Oct | 30 cm | |
| Potatoes | June | 60 cm | Plant early season varieties – see page 39 |

# Vegetable Planting Chart (Late Spring)

| Plant in May & June | | | |
|---|---|---|---|
| **Vegetable** | **Harvest** | **Spacing** | **Notes** |
| Beans | Sept - Oct | 30 cm | See notes on page 42 and 47 |
| Pumpkin / Squash | Sept - Oct | 100 cm | Pumpkins and winter squash grow BIG! |
| Zucchini | Sept - Oct | 85 cm | Also a very big plant |
| Carrots | Sept - Oct | 30 cm | |
| Beets | Sept - Oct | 30 cm | |
| Tomatoes | Sept - Oct | 75 cm | See care notes on page 48 |
| Tomatillos | Sept - Oct | 75 cm | See care notes on page 48 |
| Basil | Sept - Oct | 30 cm | |
| Kale | Oct - June | 45 cm | |
| Swiss Chard | Oct - June | 45 cm | |
| Leeks | Nov - June | 15 cm | |
| Sprouting Broccoli | Mar - May | 75 cm | |
| Brussels Sprouts | Oct - Nov | 75 cm | |



## Planting Season #1 - September

There are a number of crops that prefer to grow in the cooler spring and fall months, during so-called "**shoulder seasons**." These plants are ideal for school veggie gardens, and are the key species in Planting Seasons #1 and #2.

The challenge in Season #1 is that September in Vancouver is not always cool, and so the seeds you plant may need to be watered more frequently than those you plant in Season #2. If you select cold hardy varietals of the following plants, some of them may survive all through the winter. If you cover them with a plastic hoop house, their chances of survival increase.

In **September** plant:

| | | |
|---|---|---|
| • Radish | • Mesclun Salad Mixes | • Arugula |
| • Mustard Greens | • Pac Choi | • Choi Sum |
| • Spinach | • Cilantro | • Kale |

Harvest from **November – May**.

This is also the time to plant **cover crops** or "**Green Manures**" (see page 18). Check out the back pages of the West Coast Seeds' Garden Guide for more information. We consider this as an intermediate garden activity, and recommend planting clover, field peas and fava beans.

## Planting Season #1 - September *(continued)*

GARDENING TIP!

### GARLIC

Garlic bulbs are commonly planted in the first 2 weeks of October in Vancouver, then harvested in July. Because it is harvested during summer break, garlic may not be the first choice for schools. But it does keep very well and can be put away for use during the school year if harvested when fully mature. You can also harvest and eat garlic before it is fully mature, it just will not keep as well if harvested early. Some schools do harvest their garlic in June for use in school harvest celebrations. It is good to mulch garlic to protect surrounding soil from erosion through the winter time (many people use straw to mulch their garlic).

GARDENING TIP!

### OVERWHELMED BY CHOICE?

Many seed catalogues list dozens of varietals of common vegetables. For example, you can find small bush peas, tall climbing peas, tasty snap peas and interesting shelling peas. Tomatoes can be vining (indeterminate) or bush (determinate) and will grow small (cherry), medium or large fruits, depending on the variety. Some lettuces are adapted to growing through cooler weather, while others are adapted to growing through the summer heat (we call these heat tolerant varietals "**bolt resistant**"). Consider what you want and look for a variety that sounds right for your situation. Keep track of what varieties you plant and use experience to learn what you like.



## Planting Season #2 – Before (or just after) Spring Break

The trick with this season is to plant these cool loving "shoulder season" crops early enough that they have time to grow large and produce abundant harvests before students leave for summer break. They will if you follow the below guideline for planting.

In the last 2 weeks of February plant:

- Peas

In **March** and **early April** plant:

| | | |
|---|---|---|
| • Radish | • Mesclun Salad Mixes | • Arugula |
| • Mustard Greens | • Pac Choi | • Choi Sum |
| • Spinach | • Cilantro | • Kale |
| • Carrots | • Beets | • Early Season Potatoes |
| • Lettuce (early April only) | | |

Harvest from **May – June**.

## Planting Season #2 – Before (or just after) Spring Break *(continued)*

GARDENING TIP!

### COMPANION PLANTS – FLOWERS

Annual flowers add beauty, color, and help attract beneficial insects, which control pest populations. Below are the most popular vegetable companions, and when to sow them.

**March-April:** Calendula, Marigold, Native Wildflower Seed Mixes

**April-June:** Sunflower, Alyssum, Borage.

Herbs are also great companions, which help attract beneficial insects to the garden. Easy to grow perennials like rosemary, thyme, oregano, sage and lavender are great places to start (see page 27).

Other medicinal and tea herbs like: yarrow, bergamot, hyssop, mint, valerian, mugwort and comfry are popularly used and make good companions (beware, mint and comfry are prolific and take over large amounts of space). Saltspring Seeds offers a wide selection of seeds for plants like this.

CULTIVATE INQUIRY

### MAKE TEA

All of the herbs listed in this guide make great tea. Tea is easy to prepare and fun to share.

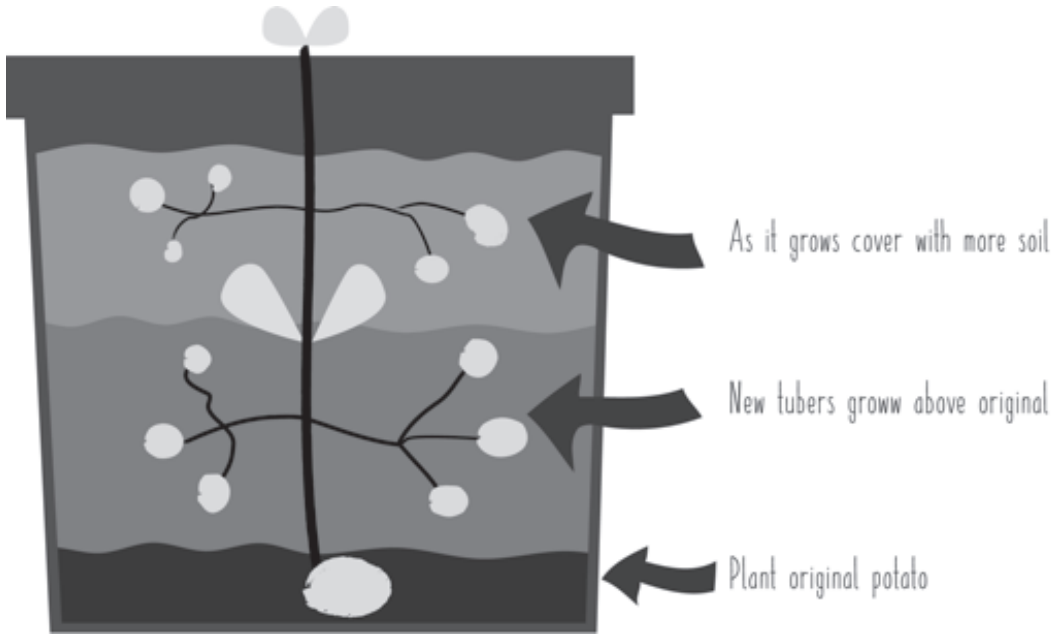
## Planting Season #2 – Before (or just after) Spring Break *(continued)*

Many people (especially folks from Eastern Canada) are shocked to learn that you can plant all of these seeds outside, directly in the garden soil. What's great about this is that during these months, it's usually still cool and quite wet in Vancouver. So many of these seeds will sprout and grow on their own, demanding little from you as a gardener. If it's unseasonably warm and dry in the week you plant, you may have to go out and water the seeds to ensure they stay moist, which is vital for germination.

If you would like to start some plants inside during this time, on a sunny windowsill or under some lights, we recommend planting from Feb 15 to April 1. Transplant these outside after 6-8 weeks – making sure to **harden them off**. Lettuce, peas and squash are often severely stressed by **transplant shock**, so we recommend planting at least some of these seeds directly in the garden.

## Plant Warba Potatoes in Tubs

Warbas are the most popular potato for school gardens in Vancouver, as they produce potatoes faster than any other variety. Plant them in March and you'll have a harvest by late May.



GARDENING TIP!

## IMPORTANT TIP FOR BEGINNERS

Many first time gardeners have best success with starter plants that they purchase elsewhere (see page 11). These transplants are robust, strong little plants that you can take out of their small pot and plant directly into your garden. During the spring, many places offer a variety of plant starts at very affordable prices. Since starter plants are already up and growing, and likely have been for at least a month, you can plant these a little later than the dates indicated in planting season #2 and still have a harvest by summer break.



## Planting Season #3 – Before Summer Break

This is the planting season in which you can grow all of those plants that use the warm summer weather to mature delicious fruits (and roots) for us to eat. Ironically, it is also the time to get several winter vegetables started; these bi-annuals use the summer to grow big and strong so they can stay alive through the following winter. This is the most difficult season to be successful with as a school gardener, as all of these plants will require regular watering (2-3 times per week) through the summer.

We recommend that you start the following plants later than most backyard gardeners in Vancouver. This is because you probably want them to be ready for harvest in September and October, when students are around, rather than in July and August.

### SUMMER VEGETABLES

In **April** and **May** plant:

| | |
|---|---|
| • Carrots | • Beets |

In **late May** and **June** plant:

| | | |
|---|---|---|
| • Beans | • Squash | • Cucumbers |
| • Tomatoes | • Tomatillos | • Basil |

Harvest from **September – November**.

Beans, Squash, Carrots and Beet seeds can be sown directly in the soil. Tomatoes, Basil and Tomatillos are most commonly started from seed indoors in March, and then transplanted out after 8-10 weeks of growing. For beginner gardeners, we recommend purchasing Tomato, Basil and Tomatillo starts from your local garden store or farmers market.

GARDENING TIP!

## BEST BEANS FOR SCHOOL GARDEN

For best results, consider purchasing seed from a local seed producer. In 2015, the BC EcoSeeds Coop formed to support local seed growers marketing and distributing their seeds. The Coop focuses on providing varietals best suited to our climate, and have a variety of great seeds to choose from. Try their Fortex Pole Bean for a great stringless green bean, or the Maxibel Green Bush Bean for a great bush variety. It's important to note that many beans have been developed as soup or dry beans – these types are no good as green beans but can be grown until the seeds are fully mature to dry and store over winter for use in soups and stews (for more info see the Harvest section on page 49). **www.bcecoseedcoop.com**

## WINTER VEGETABLES

In **late May** and **June** plant:

| | |
|---|---|
| • Kale | • Swiss Chard |
| • Leeks | • Purple Sprouting Broccoli |

Harvest from **October – May**.

These can all be directly sown as seed or transplanted as small plants into your garden.

For more information about winter vegetables, see the *West Coast Seeds Winter Gardening Guide*.



## Caring for Your Vegetables

### PLANTING

Planting seeds with a group of students can be very challenging. It seems students feel strong urges to throw tens of thousands of seeds in the earth whenever the opportunity is presented. While this is lovely to witness, a heavily overplanted garden bed is very hard to **thin** and will likely not grow well. We recommend one of two strategies for supporting orderly planting with students:

1. **Create a small furrow and give each student a very small number of seeds.** Ask each to place just one seed in the furrow at a time, and make sure that they are given instructions on how far seeds should be planted from each other (as indicated on your seed pack or in the tables on page 32-34).

2. **Create seed tape.** Using strips of chart paper and flour glue, affix seeds to strips of paper and then lightly burry the paper in your garden. The paper and flour will biodegrade, and the seeds will sprout.

**CULTIVATE INQUIRY**

## WEEDING

Your crop may need to be weeded, especially during the peak growing season from April - September. It can be tricky to tell very young seedlings apart from common weeds. This is something you have to learn through careful observation. Over time you will begin to see clear differences in the leaf structure of different plants. Until you've mastered that, try to plant your vegetables in a clearly ordered way, so that you at least know most of the plants growing in a row (or circle, etc.) are the ones you planted. Let things grow and become more mature and they should be easier to tell apart. The first two cotyledons (seed leaves) are very similar in many plants.

Try to pull weeds before they make seeds and reproduce. One weed can turn into thousands very quickly.

**CULTIVATE INQUIRY**

### IS THERE REALLY SUCH THING AS A WEED?

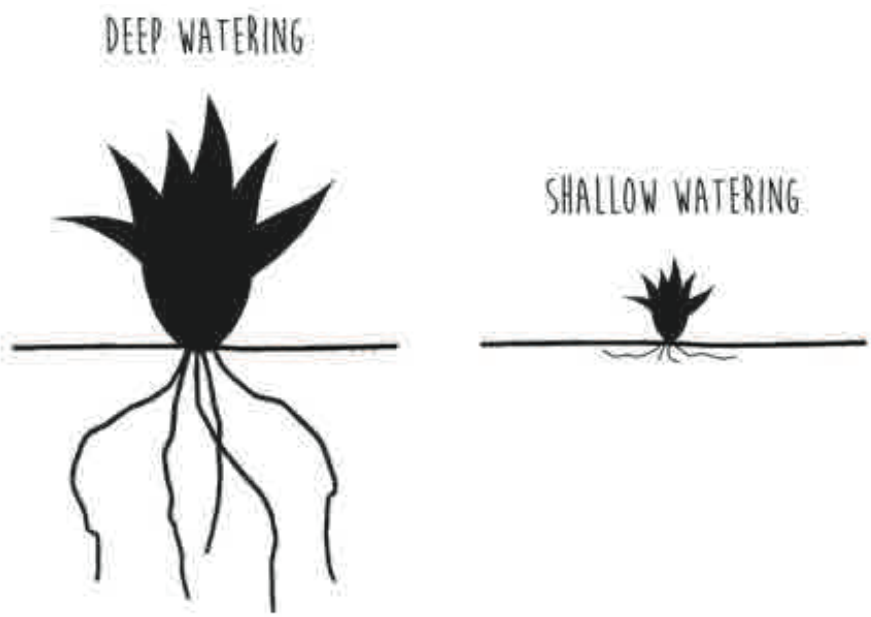
Beauty is in the eye of the beholder and weeds are determined by cultural taste and personal opinion. Many common "weeds" are actually quite useful plants. Dandelions are one of the most edible, nutrient dense and healthy things growing in your garden (and are actually pretty tasty if you harvest them at the right time). They're also commonly considered one of the most common (and pesky) weeds in many gardens. Many other so-called weeds are valuable as medicines, foods and habitat for many animals, including people. Even highly invasive plants like Himalayan Blackberry, Bindweed (aka Morning Glory) and English Ivy have proven themselves valuable for a variety of uses.



## WATERING

Soil can stay moist until May or June in Vancouver, requiring little water from the gardener. If the weather is dry and warm for more than one week, you may need to start watering your crop. Water infrequently during the spring, and only if the soil has completely dried and stayed dry for at least 3 days. Poke your finger as deep as you can into the soil to see if it's dry. Learning when soil is dry is something that takes practice and careful observation.

During the hot summer months from July - September, water is essential. Plants respond much better to deep, infrequent watering than they do to shallow, every day watering. Good garden soil can hold an impressive amount of water, so it can take some time for water to penetrate 30cm or more down. We want water at this depth, where it is not so prone to evaporation and where it will encourage big, deep, strong plant roots to grow. Water your plants 2-3 times per week in hot summer months – less on rainy weeks (though remember a light summer rain penetrates only the top millimeter of soil).



CULTIVATE INQUIRY

### DON'T BOMBARD YOUR PLANT

Many students think it is a good idea to pour water directly on top of young seedlings. This can damage the plants. Encourage students to water around their baby plants, making sure not to hit the young plants with a devastating waterfall.

Mulches help shade soil and can be used through the summer under established plants to hold water in the soil. Leaves and straw are commonly used for this purpose.

During the summer months, Vancouver often places restrictions on water use. It's important to be aware of and follow these by-laws, and to always be water wise in your school garden. Water intentionally and do not waste this precious resource.

CULTIVATE INQUIRY

### SUMMER WATER TEAMS

Consider treating your school garden like a classroom pet. You may be able to organize a weekly rotation wherein different families take on the watering, weeding and harvesting of the school garden through the summer months. Simple sign-up sheets and basic instructions for watering and weeding the garden can help motivate and organize community members around your school garden's summer care.

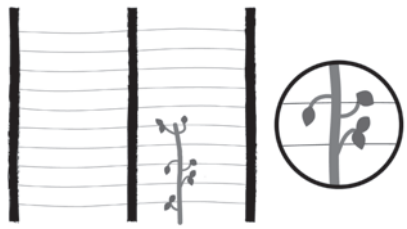


## THINNING

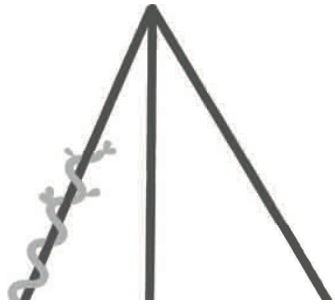
It is almost always necessary to **thin** your crop, which means pulling some plants to give others next to them enough space to grow. Refer to your seed pack for instructions on how to plant and thin each crop. If you're not sure how much space a plant needs, West Coast Seeds website and Garden Guide are great resources containing all the information you need. Note that students often over plant – clear instructions at the time of planting can help prevent hundreds of seeds from sprouting in a single square foot (which can be a nightmare to thin).

## STRUCTURES TO SUPPORT PLANTS

Peas – Vining Peas will require something to climb on. Peas use their tendrils to grab a hold and pull themselves up (as shown in image at right). They do not wrap around poles, like beans. Netting or twine strung between several stakes is commonly used to support peas.



Beans – Pole and Runner Beans will require stakes to climb on. Bush Beans are able to stand on their own. Pole and Runner Beans grow by wrapping their vines around a support (as shown in image at right). Make sure to put sturdy stakes close to your beans. Bean tepees are popular, with seeds planted in a circle. Some bean plants can grow to over 2 meters tall.



**STRUCTURES TO SUPPORT PLANTS** (Continued)

Tomatoes and Tomatillos – These plants will require sturdy supports to keep them upright once they start to bear fruit. You can use cages, stakes, or trellises for this task. Make sure to get your support set up early, so that you are not trying to wrestle a large plant into a support structure. Tomatoes and Tomatillos also respond very well to pruning – Google this to learn more. There are two types of tomatoes – determinate and indeterminate. Determinate tomatoes' growth is determined by their genes, so they will stop growing at some point and tend to have a bushy **habit**. Indeterminate tomatoes' growth is not determined by their genes, so they will keep growing and tend to have more of a vining habit. For success with indeterminate tomatoes, regular pruning of **suckers** is recommended.



## Harvesting Your Vegetables

### Greens

All of the greens (Lettuce, Mesclun Salad Mixes, Arugula, Mustard Greens, Pac Choi, Choi Sum, Spinach, Cilantro, and Kale) can be eaten at any stage. As you thin your greens, eat them. Harvest outside leaves from the base of the plant or use scissors to cut the entire plant 3cm from the soil (greens cut in this way will often grow back for another harvest).

### Radishes

Radishes are usually ready to harvest 6-8 weeks after planting. They're super fast! Don't let them go too long, as they will begin to **bolt** and become bitter and unpleasant. Plant some seeds, then plant a few more 2 weeks later, and a few more 2 weeks later again for a longer harvest window. All parts of a radish are edible. Most people prefer the roots, as the leaves are a bit spiky and best cooked. If your radishes bolt, you might leave them to eat the flowers and pods, which kids love.

### Potatoes

Early "new" potatoes are ready to start harvesting when the plants start to blossom. Tuber bulking begins to happen after plants blossom. Green tubers and potato leaves are mildly poisonous and best not to eat. Potatoes turn green when exposed to the sun. Mound soil around your potato plants so that the tubers stay covered and have more room to grow. Let your potatoes grow until at least late May. Some schools plan a harvest celebration in June and harvest and prepare all of their potatoes for this event.

## Beans

Green Beans are best when young and tender – some varietals stay tender longer than others. Dry/soup beans are harvested from inside fully dried, papery brown pods and are (ideally) rock hard when picked (at harvest time, you should have a hard time denting the seeds with your fingernail). Dry/soup bean pods and seeds can be stored and shelled by the class in the winter months. Fresh green beans can be cooked or eaten raw. Dry beans require soaking and cooking to eat.

## Tomatoes

Tomatoes are best picked when fully ripe. Harvest all of your tomatoes before a week of cool, wet weather makes them rot. In Vancouver, fruit often rots very quickly during such a week in October (watch the weather forecast and harvest accordingly). Green tomatoes can be incorporated in some recipes or left in a paper bag to ripen (adding a banana to the bag can help encourage fruit to ripen).

## Tomatillos

Tomatillos are ready to harvest when the fruits start to break through their papery husk. They are over-ripe if they start to turn yellow – they are ideally harvested when dark green and firm.

## Squash and Cucumbers

Squash and cucumbers are harvested once they have reached a mature size. If you plan to harvest and store winter squash, it's important that it has developed a tough outer rind. In this case, the stem of the squash should have begun to dry and turn brown, and the fruit should resist being marked by your thumbnail when you press into it.



## Carrots and Beets

You can harvest your carrots and beets at any time before they **bolt** in their second year. Scratch a little soil away from the top of their root to get a sense of how big they are. Hold the entire plant close to the root and pull.

## Kale and Chard

Your Kale and Swiss Chard can be harvested at any time. We recommend letting the plants grow up to a good size, and then harvesting the lower, dark green, unblemished leaves. Plants that have overwintered will likely begin to flower in the spring. Many people enjoy eating the early Kale flowers (they look like mini-broccolis), and if you harvest them the plant will continue growing more through the spring. The yellow flowers are also a good source of pollen and nectar for many insects. Once Chard begins to flower, it is not very palatable and is not favored by pollinators – we usually pull and compost chard at this point.

## Leeks

Leeks can be pulled and eaten at any time. We recommend letting them grow to a good size and then harvesting them when needed from October – April.

## Purple Sprouting Broccoli

In good conditions, Purple Sprouting Broccoli will grow leaves all through the Summer, Fall and Winter. As the daylight begins to lengthen in the spring, it will start to produce its early flowers (this is the part we eat). These plants have a small purple broccoli crown, about the size of an adult fist – try to harvest this before the flowers start to open. Once you have harvested the central broccoli crown, purple sprouting broccoli creates a profusion of smaller broccoli shoots, which can be snapped off and eaten raw or cooked. Large, healthy plants will produce an abundance of broccoli shoots over many weeks in the early spring.

GARDENING TIP!

## WHAT ABOUT CORN?

In order for corn to be well pollinated and produce a good yield of corn, it needs to be planted in a large patch measuring at least 100 square feet. Corn is also a heavy feeder, which means it makes significant demands on the garden soil. For these reasons, we do not recommend corn.

CULTIVATE INQUIRY

Corn is the most commonly planted crop in the world, and it has a fascinating history and culture in North America, having been grown by Native Americans for ~10,000 years. In this time, corn, beans and squash have all been cultivated and shared among indigenous cultures in North, Central and South America. Planting a **Three Sisters garden** of these three crops may provide a unique window for you and your students to engage in the stories and experiences that define the close and enduring relationships between people and plants on **Turtle Island**. The way these three plants help each other in this classic assemblage is also a wonderful opportunity to learn about the close and enduring relationships between plants.

# GLOSSARY OF TERMS

**Annual Plants**
Plants that complete their entire lifecycle in one year (per annum).

**Bacteria**
Constitute a large domain of prokaryotic microorganisms. Typically a few micrometres in length, bacteria have a number of shapes, ranging from spheres to rods and spirals.

**Bi-annual Plants**
Plants that will take two years to produce flowers, fruits and seeds in good conditions.

**Bolt**
When a plant (especially a leafy green vegetable) begins to enter its reproductive period of growth. The plant starts to grow a tall, central leader, from which flowers and eventually seeds are born.

**Bolt Resistant**
Some varieties of leafy green vegetables have been cultivated to resist the tendency to bolt when the weather gets hot. These varietals are termed bolt resistant.

**Cover Crops**
Plants planted to add energy and matter to the soil and help improve soil fertility over time. Plants can be pulled and composted or tilled into the soil.

**Cultivated Plants**
Plants that have been carefully selected over many generations to have specific characteristics. See also Domesticated.

**Domesticated Plants**
Plants that have been adapted through cultivation so that they might be of some benefit to humans. See also Cultivated.

**Dormancy**
A period of hibernation in which plants do not grow. Metabolic processes within the plant slow or stop and much chemical energy is stored in the plant's roots. Usually triggered by environmental conditions (in our climate, winter).

**Finished Compost**
Organic matter that has decomposed into the stable compound Humus.

**Fungi**
Any member of the group of eukaryotic organisms that includes microorganisms such as yeasts and molds, as well as the more familiar mushrooms. These organisms are classified as a kingdom, Fungi, which is separate from the other eukaryotic life kingdoms of plants and animals.

**Green Manures**
See Cover Crops.

**Habit**
The shape and form of a plant's growth; the prevailing character of that specific species or variety.

**Hardening Off**
A process of getting plants used to being outside in the cold, after growing indoors – Google "hardening plants off" for a detailed description of how to do it.

**Humus**
A stable, complex organic molecule derived from the process of aerobic decomposition. It is what gives soil its spongy, loamy texture.

**Invertebrates**
Animals lacking a backbone, including all insects and a wide diversity of microscopic organisms.

**Leaching**
The process by which soluble compounds are dissolved in water and then drained away (i.e. from soil into ground or surface water).

**Leguminous**
Any plant belonging to the legume family, a family that has forged a unique relationship with bacteria, which enables it to fix nitrogen from the air in nodules surrounding its roots (thus making the nitrogen available for uptake through plant roots).

**Lime (Dolomitic Limestone)**
A type of limestone (rock) that contains a high concentration of magnesium ions. It is widely used as a powdered amendment in many horticultural applications.

**Organic Gardening**
Gardening without the use of synthetic fertilizers or pesticides.

**Organic Matter**
Primarily carbon based molecules originally derived from living tissue. See also Humus.

**Perennials**
Plants that live year after year; in their life they will flower, fruit and make seeds multiple times in good conditions.

**Pollinators**
Any animal that aids a plant in pollination – mostly insects in Vancouver.

**Set Seed**
A colloquial term used to describe the entrance into the reproductive period of a plant's lifecycle, when it begins to produce flowers and/or seeds; primarily used to describe vegetables.

**Shoulder Seasons**
The months at the beginning and end of our growing season in Vancouver, which typically runs from March-October. The shoulder seasons are February-April and September-November.

**Soil Amendments**
Anything added to garden soil, including compost and fertilizers; typically rich in plant nutrients.

**Temperate Rainforest**
Coniferous or broad leafed forests that occur in the temperate zone and receive heavy rainfall (annual precipitation over 140 cm). Vancouver is located in a temperate rainforest.

### Thin
The process of pulling young vegetable seedlings or plants to make enough space for their cousins to grow to full maturity.

### Three Sisters Garden
The three sisters of Corn, Beans and Squash are a traditional polyculture grown by many native cultures across North America. All three sisters are interdependent and help the others grow; the corn supports the climbing pole beans, the beans as legumes add nitrogen to the soil, and the squash sprawl over the surface of the soil shading out competing weeds.

### Transplant Shock
Refers to a number of stresses that effect a recently transplanted plant. Typical in plants taken from inside and planted directly out without a process of hardening off. Some plants are more susceptible to transplant shock than others.

### Turtle Island
A commonly used indigenous name for North America. Inspired in part by the Haudenosaunee creation story of Sky Woman falling to earth and working with many sea creatures to create land on the back of a turtle.

### Salish Sea
The Salish Sea is the intricate network of coastal waterways that includes the southwestern portion of the Canadian province of British Columbia and the northwestern portion of the U.S. state of Washington. Its major bodies of water are the Strait of Georgia, the Strait of Juan de Fuca, and Puget Sound. It reaches from Desolation Sound at the north end of the Strait of Georgia to Oakland Bay at the head of Hammersley Inlet at the south end of Puget Sound. The Coast Salish are the indigenous peoples who live in southwest British Columbia and northwest Washington along the Salish Sea and share a common linguistic and cultural origin.

### Varietal
A taxonomic nomenclature used to differentiate between different subspecies of plants (i.e. tomatoes, tomatillos or peppers).

### Wild Relatives
The original wild plants that our domesticated plants have been selected from to have specific characteristics.

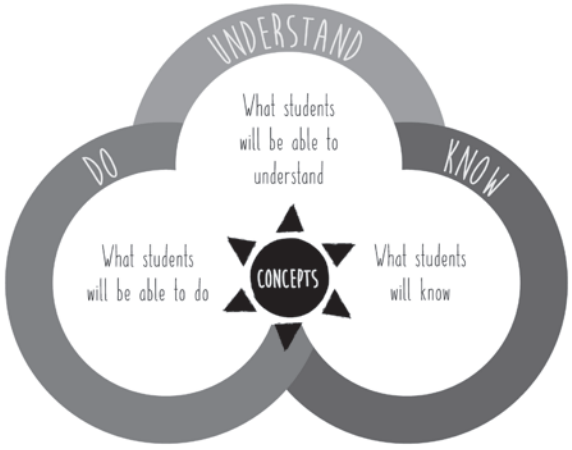
# APPROACHING OUTDOOR LEARNING IN A SCHOOL GARDEN

IDEAS *for* ACTION

Engaging in regular, effective outdoor learning may require you to develop new approaches and methods as a facilitator and educator. We encourage you to see the school garden as a flexible learning environment where students can explore relationships and follow their own curiosity.

Garden learning fits very well with the new curriculum in BC, particularly in its emphasis on:

- Deeper understanding of concepts and the application of processes;
- Supporting students in understanding themselves as learners and helping them follow their interests and passions;
- Creating learning environments that are relevant, engaging and novel;
- Helping students move from knowing something to applying this knowledge and coming to develop a deeper understanding.




## Indigenous Ways of Knowing and Being

The following Principles outline an elegant and comprehensive approach to outdoor learning. Garden and place based learning provides a unique opportunity to integrate indigenous ways of knowing and being into your curriculum and teaching practice. Consider involving an Aboriginal Education Enhancement teacher and making connections with local Aboriginal Communities and elders.

Photo by Samuel MacTavish

***Learning is connected to land, culture, and spirit.***
We—the two-legged, four-legged, finned and feathered, plants and rocks — are all related.

We must always practice reciprocity though acts of giving and receiving.

***Learning honours our Ancestors, Elders, Knowledge Keepers and Descendants.***
It respects and embraces ceremony, protocol, and teachings that are connected to the sacred medicines including tobacco, cedar, sage, and sweetgrass. Important teachings emerge through stories.

***Learning involves developing relationships, respecting distinct cultures, and honouring the perspective of others in our communities.***
The deepest learning takes place through lived experience. It requires exploring our identities, learning from our mistakes, and having gratitude for our gifts.

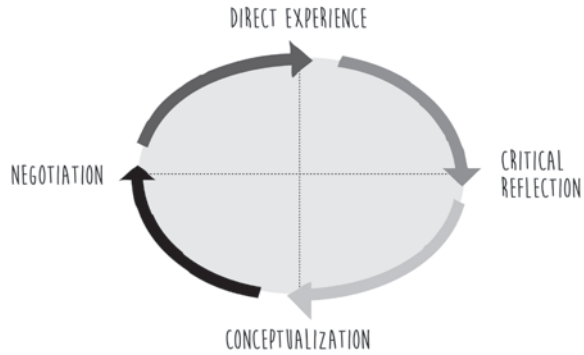
***Learning is a journey that takes courage, patience and humility.***
It is about striving to become a better human being and living in balance: body, mind, heart and spirit.

## Experiential Learning Cycle

The Ministry of Education's (2009) ***Environmental learning and experience: An interdisciplinary guide for teachers*** describes the experiential learning cycle as "a view of teaching and learning that incorporates direct experience, critical reflection and negotiation as foundations of the learning process."

Photo by Samuel MacTavish

Learners do not arrive at an end state of knowing but are constantly engaging with the world, reflecting, creating new understandings and then aligning these with their experience (see figure at right). In this learning cycle model, "teachers emphasize thinking, understanding and self-managed learning for their students."




## Foundational Conversation

Consider the following four conversations as ways to scaffold learner inquiry. They can be iteratively explored and revisited as students deepen their understanding of the topic being studied (i.e. an event, question, or problem). These conversations are inspired by Windschitl et al's (2007) article in Science Education entitled *Beyond the scientific method: Model-based inquiry as a new paradigm of preference for school science investigations*.

**1 Organizing what we know.** Learners are supported in forming a preliminary representation (or model) of the topic of interest. Ask questions to discover what students know and why they think this topic is important. Teachers may need to introduce content and allow students to have some direct experience to enable them to develop a preliminary personal model to understand the topic of interest.

**2 Generating knowledge.** Learners begin to explore how things relate and why things happen. Through direct experience students are triggered to reflect upon their preliminary model of understanding. Ask questions about what is happening, what they see, what do they find interesting?

Photo by Samuel MacTavish

**3** **Understanding why and how.** Learners develop ideas about what they have seen and are ready to start explaining why and how things are happening. Ask them how and why things interact, why do things happen the way they do, what do we know now?

**4** **Explanation.** Here, learners reflect on their initial model for understanding a phenomenon and use evidence to posit explanatory principles for why things are happening the way they are. Alternative explanations and possible problems with the argument can also be explored, and revisions to the original model made to fit observations and findings.

In this process teachers play a key facilitative role and help set the parameters at each stage. Teachers are not walking students through a neat step-by-step method where one thing easily follows another. Instead, teachers help frame student exploration and critical inquiry using a set of conversations, each of which may challenge students to go back and re-think previous conversations. The process is based in developing the intellectual skill to continue to look deeper at things and come to more nuanced understandings of why things happen the way they do.

# SEPTEMBER
# NATURE OBSERVATION


In our fast paced, technological society, young people increasingly lack opportunities to pause and really pay attention to their natural surroundings. Creating space for quiet observation, reflection and listening in natural spaces like school gardens creates opportunities for students to connect to the natural world on their own terms.

## Questioning

- Where do we live?
- Who lives with us?
- How do things change over time?
- What is our connection to this place?
- How are we influenced by seasonal changes through the year?

## Be Prepared to Be Outside

It's important to be prepared for outdoor learning. Simple learning kits will help your students be comfortable, focused and prepared for learning outside. Evergreen suggests a basic learning kit for each student in your class, which includes:

- 1 personal waterproof kit bag to store personal equipment (i.e. a small knapsack, extra-large zip-lock bag, small garbage bag)
- 1 waterproof "sit-upon" (A cheap and cheerful sit-upon can be made of one section of the daily newspaper, folded in half, tightly wrapped with a large plastic bag and taped shut.)
- 1 personal journal (unlined is best) inside its own zip-lock bag
- 1 fat primary pencil for drawing
- 1 regular HB pencil and/or pen for note taking
- 1 clipboard (can be made from cut out pieces of foamcore or cardboard)
- Pack of coloured pencils

Photo by Samuel MacTavish

- Large bandana for blindfold games and in case of spills or accidents

## Seasonal Rhythms

- Connect with the seasonal cycles of this place:
  - Salmon spawning in the fall feeds the Earth for another year
  - Winter's frost brings sleep and rest to the land
  - Early spring blossoms indicate the lengthening of daylight hours
  - Summer heat brings rapid growth to the garden
- Help students appreciate the alignment and continuous interaction of their own physical, emotional, mental and spiritual realities with these changes in season.

## Nature Journaling

- At the beginning of the school year, ask each student to find their own quiet place outside. This will be their unique place where they'll get to use all of their senses to carefully observe the world around them.
- Return to the same spot several times through the year – each time recording what they witness. Prompt students: I Notice… I Wonder… It Reminds Me Of…
- You may choose to assign writing projects to explore how students feel in their unique place or ask students to always look for certain things (i.e. insects, birds, plants, weather).
- You may ask them to draw and describe with words something they see.
- For an excellent in-depth Nature Journaling curriculum, see Opening the World through Journaling: Integrating art, science, and language arts available freely via **www.johnmuirlaws.com/cnps-curriculum**

Photo by Samuel MacTavish



## Weather Stations

- The University of Victoria has installed many weather stations in Victoria Schools. They have some handy teacher resources available at **www.victoriaweather.ca**.
- Consider acquiring one or more of the following sensors and having students monitor them: hygrometer, rain gauge, thermometer, barometer, anemometer, weather vane.

## Landscape Study

- Provide students with a base map of the school grounds and have them plot landscape features on the map.
- Use compass, measuring tape, flagging tape and graphing paper to design simple landscape studies for students to explore their surroundings.
- Use flagging tape to record areas or plants of interest. Return to these places to observe change over time.

## Other Useful Classroom Tools for Nature Observation

- Insect collection boxes or jars
- Small plastic bags for collecting plants, fungus, rocks, etc.
- String
- Hand lense
- Binoculars
- Wildlife cameras (can be purchased at Canadian Tire)
- Assorted Field Guides (Birds, Trees, Plants, Insects, Mushrooms, etc.)

Photo by Samuel MacTavish

## Other Useful Classroom Tools for Nature Observation *(continued)*

- Measuring tape
- Compass
- Flagging tape
- Graph paper
- Base maps of school grounds
- Stop watches
- Soil testing kits
- Water testing kits

## Field Trip Ideas

- Metro Vancouver – watershed tours
- UBC Botanical Garden & UBC Farm
- Stanley Park Ecology Society

# OCTOBER
# SAVE SEEDS

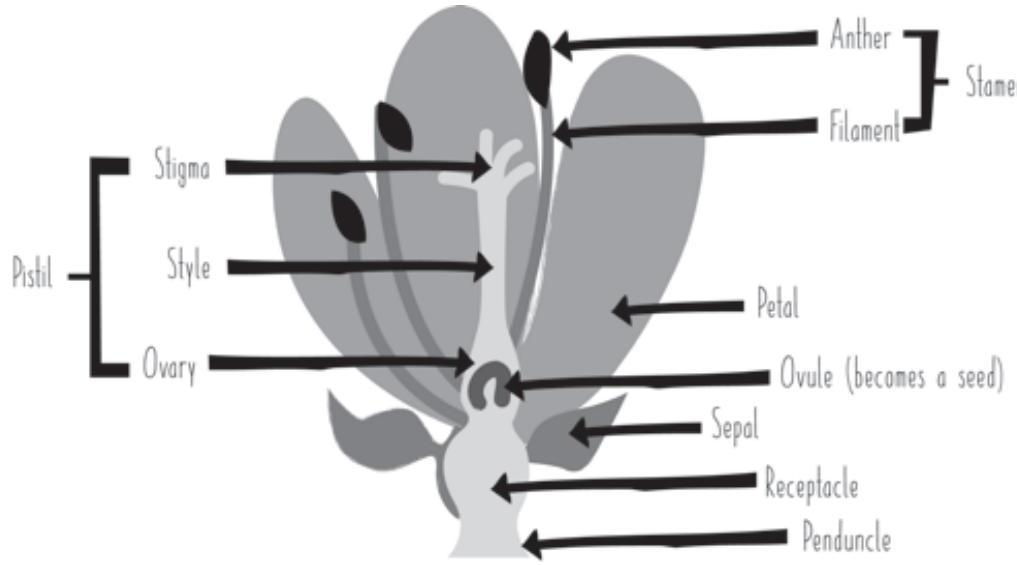

Each seed contains the story of a long and evolving relationship between plants, places and cultures. By saving and planting seeds year after year, hundreds of generations have positively impacted the health of the land. Plants produce seeds in a fascinating array of shapes and sizes, and use many dispersal techniques. Seeking out and saving seeds in the fall is a fun and engaging activity and a great way to explore our close and positive relationship to the earth!

## Questioning

- How do plants reproduce?
- Why do plants have flowers?
- What is a seed? How is it spread? What's it made of?
- How are people connected to plants and seeds?
- How do people positively impact the earth?

## Plant Anatomy

- Help students understand how seeds are made. Simple drawings of a flower, highlighting the reproductive organs of anther, stigma, style and ovary can be helpful here.
- Flowers are pollinated and then grow into fruits. These fruits take many different forms – from apples to dandelions. Asking students to pretend to be flowers, then pretending to be a bee yourself can be a helpful demonstration of how pollination works.
- Look at what's in a seed and sprout beans to investigate further.

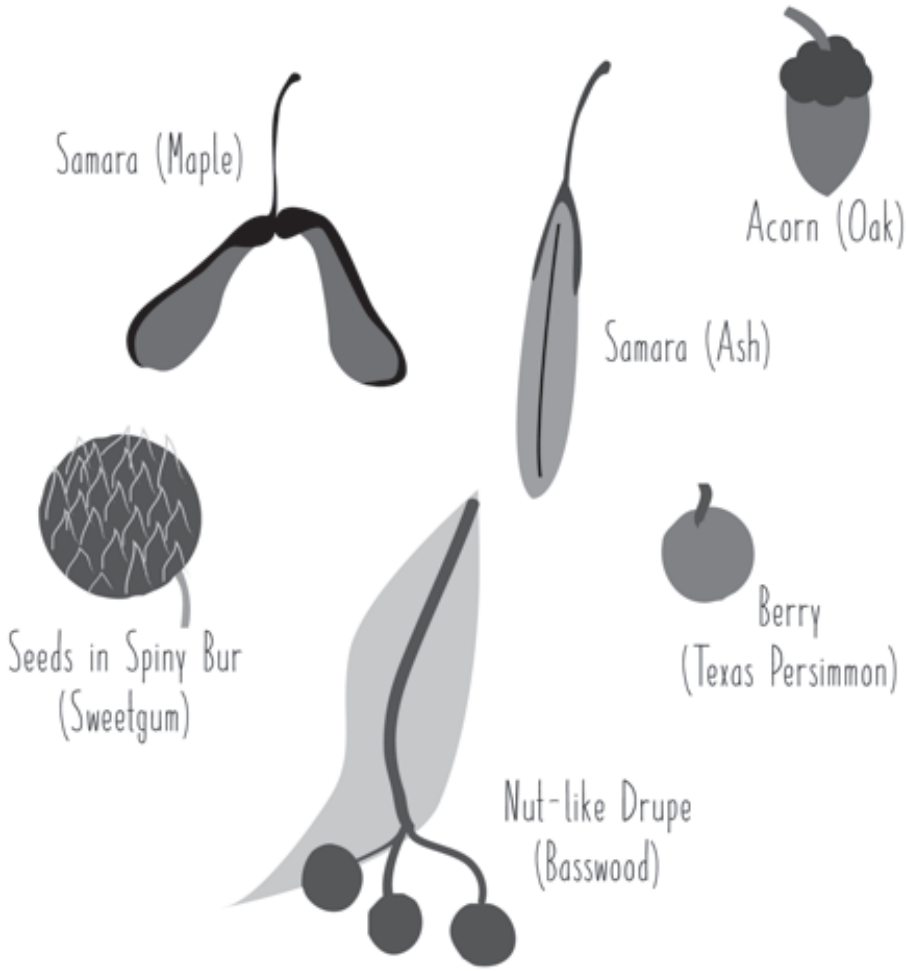



## Seed Gathering

- Explore your schoolyard for seeds on a dry day – it's important that seeds are very well dried before they are stored over winter.
- Show students a few different plants and their unique method of growing seeds. Open a rose hip or other fleshy fruit to expose the seeds. Look at some dry seeded crops and explore the different ways plants in your schoolyard produce seeds.
- Have students collect seeds from the plants they are interested in growing in the spring.
- Ideally, seeds will be dry and hard when collecting from the plant. Use your senses and explore how different plants make seeds. Look closely. Watch plants over time and keep looking closely.

## Seed Art

- Give students small coin envelopes for gathering their seeds – let them design their own seed packs.
- Gather seeds for crafts and use seeds to make art projects.
- Have students write a story about one unique seed they collected. Where did it come from? How did it end up in the schoolyard? Does your family have any seeds that it saves or grows every year?




## Seed Projects

- Start a small community seed library to help people share seeds at your school.
- Sell some of the seeds you save as a school fundraiser.
- Identify one or two heirloom varieties of seed and save them as a class, year after year.

## Seed Saving Resources

- **www.borrowsaveshare.com**
- **www.seedsavers.org/learn**
- **www.seedsecurity.ca**


# NOVEMBER
# DECOMPOSITION

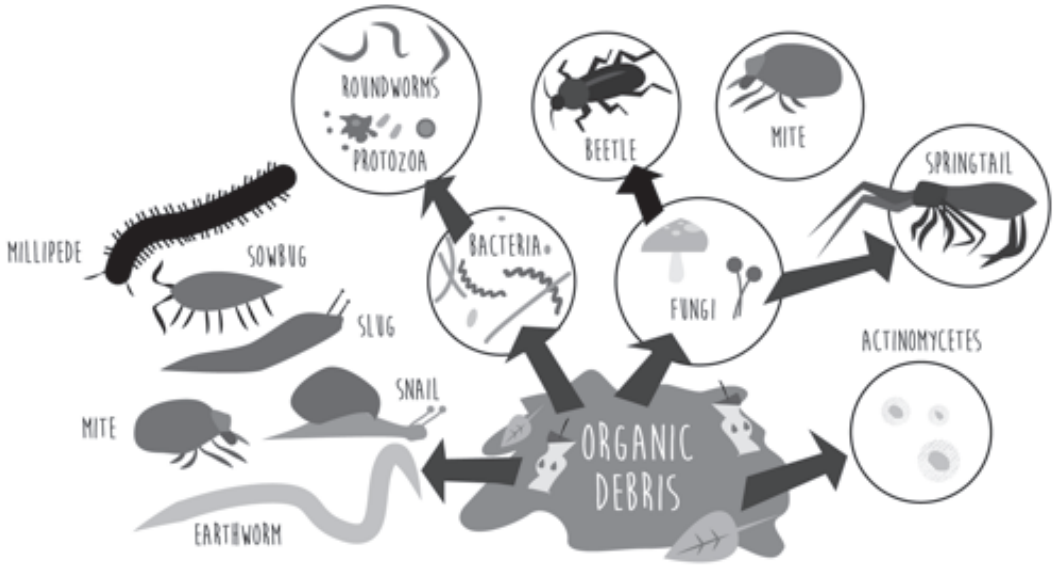
Food waste is not an end, but is the beginning of an essential life giving process. Helping students understand the magic of decomposition inspires an appreciation for what makes a healthy, sustainable food system. The return of nutrients and energy facilitated through decay makes all life on earth possible. Winter time is a great time to witness organic waste as a resource.

## Questioning

- What happens to a leaf when it falls from a tree?
- What is soil? What is it made of?
- Is soil alive? Do things live in soil?
- Are all soils the same?
- What happens to the food scraps we do not eat? Where do they go?
- How can people give back to and care for the land?

## Observation

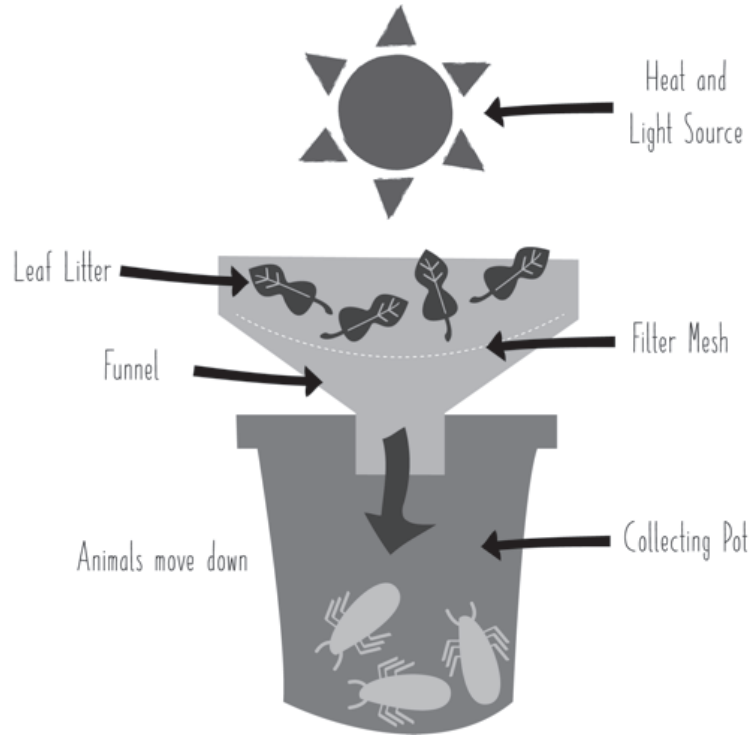
- Resist the (culturally elevated) urge to be afraid of decay.
- Put different kinds of organic materials (fruits are fun to experiment with) in different kinds of conditions and let them decompose. You can use plastic tubs or ice cream pales for this. Observe how materials break down differently in different situations (i.e. in contact with soil, in contact with leaves, with air holes punched in a lid, without air holes, in warm conditions, in cool conditions, in big chunks, in small chunks, etc.).
- Spread compost in different stages of decay on a tarp or on the ground and give students popsicle sticks and gloves and let them explore. Ask what is happening.
- Go on nature walks in and around your schoolyard garden and look for evidence of decay. Ask questions about what is happening.
- Turn over logs, rocks, and other things and explore what is underneath.




- Ask students to bring soil samples from home and compare them. Why are they different?
- Collect soil organisms in jars.

## Soil Composition

- There are many different soil types spread across Vancouver. For an introduction to the different soils of Vancouver, visit: **www.vancouversoils.ca**
- Soil is made of inorganic (sand, silt, clay) and organic (humus) materials. You can do a soil shake test to see what percentage of each is in a particular soil:
    - Fill mason jar about 1/3 full of soil.
    - Fill jar near to top with water; secure lid.
    - Add an emulsifier to help particles in soil separate (Borax works well).
    - Shake vigorously and let sit for 24 hours.
    - Sand will settle at bottom, then silt, then clay, then organic material.
    - Measure how much of each layer there is – different soils will have different compositions.
- Soil is also home to a complex community of life. You can explore different animals in soil in many ways:
    - Build a Tullgren Funnel (image on next page). Soil organisms move away from the heat and light of a lamp and fall into the collection pot below.
    - Collect and observe soil animals in the garden.
    - Use a microscope to look at the many microscopic organisms in the soil.




## Composting

- On-site composts are not only a great source of nutrients for your school garden, they are inexpensive laboratories rich in learning potential.
- Vermicomposters (aka wormbins) can be kept in your classroom.
- See the VSB's School Garden Policy for an outdoor compost design.

## Who Can Help

- Soils 4 Teachers – curriculum and teaching resources: **www.soils4teachers.org**
- City Farmer – worm bin workshops for schools **www.cityfarmer.info**
- Compost Education Centre – composting factsheets and manuals **www.compost.bc.ca**

# FEBRUARY
# CREATE WILDLIFE HABITAT


Urban areas are often habitat deserts for animals. By working with your students to create habitat, you can inspire learning across disciplines and give students tangible projects with real world connections. You also help make Vancouver a more interesting, diverse place.

## Questioning

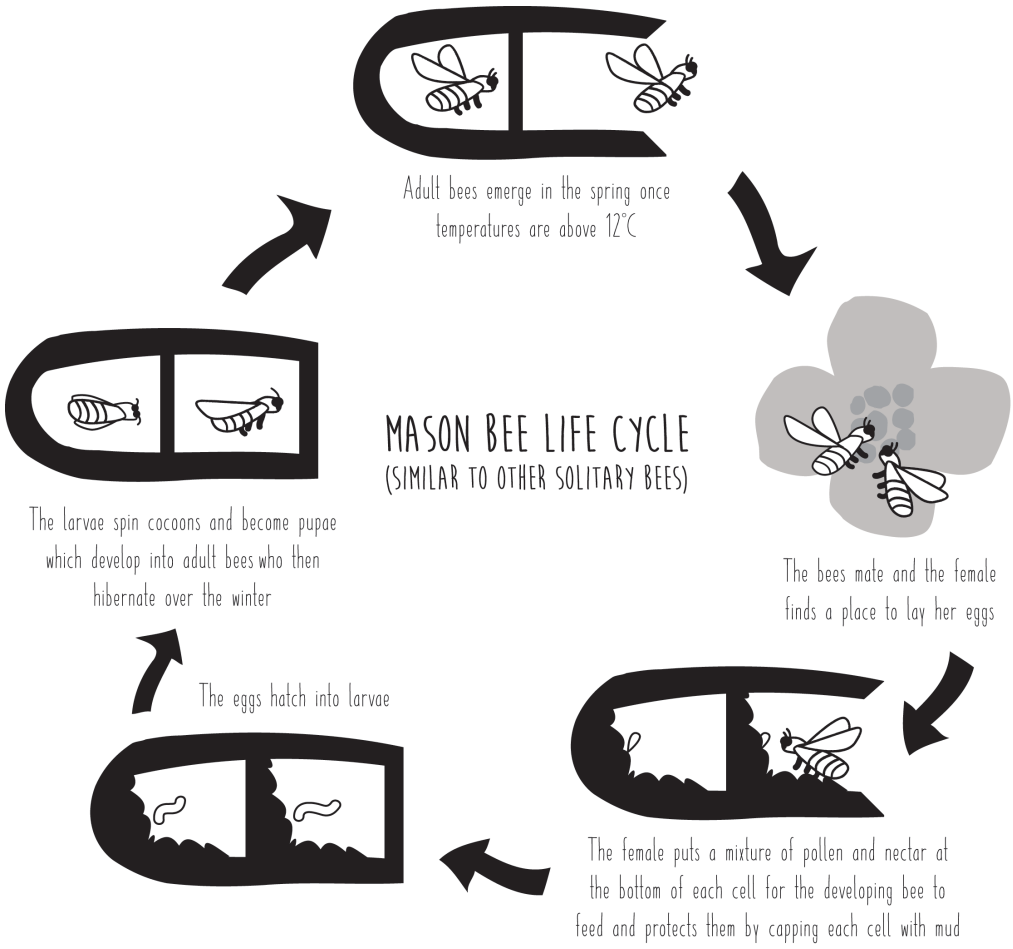
- What kinds of animals live in Vancouver?
- How do people and animals interact in the City?
- How do plants and animals interact?
- What do different animals need to survive?
- How do people help other animals and plants?

## Garden Considerations

- Wildlife need places to hide, places to sleep, and places to eat and drink.
    - Flowers and seeds are important food sources for many small animals. A good wildlife garden has flowers blooming throughout the year, or at least from March – November.
    - Bird baths and nearby ponds are important sources of water.
    - Shrubs and trees that are not pruned provide shelter for many species.
    - A diversity of habitats helps a diversity of animals; muddy areas, rotting logs, rock piles, un-mowed lawns and other natural elements often support wildlife.

## Bees

- Blue Orchard Mason Bees are one of over a hundred solitary bees native to our region. They are important **pollinators** who live in holes in old dead wood. They do not sting.
    - It's quite easy to install habitat for Mason Bees and other solitary bees. Just hang a nesting box 4-6' off the ground.
    - It's best to "seed" a new box with cocoons. You can purchase mason bee cocoons from several places (including: West Coast Seeds & Beediverse)
    - In September, you can take the mason bee house down, remove and clean cocoons and store them for next year (this helps protect them from mite predation)
    - Detailed info in the Mason Bee Resource at **www.thinkeatgreen.ca**
- Bumble Bees are social insects native to our region. They are also important pollinators, who make their nests in old burrows in the ground. Bumble bee nesting boxes are easy to install.
- Bee Resources:
    - EYA's Local Pollinator Resources: **www.eya.ca/our-services**
    - Xerces Society: **www.xerces.org**
    - The Vancouver Parks Board Pollinator Project: **www.vancouver.ca/parks-recreation-culture/pollinator-project.aspx**




## Birds

- Vancouver is right on the Pacific Flyway and is an important habitat for many species of birds – most of which struggle to survive in our heavily urbanized environment.
- Chickadee nesting boxes are a good starter bird house for Vancouver schools.
- Bird resources:
  - Vancouver Bird Week: **www.vancouverbirdweek.ca**
  - Wild Birds Unlimited Nature Shop: **www.vancouver.wbu.com**
  - Vancouver Parks Board Bird Strategy: **www.vancouver.ca/parks-recreation-culture/vancouver-bird-strategy.aspx**

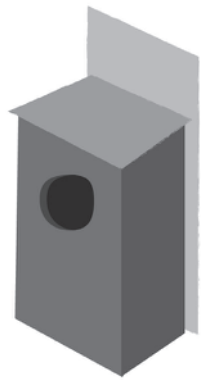


Photo by Samuel MacTavish

## Bats

- Bats are an important and misunderstood member of our local ecosystem
- Like bees, bat populations are currently declining. Unlike bees, bats aren't getting much attention
- You can build bat roosts and install them on your school grounds, or use your school garden to teach students about the importance of bats
- Bat resources:
  - Habitat Acquisition Trust: **www.hat.bc.ca/bats/about-our-program**
  - BC Bats: **www.bcbats.ca**

## Butterflies

- You can raise butterflies in your class and release them into your school garden. Products available at **www.carolina.com**
- Butterflies and bees both depend heavily on pollen and nectar from local flowers to survive. The resources listed on page 72 provide ideas and advice that will help you create butterfly habitat

## Who Can Help

- Environmental Youth Alliance – pollinator and re-wilding programs: **www.eya.ca**
- Evergreen – connecting natural and built worlds to make cities flourish: **www.evergreen.ca**
- Stanley Park Ecology Society – school programs and field trips: **www.stanleyparkecology.ca**
- Children and Nature Network – an international movement to connect children and youth to nature: **www.childrenandnature.org**

MARCH

# PLANT A VEGGIE PATCH


Even adults are mesmerized by wonder after witnessing a seed sprout. Helping a plant to grow and produce food that you can then harvest and eat is a uniquely empowering experience, with power to teach important lessons about reciprocity, care and respect, as well as science, social studies, and art.

## Questioning

- Where does our food come from?
- What is healthy food? Is it healthy for us? For other people? For the planet?
- How do plants grow? What do they need to survive?
- How do people and plants interact?
- How do animals and plants interact?

## Indoor Planting

- Planting seeds in containers inside can be a fun way to learn about germination and the early stages of plant growth. Students can measure and monitor seedling's progress in this classic classroom activity.
- Try indoor experiments playing with variables such as: light, temperature, soil, water.
- Using peas and beans works well with young students, as these seeds are large and easy to handle. They also sprout and grow relatively quickly.
- Consider house plants. They can be easily divided and cared for in the classroom.
- Some schools are experimenting with Indoor Gardens, growing plants under lights all through the year. Products available at garden stores and West Coast Seeds.

## Outdoor Planting

- Set students up for success. Give simple, straight forward instructions for planting. Organize areas clearly and demonstrate how to do it.
- Get parents and community members involved on planting days; invite others to come and help. The ability to work in small groups makes planting and working in the garden a lot easier! Parents and community members also bring knowledge and garden experience.
- Give students room to experiment and explore.
- Provide students with some choice in what they do. Identify tasks and let students choose which ones they would like to do. Options might include:
    - Moving soil or compost into place
    - Pulling weeds and old vegetables, chopping them up and composting them
    - Planting seeds and seedlings
    - Watering
    - Digging in the compost
    - Improving pathways
    - Creating art and signage
    - Monitoring plant growth and garden development
    - Mulching
    - Gathering leaves
- Frame the work positively for students – find creative ways to motivate them. It helps to explain why we do things and (especially for younger students) to use imagination and play.
- For a wide variety of lesson plans and activity guides, see the Teacher Resources section at **www.thinkeatgreen.ca**



## Caring for Your Garden

- Learn how to use simple tools like a shovel, rake, hoe, watering can and trowel effectively. Practice is a good teacher.
- Return to the garden frequently to watch how the things you planted grow. Ask the students questions about what they see and try to learn from the plants (they are the best teachers when it comes to gardening).
- Taste things as they grow. Get comfortable harvesting and using your vegetables.
- Pay attention and ask questions about what is happening.

## Who Can Help

- Society Promoting Environmental Conservation – Integrated school garden support: **www.spec.bc.ca/school-gardens**
- UBC's Intergenerational Landed Learning Program - Promotes garden based intergenerational collaboration and interdisciplinary hands-on learning: **www.landedlearning.educ.ubc.ca**
- Fresh Roots – Mentorship, education and schoolyard market gardens: **www.freshroots.ca**
- Growing Chefs – Classroom growing & cooking programs with chefs and community volunteers: **www.growingchefs.ca**
- Earth Bites – Workshops and longer term partnerships to support school garden and food programs: **www.earthbites.ca**
- The Classroom Gardener – Offering a year of in class field trips to your school garden, designed around the new curriculum: **www.meganzeni.com/the-classroom-gardener**
- Vancouver Neighborhood Food Network – Neighborhood based programs supporting healthy food programs, including gardening: **www.vancouver-foodnetworks.com**


# MAY
# MAKE ART & TECHNOLOGY

Plants are the foundation for many arts. Textiles and dyes have been made from plants for centuries. Until recently, most human technology was created by the manipulation of plants. Engaging students in simple activities that use plants in a process of creation helps connect them to a deeper appreciation and understanding of culture and society.

## Questioning

- Where do our clothes come from?
- What is technology? How and why was it developed?
- How can our relationship with technology support a healthy planet?
- What kinds of things do people use plants for? How do plants help people?
- Where does the color in our clothing and technology come from?

## Making Plant Based Dye

- For success dying fabric, it may be important to soak the fabric in a color fixative before dying:
    - Salt Fixative (for berry dyes) 1/2 cup salt to 8 cups cold water.
    - Plant Fixatives (for plant dyes) 4 parts cold water to 1 part vinegar.
    - Add fabric to the fixative and simmer for an hour. Rinse the material and squeeze out excess. Rinse in cool water until water runs clear.
- Making a dye solution:
    - Chop plant material into small pieces and place in a pot.
    - Double the amount of water to plant material.
    - Bring to a boil, then simmer for about an hour.
    - Strain and add your fabric, canvas or paper.
    - For a stronger shade, allow material to soak in the dye overnight.



- Easy to grow flowers for dye:
    - Marigold
    - Coreopsis
- Many common plants can be boiled to make a variety of colors. Simple google searches and random experimentation can reveal much.

## Fibre Arts & Weaving

- Making rope, or cordage, from day lilies is really easy and fun! There are lots of day lilies around and they are very easy to grow. A simple google search for "making rope from day lilies" will reveal easy to follow videos to help you learn to make rope.
- You can also use a variety of materials to make simple woven shapes and structures. Create pea trellises by weaving bamboo or other natural materials together. Make simple hoops and shapes with malleable willow twigs, or weave natural materials into a chain link fence.

## Other Art Activities in the Garden

- Press leaves and flowers
- Make etchings with crayons
- Design temporary mandalas with beautiful found objects
- Draw, paint
- Write
- Sing songs and make simple instruments

## Who Can Help

- EartHand Gleaners – Local artists and educators who work primarily with locally harvested materials: **www.earthand.com**
- Magic Trout Imaginarium – Inspiring curiosity and wonder for the world around us: **www.tinycommunitycenter.com**


# JUNE
# HARVEST, PREPARE & SHARE FOOD

Harvesting and eating food from a schoolyard food garden can be a transformative experience, helping students experience themselves as connected to nature's cycles. Preparing and sharing food presents opportunities for learning self-mastery, cooperation and care. Eating from the garden also gives students a chance to try new foods and celebrate the pleasure of food in a safe and supportive environment. Research suggests that early, positive experiences with food have multiple positive health outcomes.

## Questioning

- Where does our food come from?
- What do you eat at home? Why are there so many different ways to eat and enjoy food?
- How is what we eat related to where we live? What role does culture, identity, and personal meaning play in what we eat?
- What does it mean to eat healthy?
- What food do you like? What makes food delicious, filling and joyful?

## Acquired Tastes and Food Attitudes

- What and how we eat nourishes more than our physical being. Our mental and spiritual health can be fed or starved by food culture.
- Meal time in school is an important learning experience. How students access, share and eat food at school teaches important lessons about health, identity and culture.
- School garden programs tend to promote an ethical lens on food, framing local and organic as good and other types of food as bad; this can be disempowering and stigmatizing.
- Promote openness and support students in trying new things. Do not force them to eat something they don't want to. Recognize that everyone comes from a different place.
- Create meal times that emphasize the joy and pleasure of good food. Celebrate together. Make it fun.

## Harvesting and Preparing Food

- Consider food safety at every stage, from growing, to harvest, storage, preparation and consumption. For more information see Appendix A.
- Invite parents and community members to support food preparation activities – it can help to have students work in small groups.
- Practice simple knife skills with students in the classroom.
    - Get support from parent volunteers.
    - Clearly demonstrate safe ways to handle vegetables and knife: keep fingers far away from the knife; keep your fingers curled up in a "bear claw" or fist, etc.
- Give students opportunities to choose what kinds of foods they want to use in a recipe. Let them assemble their own meal in small groups.
- Know your audience and provide culturally appropriate foods. It's okay to integrate foods from the grocery store.

## Recipe Ideas

- Make kale chips and let students create their own sauces and seasonings from a variety of ingredients.
- Use electric frying pans to make simple stir fries. Let the students assemble the ingredients.
- Use blenders to make smoothies.
- Use berries to fill tarts and cover with whipped cream.
- Assemble eclectic salads and let the students mix their own ingredients and salad dressings.
- Bake vegetables or a fruit crisp.
- Design your own personal pizza with ingredients from the garden.
- Mash fruit from the garden to create simple jams.
- Dehydrate fruits and vegetables.
- Make salsa.

## Who Can Help

- Growing Chefs! – Classroom growing & cooking programs with chefs and community volunteers: **www.growingchefs.ca**
- Project CHEF (Cook Healthy Edible Food) – Experiential classroom cooking programs: **www.projectchef.ca**

Appendix
A

# *Helpful Resources*

## LESSON PLANNING

- ***Green Thumbs at School: SPEC Food Garden Lesson Book***: Nine lesson plans for teachers. Available at **www.spec.bc.ca/school-gardens**
- **UBC's Intergenerational Landed Learning Project**: Published books, online resources and more. Available at **www.landedlearning.educ.ubc.ca**
- **Think&EatGreen@School**: Broad listing of resources for educators. **www.thinkeatgreen.ca**
- **Life Lab**: Check out the many resources For Educators on School Gardening. **www.lifelab.org**

## SOIL & COMPOST

- **The Greater Victoria Compost Education Centre**: Helpful fact sheets for most types of backyard composting. **www.compost.bc.ca**
- **City Farmer**: Provides vermicomposting workshops and composting support in Vancouver. **www.cityfarmer.info**
- **Vancouver Soil Map**: An introduction to the primary soil groups in Vancouver. **www.vancouversoils.ca**

## VEGETABLE GARDENING

- **West Coast Seeds**: Educational resources for growing in all seasons. **www.westcoastseeds.com**
- **UBC Botanical Garden HortLine**: Horticultural advice answered by knowledgeable volunteers every Wednesday between 12 and 3. Call 604-822-5858 and leave a detailed message or email **garden.hortline@ubc.ca**

## INDIGENOUS LEARNING

- Contact your school's Aboriginal Enhancement Teacher for support.
- Contact parents and your local community and invite indigenous perspectives into your classroom.

# Helpful Resources *(continued)*

## NATIVE PLANTS

- Pojar, J. & MacKinnon, A. (2004). ***Plants of Coastal British Columbia***. Vancouver: Lone Pine.
- Turner, N.J. (2010). ***Food Plants of Coastal First Peoples***. Victoria: Royal BC Museum.
- Turner, N.J. (2010). ***Plant Technology of First Peoples in British Columbia***. Victoria: Royal BC Museum.
- Turner, N.J. (2005). ***The Earth's Blanket: Traditional Teachings for Sustainable Living***. Vancouver: Douglas & McIntyre.

## FRUIT TREES

- **BC Fruit Testers Association**: An organization of people who share an interest in the science and cultivation of fruit bearing trees, shrubs, vines and plants. **www.bcfta.ca**

## FOOD SAFETY

- **Health Link BC** has many helpful factsheets and handouts: **www.healthlinkbc.ca**
  - Food Safety for Fruits and Vegetables: **www.healthlinkbc.ca/healthlinkbc-files/food-safety-fruits-vegetables**
  - Easy Ways to Make Food Safe: **www.healthlinkbc.ca/healthlinkbc-files/easy-food-safety**
- **Food Safe BC**: **www.foodsafe.ca**

## VANCOUVER SCHOOL BOARD

- The Sustainability Office can offer guidance and connect you to gardening resources. Email **sustainability@vsb.bc.ca**.
- The VSB Garden How to Guide details the process of building or expanding a schoolyard garden. Find it on the Green Board at **www.vsb.bc.ca**.
- The VSB Grounds Department provides fee-for-service material and labour for many garden activities. Your school administrator can submit requests via School Dude.

Appendix
B

# *Local Organizations That Will Come to You*

**Earth Bites**
Workshops and longer term partnerships to support school garden and food programs. **www.earthbites.ca**

**Environmental Youth Alliance**
Youth mentorship, pollinator programs, natural systems restoration and native plant nursery. **www.eya.ca**

**Fresh Roots Urban Farm Society**
Field trips, workshops, and programing on VSB's own Schoolyard Market Gardens; farm fresh food, and volunteer opportunities for students. **www.freshroots.ca**

**Growing Chefs!**
Classroom growing & cooking programs with chefs and community volunteers. **www.growingchefs.ca**

**Project CHEF (Cook Healthy Edible Food)**
Experiential classroom cooking programs. **www.projectchef.ca**

**Society Promoting Environmental Conservation**
Supports food gardens and food education in Vancouver schools. **www.spec.bc.ca**

**The Classroom Gardener**
Hands-on, cross-curricular school gardening program with resources that teach to the big ideas in BC's redesigned curriculum. **www.meganzeni.com/the-classroom-gardener/**

**UBC Botanical Garden**
Field trips and training programs. **www.botanicalgarden.ubc.ca**

**UBC's Intergenerational Landed Learning Program**
Promotes garden based intergenerational collaboration and interdisciplinary hands-on learning. **www.landedlearning.educ.ubc.ca**

Appendix
C

# *Sources of Funding*

**Evergreen Learning Grounds Grants**
The Toyota Evergreen Learning Grounds program helps schools create outdoor classrooms to provide students with a healthy place to play, learn and develop a genuine respect for nature.

**Local Bank**
They have a small pot of money to help make your project happen – you just need to ask.

**Parent Advisory Councils**
School garden support is a very good and clear ask of your PAC.

**Rona, Canadian Tire, Dicks Lumber, Hardware Stores**
Write a letter on your school's letterhead (maybe with pictures from your students). Ask for the tools/lumber that you need.

**TD Friends of Environment Fund**
Founded by TD Bank Group in 1990, TD Friends of the Environment Foundation (TD FEF) is a national charity that funds environmental projects across Canada.

**Vancouver Foundation**
Vancouver Foundation grants support thousands of projects every year to help build healthy, vibrant, and livable communities across BC.

**Whole Kids Foundation**
The School Garden Program supports edible educational gardens located at a school.

## NOTES

## NOTES

## NOTES






Vancouver School Board

**School District #39**
**1580 West Broadway**
**Vancouver, BC**
**Canada V6J 5K8**

**Questions?**
**sustainability@vsb.bc.ca**