Lessons from the Pencil Patch – A Garden for Learning

School Garden Resource

BC Agriculture in the Classroom Foundation

About the Pencil Patch – A Garden for Learning

The BC Agriculture in the Classroom Foundation established the **Pencil Patch – A Garden for Learning** as an outdoor education area for teachers to develop a program for planting, growing and harvesting local vegetables and herbs. It has also been our learning ground for our Summer Institute Program for teachers, and a building resource for classrooms.

The Pencil Patch was made possible when the City of Abbotsford donated approximately one acre of land to the BC Agriculture in the Classroom Foundation for use as an outdoor education area for schools. The site at the Abbotsford Community Garden, has a rich agricultural history, and the heritage buildings provide a scenic backdrop for visitors. With a greenhouse, surrounding garden areas, and milk house built in 1921, there are plenty of areas for students to explore.

In 2011, BCAITC partnered with the Abbotsford Community Garden Society, the Abbotsford Community Foundation, the City of Abbotsford and Kiwanis Club to build the Pencil Patch. Since then we have worked with local teachers and their students to develop a comprehensive schedule and guide, with a rationale linking to the elementary curriculum, for planting and growing local vegetables and herbs during the school year.

We are excited to share what we have learned in our Lessons from the Pencil Patch resource so that you can create a similar experience at your school. We would appreciate feedback on your experience and ways that we can keep improving our school garden resource. Each spring all grade levels (K-12) are invited to visit the Pencil Patch and participate in self-guided tours facilitated by our staff. We look forward to seeing you and your students at the Pencil Patch.

Visit our website at **bcaitc.ca** or follow us on **Facebook, Twitter** and **Instagram**

Table of Contents

About the Pencil Patch – A Garden for Learning..... 2

Getting Started – Your Garden Plan.. 4

Starting Your Garden Plan.....4

Sizing the Beds.....4

Planting in Tubs.....6

Laying the Ground Work..... 7

Soil..... 7

Growing Zones..... 7

Seeds..... 7

Tools..... 8

Soil Amendment..... 8

Planting.....9

Early Planting..... 9

Planting Guidelines..... 9

Crop Rotation.....9

Preparing to Plant..... 10

Fertilizer 10

Spring Maintenance Schedule..... 11

Harvesting..... 12

Summer Maintenance Schedule..... 14

Other School Garden Resources..... 16

Learning Outcomes..... 17

Getting Started – Your Garden Plan

Before you start building and planting a garden at your school be sure that you have contacted and have support from:

- your Principal
- the Building and Grounds Supervisor for your school district
- your Parent Advisory Council
- other teachers in your school
- your community – reach out to community groups and volunteers for help with the construction of plots and garden maintenance. Groups that may be willing to help:
    - Senior homes, community centres, churches

We also recommend that you have a clear rationale as to how a garden will support the curriculum at your school.

January

Starting your Garden Plan:

First you will need to decide on a location for your garden beds. Ideally, you will want a central location where the beds will have access to full sun and a water line. For some schools, security is an issue. If it's an option for you, a courtyard in school grounds, or a fully fenced area, will help to keep out cats and dogs, and those who may be interested in helping themselves to your fresh vegetables.

- Make a sketch of your designated growing area, and include the placement of your garden beds.
- Decide on whether you want to use raised beds or in-ground beds, or both. Using a combination of raised and in-ground beds provides you with more flexibility during the gardening season. Raised beds allow you to plant earlier in the year, and can help contain invasive plants, such as mint, that spread out rapidly and are difficult to control. In-ground beds provide more space, so are better for growing larger crops, such as **corn** and require less watering in the summer.

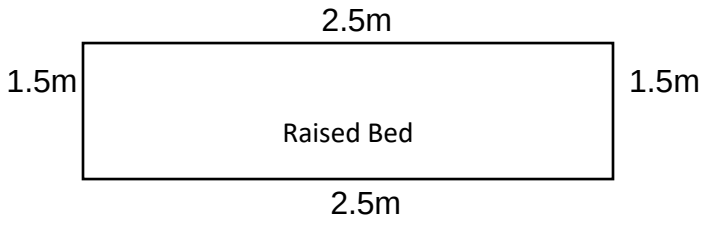
Sizing the Beds

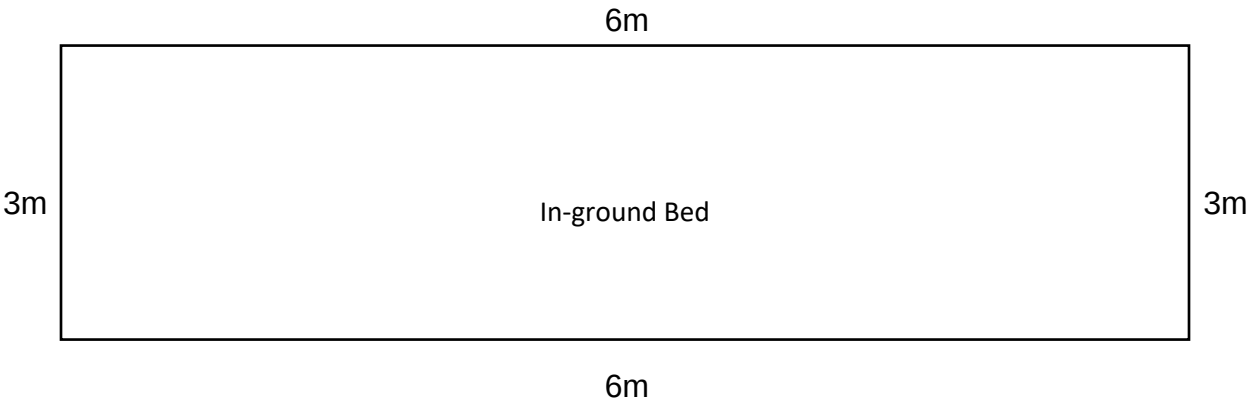
Once you have decided on your combination of raised beds and in-ground beds, measure out your designated growing area(s) and determine the sizes of you garden beds.

The Pencil Patch –A Garden for Learning

***Recommendation:** A manageable size for a class of approximately 30 students is 3m x 6m. for in-ground beds and 2-4 1.5m x 2.5m. raised beds (see example):

Adjust appropriately based on how much land you have.





Tip: If this is your first year growing a school garden, start small. You can always expand your garden in subsequent years once you have a feel for how much space you have, and the level of support and participation from your school and class(es). Some schools kickoff their growing and garden experience by participating in our Planting a Promise or Spuds in Tubs programs. Visit our website at **bcaitc.ca** for more information.

Planting in Tubs

For some schools with limited space or less 'gardeners', large plastic tubs are a good alternative to in-ground or raised beds. They take up minimal space, can be easily moved around when empty, and are good for containing aggressive or invasive plants, such as herbs and ornamental grasses.

Tubs that can be used for planting:

Heavy black nursery tubs used for growing trees; galvanized water troughs for livestock, etc.

Laying the Ground Work

Soil

Healthy soil is the key to a successful garden. Take a close look at the soil where you plan to plant. Is it part clay, sand or silt? The ideal type of soil is a balance of all three materials. If you are not sure what soil type you have, take a sample to your local garden centre or nursery for analysis and guidance.

If you are purchasing soil for your tubs or to add to your raised beds we recommend a sea soil, which can be found at your local garden centre or nursery.

You may need to improve your soil with well-rotted compost, peat moss or other soil amendments. You should go through this process every year, or every other year, to keep the level of organic matter in the soil high.

Growing Zones

Before purchasing your seeds, identify and familiarize yourself the growing zone for your area. Growing zones are geographic regions that can support specific plants, flowers and trees, and define a minimum range of temperatures that a plant or tree can survive safely in that zone. For example, the Lower Mainland Region in BC is designated as a zone 7.

Seeds

Make a list of what you would like to grow in your garden. If you are a first-time gardener you will discover that not everything can grow in the conditions provided by a school garden. Through trial and error, each season you will learn which plants thrive in your garden, and those that do not. A garden log is a good way of keeping track of the plants that grow well in your garden, and ones to avoid planting in future seasons. We have compiled a list of plants that have done well in the Pencil Patch Garden. (See March, April and May planting).

Specific seed varieties are available online from these nurseries:

- Stokes Seeds - http://www.stokeseeds.com/
- McKenzie Seeds - http://www.mckenzieseeds.com/
- Heirloom Seeds - http://heirloomseeds.com/

You can also purchase seeds from local nurseries in early spring. Seed companies have a wealth of information on choosing, planting, growing and harvesting crops. When selecting your seeds, also think about when the plants will be ready for harvest. A school garden needs crops that mature in early summer so that students can harvest them before the end of the school year.

Be sure to purchase new seed every year. Older seed from previous growing seasons may not germinate and will also be more susceptible to disease.

February

Get ready for the gardening season.

Tools

Take an inventory of tools available at your school. Purchase any new tools you'll need for the coming growing season. Some tools to have on hand:

- Work gloves/garden gloves (to protect gardeners' most important tools – their hands)
- Hoe
- Steel garden rake
- Spading fork
- Hose with spray nozzle attachment
- Wheel barrow
- String for measuring garden areas
- Wooden stakes for labeling crops
- Hand tools for students (trowels, rakes)
- Watering cans for students

March

Prepare garden beds for the season.

Soil Amendment

When you first start a garden, and after every summer of growing crops, you need to replenish the nutrients in your soil. Gardeners call this 'amending' the soil.

First, cover the soil with a layer of well-rotted compost or manure (about 5 to 10cm)

Have your students mix the amendment into the top layer of soil. This loosens up the soil, adds organic matter and will give you better growing results. Since heavy rains in the Lower Mainland make the soil acid, you can also add a small layer of garden lime to the amendment to sweeten the soil. For in-ground beds, that are lower to the ground, and at greater risk of frost, wait until April to begin working the soil. This also gives the soil more time to dry out in preparation for planting.

Seeds

Using the list you made in January, order or buy your seeds from local nurseries.

Planting

Early March Planting

If you have access to a greenhouse, or even sunny windows in your classroom, you can start some plants early in seed trays, which you can then transplant to tubs or garden beds in April. Some plants that can be planted early include:

- Swiss Chard
- Lettuce
- Peas
- Green Onions

Planting Guidelines

Check the back of each seed packet for specific instructions on planting depth and spacing, number of days to maturity, etc.

Growing an assortment of grains can be beneficial for educational purposes to show students the many types of grains we grow in BC and Canada. Seeds for growing wheat, barley and oats can be purchased from local feed stores.

Crop Rotation

Growing the same, or related crops, in the soil for many seasons in a row depletes it of nutrients. Crop rotation helps maintain a balance of nutrients, organic matter and microorganisms necessary for healthy soil. A good rule of thumb for organic gardening, and good yields, is to try to rotate plant families from one season to the next. For example, if you grew carrots the previous two seasons in the same area, the next season plant lettuce.

April – May Planting

When	Transplant	Direct Seed
April	**Swiss chard** (Northern Lights variety) **Lettuce** (Black Seeded Simpson, Butter Crunch varieties) **Green onion sets** **Peas** (Knight, Spring varieties)	**Potatoes** (Warba variety) **Spinach** (Sardinia variety) **Radishes** (Sparkler variety) **Carrots** (Nantes) **Sweet peas** **Beets** (Ruby Queen variety)
May	**Herbs** (mint, chives, rosemary, basil, sage, cilantro, parsley). **Flowers** annuals	**Corn** (Gourmet Sweet variety) **Pumpkins** (Field Trip variety) **Sunflowers** (Giganteus variety) **Beans** • Scarlet runner beans (Scarlet Emperor variety) • Pole Beans (Blue Lake variety) **Grains** (available at nurseries or feed stores) • Wheat • Oats • Barley • (**Tip:** label each crop, as they look very similar until they mature).
June		Plant second crop of carrots for the fall

Preparing to Plant

Using a garden rake, spading fork, or shovel, turn the soil so that it's loose and easier for students to make rows and plant the seeds.

Fertilizer – Mix in a *slow-release fertilizer* (water-insoluble nitrogen (WIN) fertilizers which last for 8 to 12 weeks) into the soil to maximize growth of your crops. Slow-release fertilizers are available at your local nursery. Be sure to water the plants and surrounding soil after you have mixed in the fertilizer. Check the bag for the slow release formula 6-8-6.

Spring Maintenance Schedule

Weeding

As your crops continue to grow, set up a weeding schedule of 1-2 times a week. If the weather is warm, extra weeding may be necessary.

If the weather is warm and rainy, extra weeding may be necessary.

- Technique: carefully hand-weed around the crops, and use a hoe between rows. Weed your garden when the weather is hot and sunny as this kills the roots of the weeds and keeps them from growing back

Tip: Pull out weeds when they are small. If you wait until they are larger, they will choke out plants and minimize the production of your crops.

Watering

Make sure crops are well watered. Although spring is usually a wet season, there can be years that are unseasonably warm and require extra watering.

Fencing

Depending on the location of your garden, you may want to invest in some fencing around the beds to keep out unwanted pests such as rabbits. Using chicken wire is an inexpensive and easy way to protect your crops. This can be found at any home improvement store.

Thinning the Rows

To ensure a good yield from your crops, you should 'thin out' crops such as carrots and beets once during the season when the plants are still small (1 to 1.5" tall). Thinning the rows simply means selectively pulling out some of the plants that are growing too close together so that the remaining plants have enough space to ripen to the optimum size and shape.

Harvesting

Harvest Schedule:

Depending on how warm the spring is in your region, you may be able to harvest lettuce and spinach as early as May. The following is a general schedule that will vary depending on the weather and your zone.

June

- **Lettuce –** break off the leaves at the base of the plant
- **Swiss Chard –** break off the leaves at the base of the plant
- **Radishes –** grasp each radish by the base of the green top and pull
- **Green Onions –** grasp each onion by the base of the green top and pull
- **Spinach –** break off leaves at the base of the plant

July to September

- **Beans** (Harvest in July for eating, and in September to collect the seeds)
    - **Scarlet Runner Beans –** use two hands to break off the stem at the top of each bean
    - **Pole Beans –** use two hands to break off the stem at the top of each bean

September to October

- **Sunflowers**
    - Cut the heads off the sunflowers before the fall rains begin. Sunflowers are ready for harvest when the plant becomes wilted, dry and brown, and the underside of the head turns yellow. Cut off the heads, leaving a few inches of the stem intact, and bring them inside for a few days to allow the seeds to dry. Harvest the seeds when dry. Tip: To prevent losing seeds during drying, place each sunflower head in a brown paper bag, securing around the stem with a piece of string or twine. Turn it upside down and hang it in a warm, dry spot with good ventilation.
- **Carrots**
    - Grasp each carrot by the green tops and pull out of the ground. Carrots can be harvested until first frost.
    - Tip: Loosening the soil with a garden trowel or fork, or watering the soil first, makes it easier to pull up carrots without separating the root from the green tops. Pull out a couple of test carrots first to check that they are at the right size for their variety and ready for harvesting.
- **Pumpkins**
    - Harvest when completely orange and stems are still firm

Summer Maintenance Schedule

June

Watering

Set up an irrigation system or plan for watering. Make sure plants are continually well watered, especially those growing in planters or pots, since they dry out more quickly than in-ground beds. Recommendation: Ask your summer volunteer gardeners to join you a couple of times for watering and weeding to familiarize themselves with your garden and crops – they might enjoying participating and sharing in an early harvest too!

July

Water as necessary

Weed regularly

Train beans to grow on arbor or pole by gently lifting any vines on the ground and twining them around an arbor or pole.

August

Water as necessary

Weed regularly

September

Clean up any old summer crops

- For in-ground and large raised beds, plant fall rye as a cover crop for the winter
    - A cover crop will enrich the soil, replacing nutrients and hold the soil in place during the winter

October/November

Garden clean up

- remove old crops as they die off Don't forget, the dead plants and weeds that you clean out now become valuable additions to your compost pile
- start a compost program if your school does not already have one – find a local resource – We have a partner in Net Zero Waste http://netzerowasteabbotsford.com/#home to help us with our composting
- clean and store garden tools for the winter
- start planning for next year

Other School Garden Resources

Healthy Eating at School: http://healthyeatingatschool.ca/in-the-garden

Environmental Youth Alliance: http://eya.ca/our-programs/

The Evergreen Foundation: http://www.evergreen.ca/

For more tips on gardening, get in touch with your local Master Garden Club, which can be found at your local garden centre.

Pencil Patch New Curriculum Chart

Grade	Subject	Content Connection
Kinder	Science	- Basic needs of plants and animals - Living things make changes to accommodate daily and seasonal changes - Local First People's uses of plants and animals - Weather and seasonal changes
	Social Studies	- Relationship between the community and environment
Grade 1	Science	- Classification of living and non-living things - Names of local plants and animals - Behavioural adaptations of animals in the local environment
	Social Studies	- Relationship between the community and environment
Grade 2	Science	- Similarities and differences between **offspring and parent** - **Water sources** including local watersheds - Water conservation and the water cycle
	Social Studies	- Diverse features of the environment - Relationship between the community and environment - Aspects of life shared across cultures (family, holidays, food, etc.)
Grade 3	Science	- Biodiversity in the local environment
	Careers	- Connections to the community (local jobs)
	Physical Health Education (PHE)	- Nutrition and hydration choices to support different activities and overall health
Grade 4	Science	- Sensing and responding to humans, environment, and animals
	Careers	- Jobs in the local community, influence of peers, family and community on personal choices and goals
Grade 5	Science	- Interconnectedness with the environment - The nature of sustainable practices around BC resources - First Peoples concepts of interconnectedness and sustainability
	Careers	- Goal setting, problem solving and decision making strategies
	PHE	- Food choices to support active lifestyles and overall health
Grade 6	PHE	- Practices to promote health and well-being; influences on food choices
	Social Studies	- Urbanization and migration of people - Economic policies/interdependence and resource management - Globalization and trade

Grade 7	Science Social Studies Careers	- Organisms have evolved over time - Survival needs and natural selection - Evidence of climate change over time and human impact - Human responses to particular geographic challenges and opportunities - Local and global needs and opportunities - Life and career planning
Grade 8	Science Social Studies ADST	- Characteristics of life - Photosynthesis and cellular respiration - Relationship of microorganisms with living things - Human responses to particular geographic challenges and opportunities, including climate, landforms and natural resources - Food Studies → social factors that influence food choices; variety of eating practices; local food systems - Entrepreneurship/Marketing → role of entrepreneurship in designing and making products/services (branding, pricing, record keeping); difference between consumer wants and needs
Grade 9	Science ADST Careers	- Sexual and asexual reproduction - Matter cycles within biotic and abiotic components of ecosystems; sustainability of systems - Food studies → ethical issues related to food systems; health, economic and environmental factors that influence availability and choice of food - Entrepreneurship/Marketing → flow of goods and services from producer to consumer; identification of a good/service - Factors affecting types of jobs in the community - Career value of volunteering - Workplace safety
Grade 10	Sciences ADST	- DNA structure and function - Patterns of inheritance - Mechanisms for the diversity of life - Applied genetics and ethical considerations - Food Studies → simple and complex global food systems; causes and consequences of food contamination outbreaks - Culinary Arts → locally available food products

Grade 11	Sciences	- Human actions and their impact on ecosystem integrity - Resource stewardship - Water distribution has a major influence on weather and climate - Levels of biotic diversity - Evolution, artificial selection and genetic modification
	Social Studies	- Global agriculture practices - Demographic patterns of growth, decline and movement
	ADST	- Food Studies → issues involved with food security; factors involved in the creation of food guides/labelling - Culinary Arts → BC agriculture practices
Grade 12	Sciences	- Organ systems structure and function/interdependence - DNA/ gene expression - Land use, degradation and management - Conservation of water
	Social Studies	- Global agricultural practices
	ADST	- Food justice, legislation, regulations and agencies that influence food safety and food production; factors in regional and national food policies; development of a food philosophy