A Step by Step Teacher's Guide to Growing a Garden with your Class

BC Agriculture in the Classroom Foundation
bcaitc.ca

Welcome to the BC Agriculture in the Classroom Foundation's Harvest Bin Project.

At BCAITC, we understand that many school grounds are simply not suitable for a school garden - due to lack of space or lack of garden beds with nutrient rich soil. This can be a frustrating hurdle for teachers who want to bring gardening into their schools, so a solution was devised in the form of the Harvest Bin Project.

The Harvest Bin Project is a three year initiative that provides schools with the materials needed for successful raised bed style garden plots, with minimal disruption to the school grounds. This project allows teachers to bring BC's agriculture into the classroom through engaging students in hands-on, place based, experiential learning. Students will be involved in the farming process from setting up the bins, to planting, growing, and harvesting a wide variety of crops. Through the Harvest Bin project students will have the opportunity to develop the intellectual, personal, and social/emotional proficiencies associated with the New BC Curriculum, as well as meet the needs of multiple curricular and content goals. In addition, students will be able to engage with their peers to develop cooperation and collaboration skills, and foster the life-long skill of gardening!

The Harvest Bin Project can help support the learning objectives for a variety of classrooms. It has purposefully been structured with flexibility in mind so that it can be a meaningful learning experience regardless of grade or subject. The Harvest Bin Project also facilitates many cross curricular experiences, including collaboration with other classes, local community organizations, and Indigenous groups.

Program Objectives:

1. To support teachers with the initial set up of a school garden
2. To provide students with the opportunity to plant, grow and harvest their own food
3. To enable students to gain an appreciation of BC's Agriculture
4. To assist teachers in providing students with hands on, place based learning experiences in line with BC's new curriculum.

We hope you enjoy The Harvest Bin Project, and look forward to working and growing with you!

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NEW BC CURRICULUM -
CONNECTIONS AT A GLANCE

GRADE & SUBJECT	BIG IDEAS	CONTENT
K Science	Plants and animals have observable features Daily and seasonal changes affect all living things	- Basic needs of plants, adaptations, living things accommodate daily/seasonal changes
K Social Studies	Healthy communities recognize and respect the diversity of individuals and care for the local environment	- Relationship between the community and environment
Grade 1 Science	Living things have features and behaviours that help them survive in their environment Observable patterns and cycles occur in the local sky and landscape	- Names of local plants and animals - Behavioural adaptations of animals in the local environment
Grade 1 Social Studies	Healthy communities recognize and respect the diversity of individuals and care for the local environment	- Relationship between the community and environment
Grade 2 Science	Living things have life cycles adapted to their environment Water is essential to all living things, and it cycles through the environment	- Similarities and differences between off spring and parent - Water sources including local watersheds - Water conservation and the water cycle
Grade 2 Social Studies	Local actions have global consequences, and vice versa	- Diverse features of the environment - Relationship between the community and environment
Grade 3 Science	Living things are diverse, can be grouped, and interact in their ecosystems.	- Biodiversity in the local environment - Connections in the community

GRADE & SUBJECT	BIG IDEAS	CONTENT
Grade 4 Science	All living things sense and respond to their environment	- Sensing and responding to humans, environment, and animals
Grade 5 Science	Multicellular organisms have organ systems that enable them to survive and interact within their environment	- Interconnectedness with the environment
Grade 6 Science	Multicellular organisms rely on internal systems to survive, reproduce and interact with their environment	Basic structures and functions of body systems
Grade 6 Applied Design Skills and Technology (ADST)	Design can be responsive to identified needs	Practices to promote health and well-being; influences on food choices
Grade 7 Science	Evolution by natural selection provides an explanation for the diversity and survival of living things	- Organisms have evolved over time - Survival needs
Grade 7 Social Studies	Human and environmental factors shape changes in population and living standards	- Human responses to particular geographic challenges and opportunities
Grade 7 Careers	Our attitudes toward careers are influenced by our view of ourselves as well as by our friends, family, and community	- Local and global needs and opportunities - Life and career planning
Grade 8 Science	Life processes are performed at the cellular level	- Characteristics of life - Relationship of microorganisms with living things
Grade 8 ADST	Design can be responsive to identified needs Complex tasks may require multiple tools and technologies	- Food Studies→social factors that influence food choices; variety of eating practices; local food systems

GRADE & SUBJECT	BIG IDEAS	CONTENT
Grade 9 Science	Cells are derived from cells The biosphere, geosphere, hydrosphere, and atmosphere are interconnected, as matter cycles and energy flows through them	- Sexual reproduction - Matter cycles within biotic and abiotic components of ecosystems
Grade 9 ADST	Complex tasks require the sequencing of skills Complex tasks require different technologies and tools at different stages	- Food Studies →ethical issues related to food systems
Grade 9 Careers	Our career paths reflect the personal, community, and education choices we make The value of work in our lives, communities and society can be viewed from diverse perspectives	- Factors affecting types of jobs in the community
Grade 10 Science	DNA is the basis for the diversity of living things	- DNA structure and function - Patterns of inheritance - Applied genetics and ethical considerations
Grade 10 ADST	Diner needs and tastes inform culinary service Social, ethical, and sustainability considerations impact the culinary arts/design Consumer needs and preferences inform food production and preparation	- Food Studies →simple and complex global food systems; causes and consequences of food contamination outbreaks - Culinary Arts →locally available food products
Grade 11 Science	Human practices affect the sustainability of ecosystems Humans play a role in stewardship and restoration of ecosystems Complex roles and relationships contribute to diversity of ecosystems	- Human actions and their impact on ecosystem integrity - Resource stewardship - Water distribution has a major influence on weather and climate - Levels of biotic diversity

GRADE & SUBJECT	BIG IDEAS	CONTENT
Grade 11 Social Studies	Physical features and natural resources influence demographic patterns and populations distribution	- Global agriculture practices - Demographic patterns of growth, decline and movement
Grade 11 ADST	Services and products can be designed through consultation and collaboration Service and creativity inform the culinary arts Cuisine design interests require the evaluation and refinement of culinary principles and practices	- Food Studies →issues involved with food security; factors involved in the creation of food guides/labeling - Culinary Arts →BC agriculture practices
Grade 12 Science	Sustainable use land use is essential to meet the needs of a growing population Living sustainably supports the well-being of self, community, and Earth	- Organ systems structure and function/ interdependence - DNA/ gene expression - Land use, degradation and management - Conservation of water
Grade 12 Social Studies	Physical features and natural resources influence demographic patterns and populations distribution	- Global agricultural practices
Grade 12 ADST	Service and creativity inform the culinary arts Cuisine design interests require the evaluation and refinement of culinary principles and practices Services and products can be designed through consultation and collaboration	- Culinary Arts →Culinary best practices; Characteristics and properties of culinary ingredients; Social, economic, and environmental effects of food procurement decisions - Food Studies →food justice in the local community; legislation, regulation and agencies that influence food safety and production; perspectives on indigenous food sovereignty

For a complete list of Core Competencies, Big Ideas, Curricular Competencies and Content Connections, please see the New BC Curriculum website at **https://curriculum.gov.bc.ca/**

"It was a great learning experience on how to grow and harvest food rather than just going to the store."

- Student, Guru Angad Dev Elementary School

HARVEST BIN PROJECT

PROJECT TIMELINE EXPECTATIONS

Year 1 of the project you will receive:

- 5 large berry harvest bins
- A gift card ($275) to a nursery or garden centre in your area to purchase:
  - Plants
  - Seeds
  - Two yards of soil and delivery to the school
  - Slow release fertilizer for feeding the plants
- A guidebook including planting and harvesting tips.
- A visit from the Project Coordinator and a local farmer.
- Updates and helpful hints from the Project Coordinator.

Year 2 of the project you will receive:

- A gift card ($100) to a nursery or garden centre in your area to purchase:
  - 6 bags of amending soil
  - Soil tester kit
  - Seeds
  - Plants
  - Plant fertilizer
- Updates and helpful hints from the Project Coordinator.
- Guidebook Supplement Lessons.

Year 3 of the project you will receive:

- A gift card ($75) to a nursery or garden centre in your area.
- Updates and helpful hints from the Project Coordinator.
- Guidebook Supplement Lessons.

Schools will need to Supply:

- Wheel barrows
- Shovels
- Hoses
- Watering jugs
- Trowels
- Hoes
- Water source

STEP 1 - PREPARING TO PLANT

Preparing to Plant: Things you should know and do BEFORE your soil and Harvest Bin kits arrive

March

1. The Harvest Bin Program Coordinator will arrange a phone/online meeting with you and your school team to go over the outline and expectations of the program.
    a. A location for the bins at the school
    b. An initial outline of your garden plan for the year
    c. Criteria for a year-end report from you and your team (See Reports pg. 14)

   During this month you will also receive a visit from the Program Coordinator/Volunteer and a farmer who will give a presentation on their career and will provide expertise on growing and harvesting crops (Program Coordinator to arrange).

2. Create a concept garden plan based on your outline. Share your garden plan when we visit, considering what you will be planting and the general set up of the garden (see Garden Planning Ideas page to help get you started).

3. Plant seedlings such as tomatoes, peppers, broccoli, cabbage, and leeks indoors and leave near a sunny window until ready to transplant.

4. Plan with your teacher colleague and communicate to the Program Coordinator which of the available dates and times you would like the kits to be delivered to your school (teacher@aitc.ca).

5. Identify the area where the equivalent of two yards of soil can be placed. It is your responsibility to purchase the soil you need for this project from a garden or home centre.
    a. Ensure there are shovels and wheelbarrows for students to use to fill the bins.
    b. Have a water source or watering cans available to use immediately after planting.

April

6. You will receive your gift card in April to purchase plants and seeds of your choice. See Westcoast Seeds planting charts and Pencil Patch resources list of plant varieties and when to plant them.
    a. Westcoast Seeds Ltd offers a complimentary seed donation to schools interested in gardening on school property. More information is available at https://www.westcoastseeds.com/seed-donations/

7. Review the guidelines of how to plant - listed on next page.

Things you should know and do the day your kits arrive (April)

1. **Ensure that the following materials have been delivered:**
    a. Five Harvest Bins – from BCAITC
    b. Soil – from your arranged provider

Things you should know and do when planting (April-May)

1. **Prepare the Bins:**
    a. Using shovels and wheelbarrows, transfer the soil into the bins (around three wheelbarrows full).
    b. Top up the bins fully with soil using the shovels.
    c. Once the bins are full, thoroughly mix plant food into the soil according to directions on the plant food package.
    d. Based on your garden plan, proceed to step two or three.

2. **For transplanting (this should be done in late April or May):**
    a. Dig small wells into the soil for each plant.
    b. Separate the plant varieties and place in front of the bins they will be planted into.
    c. Gently remove plants from the pots and place in the wells.
    d. Make sure the plant, when removed from its pot and placed into the bin, is replanted at the same soil level (i.e. the plant should not be buried lower than its original soil line).
    e. Backfill each plant with more soil. Leave the labels with plants for easy identification.

3. **For direct seeding:**
    a. Follow the directions for spacing and soil depth on the back of the seed packet.
    b. Plant seeds and cover with soil (according to the directions on the back of the seed packet).

4. **Water each bin thoroughly:**
    If you are able to use a hose this is ideal, since the soil will need a good soaking after you plant. If not, a watering can will work.

Additional resources on growing food and gardening can be found at the following websites:

a. Westcoast Seeds Ltd: www.westcoastseeds.com
b. The Old Farmer's Almanac: https://www.almanac.com/gardening/planting-calendar/BC
c. Gardening BC: http://www.gardeningbc.com/

STEP 2 - GARDEN MAINTENANCE

Plant Care Guide: Things you should know and do throughout the growing season

1. **Ensure your plants are well watered - if the weather is warm and dry this may have to be done every 2-4 days**

   How to tell if your bin needs watering

   a. Check to see if the plants are dry by feeling the soil or observing if the soil is pulling away from the side of the bin.
   b. A fun way to check if the bins need water is to have your students plunge a finger into the soil (being careful not to harm the plants). If their finger comes out with soil stuck to it then the bin should not need water. If their fingers are clean then the soil is dry and it is time to water the plants.
   c. Watch for wilting and diseased plants, and remove or treat as needed.

2. **Weeding – even in container gardens, weeds can find their way in and take over the rest of the crops.**

   a. Weeding is easiest when the weed is small: don't wait for them to get big!
   b. Ensure the entire weed is removed (plant and root), otherwise it is likely to grow back.
   c. For large, stubborn weeds with deep roots, use a small garden trowel to gently loosen the soil before pulling the plant out. This is easier to do if the soil is wet.

3. **Thinning – this will need to be done for plants that are growing very closely together, such as carrots.**

   a. Thinning should be done while the plants are still young, in order to provide enough space be tween each plant to grow to its full size without getting tangled in a neighbour or competing for water and nutrients.
   b. Thin the plants in a straight line, taking the thinnest plants first. These thinned plants can be added to a compost pile.
   c. Thinning may also need to be done for seedlings prior to transplanting, if more than one seed was planted in a pod.

4. **Building supports in the garden – some plants, such as peas and beans, need additional physical supports to help stabilize the plant as it grows.**

   a. Peas need wooden poles or a trellis to help guide the vines up to the sun and prevent tangles with other plants, which will make harvesting your crop much more difficult
   b. A simple trellis can be made with thin wood (such as bamboo) stakes and chicken wire, spaced evenly along the length of the bin.
   c. Beans will wrap around stakes made of wood with some gentle guidance: take the tip of a vine and lightly wrap it around the pole. The vine will climb naturally upwards towards the sun.

STEP 3 - HARVEST

Harvest: Things you should know and do when it is time to harvest your gardens

We encourage you to maintain your bins throughout the summer months. This is the time when you will see the most growth from your crops.

1. **Harvesting Early Summer Crops:**

   a. You should be able to harvest salad greens, spinach, peas, radishes, and tender herbs like cilantro by late May or June, depending on the spring temperatures and size of the plants.

   b. The transplants will take less time to be ready for harvest, but still need time to adjust to their environment and become rooted in the soil (2-3 weeks from planting).

   i. Swiss Chard: Cut leaves at the base of the plant with a sharp knife.

   ii. Lettuce: use a knife or sharp shears to cut individual leaves of lettuce off each plant until you have handful. The plants will keep making more leaves for you. You will not be able to harvest a full head of lettuce from these greens.

   iii. Spinach: Small spinach leaves can be harvested with scissors by simply cutting the leaves at the stem. One way to do this is start harvesting the outer, older leaves first and then gradually working your way in to the center of the plant as those leaves mature. You can also just cut the whole plant off at the base.

WHAT DO I DO IN SUMMER & WINTER?

We encourage you to make your garden a year round space for learning and growing. The following are some suggestions for how to maintain your gardens through the summer and winter months.

SUMMER

Summer is the time when you will see the most growth in your bins, especially if you planted crops such as carrots or beans that are traditionally harvested through the later summer months.

- Consider setting up a class volunteer system for watering and maintaining your garden through the summer months.

- Get involved with community groups, such as seniors centres, youth service groups or community gardeners to help with summer maintenance

- Set up an automatic or timer based watering system to help supplement visits to the garden over the summer.

- Organize a summer harvest day where everyone comes to the school to help with the harvest, and gets to take home their yummy produce!

- If desired, let some plants go to seed and record the results in September.

WINTER

There are ways to extend the growing season for your gardens into the late fall and even early winter months. Here are a few examples:

- By using cloches (protective barrier) or mini-greenhouse structures to enhance the micro-climate and warm the soil for early germination.

- Making a hoop tunnel cold frame - an easy and non-disruptive method is to sink 12- to 18-inch metal stakes into the ground and slide 6-foot sections of electrical conduit or PVC pipe over them, creating an arch. You can then stretch plastic over these hoops and protect the plants underneath from nighttime temperatures and frost.

Some small structures can also be purchased for around $100, including this Mini Greenhouse from Wayfair.ca.
When considering building any type of structure, school administration will need to give approval.

- Starting plants inside with a grow light is another possibility. There are a range of plants that be started as early as end of January. Combined with a protective structure some seedlings may be placed outside.

REPORTING DEADLINES

MAY 30TH - MIDTERM REPORT

Report must contain 3-5 captioned images showing garden progress, sent to the Program Coordinator via email teacher@aitc.ca

All submitted images must be digital, high quality resolution photos. We will sometimes use these images to promote our programming or for sponsorship reports, and we appreciate getting to see our programs in action!

JUNE 25TH - FINAL REPORT

A Summary Report of the Harvest Bin Project is to be sent to the Program Coordinator via email teacher@aitc.ca.

Report Formatting:

Upon meeting with the Program Coordinator in March, you will need to outline criteria for your final reports. Some examples of report styles include:

- Written reports, PowerPoint or Prezi slideshows
- Videos or other multimedia presentations
- Creating a website or blog

Using your chosen format, your report must answer the following questions:

- Describe what you and your students chose to do with the Harvest Bins
- How did you tie this project to the BC Curriculum? (Please include Big Ideas, Curricular Competencies and Content for each grade and subject)
- What impact did this project make at your school overall?
- How many students or members of the community were reached through this project?
- Provide at least three examples of successes you had during the project. These can include images, quotes, or “ah-ha” moments.
- What challenges did you encounter during this program?
- How effective was the support and communication from BCAITC during the program? Any suggestions for improvement?

You will be contacted via email when your reports have been received.

GARDEN PLANNING IDEAS

A large part of the fun in gardening is the initial planning and designing of your gardening space. There is plenty of opportunity for creativity in the garden, even before you plant! Encourage involvement from your students and community groups to extend the learning.

The following list contains suggestions for design elements that can be incorporated into your Harvest Bin gardens:

1. Consider using the blue Harvest Bins to create a larger shape – maintaining clear access to each bin for watering and harvesting. One example is the formation of a Medicine Wheel garden – see lesson plan booklet

2. Label the plants with their common name, Latin names, and Indigenous names.

3. Add welcoming elements to the garden such as seating, decorative pathways, and garden decorations.

4. Consider how to make your garden attractive to pollinators– plant some pollinator friendly plants, or create your own butterfly and birdfeeders using recycled materials.

5. Create custom signage explaining the parts of your garden and to mark where and what your plants are in each plot.

6. Try adding a composting station to help fertilize the plants – see the link to building a worm hotel at: https://www.bcaitc.ca/sites/default/files/resources/Wonderful%20Worms.pdf.

7. Include a weather station in your garden – the perfect place to monitor events such as precipitation, wind speed and temperature.

HARVEST BIN EXTENSION LESSONS

Starting a gardening project is a great way to connect to the BC Curriculum. The Harvest Bin Project is designed to be used with multiple subject areas from Kindergarten to Grade 12, and to help get you started, we have provided you with some specific Harvest Bin lessons available on our website, www.bcaitc.ca

Like our programming, this list of lessons will be growing each year, so check in regularly! If you have a lesson or unit you used for the Harvest Bin Project that you would like to share, please submit it to teacher@aitc.ca

Check out these other great FREE resources at www.bcaitc.ca:

- A Slice of Soil
- Investigating Topsoil
- My First Herb Garden
- Plant Something Bee Friendly
- Watering and Plant Growth
- Wonderful Worms

BC Agriculture in the Classroom Foundation
bcaitc.ca

Contact Information:
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MANY THANKS GO TO:

Our Program Sponsors

BC Youth in Agriculture Foundation |
Network Paper and Packaging (Netpak) | Diamond Delivery |
Snowcrest | Silver Valley Farms | Vancity

HARVEST BIN PROJECT

A sample of Student Worksheets & Activities to use with your class

HARVEST BIN GETTING STARTED
KWL CHART

What I Know About Gardening/Farming:

What I Want To Know About Gardening/Farming:

What I've Learned About Gardening/Farming:

PLANTING RECORDS:
WHAT'S IN YOUR BIN?

Observations:

PLANTING RECORDS:
WHAT'S IN YOUR BIN?

BIN ONE: _____

1

_____

_____

BIN TWO: _____

2

_____

_____

BIN THREE: _____

3

_____

_____

BIN FOUR: _____

4

_____

_____

BIN FIVE: _____

5

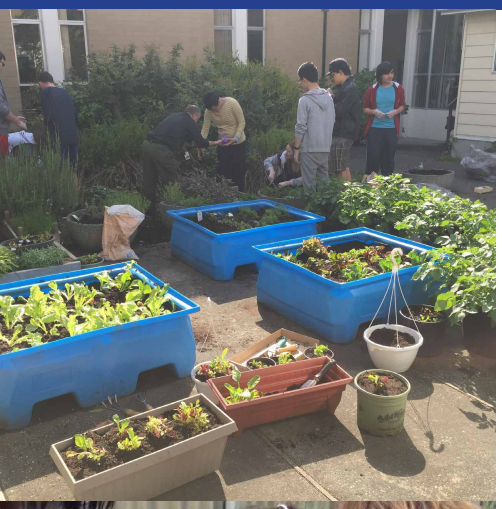
_____

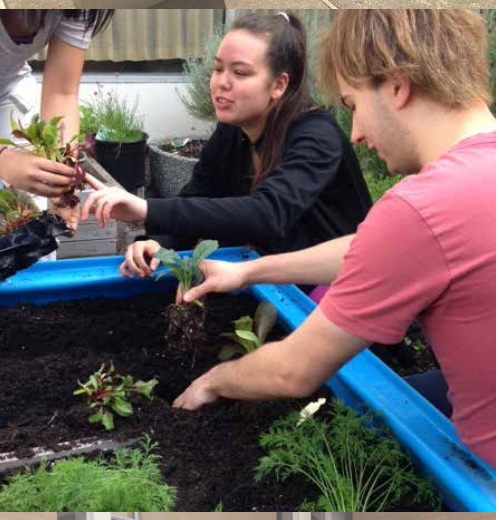
_____

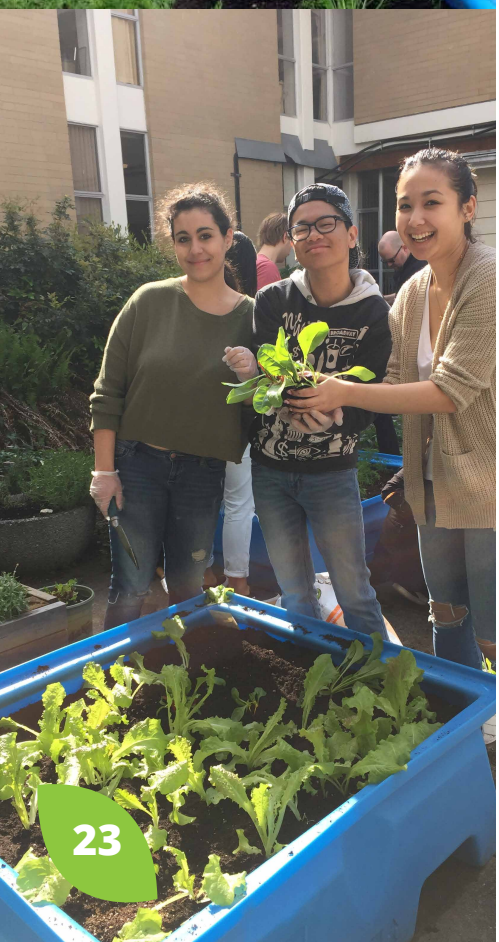
HARVEST BIN WORD SEARCH

E T A A E G U H L R R X E T D
E R S M N O A J O W E U L E E
G V U I E R H T C R Z X B O W
R N T T V N A Z E V I F I B E
C A I E L N D T E M L S D I X
E R S W I U G I Z I I U E N Y
L T O L O P C C N T T N Y S S
J P L P P R G I J G R L W F L
X O F O N M G G R S E I Q D P
P L A N T I N G O G F G I D O
T S O P M O C I Q Q A H J P L
W A T E R N L C N R B T X D E
X Q I N I H V Y P X Z P M X D
T F O C O J U O W J E M L A E
W J H S N N I Y S S B F W P L

AGRICULTURE
BINS
CROP
EDIBLE
FIVE
HARVEST
POLLINATOR
SUNLIGHT
AMENDING
COMPOST
EATING
FERTILIZER
GROWING
PLANTING
SOIL
~~WATER~~







KEEP IN TOUCH!

For more information about our programs and teacher resources visit:

www.bcaitc.ca

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Happy Harvesting!