



# A SEASONAL BALANCE (Part I)

**GRADE** Grade 4

**PART** 1 of 3

**TOPICS** Plants, growth, change, interactions, citizen science

## CURRICULAR CONNECTIONS

Grade 4 Science

Topic E – Plant Growth and Changes

1. Describe the importance of plants to humans and their importance to the natural environment
4. Recognize that plant requirements for growth; i.e., air, light, energy, water, nutrients and space; vary from plant to plant and that other conditions; e.g., temperature and humidity; may also be important to the growth of particular plants
6. Recognize that a variety of plant communities can be found within the local area and that differences in plant communities are related to variations in the amount of light, water and other conditions
11. Describe ways that seeds are distributed; e.g. by wind, by animals; and recognize seed adaptations for different methods of distribution

## READING LIST

- **Thirteen Moons on Turtle’s Back** by Joseph Bruchac & Jonathan London
- **Braiding Sweetgrass** by Robin Wall Kimmerer

## OVERVIEW

Students will begin their investigation of the relationships between plants, animals and people by looking at food webs. They will be challenged to look at how plants and animals benefit each other and what happens when these connections are separated. By immersing themselves in a natural setting and making observations using their senses, they will gain a broader appreciation for the interactions that are happening around them.

## OBJECTIVES

- Students will understand that both plants and animals have needs that must be met
- Students will understand that all organisms are interconnected to one another
- Students will appreciate that seasons and plants are linked to important cultural ceremonies in different cultures

## KEY TERMS

- **Decomposer** – a living thing (e.g. fungus or insect) that feeds on and breaks down plant and animals matter into simpler parts
- **Food chain** – a sequence of plants and animals that depend on each other for food
- **Food web** – the whole group of interacting food chains in a community
- **Reciprocity** – the give-and-take process of exchanging resources or knowledge with others that benefits both sides
- **Seasonal round** – the movement of First Nations, Métis and Inuit people during different times of year to obtain resources

## GUIDING QUESTIONS

- Why are the relationships between plants and animals important?
- What are some ways that plants directly benefit from their relationships with animals?
- How do the traditional practices of First Nations, Métis and Inuit people show reciprocity?

## BACKGROUND ESSAY

Plants – like all living things – need energy to live. For people and animals, our energy comes from the food that we eat. Plants get their energy from soil, light, nutrients, water and air. This energy allows plants to survive and grow. How do these needs compare to human needs? What will happen to a plant if it is not able to meet any one of these needs? For example, imagine what would happen if we stopped watering our houseplants. How long would they be able to survive? What changes would we expect to see?

In addition to meeting their basic needs, many plants form important relationships with animals that are vital for their ability to produce



seeds and more plants. These relationships are one part of a very complex interconnected system that everything in nature depends on to survive and thrive. We call the relationships between plants and animals that depend on each other for food a **food chain**.

A simple food chain might start with whitebark pine nuts, which are eaten by Clark's nutcrackers. Then the nutcrackers are eaten by great grey owls. Energy is passed from one part of the food chain to the next. Eventually **decomposers** like bacteria and mushrooms break down animals when they die and the whole chain begins again. While the nutcrackers rely on the whitebark pine nuts for food, whitebark pines also rely on nutcrackers to spread and plant their seeds. Nutcrackers stash these seeds underground to save them for later, but do not always remember where the seeds were stored. The seeds they forget might grow into a new tree!

Usually animals eat more than one type of plant or one type of animal. Imagine a grizzly bear that eats dandelions, buffaloberries, pine nuts and ground squirrels. Each of those plants and animals has its own needs to meet. We call multiple food chains that interact with one another a **food web**. Food webs are closely tied to the seasons. For example the food that a grizzly bear eats in the spring will be different than the food that it eats in the late summer.

**DURATION** 20-30 minutes

**MATERIALS**

- Ball of yarn
- Food web cards

**ACTIVITY – BUILD A FOOD WEB**

Students will understand how all living things are connected within an ecosystem through this hands-on activity. They will explore the ripple effect that is created when a link in the web is removed.

1. Begin by leading a discussion about the interconnectedness of ecosystems. What are examples of predator/prey relationships in an ecosystem? Encourage students to think beyond animal-to-animal interactions and to consider what plants need to survive and what happens to animals after they die.
2. Distribute food web cards to students. The cards will say what the organism eats/needs to survive and what eats/preys upon that organism.
3. Review the rules of the game: do not pull on the string, do not let go of the string unless the teacher tells you to do so. Hold your card up so that everyone can see what card you have.
4. Choose one student to start. They will read aloud the name of the organism they have and what they eat. Holding onto the yarn, they will pass the ball of yarn to one of the organisms that they eat (or one of their needs in the case of plants and mushrooms).
5. Encourage the students to try to pass the yarn to organisms that have not been included yet. Once all of the organisms have



received the yarn, pause the activity. Lead a discussion about the connections that the students see. What does the yarn resemble? Do some organisms have more connections than others? What impact does this have on their response to changes?

6. Illustrate the impact that a change can have on the entire system by introducing out an ecosystem scenario (e.g. *a new highway is built through the area and all the grizzly bears are cut off from the ecosystem*). The student holding the organism in question will drop their string. Any animal that eats that organism will drop the string connected to them. If it is the only string they are holding, they die. Continue with this chain of reaction.
7. Compare the effect of removing an organism with few connections versus one with many. Compare the impact of losing a producer versus a consumer. What happens when soil is removed?

This activity has been adapted from “The Food Web” from Pollinator Partnership. View the original lesson plan at [www.pollinator.org](http://www.pollinator.org).



#### KEEP READING

Robin Wall Kimmerer is a member of the Citizen Potawatomi Nation and a botanist. In her book **Braiding Sweetgrass**, she draws both on traditional teachings of plants and the tools of science to share the lessons and gifts of other living beings. This beautifully written collection of essays has many stories about our reciprocal relationships with plants that you can share with your class.

#### BACKGROUND ESSAY

What are some of the things that happen each year in the environment that you look forward to? Do you look forward to hearing the first spring peepers in the spring? Or juicy peaches in the summer? What about the changing colours of the larches in the fall? Depending on where you live the changes that you look forward to each year will be different. You might find peepers on the East Coast, juicy peaches in the Okanagan Valley and larches high in the Rocky Mountains.

Animals are not the only creatures that have formed important relationships with plants. Since time immemorial, humans have harvested plants and animals in order to survive. Families moved locations with the seasons, following the annual cycles of plants and animals. For example a Métis family living in the prairies may have planted a garden in a home community in the late spring and early summer, hunted bison in the late summer, harvested berries in the fall and spent the winter trapping. This movement of people is referred to as a **seasonal round**.

Weather conditions and natural signs would affect when and where people moved and what they harvested.

“For the Métis of the Paddle Prairie region of northern Alberta, the seasonal cycle began in Niskipesim or Goose Moon (March), when geese begin their migratory flight to northern nesting grounds, announcing the arrival of spring. All exposed grass, stubble fields, and dead leaves are burned at this time to renew the forest and meadows.” (*Métis Seasonal Cycles* – Darren R. Préfontaine, Patrick Young and Todd Paquin)



Just as there is a reciprocal relationship between Whitebark pine and Clark's nutcrackers, the example above shows the reciprocal relationship between people and forests. The concept of **reciprocity** reminds us that there is a give-and-take relationship between all things.

Today there are many people who live a traditional lifestyle in part or in whole that focuses on seasonal cycles. Ceremonial gatherings continue to be held in Alberta First Nations communities to celebrate and give thanks for the changing of the seasons, such as the Tea Dance (*dawots'ethe*, Dené Tha') and the Round Dance (*mâskisimowin*, Woodland Cree; *pîcîcîwin*, Plains Cree). In settler-dominant communities, yearly festivals and events such as the Lilac Festival in Calgary or Harvest Fest in Edmonton also celebrate changing of seasons.

**DURATION** 5-20 minutes

**MATERIALS**

- Foam pads (optional)
- Plastic bag (optional, for sitting on wet days)

**ACTIVITY – SIT SPOTS**

This activity gives students an uninterrupted opportunity to observe nature. Afterwards, there are lots of opportunities for reflection to accommodate different learning styles.

1. Begin by setting the expectations and ground rules for the activity. This is an independent activity. Students will be expected to sit in one spot for a set amount of time. During this time they should not talk or interact with their classmates. This is their opportunity to quietly observe their surroundings.
2. Encourage students to use their senses to hear, see, smell and feel (but not taste) their surroundings. In particular, students should make observations about interactions that are happening around them.
3. Students should find a spot where they can sit safely and comfortably. Teachers may want to strategically select spots for the students to prevent likely distraction between certain individuals.
4. Once the time has passed, bring the students back together to share their observations and reflections. What did you hear, see, smell and feel? What plants, insects or animals did you see? What were they doing? Did you observe any plants or animals that you didn't recognize? Did you feel calm, relaxed or distracted? Ask students to make predictions about how the things they observed might change through the seasons.
5. *Extension: Make regular time for your class to revisit their sit spots throughout the year. Ideally students will use the same spot each time so that they can observe changes in the environment through the seasons. If it is the first time that your class is doing a sit spot, you may wish to sit for a shorter amount of time. As students gain*



*familiarity and comfort with their spots and the activity, extend the time.*

6. *Extension: Have students share what they observed through different artistic interpretations such as journals, paintings or theatre.*

## REFERENCES

Alberta Education. (2012). *Symbolism and Traditions: Ceremonies*. From *Walking Together: First Nations, Métis and Inuit Perspectives in the Classroom*. Government of Alberta. Online resource.

Paquin, T., Préfontaine, D. R. & Young, P. (n.d.). *Métis Seasonal Cycles*. Métis Museum. <http://www.metismuseum.ca/media/db/00742>



# A SEASONAL BALANCE (Part II)

**GRADE** Grade 4

**PART** 2 of 3

**TOPICS** Plants, growth, change, interactions, seasons, citizen science

## CURRICULAR CONNECTIONS

Grade 4 Science

Topic E – Plant Growth and Changes

1. Describe the importance of plants to humans and their importance to the natural environment
3. Describe common plants, and classify them on the basis of their characteristics and uses
4. Recognize that plant requirements for growth; i.e., air, light, energy, water, nutrients and space; vary from plant to plant and that other conditions; e.g., temperature and humidity; may also be important to the growth of particular plants
6. Recognize that a variety of plant communities can be found within the local area and that differences in plant communities are related to variations in the amount of light, water and other conditions
11. Describe ways that seeds are distributed; e.g. by wind, by animals; and recognize seed adaptations for different methods of distribution

## OVERVIEW

Students will continue their investigation of the relationships between plants, animals and people by looking at the ways in which different cues from the environment determine when changes will occur. By relating key seasonal environmental events to their own lives, they will gain a greater appreciation and understanding of the delicate balance that exists between different species.

## OBJECTIVES

- Students will be able to provide examples of cues that plants and animals receive from changing seasons
- Students will be able to provide specific examples of animal-plant interactions
- Students will understand how climate change can disrupt animal-plant interactions

## KEY TERMS

- **Climate** – the average measurements of temperature, wind, humidity, snow and rain in a place over the course of many years
- **Deciduous** – trees and shrubs that shed their leaves every year, usually in the autumn
- **Phenology** – the study of yearly cycles of animals and plants
- **Pollinator** – an animal that allows plants to make fruit or seeds
- **Prediction** – a statement about what might happen in the future

## GUIDING QUESTIONS

- What are the cues that indicate to plants when it is time to undergo certain changes?
- How are climate and weather different from one another?
- What are some of the ways that changing climate could disrupt relationships between plants and animals?

## BACKGROUND ESSAY

How do we know that the seasons are changing? How do we change our behaviours to adapt to different seasons? We might use a clock or a calendar to determine when it is time to do certain things. Perhaps we know what season it is based on events that come around every year, such as returning to school after summer vacation or celebrating an important holiday with our families. But what would happen if we had no calendars?

Plants and animals rely on cues from the environment to know when to undergo changes. The study of the yearly cycles that plants and animals go through is known as **phenology**. The changes that plants and animals go through each year have nothing to do with the calendar that guides many humans' activities. In the spring, leaf buds and flowers develop and bloom. In the fall, **deciduous** trees like aspen and poplars lose their leaves.





Plants and animals respond to natural cues to know when to it is time to change, grow or move. These cues include length of day and the movement of other animals. They are also closely linked to the **climate** of where they grow. Climate is the average measurements of temperature, wind, humidity, snow and rain in a place over the course of years. Climate is similar to weather, except that it happens over a long, long time rather than what is happening outside your window at one exact moment in time.

In Part I, we learned about the important interactions between plants and animals that are key to their survival. Phenology is very important when we think about how and when animals meet their needs. For example, when grizzly bears emerge from their dens in the spring they travel to the valley bottoms where the snow has melted and the first flowers like dandelions are flowering. As the snow melts at higher elevations in early summer they might travel back uphill in pursuit of Whitebark pine nuts, until the buffaloberries ripen in late summer and the bears return to the valley bottoms.

Another important relationship to consider is between flowers and **pollinators**. Pollinators are animals that allow plants to make seeds and fruits. They do this by moving pollen from one part of the flower of a plant to another part of the same plant or a different one. Often the time that a flower is blooming is very short, so it is very important that pollinators can find them during these short windows so that plants can produce seeds and more plants. Over many, many years, animals and plants have perfected these relationships.

For many thousands of years, people have broken up the year into seasons based on distinct weather patterns, amount of daylight, or food gathering activities. Our ancestors survived by making observations about their natural environment and learning when to hunt, plant, or gather certain types of food.

**DURATION** 20-30 minutes

**MATERIALS**

- Ball of yarn
- Food web cards

**ACTIVITY – PHENOLOGY CALENDAR**

Students create a month by month calendar of phenological events in order to reinforce the idea that they likely already have a good baseline understanding of phenology even though the term is likely to be new to them.

1. Place 6 or 12 sheets of chart paper around the room. Label each sheet with a month of the year. For smaller groups, you may choose to label each sheet with two consecutive months (e.g. January/February, etc.). Some younger students may need to complete this activity using seasons instead of months.
2. Divide students into groups based on their birthday months. *As an added challenge, you can first ask students to arrange themselves in a line based on their birthdays **without talking**. This activity can further emphasize that nature is organized based on different cues,*



*whereas humans are accustomed to using talking to organize themselves.*

3. Ask students to fill in the calendar with different things that happen outdoors in the natural world during their birth month (or season). Ask them to think about plant, animal and human relationships with nature as well as the changes in weather and temperature during their month. Start by discussing the changes that are happening in the environment outside right now. *Depending on the level of reading/writing comprehension of the group, students can also draw their responses. Alternatively, an adult can write their ideas down.*
4. Some things that students might consider: animal migration, allergies, berry seasons, leaf colour change, annual festivals that celebrate the seasons, hunting or sports seasons. Students may find it easier to relate to things that happen in their own lives during different seasons that are not necessarily directly related to the environment (e.g. starting school, Christmas holidays). During the discussion you can help the students to relate these events back to environmental changes. Do any of the events relate to one another? For example does the arrival of a migratory bird overlap with the appearance of a certain type of berry?
5. Ask students to present their ideas to the class. Was there any overlap between months? How do events change from year to year? How do differences in where people have lived effect their understanding of yearly events? Explain to students that phenology is represented by the events that the students have added to the calendar.
6. *Extension: Create a classroom phenology-birthday book. Each student can contribute a page with an essay, poetry, images, etc. about a phenology fact corresponding to their birthday. Students could also create a phenology wheel, described how the changes, activities or cycles that one plant or animal species undergoes through the year.*

This activity has been adapted from “Phenology Calendar Activity” from the University of Maine – Signs of the Seasons: A New England Phenology Program. View the original lesson plan at [extension.umaine.edu/signs-of-the-seasons/resources-for-educators/phenology-calendar-activity/](https://extension.umaine.edu/signs-of-the-seasons/resources-for-educators/phenology-calendar-activity/).

### **BACKGROUND ESSAY**

Scientists make **predictions** about the timing of seasonal changes to predict how climate and the environment might change in the future. We have already learned that plant and animal growth and changes are closely linked to climate and that there are delicate relationships that exist between life forms. Currently the climate of the Earth is





changing much more quickly than it has in the past. This has led to warmer-than-average temperatures as well as changes to the amount of snow and rain that some places receive. One of the consequences of a changing climate is changes in flower and plant blooming times.

When the weather changes suddenly, humans can adapt by wearing warmer clothing or putting winter tires on our cars. However for plants and animals, it takes time for creatures to adapt to changes. Imagine for example that due to snow melting earlier, a plant that depends on a certain insect pollinator grows flowers a week earlier than it has in previous years. It takes time for insects to develop from egg to larvae to adult, and therefore they might not be able to fly from flower to flower to transport pollen. The delicate balance between insect and flower has been disrupted and it may take a long time to establish a new balance.



### LOCAL RESEARCH

Researchers Greg McDermid, David Laskin & Scott Nielson from the University of Calgary investigated how warming temperatures might affect the diet of Alberta's grizzly bears. Their research found that by the end of the 21<sup>st</sup> century, buffaloberries are expected to ripen nearly three weeks earlier in Alberta's Rocky Mountains. This would widen the gap between the availability of this important food source and hibernation.

Read more at

[theconversation.com/alberta-grizzly-bears-will-feel-the-effects-of-climate-change-113001](http://theconversation.com/alberta-grizzly-bears-will-feel-the-effects-of-climate-change-113001)

Another example is the connection between grizzly bears and buffaloberries. Buffaloberries are the major source of food for grizzly bears in the Canadian Rockies. During late summer, bears can eat up to 200,000 berries in a single day. Research predicts that in the coming decades these berries will ripen earlier than they have historically. This means that bears will have less time to forage for this important food source before hibernation. This could lead bears to look for food elsewhere and potentially bring them into contact with humans.

All food chains begin with plants. Anything that affects a plants' ability to reproduce can impact the other parts of the food chain and food web. Changing conditions can have a significant impact on how we live our lives and the interactions that we have with the natural environment.

Scientists around the world are using data about the timing of key seasonal events like flowering, fruiting and pollination to predict how climate and ecosystems might change in the future. Monitoring plants can provide valuable information about how the climate is changing and is among some of the oldest scientific data on record. Farmers have used phenological observations to determine when to plant and harvest crops and nature lovers use them to predict when the best time for viewing wildflowers will be.

**DURATION** >1 semester

### MATERIALS

Materials for the Classroom Phenology will vary based upon the type and depth of investigation undertaken by classes

### ACTIVITY – CLASSROOM PHENOLOGY

Citizen science is a great way for students to learn about phenology and local ecosystems while also contributing valuable information about phenology and climate change.

Plants undergo dramatic changes throughout the school year. This activity lends itself to a semester- or year-long activity, during which students take ongoing measurements to understand how weather and



plants change throughout the year and how those changes are linked to one another.

### NatureWatch & Alberta PlantWatch

The PlantWatch program empowers citizen scientists to record flowering times for selected plant species. The information that citizen scientists record is shared with researchers who are trying to understand how ecological changes may be affecting our environment. Participating in the Plantwatch program is a great way for students to learn about the terrific diversity of plants in their backyard while also helping scientists to better understand the effects of climate change in Canada.

Begin by creating a NatureWatch profile and acquainting yourself and your class with the species that are included. Get outside with your class and try to find as many of the plants on the list as possible. You may want to install semi-permanent markers (e.g. metal stakes with flagging tape) so that you can visit the same plants year after year. Within your account you will be able to submit your class observations for a list of species and specify whether you observed a first bloom, leafing out or mid-bloom event.

The Alberta PlantWatch website has many terrific classroom resources for teachers interested in getting involved. Get started at [www.naturewatch.ca/plantwatch/](http://www.naturewatch.ca/plantwatch/) and [www.plantwatch.naturealberta.ca](http://www.plantwatch.naturealberta.ca).

### Nature's Notebook

Nature's Notebook is a project of the USA National Phenology Network. While the data observations are specific to the United States, they have numerous associated activities that can be adapted to Canada and the Bow Valley. Their user friendly website allows you to select activities based on audience type, activity type and length, and keyword search.

For more information, visit [www.usanpn.org/nn/educate/activites](http://www.usanpn.org/nn/educate/activites).

### REFERENCES

Budburst. (n.d.). *About Phenology*. Chicago Botanic Garden. [budburst.org/phenology-defined](http://budburst.org/phenology-defined)



# A SEASONAL BALANCE (Part III)

**GRADE** Grade 4

**PART** 3 of 3

**TOPICS** Plants, growth, change, interactions, seasons, citizen science, stewardship

## CURRICULAR CONNECTIONS

Grade 4 Science

Topic E – Plant Growth and Changes

1. Describe the importance of plants to humans and their importance to the natural environment
3. Describe common plants, and classify them on the basis of their characteristics and uses
4. Recognize that plant requirements for growth; i.e., air, light, energy, water, nutrients and space; vary from plant to plant and that other conditions; e.g., temperature and humidity; may also be important to the growth of particular plants
6. Recognize that a variety of plant communities can be found within the local area and that differences in plant communities are related to variations in the amount of light, water and other conditions
11. Describe ways that seeds are distributed; e.g. by wind, by animals; and recognize seed adaptations for different methods of distribution

## OVERVIEW

Now that students have developed a solid understanding of the interconnectedness between plants, animals and people, it is time to delve into some ways that they can be stewards of the natural environment. The activities included within this lesson plan are just a couple of ways to build students' appreciation of the natural environment and the role that they can play in protecting it. Teachers may want to make further connections between climate change and carbon emissions by tackling action projects that reduce our collective carbon footprint.

## OBJECTIVES

- Students will understand that phenology is all around them
- Students will become familiar with several local native plant species
- Students will understand that they can participate in projects within their schools and homes that help plants and animals survive and thrive

## KEY TERMS

- **Citizen science** – the practice of public participation in scientific research to increase scientific knowledge
- **Habitat** – the place where a plant or animal grows or lives in nature
- **Native species** – plants or animals that originated and live in an area without human involvement

## GUIDING QUESTIONS

- How can individuals help to ensure that plants and animals are able to meet their needs in a changing climate?
- What are ways other than scientific research that people can bring attention to the needs of plants and the problems they might be facing?

## BACKGROUND ESSAY

Phenology gardens are planned landscapes that allow your class to monitor plant and animal phenology throughout the year. This might be as simple as a few plants in a window box outside the school or a forested area that is within walking distance. They are a terrific way to bring nature closer to the classroom and can be visited throughout the year with no added cost! With some planning, these 'gardens' can be easily incorporated into different units, topics, and subjects.

Phenology gardens are perfect companions to the Classroom Phenology Activities suggested in Part II of this lesson plan. Native plant gardens can be used in citizen science projects to contribute valuable scientific data to researchers investigating how climate change is impacting local ecosystems.



In the Bow Valley, most or all of our schools are situated within walking distance of habitat patches or forests that boast a wide variety of **native species**. Rather than planting a new garden, the most appropriate approach might be to designate a specific space that you will return to again and again.

### ACTIVITY – PHENOLOGY GARDEN

Some ideas to get you started with your phenology garden:

1. Define your scientific, educational, ecological and community development goals. Will you be collecting data for an initiative such as PlantWatch or will your investigations be limited to your class? If you want to collect data over a long-term (multiple years), how will you ensure that data is accessible and consistent?
2. Consider ways of making the garden more inviting by creating a beautiful place to rest and think. Simple additions such as benches (stumps work well) will encourage students and community members to visit the garden outside of scheduled class visits!
3. Have students create signage for your 'garden' that identify the common and scientific names of the species as well as other interesting information.
4. If you are using a natural forest for your garden, be mindful of understory vegetation and where students will be walking. It may be advisable to create defined paths or routes that students will stick to in order to minimize disruption of sensitive plants and animals.
5. There are many wonderful books and online resources about landscaping with native plants in Alberta. The Alberta Native Plant Council ([anpc.ca.ca](http://anpc.ca.ca)) has guidelines for sourcing and using native plants in landscaping on their website.
6. Garden with WildSmart practices in mind! Bears are attracted to ripened fruit because of its sweet taste and high caloric value – landscape with non-fruit bearing species. For a list of recommended species and plants to avoid in the Bow Valley, visit [www.biosphereinstitute.org/attractant-management-resources](http://www.biosphereinstitute.org/attractant-management-resources).
7. With your students, brainstorm ways that they can share what they have learned with a wider audience. For example, could students lead a tour of your 'garden' for younger (or older) students or parents where they help to identify some of the species that they have been investigating?
8. Invite a local botanist, ecologist, Elder or traditional Knowledge Keeper to join your students to talk about how the plants are used in different cultures or why they are important for different beings.



Let them know ahead of time what plants are in your garden and/or which plants your class has been studying.

The California Phenology Project has created a guide to help teachers integrate phenology into garden and lesson planning. For more information on creating a phenology garden and associated activities, visit [cpp.usanpn.org/education/phenologygardens](http://cpp.usanpn.org/education/phenologygardens).

### BACKGROUND ESSAY

In Part II we talked about the important relationship that exists between flowers and pollinators. Pollinators play a key role in allowing plants to make seeds and fruits. With changes in climate and phenology, it can be harder for pollinators to find the flowers that they rely on for food and in turn for the flowers to receive this much needed service that the pollinators provide. Building a native bee or pollinator house is a great way to increase pollinator **habitat** in your own backyard.

In addition to building a native bee or pollinator house, a great way to help pollinators is by planting a pollinator-friendly garden with native plant species.

### ACTIVITY – BUILD A POLLINATOR HOTEL

From the Alberta Native Bee Council:

“In 2017, the Alberta Nature Bee Council launched a citizen science bumble bee box monitoring program. Bumble bee boxes are similar to bird houses wherein bumble bees may or may not colonize the box.

If you would like to participate in our bumble bee box program you can either build your own bumble bee box or join us at a workshop to build and assemble a bumble bee box.

Once you have a bumble bee box, place it in your yard, on your balcony or anywhere outside where a bumble bee queen might find it. Bee boxes can be placed on the ground, above the ground affixed to a tree or fence post or even buried underground connected to the surface with a tube.”

#### Important Note:

There are many commercially available bee houses. Unfortunately many of these are not made of appropriate materials nor do they come with instructions. If these houses are not well cared for they can have negative impacts on native bee and pollinator populations. Imagine what it would be like to stay in a hotel that has never been cleaned. Gross!

To avoid these issues, do your research, follow instructions from reputable sources like the Alberta Native Bee Council when

**DURATION** 60 minutes

#### MATERIALS

- Spruce or pine fence boards
- Small hinge (2.5")
- Small screws
- 12 x 1 ½" deck screws
- Wad of raw cotton
- Power drill & small drill bits



constructing your own, and most importantly follow the maintenance instructions.

“In the fall remove all nest contents and wipe the inside and front of the bee box with a ~70% bleach solution and paint or re-paint the box. The box can be left outside for the winter.”

For complete instructions about how to build your own bumble bee house and to participate in the Alberta Native Bee Council’s citizen science project, visit [www.albertanativebeecouncil.ca/bumblebee-box-program-1](http://www.albertanativebeecouncil.ca/bumblebee-box-program-1).

## REFERENCES

California Phenology Project. (n.d.). *Phenology Gardens*. USA National Phenology Network.  
[cpp.usanpn.org/education/phenologygardens](http://cpp.usanpn.org/education/phenologygardens)