



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) 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.
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.

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.

REFERENCES

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