



# 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>