



Everything is Connected



*Christi Belcourt, book and artwork*

### Big Ideas & Enduring Understandings

- ❖ First Nation and Métis believe all aspects of the environment are interconnected.
- ❖ Respect is shown through thankfulness and our actions in the environment.

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**Grade 7**

**Science**

## DEFINING THE DESTINATION:

UbD Stage One — What do we want them to learn?

### Outcomes:

**IE 7.1** - Relate key aspects of Indigenous knowledge to their understanding of ecosystems.

**IE7.2** - Observe, illustrate, and analyze living organisms within local ecosystems as part of interconnected food webs, populations, and communities.

**IE7.3** - Evaluate biogeochemical cycles (water, carbon, and nitrogen) as representations of energy flow and the cycling of matter through ecosystems.

**IE7.4** - Analyze how ecosystems change in response to natural and human influences, and propose actions to reduce the impact of human behavior on a specific ecosystem.

### Understandings:

First Nation and Metis believe all aspects of the environment are interconnected.

Respect is shown through thankfulness and our actions.

### Essential Question:

What are some traditional indigenous practices with respect to the relationships and connections between people and their ecological environment?

What are the key aspects of Indigenous knowledge and First Nations and Metis people's practices that contribute to their understanding of ecosystems and the interactions of their components?

What are some differences between biotic and abiotic material from indigenous times to now?

### Know:

Stories teach through oral traditions about the natural world.

Animals adapt to their environment (biomes).

Worldview affects the way we perceive the natural world and ecological connections.

Lakota people have their own animal classification system.

### Do:

Define traditional Indigenous beliefs as demonstrated through stories..

Provide examples of Indigenous knowledge in understanding their ecosystems.

Students will gather information about traditional Indigenous practices with respect to the relationships and connections between people and their ecological environment.

## EVIDENCE OF UNDERSTANDING

**UbD Stage Two** – How will we determine what they know?

### Assessment:

#### Summative

##### *Performance Tasks*

Poster of adaptations, biomes & human impact

Experiment: bending wood

Experiment: growing traditional plants

Project Based action plan – sharing with an authentic audience

#### Formative

##### **Prior Knowledge:**

Through stories and discussions – what is the level of awareness of First Nation worldview towards the natural world?

##### **Ongoing Assessment:**

- Exit Slips
- Comparison of worldview through graphic organizer
- Inter-connected Concept Exercise
- Town meeting (role play) or report

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## LEARNING PLAN

### UbD Stage Three – How will we teach?

### Setting the Context through Stories:

#### “Rhythm of the Seasons”

Read “How Kishelemukong Made The People and the Seasons”.

[www.jefpat.org/Documents/Unit5-2worksheet.pdf](http://www.jefpat.org/Documents/Unit5-2worksheet.pdf) from Native Plant Stories, as told by Joseph Bruchac.

Discuss what understandings the story shows (life is attuned to the rhythm of the sun, moon, and seasons and sustenance of humans is rooted in green plants. Students will make a model of the turtle with the world on his back. See attached for directions on how to make the turtle.

#### “Biomes”

Read “The White Buffalo Calf Woman”. Provide cards made with the name and description of the biomes of North America (<http://waynesword.palomar.edu/biomes.htm>). Talk about which biome is described in the story. Students research Indigenous stories reflecting a biome.

Extension activity: Discuss the concept of the earth as a Turtle. Make a model (on the turtle’s back) to show how people would interact in that biome.

#### “Animal Classifications”

Read “Otokahekagapi” (Lakota legend). Talk about the animal in the story (where it lives, what it eats, what it’s purpose is). Classify the animal according to the Lakota way of knowing using 4 categories:

1. Wahununpa - animals that walk on two legs
2. Wakinyan - animals that fly
3. Waslohan - animals that crawl
4. Wahutopa - animals that walk on four legs

How do ecosystems change in response to natural and human influences? Propose actions to reduce the impact of human behavior on a specific ecosystem. Create posters to illustrate an animal, indicating the Lakota category, their biome and any impact humans have had on their environment. Has the animal made adaptations? Explain the relationship to the environment and the adaptation.

### **“Respect for the Land”**

Read the Seneca story “The Thanks to the Trees” (or any story relating to First Nations peoples giving thanks to the land). Discuss some way in which First Nations peoples gave thanks and why they gave thanks. Show students the “Round Dance of Unity and Thanksgiving”. Student inquiry: Why is thankfulness important to First Nations people and how is it connected to the environment?

### **Exit Slip:**

How do stories help us understand the perspective of a culture?

List one thing you learned from the stories about ecology and relationships.

## **Understanding Ecological Inter-connectedness**

### **Lesson 1: Circle of Life - Worldviews**

Ecological Pyramids- Compare a pyramid of numbers to the First Nations and Métis “Circle of Life.”



Analyze the graphic organizers (above) for information provided. Write down observations of the pyramid of numbers and from the Circle of Life. What is similar and how are they different? Why do Aboriginal people use a circle to represent the concept as opposed to a pyramid? Discuss with a partner. Share your thinking with a group discussion.

Teacher Note: The Pyramid represents that the strongest species is at the top and the weakest is at the bottom. The Circle of Life represents that they are all the same and not only need one another to survive but that it is a cycle instead of a hierarchy.

Extension: Students create their own Circle of Life graphic organizer based on Aboriginal animals of Canada, including Aboriginal/Non Aboriginal people in the circle.

## **Lesson 2: “Circle of Life” - Identifying changes in animal life in an ecosystem.**

First Nations people recognize one of the simplest — but frequently ignored — facts of life: everything in nature is connected. This concept is often described as the “circle of life.” In this modern technological age, it can be difficult for many of us to grasp the complexity and inter-relatedness of all living things. This activity is designed to illustrate nature’s connections to the students and how the circle of life can be broken by the actions of humans.

Plants, animals, and the environment within which they live, create an ecosystem. Each element and being maintains the ecosystem by transferring energy through a food-chain.

Examples of a food-chain include:

- herring to salmon to sea lion to orca whale
- beetle to shrew to snake to fox
- algae to tadpole to bass to otter
- bacteria to fungus to tree to squirrel.

How does the absence of any component within a food-chain, affect the ecosystem as a whole? Example: trees are an important energy source in a food-chain; aphids feed on the nutrients in the leaves of the trees; the aphids are eaten by sparrows and other birds, which are then eaten by hawks and eagles. When the carnivores die, decompose and become part of the earth, we return back to the beginning of the cycle (circle).

### Inter-connected Concept Exercise:

Clear a large space in the classroom or, better; go outside to a grassy area. Give each student a number from one to four and put all the “ones” together in one group, etc. Assign each group a component of the food-chain. In the example above, “ones” are trees and “fours” are hawks, etc.

Form the circle of life by moving in the room. One student from each of the four groups should stand in the cleared area, shoulder-to-shoulder next to each other, facing the centre of the circle. Keep adding to the circle in sets of four until all the students are in it. Instruct students to turn to their right and take one step toward the centre. Everyone should place their hands on the shoulders of the person in front of them. Tell them that at the count of three, they must slowly sit down, on the knees of the person behind them, keeping their own knees

together to support the person in front of them. When they are all supporting each other, tell them that this represents the circle of life. Tell them that once they have mastered the routine, they will understand how the transfer of energy affects an ecosystem. It may take several attempts before the entire group is able to maintain its composure and posture. Repeat the routine until they have succeeded in keeping everyone supported. When the group has mastered the routine and a strong lap-sit circle is formed, identify a student who represents an aphid. Tell students that pesticide sprayed on the fields has spread to the surrounding trees. Then remove the “aphid” from the circle. If the circle does not collapse completely, the students will be struggling to maintain it. Students can be removed from the circle based on a variety of conditions: logging, toxic waste, urban expansion, soil erosion, acid rain, poachers, oil spills and over-fishing.

### **Exit Slip:**

Explain how the exercise deepens your understand of inter-connectedness in ecosystems.

### **Lesson 3: Future Predictions**

How can we use the past and present to determine what the future may hold?

Students will need a fairly large piece of paper to section into three separate parts.

Based on what students have learned so far about Aboriginal ways of knowing ask them to draw a picture of what their area would have looked like when Aboriginal people were living in the past. (It should include animals, plants, water etc.) Teacher Note: Everything would have been natural and healthy with little to no interruption of ecosystems. Next, ask them to draw a picture of the present. (This should include some more modern things such as buildings and garbage. Yet, for more impact maybe the buildings should be on the outskirts of a forest.) Then, ask them to draw the future picture based on 5, 10, or 25 years from now. The students will make their own decision based on the past and present pictures that they have chosen to represent.

Extension:

- 1) Have students write a paper to propose a course of action in hopes of making our ecosystems healthier. Ask them to keep the following in mind as they write: How has the Earth been affected? How have the animals been affected? How have people been affected? How has our water been affected?
- 2) Or, hold a Town Council meeting in which each student attends in role to discuss our future and changes that need to be made. Examples of roles might be – mayor, town council, Chamber of Commerce, tree planter, naturalist, photographer, chief, elders, biologist, etc.

### **Lesson 4: The importance of water and its many uses.**

Evaluate biogeochemical cycles (water, carbon, and nitrogen) as representations of energy flow and the cycling of matter through ecosystems.

Share the following information with students before the activity (found at)  
[www.literacommunity.com/grade3/firstnations/environment.htm](http://www.literacommunity.com/grade3/firstnations/environment.htm)

First Nations people used water for cooking and washing, and as an essential ingredient in remedies and cures. They also used water to manipulate leather for clothing and wood products for canoes and snowshoes. Water softened porcupine quills so that women could use them to decorate clothing, footwear and articles such as baskets, pouches, and quivers to hold arrows or knives. Many First Nations built sweat lodges of various sizes. They were often constructed with wood, usually alder or willow saplings. Wood was shaped by hand to create a dome two to three meters high. The dome was then covered with bark or animal skins. There was a small opening for bathers to go in and out. This opening was also used to bring in small rocks that had been heated in a nearby fire. These rocks were usually placed in a small pile inside the lodge in a shallow depression in the ground. The bathers splashed water on the rocks periodically to produce a cleansing, relaxing heat and steam. The effect was similar to a modern-day sauna or steam bath. In many First Nations communities, the sweat lodge was an integral part of numerous vital, sacred ceremonies.

Water was also required to make leather from animal skins such as moose, caribou and deer. Water softened the hide after the hair and excess flesh had been scraped away. Without water, hides could not have been stretched during the tanning process to produce a thinner, softer, more pliable material. First Nations recognized water's ability to soften wood such as cedar and ash so that strips of these woods could be bent to produce curved pieces without breaking. These curved and shaped woods were needed to build canoes, snowshoes, lacrosse sticks and baskets. Wood soaked in water was shaped to produce gunwales and ribs for canoes. Builders also soaked the stiff bark for the canoe in water so that they could then shape it onto the wooden frame. After immersion in water for several hours or days, cedar, ash, hickory and other woods become pliable. They can be bent without fracturing or cracking. A skilled builder can gauge how long wood needs to soak in order to achieve the series of bends to create the desired shape. This process might require several days and several bends. When many bends are needed to produce the final product, the wood is often tied to retain the initial and successive bends. Once the wood for a snowshoe frame was bent to the proper shape and curve, for example, it was bound with spruce roots or rawhide to help it retain its new shape permanently.

Roots from trees — especially spruce roots — produced strong and sturdy bindings. After these roots had been stripped into long, thin pieces, they were immersed in water for several days. They were used to bind materials together and when they dried, the binding or lashing was durable and extremely tough. Long, thin strips of rawhide, treated in the same way, served a similar purpose. Thinner and lighter than coniferous roots, wet rawhide served to bind stone and flint heads to arrows and spears, and bone and hardened wooden hooks to fish hooks. When the rawhide dried, the thin strips shrank and hardened to produce a very strong, but lightweight, binding.

All First Nations looked upon water as a vital, living element in their environment. Water, as a



living entity, occupied an important place in the oral histories and sacred stories of each First Nation.

### **Activity: Bending Wood**

The class can undertake a project to bend wood that has been soaked in water. To do this, you will require one or several pieces of thin, untreated wood, approximately 30 centimeters long, a six-liter pail or container and some heavy twine or light rope. If you have access to natural wood, use cedar, ash or maple tree branches that are no more than two to three centimeters thick. Immerse the wood in water for two to three days. Then remove the wood and have students start to bend the pieces of wood carefully. When the wood begins to bend, some care will be necessary to ensure that the bend does not crack or break the wood. When the maximum bend is achieved at the first attempt, tie the wood so that it does not spring back to its original shape — notch the wood at each end and secure it with twine. Immerse the wood again for some time; then continue to bend it and tie it until the desired shape or bend is achieved. Under the right conditions, the wood can be bent to a permanent U or circle shape, without being damaged.

### **Lesson 5: Healing Plants and Traditional Knowledge**

Christi Belcourt is a Métis artist and naturalist, who has shared her traditional knowledge in a book called Medicines to Help Us. The painting on the cover is a manifestation of her prayers for all things in life to be in balance and in harmony. She includes plants throughout the different stages of their lifecycles, signifying their shortness and the inevitability of change. Christi's explanation for this work is that it is "...a painting for the Métis Nation. Each plant depicted is a type of wild plant that can be found in one or all provinces from Ontario to British Columbia. Some of the plants are indigenous to North America...and some are introduced species from Europe, but also have been used by Indigenous people for medicines...the medicines and plants in this painting are my prayers for the Métis Nation to encourage our healing..." Publisher: Gabriel Dumont Institute, Date: 2003









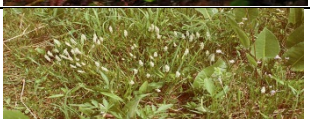
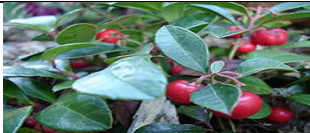
Watch a film of Christi talking about her mural "My Heart is Beautiful"

<http://www.belcourt.net/>

Grow traditional Aboriginal medicinal plants in your classroom.

First Nations and Métis people have traditionally used parts of herbs, shrubs, and trees to help treat and cure many body problems. For example, some First Nations people chewed on the leaves of willows to relieve aches and pains. These leaves contain salicylic acid, a compound very similar to aspirin.

The following chart shows Saskatchewan plants that have been used as remedies, by First Nations and Métis people.

Plant	Plant Name	Use
	Alumroot	Applied to wounds to stop bleeding and to speed healing.
	Bearberry or Cranberry	Used to treat diarrhea and kidney infections.
	Bergamot	Used to treat bladder and blood problems as well as stomach aches.
	Bloodroot	Used to treat rheumatism, asthma and bronchitis.
	Echinacea	Used to treat colds and prevent infections.
	Ginger	Used to treat chest colds and heart disease
	Labrador Tea or Wild Rosemary	The leaves are used to make a tea for stomach and kidney problems.
	Sundew	Used to treat respiratory problems such as asthma
	Seneca Root	Used to treat coughs, colds and asthma.
	Teaberry or Boxberry	To treat headaches, upset stomach, arthritis, and rheumatism.

Europeans explorers who first came to North America learned about and relied on traditional remedies from First Nations peoples.

Experiment: Put students into groups. Each group is responsible to grow at least two plants. They will need to determine the kind of soil preferred, the nutrients needed, natural ways to create the correct environment for the plant. Investigate what perma-culture means and how to apply natural principals to preparation and care of the plant and soil. Students will need to understand the use and purpose of the plant and might be able to collect stories about the plants from family, elders or other experts. The students must check the plants regularly to monitor and record growth information. Students can observe one another's plants.

### Project Based Learning: Authentic Audiences

When the plants appear to be mature, students determine who they would like to share their experiment with an audience. Who would be most interested to know about their plants? How might they share the knowledge gained? Are there healing stories they can include to illustrate the power in the plant? Students create a plan of action to share their work.

**Extension:** Living Sky division schools might consider becoming a part of a project called the "Healing Garden" through the Allen Sapp Gallery in North Battleford. Call the gallery for details.

**Extension:** Water and its use is a big part of the Ecosystem curriculum. Groups could have a plant labeled A and a plant labeled B. They could water one regularly and one sporadically. They could record the differences.

## **Appendix 1**

Instruction for building the turtle from lesson 1:

Materials: One sheet of plywood measuring 1.2 meters X 1.2 meters x 1.3 cm thick. One 31 cm wooden support and eight 18 cm wooden supports (strong sticks) . Wire cutting pliers. Thin wire. Measuring tape. Lots of newspaper. Wheat paste. water. Modeling clay. Tempera paints and brushes. Pipe cleaners. Cloth Straps. Toothpicks. Construction paper. Crayons. Paste. Scissors. Hammer. Nails. Fence staples. Pencils. Writing paper. Scissors. 60 cm sheet of plastic. Beachball. Golfball. String.

