

Great Bear Rainforest Activity Plan

Inquiry:

What is stewardship?

In this activity plan, students learn how harvesting practices of First Nations living within the Great Bear Rainforest region demonstrate stewardship and sustainability. Students have the option of creating 2D or 3D objects for harvesting, or creating a visual presentation of how harvesting practices have changed over time.

Learning Objectives

Students will:

- Define stewardship
- Describe traditional ecological knowledge (TEK) and how it is used
- Identify specific traditional harvesting practices used by First Nations within the Great Bear Rainforest region
- Recognize the contribution of modern technologies to traditional First Nations harvesting practices

Preparing for the Activity Plan

Read backgrounders listed in the Materials section and watch the videos.

Materials

- computer / projector
- student computers / tablets / devices
- access to Internet
- blackline masters
- books, articles
- chart paper

Reference

Definitions - Traditional Ecological Knowledge

http://nafaforestry.org/forest_home/documents/TKdefs-FH-19dec06.pdf

Videos

The Elders are Watching (9:32)

A story about stewardship.

<https://www.youtube.com/watch?v=4VLBfOqS4j4>

Mysteries of Ancient Clam Gardens (6:43)

An elder talks about clam gardens.

https://www.youtube.com/watch?v=DIGn4yd15_I

A Wall Worth Building: Making Clam Habitat Great Again (3:55)

The rebuilding of the tradition of clam gardens.

<https://www.youtube.com/watch?v=22Nytmxw2Z8>

Teacher Resources

Great Bear Sea > Elementary > Lesson 2: Traditional Knowledge

Includes a helpful distinction between traditional knowledge and traditional ecological knowledge.

<http://greatbearsea.net/elementary-curriculum/lesson-2/>

Great Bear Sea > Elementary > Lesson 10: Stewards of the Sea

Includes information on the Coastal Guardian Watchmen and stewardship.

<http://greatbearsea.net/elementary-curriculum/lesson-10/>

Great Bear Sea > Secondary Environmental Science > Lesson 2: Traditional Knowledge and Collaborative Research

Includes useful information on Indigenous and Traditional Ecological Knowledge (TEK).

<http://greatbearsea.net/environmental-science/lesson-2/>

Great Bear Sea > Secondary Social Studies > Lesson 5: Planning for the Future of the Great Bear Sea

Includes summaries of Marine Protected Areas, the Northern Shelf Bioregion MPA Network, the Coastal Guardian Watchmen, and the Supporting Aboriginal Stewards (SEAS) program.

<http://greatbearsea.net/social-studies/lesson-5/>

Science First Peoples

A series of grades 5-9 unit plans for teachers that discusses traditional ecological knowledge and many related topics.

<https://tinyurl.com/y8pbako5>

Two Ways of Knowing: Traditional Ecological Knowledge and Scientific Knowledge (Forests for the Future)

A teacher resource that includes a section on traditional ecological knowledge.

<https://ecoknow.ca/documents/TEKUnit1.pdf>

Blackline Masters

Clam Gardens (Science First Peoples)

First Peoples' Connections

Traditional Ecological Knowledge Research (Science First Peoples)

What is Traditional Ecological Knowledge? (Science First Peoples)

Rubric

Self-assessment – Harvesting Project

Supplementary Resources

Audio

Legends of the Kwakwaka'wakw (54:00)

<http://www.cbc.ca/radio/ideas/legends-of-the-kwakwaka-wakw-1.2913500>

Legends of the Old Masset Haida (53:59)

<https://www.cbc.ca/player/play/2335401544>

Background Information

Relationships to the Land (in particular, Case Study: How the Kwakwaka'wakw Adapted to their Environment, page 11)

Stewardship of the Land (in "The Voice of the Land is Our Language," page 8)

Looking Back, Looking Forward (in "The Voice of the Land is Our Language," page 9)

Delivering the Activity Plan

Be sure to review materials and background information documents on traditional ecological knowledge (TEK).

Access Prior Knowledge

- Ask students if they know the definition of stewardship. Write down answers on the board. Project and discuss the following definition:

Stewardship is the collective care and management of natural resources. It implies a responsibility to respect and protect the resources in return for using them.

Inquire

- Tell students the guiding questions for this activity plan:
 - » What are traditional harvesting practices of First Nations living within the Great Bear Rainforest region?
 - » How do these practices demonstrate stewardship and sustainability?
- Project and read the following excerpt to the class:

Among First Nations, stories carry different meanings as an individual journeys through the stages of his or her life. Stories also have many historical components. In stories we find references to ancient history, recent history, and modern times. Stories tell about the importance of the land and stewardship, as well as about leadership responsibilities and the philosophies of governance.

– BC First Nations Studies textbook

- Show students the following video, a First Nations story called *The Elders are Watching* (or read a copy of the book out loud to the class). Have them write down any references to stewardship (or its absence) in the story:

The Elders Are Watching (9:32)

Written by Dave Bouchard, illustrations by Roy Henry Vickers.

<https://www.youtube.com/watch?v=4VLBfOqS4j4>

(Scars on the landscape from mining, overfishing and overhunting, needing to care for the Earth, etc.)

- Project or print and hand out the section “Stewardship of the Land” from the backgrounder, “The Voice of the Land is Our Language.”

Experience

Survival Brainstorm

- Divide students into small groups with chart paper. Have them brainstorm the question:

How would you survive if the power went off, never to be turned back on?

Important considerations could include food and medicine, clothing, tools, shelter, transportation etc. Come back as a class and have groups discuss their brainstorms.

Traditional Knowledge (TK) and Traditional Ecological Knowledge

- Hand out two blackline masters: “First Peoples’ Connections” and “What is Traditional Ecological Knowledge?” Either in a small-group discussion or as a written assignment (in their own words), have students answer the following questions:
 - » How did First Nations survive in their territories for thousands of years, from one generation to the next?
 - » What types of knowledge and wisdom would people need to know and pass on to future generations?
 - » In what ways would stewardship and sustainability have been important for their survival?

Read out some of the following definitions of traditional knowledge (TK) and traditional ecological knowledge (TEK).

Definitions of Traditional Knowledge

http://nafaforestry.org/forest_home/documents/TKdefs-FH-19dec06.pdf

- Ask students which definitions resonate with them.
 - » Point out that TEK includes the cultural traditions, values, beliefs, and worldviews of local peoples. This knowledge is the result of indigenous peoples’ direct experience of interacting with nature.

Clam Gardens

- Illustrate TEK by discussing the construction of clam gardens, a resource management method used by coastal First Nations.
 - » Hand out the “Clam Gardens” blackline master for students to read.
 - » Show the class the following clam garden videos:

Mysteries of Ancient Clam Gardens (6:43)

https://www.youtube.com/watch?v=DIgn4yd15_I

A Wall Worth Building: Making Clam Habitat Great Again (3:55)

<https://www.youtube.com/watch?v=22Nytmxw2Z8>

Discuss how this TEK includes cultural traditions, beliefs and world view.

- Hand out the blackline master, “Traditional Ecological Knowledge Research.”
- Give students the option of completing one of the following activities:

Option A:

Create 2D or 3D replicas of objects used for harvesting

Individually or in small groups, students research and then create 2D or 3D representations of First Nations objects that are used for harvesting, or that would be the result of harvesting in the Great Bear Rainforest.

Examples:

- tools (adze, fish hook)
- dugout canoe
- post and beam shelter
- cedar bark hat or clothing
- fish weir
- fish trap
- basket
- clam garden
- monumental art
- masks
- button blankets

Option B: Present How Harvesting Practices have Changed Over Time

Individually or in small groups, students research one harvesting practice of a First Nation in the Great Bear Rainforest. Areas of study could include: transportation, fishing, hunting, clothing, food preservation, shelter, and medicine. Students must answer the questions:

- How have harvesting practices changed over time using modern technology?
- How have they stayed the same?

Examples:

- **Shelter:** use of modern materials, electricity, etc., but also continued use of big houses / longhouses
- **Medicine:** modern medicines, but also use of traditional medicines derived from plants
- Students create a visual presentation of their research. Examples: three-panel display board, collage, illustrated timeline, documentary video, PowerPoint, diorama, board game, etc.

Note: For both options, encourage students to interview elders or First Nations community members, and visit a harvesting or processing site, if possible.

- Set up a gallery walk in the classroom. Invite other classes in the school and/or family and community members.
- For a final reflection activity, have students write a paragraph or multi-paragraph response on the following question:

What can the world learn from the traditional ecological knowledge of Indigenous peoples?

Explore

Direct students to the Great Bear Rainforest educational website for further exploration.

Assess

- As students are researching to complete Option A or Option B, ask informal questions to determine understanding.
- Do the 2D or 3D replicas and presentations reflect student research and understanding of harvesting practices?
- Rubric: Self-assessment- Harvesting Project

Go Beyond

- If possible, arrange for a local First Nations storyteller to visit the class to tell a story that exemplifies TEK and local sense of place.
- Arrange a field trip “on the land” with an Indigenous elder or knowledge keeper to discuss traditional ecological practices.
- Have students research TEK in their local region.
- Students write a letter to the government or an environmental agency that suggests ways that traditional practices could be used today.

Self-assessment - Harvesting Project

Scale

- 4 Extending
- 3 Proficient
- 2 Developing
- 1 Emerging

I can	On a scale:1 - 4	Evidence
I can experiment with different approaches to solve problems.		
I can work with others to achieve a common goal; I do my share.		
I can generate my own ideas and build on others' ideas.		
I can participate in building and presenting a group project.		
I can celebrate my efforts and accomplishments.		

Clam Gardens

One of the food sources that helped coastal First Nations survive in the past was the clam. If you go to an ancient village site along the British Columbia coast, you will find it is built on deep layers of white shells from clams and other shellfish, like cockles and mussels.

Clams are very nutritious. They are rich in protein, and also nutrients such as iron, Vitamin C and Vitamin D.

There are four main species of clams along the BC coast: butter clam, littleneck, horse clam, and cockles.

Harvesting clams

Clams and cockles are easy to harvest by all members of the family. They live below the surface of beaches in the intertidal zone. They sometimes give themselves away by squirting water through holes.

In the past, clams and cockles were a dependable food source. People could almost always find a good feed of shellfish, summer or winter.

The best time of year to gather clams is in the winter. In warmer months people knew that they might not be safe to eat. They could be polluted by what we call "red tide."

As well as observing the water to see a change in colour, people would watch the animals like seagulls and otters. If they were eating the clams, then people knew they were safe to dig.

Preserving clams

First Nations families harvested large amounts of clams in the past. Some were eaten fresh, but most were preserved to be eaten later.

The shellfish were steamed open and the meat was threaded onto sticks to be roasted or smoked over a fire. Some people put them between mats and stomped on them to make them more tender.

The dried clams could be stored for a long time, or they could be traded with other First Nations.

The clams made a good snack. Sometimes people strung them on strings which they wore around their neck. If they got hungry while going about their work, they could pull off a clam to eat.

Clam gardens

We know clams were an important food source in the past because First Peoples built large clam gardens to improve the quality and quantity of the clams.

To do this, people long ago built walls along a sloping beach, and filled it in with sand to make level ground.

All along the Pacific coast, First Nations people built thousands of these beach terraces. In one bay alone on Quadra Island there are at least 49 separate gardens.

It took a great deal of knowledge to build and maintain these gardens. First, the builders had to understand the currents and tides to know the best places to build them.

The clam gardeners must have had a detailed understanding of the intertidal ecosystem to create such successful technology to manage their shellfish harvest.

The walls were as much as two meters high. They were created by rolling boulders down to the lowest of the low tide levels.

The rock walls were built at just the right height so the sandy terrace behind it would create the best growing habitat for the clams.

The waves washing over it would bring in nutrients. As people harvested the clams and cockles, using their digging sticks, they kept the sand loose enough for the shellfish to move about.

Certain people in the community were stewards of the clam gardens. They would observe the condition of the gardens.

They would make sure there was no overharvesting. If the quality or number of clams got too low, they would leave the area untouched for a period of time.

Sometimes they would take small clams from another clam beach and “plant” them on a struggling beach.

Scientists have done some tests in clam gardens and found that more clams grow on beaches with walls than regular beaches. As well, clams grow faster and are more likely to survive in clam gardens.

The vast system of clams gardens wasn’t built quickly. They were built over many generations. Families passed on the knowledge and skills involved so that the gardens could be continue to be cared for.

The use of the clam gardens was part of First Nations political and social organization. In some communities certain families or hereditary groups had the use of certain gardens, which were passed down. As well as the rights to use the gardens went the responsibility to care for them.

Sea Garden

The rock walls did more than hold back the sand for the clam gardens. They also created a reef ecosystem where other sea creatures could live, such as octopus, sea cucumbers and chitons. These are all seafood delicacies, and no doubt were an added benefit to the clam gardeners.

First Peoples' Connections



Since Time Immemorial, First Peoples have prospered and continue to exist alongside nature in this world. Their lifestyle before contact did not challenge the carrying capacity of the land. The land provided food, medicines, tools, clothing, and shelter: everything. Traditional cultural knowledge provides an ability to utilize animal parts, stones and natural materials to construct complex tools, survive in extreme conditions, travel long distances, and make medicines. This knowledge is vast and all encompassing; to understand one's surroundings was, and is, paramount and transmitted with respect through the oral tradition of storytelling, dance, language and personal experience. It continues to be shared through intergenerational teachings today.

Some key features of Traditional Ecological Knowledge include the following:

- It is a system of knowledge
- It is specialized knowledge of the interconnectedness of all aspects of the world
- It connects with worldview, values and beliefs shared by a group of First Peoples
- It is local place-based knowledge about ecosystems in a particular territory
- It is cumulative, having been learned and passed on over a long period of time
- It enables a sustainable use of resources
- It holds knowledge about how to survive in a specific territory from one generation to the next
- It enables people to be adaptable, dynamic and resilient in the face of change

First Peoples' Connections

Main Areas of Traditional Ecological Knowledge

- Worldview and belief systems
- Practical knowledge and skills
 - biology of species of plants and animals
 - understanding of life cycles
 - if species are edible or poisonous
 - harvesting and processing skills
 - using natural resources to make tools and other material goods
 - knowledge about how species change in an ecosystem after a disturbance (ecological succession)
- Learning and teaching of skills and knowledge from one generation to the next
 - language
 - stories
 - ceremonies
 - demonstration
 - participation

Adapted from Nancy J. Turner, *Ancient Pathways, Ancestral Knowledge*, v 1 pp 35-37.

What is Traditional Ecological Knowledge?

Research Question:

Knowledge About Plant
Animal or Material

Harvesting and Processing Skills

Beliefs and Spiritual Connections

Learning and Teaching
Knowledge and Skills

What is Traditional Ecological Knowledge?

TEK is Local Knowledge

TEK is Cumulative Knowledge

TEK understands Interconnectedness

TEK is necessary for Survival

TEK practices Sustainability

Traditional Ecological Knowledge helps us understand the connections between aspects of the local ecosystem:

- Plants species
- Animals species
- Habitats
- Landforms
- Weather
- Seasonal changes



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