



# WILDLIFE MANAGEMENT AND TEK (Part I)

**GRADE** Grade 5

**PART** 1 of 3

**TOPICS** Wildlife, story, traditions, treaties, culture

## CURRICULAR CONNECTIONS

Grade 5 Social Studies

Topic 2 – Histories and Stories of Ways of Life in Canada

1. Appreciate the complexity of identity in the Canadian context:
  - Acknowledge oral traditions, narratives and stories as valid sources of knowledge about land and diverse Aboriginal cultures and histories
2. Examine, critically, the ways of life of Aboriginal peoples in Canada by exploring and reflecting upon the following questions and issues:
  - What do the stories of First Nations, Métis and Inuit peoples tell us about their beliefs regarding the relationship between people and the land?

## OVERVIEW

How do we know what we know? While much of our early learning today takes place in the classroom, through books and the Internet, there are myriad other ways that people have learned about the world around them. In this lesson, students will be introduced to the concept of Traditional Ecological Knowledge. They will explore the role of place to the knowledge that we acquire and learn about the importance of protocol for Indigenous and Settler people alike in the exchange of knowledge.

## OBJECTIVES

- Students will be introduced to the concept of Traditional Ecological Knowledge
- Students will understand the importance of protocol when requesting or receiving Traditional Ecological Knowledge

## KEY TERMS

- **Knowledge** – facts, information and skills acquired by a person through experience or education
- **Indigenous** – coming from a particular area
- **Protocol** – a way of interacting with people and places that respects traditional ways of being
- **Traditional Ecological Knowledge (TEK)** – refers to a vast body of knowledge that Indigenous people have about the environment within their territory

## GUIDING QUESTIONS

- What are some of the ways that we obtain knowledge?
- What are different protocols that are observed by Indigenous cultures in the local area where you live?
- Why is it important to acknowledge the territory that you are in?

## BACKGROUND ESSAY

**Knowledge** refers to the facts, information and skills that people acquire through experience or education. It allows us to get through the day and to navigate the world around us. Depending on where and how we live, the knowledge that we possess will be different. For example a person living off the land in northern Alberta will require different knowledge that a person living in downtown Calgary. What is some knowledge that you possess that is specific to the place that you are living?

The knowledge that we acquire is deeply rooted in the local landscape, our upbringing, and the needs that we have to meet. When we talk about ways of knowing, we are talking about the ways that people look at the world and try to give meaning to it.

There are many ways that we gain knowledge about our world. Some knowledge is gained through experiential learning or through learning



by doing. Other knowledge is gained and shared through oral storytelling. The knowledge contained within these stories may reach us instantly in the form of a moral, or it may be many years before we truly appreciate its importance. Storytelling is one common way that Indigenous cultures have passed on Traditional Ecological Knowledge to future generations.

**Traditional Ecological Knowledge (TEK)** is a vast and dynamic body of knowledge held by different Indigenous people, which relates to community, traditional lands and the cultures of the people who are **indigenous** to the area. It is held by individuals and communities and is often passed on through story. This collective body of knowledge also describes specific **protocols** that must be followed when harvesting plants or animals, what knowledge can be shared, when it can be shared and with whom. The knowledge comes from living within local ecosystems since time immemorial.

**DURATION** 10-15 minutes

**MATERIALS**

- Whiteboard & projector
- Scrap paper
- Writing utensils
- Post-It® Notes

**ACTIVITY – QUESTION FORMULATION**

This activity is designed to get students to start thinking about the topic and to think about how humans acquire knowledge. Asking good questions is a key part of scientific inquiry, participation in democracy, advocating for oneself and community and holding elected officers accountable.

1. Divide the students into groups of 3 or 4. Explain to students that you will be showing them an image or phrase related to the topic (e.g. an old growth forest or an abandoned bear den).
2. Explain the rules of the activity:
  - a. Ask as many questions as you can
  - b. Do not stop to discuss, judge, or answer the questions
  - c. Write down every question exactly as it is stated
  - d. Change any statement into a question
3. Once the students have had ample time to ask questions, tell them to stop. Tell the group to select the question(s) that they consider the most important, that they would most like to learn about, or would be the most helpful for finding a solution to a problem. Students can circle, underline, or write their chosen questions on a Post-It® note.
4. Ask the groups to share these questions with the class. As an extension, task the groups with organizing their questions together based on similarities. You may choose to revisit these them later on and ask students how they could turn their questions into scientific research questions.
5. Lead a discussion about how the students could approach finding answers to the questions that they have asked. Likely responses will include the Internet, books and people of



authority such as teachers or scientists. Ask students to consider the role that Elders and Knowledge Keepers play in Indigenous communities and how this knowledge is passed along.

Source: The Right Question Institute (RQI). The Question Formulation Technique (QFT) was created by RQI. Visit [www.rightquestion.org](http://www.rightquestion.org) for more information and free resources.

**DURATION** 10-15 minutes

### ACTIVITY – BROKEN TELEPHONE

Many students will have already played some version of this classic activity. Depending on the group, you may wish to come up with the message that the students share. In order to relate this activity to the topic of TEK, it is important to facilitate a discussion about the value of oral storytelling, the ability of knowledge to evolve over time and the impact of changing the message.

1. Instruct students to stand in a semi-circle. Select one student at the end of the line to come up with a ‘secret message.’ They will then whisper that ‘secret message’ to the person beside them.
2. Have each student in the semi-circle receive and transmit the message to the person beside them, until every student has heard the message.
3. Compare the final message with the original message. As a class, brainstorm and list how and why the message may have changed. Ask the students to consider the following questions:
  - a. How was the message transmitted?
  - b. Were there any checks in place to make sure that the message was not being changed?
  - c. Is it a problem if the message changes?
4. Remind the students that all information from casual conversations in the hallway, scientific debates or TEK is shared, modified and used according to a unique set of principles.



### KEEP WATCHING

“TEDxYouth@Victoria: Bradley Dick—Honouring Tradition” (Run Time – 13:17) shares traditional introductory protocols from the Lekwungen First Nation. Bradley explains his learning process, how he has gained knowledge and reflects on the meaning and importance of protocols. [youtu.be/s7ZQqIFeE7g](https://youtu.be/s7ZQqIFeE7g)

### BACKGROUND ESSAY

Individual Indigenous communities or cultures have specific protocols in place to guide the relationships that humans have with the natural world and with each other. Protocols are more than just manners or rules. They instruct us on how we can show respect to others and ourselves. It is important to recognize that knowledge and protocols differ from nation to nation, community to community, and person to person. While there may be beliefs and concerns that are shared by different Indigenous people, histories and traditions of different communities are rich and varied.

While protocols may differ from place to place, there are a few simple protocols that people can follow which are common to most Indigenous cultures across Canada. These include acknowledging the



traditional lands where you are situated and introducing yourself. It may also be appropriate to offer tobacco or a gift before requesting knowledge from an Elder in some contexts (but not in others). Typically this would come before asking an Elder to share some of their knowledge or stories with you.

Beyond these two simple protocols, students should be aware that there are other protocols that can only be learned through experience. Understanding and practicing protocols is a lifelong learning process, and demonstrates awareness and respect. The best way to learn is to build relationships with Indigenous people and to ask questions. Be prepared to make mistakes, to apologize if necessary and to be open and ready to learn.

**DURATION** 15-20 minutes

**MATERIALS**

- Computer with Internet connection

### ACTIVITY – INTRODUCTIONS

This activity will familiarize students with some simple protocols that can be adopted by Indigenous and non-Indigenous students alike. Learning these protocols will also provide students with a greater understanding of how our individual cultures contribute to the types of knowledge that we possess.

#### Acknowledging Traditional Lands

Acknowledgement of traditional lands typically happens at the beginning of a meeting, a presentation or a celebration by an Indigenous person local to the area, an Elder, or by the facilitator. Students can start by learning about the First Nations, Métis and Inuit people who are local to their area, as well as any treaties that cover that area. Below is an example of an acknowledgement for the Bow Valley; keep in mind that it can be adapted. Most important is that the words are authentic and that we recognize that we are all treaty people. Understanding why we acknowledge traditional lands will help with this authenticity.

*I would like to acknowledge that we are gathered on the traditional territories of the Niitsitapi (Blackfoot) and the people of the Treaty 7 region in southern Alberta, which includes the Siksika, the Kainai, the Piikani, the Tsuut'ina and the ȩyāhē Nakoda Nations, including the Bearspaw, Chiniki and Wesley First Nations. This is also home of the Métis Nation of Alberta, Region III.*

*We acknowledge past, present and future generations of Indigenous people who have been living, working and stewarding this landscape since time immemorial. We honour those who have taken care of this land and will work to continue to be stewards of this landscape.*

#### Introducing Yourself

In addition to acknowledging the place that you are situated, it is customary to also introduce yourself at the beginning of a meeting. An introduction should include your name and where you come from. For



Settler or non-Indigenous people, this does not mean the place where you were born and/or grew up (though you may also wish to mention this). Instead it refers to your cultural and geographical background prior to settling in North America. Students may not know where their relations are originally from and will have to speak with family members to learn about their heritage. Below is an example from Biosphere Institute educator Adam:

*My name is Adam Mertens. I am from Scotland, England and Germany on my mother's side and the Netherlands on my father's side. I grew up in Bridgewater, Nova Scotia, part of Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq people.*



### KEEP READING

The Stoney Education Authority has created an app that contains over 590 language audio files featuring native Nakoda speakers. It includes stories, songs, games and quizzes. The app can be downloaded wherever you get your apps.

Students can learn a few words of greeting in the language of the Indigenous people local to your area. Below are a few words in Îyãñé Nakoda (Stoney Nakoda) from the Stoney Nakoda Language app. Keep in mind that Îyãñé Nakoda—as with many Indigenous language—was historically not a written language and therefore you may encounter different spellings of the same words.

- Âba wathtech = It's a good day (greeting)
- Doken yaû? = How are you?
- Dââwaûch = I'm fine
- Îsniyes = Thank you

Students can practice these protocols and Nakoda words by introducing themselves to one or more of their classmates. For many people (students and adults), this may feel uncomfortable at first but will become more comfortable with familiarity and practice.



# WILDLIFE MANAGEMENT AND TEK (Part II)

**GRADE** Grade 5

**PART** 2 of 3

**TOPICS** Wildlife, story, traditions, treaties, culture, conservation

## CURRICULAR CONNECTIONS

Grade 5 Social Studies

Topic 2 – Histories and Stories of Ways of Life in Canada

1. Appreciate the complexity of identity in the Canadian context:
  - Acknowledge oral traditions, narratives and stories as valid sources of knowledge about land and diverse Aboriginal cultures and histories
2. Examine, critically, the ways of life of Aboriginal peoples in Canada by exploring and reflecting upon the following questions and issues:
  - What do the stories of First Nations, Métis and Inuit peoples tell us about their beliefs regarding the relationship between people and the land?

## OVERVIEW

*“The Elders believe we must teach all of our brothers and sisters that life is interrelated, and we must live in harmony in the renewal process of the seasons.”*

Chief John Snow, *“These Mountains are our Sacred Places”*

Building upon what students learned about Traditional Ecological Knowledge in Part I, this lesson will ask students to look at some of the similarities and differences between TEK and Western science. An examination of the strengths of both ways of knowing will lead to a look at some different examples of how TEK and Western science provide complementary lenses for tackling conservation challenges.

## OBJECTIVES

- Students will understand some of the similarities and differences between Traditional Ecological Knowledge and Western science
- Students will understand that all organisms are interconnected to one another
- Students will be familiar with an example of how TEK is contributing to improved wildlife management in Kananaskis Country

## KEY TERMS

- **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
- **Western science** – a system for learning about the natural world through experiments and observation
- **Etuaptmunk (Two-Eyed Seeing)** – a Mi’kmaq term describing the ability to view the world with the strengths of both Indigenous and Western knowledges

## GUIDING QUESTIONS

- What are strengths of TEK? What are strengths of Western science?
- What is an example of a Western science approach to conservation creating long-term problems for ecosystems?

## BACKGROUND ESSAY

Traditional Ecological Knowledge (TEK) is one way of looking at the world around us. Another way of learning about the world is through **Western science**, a name given to the type of science with which many people are most familiar. Broadly speaking, Western science tries to understand the natural world by studying individual parts. It is called Western science because it originated in Western Europe, and is distinct in many ways from Indigenous science or TEK. Traditional Ecological Knowledge on the other hand seeks to understand the





world as an interconnected system. The table below shows some of the differences between TEK and Western Science.

Traditional Ecological Knowledge	Western Science
Acquired over a long period of time	Acquired over shorter periods of time
Long-term wisdom	Short-term prediction
Explanations based on examples and anecdotes	Explanations based on hypothesis, theories and laws
Includes the natural and the supernatural	Excludes the supernatural
Context and community based	Controlled experiments
Values-based	Objective
Locally valid	Universally valid
Humans part of the environment	Humans separate from the environment
Oral or visual	Written
Interconnectedness	Separate areas of study

*Adapted from Alaska Native Science Commission*

The Mi'kmaq word *Etuaptmunk* describes a principle known as Two-Eyed Seeing which comes to us from Mi'kmaq elder Albert Marshall from Eskasoni First Nation and the Institute for Integrative Science and Health in Cape Breton, Nova Scotia. In the words of the Institute:

*“We often explain Etuaptmunk/Two-Eyed Seeing by saying it refers to learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing ... and learning to use both these eyes together, for the benefit of all.”*

Given the differences between the two ways of knowing, Traditional Ecological Knowledge and Western science can be complementary to one another and help us better understand the natural environment. While there are many differences between these two ways of knowing, there are also many similarities between TEK and Western Science.

Similarities between TEK and Western Science
Both explain complex systems
Both seek to understand the physical world
Both are based on observation
Both bodies of knowledge change over time
Both verify through repetition



*Adapted from Baker, Rayner & Wolowic (2011)*

Increasingly, Western science is adopting a more holistic view towards nature. This transition is more closely aligned with Indigenous worldviews, which recognize the interconnectedness of all things. Integrating these two bodies of valuable knowledge is crucial for addressing modern challenges in resource conservation and ecosystem health. When one thing changes in an ecosystem, all other things are affected. The interconnected nature of ecosystems can be represented through **food chains** and **food webs**.

**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 a 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 you are instructed to do so by the instructor. Hold your card up so that everyone can see what card you have.
4. Choose one student to start. They will read what 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 other? What impact does this have on their response to changes?
6. Illustrate the impact that a change can have on the entire system by reading out an ecosystem scenario. 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).

### BACKGROUND ESSAY

Across North America, Indigenous people have protected and cared for the land, plants, and animals that have sustained them since time immemorial. For example in the region that we now know as Alberta, Indigenous Peoples used controlled burns to manage forests. The time and location of the burns were based on Traditional Ecological Knowledge and represented an important element of stewardship of the land. The reasons for burning were numerous and included maintaining grazing land for game animals and stimulating the productivity of food and medicinal plants. These burns were carefully monitored and took place during low risk conditions such as early spring or late fall.

As European settlers arrived and introduced policies that removed Indigenous people from their traditional territories, the practice of controlled burns became less common. European settlers brought with them a very different attitude towards fire and stewardship than the Indigenous worldview.

Parks and protected areas—such as Banff National Park, Canada’s oldest national park which was established in 1885—were created with the stated goals of preserving wildlife and spaces for settlers to recreate. Early ideas of preservation and conservation did not take into consideration the important role that Indigenous people had in the stewardship of the land. Management policies were informed by Western science and often prioritized one species over another, without considering the effects that changes could have on ecosystems as a whole.



#### KEEP WATCHING

“How Wolves Changes Rivers” (Run Time – 4:33) describes how the reintroduction of wolves to the Yellowstone National Park transformed the landscape from the presence of the smallest creatures to the configuration of the rivers.

[youtu.be/y5a50BhXz-Q](https://youtu.be/y5a50BhXz-Q)

Perhaps the best known example of the problems that can arise with a simplified Western approach to conservation is the wolves of Yellowstone National Park in the United States, which was established in 1872. The park has a long history of removal of wolves, which were viewed as a threat to deer and livestock. Not long after the last wolves were killed in 1926, elk populations began to rise significantly. This led to lasting impacts on other species and the whole landscape, including shrubs, trees, fish and rivers. In 1995 wolves were reintroduced to the area, and over time the entire ecosystem rebounded.

Today, conservation science in Canada is changing. Increasingly the importance of Traditional Ecological Knowledge is being acknowledged and incorporated into the conservation and stewardship of lands, including Canada’s parks and protected areas.



## TEK in Action: Stoney Nakoda Grizzly Bear Cultural Monitoring

In the Bow Valley, the Stoney Nakoda Nations are helping to improve grizzly bear management through the use of Traditional Ecological Knowledge. This single year project used cultural monitoring as a tool to improve conservation in areas of cultural importance to the Stoney Nakoda. The Traditional Knowledge specific to this landscape that is held by Elders is being shared in order to better understand conservation concerns from a cultural viewpoint.

*“As with most wildlife management today, grizzly management has become a process that relies heavily on Western science to inform management strategies and policies. There is, however, an alternate view that incorporates cultural values, intuition and ancient relationships that are inseparable from the place and space in which they were born.”*

This project involved extensive interviews and field visits with Elders to Kananaskis Country in order to document local perspectives and to develop recommendations for grizzly bear conservation planning. The finished report includes written interviews from Stoney Nakoda elders and can be accessed at [bit.ly/2YNapVj](http://bit.ly/2YNapVj).

## REFERENCES

Baker, J., Rayner, A. & Wolowic, J. (2011). *A Primer for Science Teachers*. Retrieved from [ctabobandung.files.wordpress.com/2011/11/ns-primer.pdf](http://ctabobandung.files.wordpress.com/2011/11/ns-primer.pdf)

Nature Conservancy of Canada. (2020). *What We Do: Indigenous Conservation*. Retrieved from [www.natureconservancy.ca/en/what-we-do/indigenous-conservation/](http://www.natureconservancy.ca/en/what-we-do/indigenous-conservation/)

Stoney Consultation Team, Stoney Tribal Administration. (2016). *Stoney Nakoda Nations Cultural Assessment for the “enhancing grizzly bear management programs through the inclusion of cultural monitoring and traditional ecological knowledge.”* Retrieved from [canadianmountainnetwork.ca/wp-content/uploads/2016/10/Stoney-Nakoda-Nations-Cultural-Assessment-for-the-%E2%80%9CEnhancing-grizzly-bear-management-programs-through-the-inclusion-of-cultural-monitoring-and-traditional-ecological-knowledge.%E2%80%9D-2016.pdf](http://canadianmountainnetwork.ca/wp-content/uploads/2016/10/Stoney-Nakoda-Nations-Cultural-Assessment-for-the-%E2%80%9CEnhancing-grizzly-bear-management-programs-through-the-inclusion-of-cultural-monitoring-and-traditional-ecological-knowledge.%E2%80%9D-2016.pdf)