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...in the classroom

Science 7

Informed Decision Making

Indigenous Knowledge Lesson Plan

Local and Traditional Knowledge in Watershed Governance
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Science 7: Informed Decision Making

RATIONAL OF CURRICULUM CONNECTIONS

This lesson meets cross-curricular outcomes for Science 7 and Social Studies 7. Students will learn the contributions of Indigenous knowledge to decision-making about current events/issues in the Mackenzie River Basin, which is within the circumpolar region.

Purpose:

Students will learn the significant relationship between humans, the ecosystems of which they are part, and how traditional, local and scientific knowledge is used to make informed decisions. This lesson shares several case studies made up of information, quotes, and photos from Elders, land users, community members and researchers about an important environmental issue.

The final component of the lesson introduces students to interviewing Elders or community members in relation to an environmental issue that matters to them. While learning outcomes may be met without the interview, we believe the interview is an important way for students to experience the vitality and necessity of intergenerational sharing of Indigenous knowledge of the land. Benefits also extend to the Elder or community member, who is enabled to pass on knowledge, culture, and language in relation to scientific learning.

SCIENCE 7

Unit A: Interactions and Ecosystems (Social and Environmental Emphasis)

Focusing Questions: How do human activities affect ecosystems? What methods can we use to observe and monitor changes in ecosystems, and assess the impacts of our actions?

- Describe the relationships among knowledge, decisions and actions in maintaining life-supporting environments:
 - Illustrate, through examples, the limits of scientific and technological knowledge in making decisions about life-supporting environments (e.g., identify limits in scientific knowledge of the impact of changing land use on individual species; describe examples in which Aboriginal knowledge—based on long-term observation—provides an alternative source of understanding)
 - Analyze a local environmental issue or problem based on evidence from a variety of sources, and identify possible actions and consequences (e.g., analyze a local issue on the control of the beaver population in a nearby wetland, and identify possible consequences)

**Cover Photo: Government of Northwest Territories, Fort Good Hope
Biodiversity Program, Sahtu Region**

Photo Credit: Julien Schroder

SOCIAL STUDIES 7

This lesson explicitly addresses Indigenous Knowledge, a key focus of the social studies curriculum (Junior Secondary Social Studies Curriculum, 1993, p. 10), in order to address a key Social Studies 7 issue for inquiry: "How should circumpolar people resolve the conflict between resource development and environmental degradation?" (p. 20).

- https://www.ece.gov.nt.ca/sites/ece/files/resources/social_studies_-_grade_7-9.pdf

Common Learning Experiences: Students will write a letter to express a point of view regarding a circumpolar issue.

Major Understandings: Circumpolar regions are changing rapidly in areas of technology, economic activity, social structure and political organization.

Knowledge: Students will demonstrate knowledge of the following:

- How technological, societal, political, and economic changes have impacted traditional circumpolar societies
- How the environment of the circumpolar regions affects peoples: their lifestyles, occupations, leisure and economic activities

Skills: Students will be able to do the following:

- *Processing:* acquire information to find answers through listening, observing, reading, and utilizing community resources
- *Processing:* compare information about one topic from two or more sources to see if they are identical, similar, parallel or inconsistent, unrelated, or contradictory
- *Communication:* read, listen and observe to acquire specific information
- *Participation:* converse with others in a variety of settings, including informal small group and whole class discussions

Attitudes: Students will be encouraged to develop:

- An appreciation of the need for cooperation in group work and community life
- An appreciation for the consequences of people's interactions with their physical and social environments
- A sense of responsible stewardship over the northern environment

Northern Studies Focus: Focus on Canada's challenges and policies with regard to its northern peoples and territories. Also focus on the challenges facing northern aboriginal peoples: the preservation of culture, the pursuit of economic prosperity, the settlement of land claims, and the negotiation of self-government.

Teacher Resources

- School protocols for engaging elders and community members.
- Elders in Schools Handbook: https://www.ntassembly.ca/sites/assembly/files/13-06-3td_84-174.pdf
- Mackenzie River Basin (location and introduction): <http://www.trackingchange.ca/river-basins/mackenzie/>
- This lesson is based on research from Tracking Change: Local and Traditional Knowledge in Watershed Governance: <http://www.trackingchange.ca/>

Materials Needed:

- Image of Mackenzie River: <http://www.trackingchange.ca/news/15459/>
- Projector or color printout to display the image of the Mackenzie River to the class
- Copies of:
 - Issue Note-Taking Worksheet
 - Letter-writing Worksheet
 - Indigenous Knowledge Handout
 - Tracking Change: Sport Fishing Case Study
 - Tracking Change: Pollution Case Study
 - Tracking Change: Land Guardian Case Study
 - Tracking Change: Mining Case Study
 - Tracking Change: Water Issue Case Study
- Computers/library resources for additional research
- Local Elder(s) or community member(s) for the issue interview
- Handout: How to conduct an interview (optional)

INTRODUCTION

The Mackenzie River Basin is spread out between the NWT, Alberta, Saskatchewan, and BC, and is an important part of many people's lives. However, due to human activities such as development, climate change, hydro damming, and others, there are many problems facing this important river basin. Managing or dealing with these issues is important in ensuring that the health of the river is protected and people's livelihoods are supported.

This lesson introduces students to the importance of using all knowledge available (traditional, local, and scientific) in making decisions about current and future problems.

Key questions for student inquiry:

- Why is including Traditional Knowledge and Indigenous perspectives important? How do both local knowledge and Western science contribute to decision-making about the environment?

LESSON PLAN PROPER

- **Location:** In classroom; interviews may take place inside or outside the classroom
- **Length of activity:** 1-2 periods or 2-3 periods with the inclusion of Part 3
- **Activating Strategies:**
 - *Mind Map Brainstorm:* Display the photo of the Mackenzie River with the community alongside it. Ask students to quietly think about the river and create a mind map of all the different ways they could come to understand it: look at the shape of the river. Consider how the river might change over time, through the seasons and over years. Consider the quality of the water, and what impacts the health of the water. Consider what lives in and around the river, things visible and invisible to us. Consider who might see (or sense in other ways) what we cannot see, and how. Consider the community next to the river and all the different ways the river is part of that community's life - for food, transportation, recreation, stories, directions, etc. Consider the ways the community might see the river differently from guests. Consider how fish and animals change with the river, and how. Consider what impacts the health of the river over time, including any climate impacts or toxins come from near or far.
 - *Land-based option:* take the students outside to the local river, and work through the same exercise using notebooks.
 - Once students have mind mapped the river, share ideas together as a class to create a class mind map.
- **Learning Experiences:**
 - *Part 1: Indigenous Knowledge*
 - Introduce the concept of "Indigenous knowledge" and distribute the handout. As you discuss the handout, connect examples of Indigenous knowledge to the mind map the students have created.
 - Indigenous knowledge is knowledge that is developed over long periods of time - hundreds or thousands of years - through direct contact with the land. It connects knowledge of the land with people's lives, noting changes over time that affect communities. It can involve things we usually think of as "science," like measuring, counting, and monitoring

various things. On the river, this could include water levels, numbers of fish, length of fish, size of algae blooms. It can also involve things we may not think of as "science," like memories of how the river has changed (or stayed the same) over generations, or stories of how people no longer visit certain fishing areas because the fish are simply known to be no longer healthy. People keep and pass on this knowledge because it is relevant to their lives and wellbeing.

- Discuss as a class: How does Indigenous knowledge contribute to our understanding of the river in ways that traditional science does not? Why might Indigenous knowledge be important to decision-making about the river?
- Have students create a Venn diagram showing the similarities and differences between the contributions of traditional science to decision-making and the contributions of Indigenous knowledge.
- *Part 2: Case Study*
 - Provide students with copies of the "Tracking Change Case Studies" (Sport Fishing, Pollution, Land Guardian, Mining, and/or Water Issue). Review the instructions and have students complete the case study individually or in small groups. Select the case study (or studies) most appropriate for your class.
 - Once they are finished, have students present evidence for why Indigenous knowledge is important in decision-making. [3-5 minute presentation].
- *Part 3: Analyze a Local Environmental Issue*
 - Brainstorm with students to identify a local environmental issue that matters to them. This could be one of the topics already explored, or it could be something new.
 - Identify the kinds of information that are available to make decisions about that issue. This could include web research on the selected topic, scientific testing, and local reports. It should also include speaking with land-users and Elders in a respectful manner.
 - Conduct initial research on the issue as a class. Divide students into groups to research and have them complete the "Issue Note-Taking Worksheet." Ensure students use at least two sources to find information.
 - Share the information together as a class to refine understanding of the issue.
 - Identify a local Elder or land user who could share knowledge about this issue. Depending on the community context, you may invite one or more guests to class or have students interview family or community members on their own. Discuss as a class: what other kinds of information could we learn by talking with a local Elder or land user? Generate a list of questions to ask this person. See the "how-to" handout for information on

this process.

- Interview the Elder(s) or community member(s) using the students' interview guide. Students should take notes during the interview on the interview question sheet.
- Following the interview, have students review what they learned from the various sources of information. Based on what they have learned, have students either (a) write a letter or (b) draw a picture for the Elder or community member, expressing how this person impacted their point of view on the issue. Encourage students to capture what they learned from the interview either in text or visually. If they are unfamiliar with letter writing, provide them with the "Letter-Writing Worksheet" (attached). Once they are complete, provide the letters and pictures to the guest directly.

Keywords: informed decision making, indigenous knowledge

Themes: traditional knowledge, indigenous knowledge, decision making, governance

Optional Student Handout: How to Conduct an Interview

Generating Interview Questions:

There are different types of interview questions:

1. Closed-ended questions require a simple answer (what is your name?), or a selection from a few set answers. Closed-ended questions are handy when you are interviewing a lot of people and want to easily compare their answers.
2. Open-ended questions require the person being interviewed to explain in some detail. Open-ended questions are helpful when you want to discover more depth or complexity. You might ask them as follow-up questions to things people have said earlier in an interview.

Activity: Interviews

Read and label each question below in the blank provided. For closed-ended questions, write "C," and for open-ended questions, write "O." (Adapted from NWT Heritage Fairs Teacher Manual https://www.pwnhc.ca/wp-content/uploads/2014/03/nwt_heritage_fairs_teacher_manual.pdf):

- | | |
|-------|--|
| _____ | 1. What was it like when you went fishing as a child compared to now? |
| _____ | 2. When were you born? |
| _____ | 3. You said earlier that travelling over the ice is different for young people today than it was when you were young. Can you tell us how it is different? |
| _____ | 4. Would you tell me about your memories of hunting caribou with your uncle? |
| _____ | 5. Do you like ice hockey? |

Prepare for the interview. Interviews may take place in school or outside of school. Outside of school, students may meet the Elder somewhere natural (in a home or outside), and they may help with daily tasks, so conversations will flow more naturally. If students are inviting the guest(s) to the school, prepare to welcome them and create a hospitable environment in the classroom. Walk through the handout, "Best Practices for Interviews." Role play interview best practices in pairs.

Best Practices for Interviews:

Keep these best practices in mind when you're conducting interviews for your project:

1. Locate a quiet and comfortable place for the interview.
2. If the person being interviewed is more comfortable in another language, then ensure you've planned for a translator.
3. Introduce yourself.
4. Record the person's name, the date of interview, and the location.
5. Explain the purpose of the interview and how you will use the information.
6. Do more listening than talking.
7. Take necessary notes.
8. Ask for clarification of special language and terms.
9. Write follow-up notes about your impressions, ideas, and questions you still need to ask. Analyze your findings to identify the important points.
10. Decide if any follow-up is needed.
11. Send your interviewee a thank-you note.

Interview the Elder(s) or community member(s) using the students' interview guide. Students should take notes during the interview on the interview question sheet.

Adapted from NWT Heritage Fairs Teacher Manual https://www.pwnhc.ca/wp-content/uploads/2014/03/nwt_heritage_fairs_teacher_manual.pdf

Student Handout: Water Issue Case Study

ISSUE DESCRIPTION

Water is an important source of life on earth. It helps in growing the plants that we eat, it sustains a vast aquatic ecosystems, and is used by animals and humans to travel and survive. However, human activities such as development, hydroelectric damming, and climate change, threatens this important source of life. In some places the water levels are dropping, causing problems to rivers, lakes, channels and creeks. These changes make travel difficult, especially for Indigenous communities live near waterways and rely on them for food, travel, and drinking water. Since their lives are connected to the land, many Indigenous peoples are noticing changes to the water and are trying to use their knowledge to deal with these issues.

Below are excerpts from Mikisew Cree First Nation's reports on concerns about water quantity and fish health. The excerpts also talk about their community based monitoring program, which is one of the ways the community has been making headway in understanding how to deal with the issue that they are facing. As you read this case study, consider the observations people are making about the land, the issues they identify, and how their knowledge of the land might be helpful to make decisions about the environmental problem. Think: what do these reports tell us that scientific monitoring does not?

BACKGROUND

For several years the Misikew Cree First Nation has been operating a Community Based Monitoring Program, out of Fort Chipewyan, Alberta, to understand the changes that their Elders have observed in traditional territories. This program uses both traditional science and Indigenous knowledge of the land to understand changes. Of greatest importance to the community was the need to better understand the negative changes to water quality and quantity, and fish and animal health in the Peace Athabasca Delta (PAD).



COMMUNITY-BASED MONITORING

Community-Based Monitoring takes into account local needs and community values in thinking about how resources are managed. Local people give feedback on their experiences with changes and impacts in their environment, share critiques and suggestions, and make recommendations.

The Community Based Monitoring Program identified serious concerns with the water quantity, which constrains the access to people's traditional hunting, fishing and harvesting areas.

"The most pervasive problems facing the Mikisew is the change to water quantity. The combined pressures of hydroelectric development, water withdrawals for Tar Sands development and climate change has reduced the amount of water reaching the Peace Athabasca Delta" MCFN 2017-18 Report

"Low water affects the ability of Mikisew Cree First Nation members to reach traditional use areas along transportation routes (Figures 1&2). This access has been disrupted by hydroelectric development along the Peace River, the exploitation of the Oil Sands and further exacerbated by climate change."
MCFN 2016-17 Report

One of the ways that Misikew Cree First Nation has addressed the issue of decreasing water levels is by creating an Navigational Hazard App. The app allows Community Based Monitoring staff and community members to use their knowledge to continuously update a mapped database of navigational hazards (e.g. low water levels). People use tablets or smartphones to record and upload information like the geographic coordinates and description of the area, quality of the travelling conditions, and photographs. The field data is used to create an interactive database and map with real time hazard updates of the conditions of the area. This data helps community members adapt to the rapid travelling changes occurring in the PAD by providing better information for them to prepare for safe navigation.

Their Community Based Monitoring program also selectively sampled fish, in order to research the health implications for the consumption of foods related to a traditional diet.

"These tumours and lesions are often caused by elevated concentrations of Polycyclic Aromatic Hydrocarbons (PAHs). Some fish from environments high in PAHs may also display what are known as toxicopathic hepatic lesions." MCFN 2016-17 Report

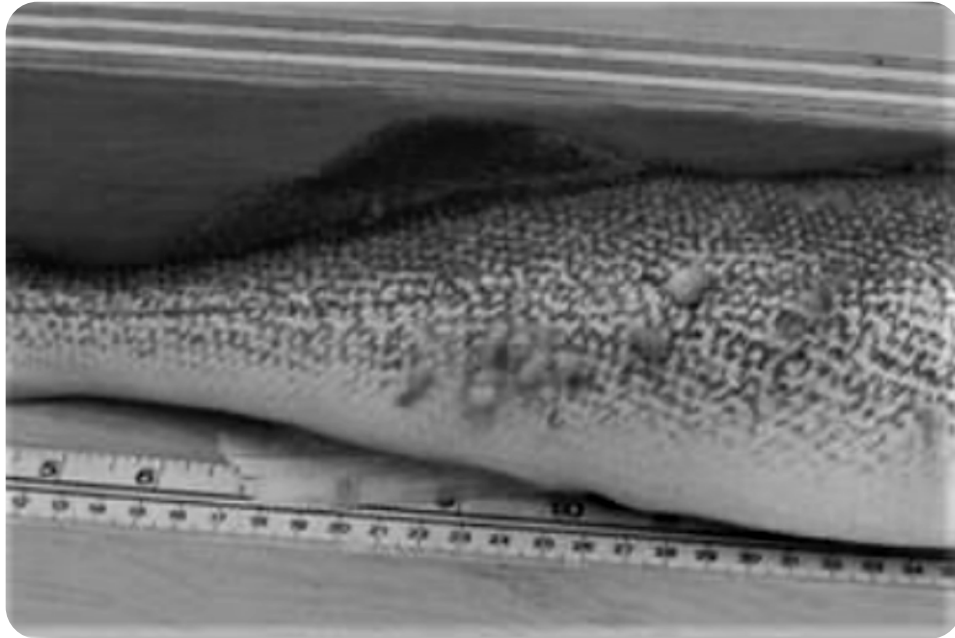
Key Questions to Consider:

1. Why is this an important issue, and what are people saying about it?
2. Why is it important to learn from Indigenous knowledge before making a decision about this issue?

Image (Previous Page): Canoeing on Boundary Creek, Sahtu Region

Photo Credit: Julien Schroder

3. How might Indigenous knowledge contribute to decision making in a way that western science might not?
4. Who might you be able to talk to in your family or in your community more about this topic?



Neoplasm on a Walleye Quatre Fourches (PAD)

Photo Credit: Unknown



Whitefish with a large tumour being studied at a lab in Alberta (2010)

Photo Credit: Ed Kaiser, Winnipeg Free Press, <https://www.winnipegfreepress.com/canada/letter-to-pm-demands-study-of-deformed-fish-near-oilsands-103119914.html>

Student Handout: Sport Fishing Case Study

ISSUE DESCRIPTION

Sport fishing is the practice of fishing for pleasure or for competitions. Some people travel across the world to catch pike, trout, and char (i.e. that trophy worthy fish), and to enjoy an uncrowded, natural landscape. There are many fishing lodges and tours that profit off of sport fishing, and it may be part of the economic development in local communities.

However, this human activity can damage fish populations and harm the people who rely on the fish as a source of food, such as the local Indigenous communities. Increasing numbers of highways, back roads, and boat launches allow sport fishers to visit traditional fishing areas of local Indigenous communities. These places become crowded, and it becomes harder for Indigenous people to fish for their food. It is very difficult to limit the number of people travelling, boating, or fishing along the highway and backroads. Without limits, overfishing leads to drastic decreases in fish populations.

Below are some excerpts from reports that talk about the concern of overfishing caused by sport fishing in the Peace River area. This area is part of the Mackenzie River Basin. As you read this case study, consider the observations people are making about the land, the issues they identify, and how their knowledge of the land might be used with western scientific knowledge to make decisions about this environmental problem caused by human activity?

Excerpts:

The highway that runs along the Peace River is one of the areas that is of concern for the Indigenous peoples in the area.

With Highway 29 running the entire length of the Peace between Hudson Hope and Fort St. John, and several boat launches, traditional fishers believe that sport fishing has caused a decline in the number of fish. For instance, after an entire afternoon using two different fishing nets of up to 100 feet each, only two fish were caught at the Eagle Island Fish Camp. Treaty 8 Association of BC area, p. 64-65, 2016-2017 Report

Backcountry roads are also a major concern for the Indigenous people.

In tributary rivers like the Moberly, Halfway, Pine, Sukunka, Murray, Burnt, Wolverine, it is common knowledge among local fishers that fish populations are in rapid decline. Most fishers believe it [decline in fish population] is due to overfishing because backcountry roads had created open access to once remote fishing spots. Treaty 8 Association of BC area, p. 65, 2016-2017 Report

Key Questions to Consider:

1. Why is this an important issue, and what are people saying about it?
2. Why is it important to learn from Indigenous knowledge before making a decision about this issue?

3. How might Indigenous knowledge contribute to decision making in a way that western science might not?
4. Who might you be able to talk to in your family or in your community more about this topic?



Fish caught for sport along the Peace River

Photo Credit: Annie Vos <https://www.travelalberta.com/ca/articles/five-tips-for-fishing-in-the-peace-river-for-dummies-3173/>



Anti-Poaching Image for the Government of Alberta

Photo Credit: Government of Alberta <https://open.alberta.ca/dataset/dbf392f4-266f-4947-adco-fa4bdf4e2c9c/resource/da6455ef-0351-4655-b7be-eb18ebbeb9c/download/alberta-guide-sportfishing-regulations-2019.pdf>

Student Handout: Pollution Case Study

ISSUE DESCRIPTION

Pollution is when a substance is introduced into the environment that is harmful to the environment and local inhabitants. Five major types of pollution include: air pollution, water pollution, soil pollution, light pollution, and noise pollution. Industries that cause pollution may create benefits, such as economic development and job creation. However, these industries are also detrimental to the environment and human inhabitants in the area. Some of those most affected by pollution are the people who live and rely on the land, mainly Indigenous peoples. These individuals and communities are often the first to notice changes to the environment caused by pollution. Indigenous knowledge is an important part of noticing changes to the environment.

The following case study includes information and excerpts from research reports that share the concerns Indigenous communities have about the effects of pollution on the environment. As you read this case study, consider the observations people make about the land, the issues they identify, and how their knowledge of the land may be used to make decisions about this environmental problem caused by human activity.

BACKGROUND

Clearcutting is a method used in forestry that removes all of the trees from an area, rather than leaving some to protect the forest and help it grow back. Trees absorb and hold water, which keeps the land from flooding and spreading dangerous chemicals. After clearcuts, floods become more severe. The chemicals and dirt that would have been trapped by the trees drains into waterways affecting the fish and health of the water. Changes to water and fish health impact the people who rely on them to live. Clearcutting also destroys habitats for many animals, insects, and hunters.

All that clearcutting, every time it rains, all the silt and chemicals from the forestry area, it drains down and eventually comes down to our lakes. And the fish are affected. It's true those chemicals are in the sand but the fish eat from the bottom. Everything is going downhill. There is already mercury in this lake - Lesser Slave Lake Elder, Treaty 8 FN of Alberta, p. 87-88, 2016-2017 Report

Clearcutting is not the only human activity that impacts the environment. Industrial activities like oil and gas, as well as farm operations, can affect the health of the water and fish.

The fish were good back in the 1950s because there was no forestry and oil activity in the hills. But since then the fish are becoming poor. It's also the farmer's fields and all the chemicals that they use for their crops and it drains into the creeks and streams and goes into the lake - Lesser Slave Lake Elder, Treaty 8 FN of Alberta, p. 89, 2016-2017 Report

Key Questions to Consider:

1. Why is this an important issue and what are people saying about it?
2. Why is it important to learn from Indigenous knowledge before making a decision about this issue?
3. How might Indigenous knowledge contribute to decision making in a way that western science might not?
4. Should Indigenous knowledge be incorporated into decision making?
5. Who might you be able to talk to in your family or in your community more about this topic?



Images (from top to bottom): A Petro-Plant releasing pollutants into the air & an example of a forest that has been clearcut

Photo Credit: Cheryl Empey & Roya Ann Miller

Student Handout: Land Guardian Case Study

ISSUE DESCRIPTION

Indigenous Guardians programs empower communities to monitor, manage, and care for their territory. There are Guardian programs all across Canada, although guardians sometimes go by different names, like watchers, watchmen, monitors, rangers, and others. Guardians draw upon Traditional Knowledge and scientific testing to identify and report on changes happening in the environment.

Many communities have benefited from these types of programs, such as protection of the land and water. Communities have also asserted more influence and control over resource management in their area. Land Guardian programs are also a great way to involve people in cultural activities and facilitate knowledge sharing between Elders and youth.

"Indigenous Guardians programs strengthen our communities. They create jobs, lower crime rates, and improve public health. But most importantly, they inspire our young people. They connect them to the land and their Elders. They give them professional training tied to their language and culture. That offers hope that can combat the despair that so many Indigenous youth feel today."
- Valerie Courtois, Director, Indigenous Leadership Initiative (Indigenous Guardian Toolkit website)

Check out the video Indigenous Guardians - Caring for the Land to learn more about what communities are doing across the country. https://www.youtube.com/watch?v=q4W1gTWcuto&feature=emb_title

BACKGROUND

Indigenous Guardians include paid staff and community volunteers. There are a wide variety of activities that Guardians complete, such as:

- Actively patrol and monitor the land and water, increasing presence on the land
- Use local and traditional knowledge to manage the environment
- Promote Indigenous culture (including Elder-youth mentorship, language learning camps, on-the-land programs)
- Research and collect data about key issues, and use that information to make decisions about the land
- Strengthen Indigenous authority to manage their lands and waters

The Dehcho K'éhodi Stewardship Program and the Dehcho - Aboriginal Aquatic Resources and Oceans Management Program have been working together to create a Dehcho Guardian program. Each community that is part of Dehcho First Nations employs 1-2 Guardians who monitor the land and water. Three principles make up the foundation for the program: (1) take guidance from Dene laws & values, (2) support & strengthen Dene language, and (3) enable youth-Elder mentorships to ensure future generations of Dene can learn their culture and how to be on the land.



Key Questions to Consider:

1. Is there a Land Guardian program in your community?
2. What are the benefits and strengths of this type of program? What are the challenges and limitations?
3. How could Land Guardian programs be useful in managing issues facing communities?
4. Who might you be able to talk to in your family or in your community to learn more about community approaches to monitoring?



Images (from top to bottom): Responsibilities of a Land Guardian & the Dehcho First Nations Logo
 Photo Credit: Indigenous Guardians Toolkit <https://www.indigenousguardianstoolkit.ca/> & Dehcho First Nations

Student Handout: Mining Case Study

ISSUE DESCRIPTION

Mining has a long history in the Northwest Territories. There are active mines like the Diavik and Ekati diamond mines and many abandoned mines throughout the north, such as the Giant Mine outside of the City of Yellowknife. Both types of mines have raised some concerns about the different impacts on the environment. The people most concerned about the environmental impacts caused by abandoned mines and mining development are those who live on the land and see the changes the most: Indigenous Elders, land users, and community members. After years living on the land hunting, fishing, and harvesting, they know the land the best.

Below are some statements from Elders, land users, and community members about their concerns on the impacts of mining on the environment. As you read the quotes and look at the photos, consider the observations people make and the issues they identify. How might their knowledge of the land be used to make decisions about how to address the negative environmental effects of mining?

BACKGROUND

The draining of lakes and rerouting of ground water as a result of diamond mining activity is a major concern. The Gahcho Kue Diamond Mine is less than 100 kms from the community of Lutsel K'e. The diamond mine affects both the Artillery Lake and Lockhart River.

...it's hard to get by sometimes. We aren't miners, we're bush people. It's really scary. What's happening at the mines. I know they say it's okay, it won't affect the environment, but when they're gone we're going to have to deal with it. I don't know what's going to happen there. - Joseph Catholique, Lutsel k'e area, p. 51, 2016-2017 Report

The Yellowknives Dene First Nations have been deeply involved in various kinds of research initiatives and consultations regarding the impacts of this mine on their health, culture, and livelihood. It has also made people suspicious about the impacts of other mines. In general, it is believed that where there are mines the fish are unhealthy and where there are no mines the fish are healthy (Yellowknives Dene First Nation Elder). Akaitcho area report, p. 54, 2016-2017 Report



Aerial View of an Open-Pit Mine

Photo Credit: Dion Beetson

Key Questions to Consider:

1. Why is mining an important issue? What are people saying about it?
2. Why is it important to learn from Indigenous knowledge before making a decision about this issue?
3. What does Indigenous knowledge contribute to decision making that western science may not?
4. Should Indigenous knowledge be incorporated into decision making?
5. Who might you be able to talk to in your family or in your community more about this topic?



Giant Mine Remediation Project

Photo Credit: Kevin O'Reilly

Student Handout: Letter Writing Worksheet

NAME

DATE

ASSIGNMENT

On a separate sheet of paper, write a letter to the Elder or community member who visited your class, expressing how this person impacted your point of view on the issue.

Make sure you include the following:

- Introduction: Thank the guest and describe the overall impact of their visit.
- Paragraph One: Describe what you learned from other sources and how the interview added to your perspective. Be sure to include specific examples.
- Paragraph Two: List any additional questions that you still have AND/OR say how you will act on what you learned. Will you do anything differently now?
- Conclusion: Thank the guest again

Be sure to follow proper letter writing format!

BRAINSTORMING:

Student Handout: Issue Note-Taking Worksheet

NAME

DATE

While you're reading the case studies or conducting your own research, use this sheet to take notes on the issue!

Background information and context: where is this issue happening, and what is going on?

Issue definition: what is the problem and why?

Existing information: how does scientific research contribute to our knowledge of this issue?

Other information: is there anything else important you have discovered?

Identify further research questions: is there anything else you would like to find out before making a decision or taking action on this issue?

Student Handout: Indigenous Knowledge

INTRODUCTION

Indigenous knowledge is knowledge developed over long periods of time (hundreds or thousands of years) through direct contact with the land. It connects knowledge of the land with people's everyday lives. People note changes in the land over time that affect their communities. These people then use that knowledge to make daily decisions related to harvest and stable access to food.

Indigenous knowledge can involve things we usually think of as "science," like measuring, counting, and monitoring various things. On the river, this could include measuring water levels, numbers of fish, length of fish, and changing size of algae blooms. It can also involve things we may not think of as "science," like memories of how the river has changed (or stayed the same) over generations, or local knowledge of which fishing areas contain unhealthy fish. People keep and pass on this knowledge because it is relevant to their lives and wellbeing.

Oral histories are an important aspect of the knowledge held by Indigenous communities about the Mackenzie River Basin. Oral histories are histories that are not written down. Instead, they are passed on out loud from generation to generation. Elders and active harvesters are an important part of oral history. They are experts about environmental changes. Their past experiences, observations and perceptions represent important "data" that exists about the regions, places, and resources that matter most to communities. Some types of oral histories include **biographical oral histories** (stories about people), **place-based oral histories** (stories about land), and **issue-oriented oral histories** (stories about issues).

A lot of knowledge about both social and ecological change is linked to specific places. Elders and active harvesters have knowledge about places that matter to them, including areas around traditional fish camps, travel routes, spiritual sites, sites for healing, and more. There is also knowledge that is place-related because of hazards or problems (e.g. an area affected by mining, a permafrost slump, an abandoned mine, etc.). There are different ways to document stories about places.



Women preparing fish in a Wellness Camp in Łutselk'e August 2020

Photo Credit: Łutselk'e Dene First Nation provided by LauraJane Michel

LOCAL AND TRADITIONAL KNOWLEDGE INDICATORS

Qualitative Indicators (Things we can describe)	Quantitative Indicators (Things we can count)
<ul style="list-style-type: none"> • risk perception (e.g. how comfortable we feel eating the fish) • quality of the habitat conditions • water quality (e.g. colour, algae blooms) • texture and colour of fish flesh • taste of water 	<ul style="list-style-type: none"> • number of fish in a catch • length and weight of fish • thickness of fat around organs (e.g. ducks, fish) • water levels

WAYS TO LEARN INDIGENOUS KNOWLEDGE OF THE LAND

1. Creating video recordings of places
2. Interviewing Elders or land users
3. Taking photos of places over time to compare year to year
4. Combining interviews with Elders and land users with scientific measuring of the quality and quantity of water
5. Researching Indigenous place names
6. Gathering young people and Elders together to share knowledge

Researchers with Tracking Change have documented examples of Indigenous knowledge of fish populations. Consider the following from the handout:

- What are three quantitative indicators of fish health?
- What are three qualitative indicators of fish health?
- What changes have people seen in fish populations over the years? How do people track changes in fish populations?
- In what ways do people relate the health of fish and fish populations to their own livelihoods?
- In what ways are these methods of monitoring fish similar to or different from the approaches of western science?