Cultural Perspectives on Sustainability: Lessons to Support Science 10

by

John Wright
These lessons were developed by the following team of teachers, Elders, and cultural advisors: Yvonne Chamakese, David Hlady, Anna-Leah King, Duane Johnson, Marcia Klein, Lana Lorensen, Sally Milne, Joseph Naytowhow, Lamarr Oksasikewiyin, Stuart Prosper, Ron Ray, Ted View, John Wright, and Laura Wasacase. Support was provided by Dean Elliott from the Ministry of Education, and Margaret Pillay from the Saskatchewan Professional Development Unit.

All resources used in these lessons are available through the Stewart Resources Centre: http://www.stf.sk.ca/services/stewart_resources_centre/online_catalogue_unit_plans/index.html

Information regarding the protocol when inviting Elders into the classroom can be found in the document: Elders in the Classroom by Anna-Leah King (attached as Appendix C). Further information can be found in the Saskatchewan Learning document: Aboriginal Elders and Community Workers in Schools.
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Overview

These activities provide background information on a western and First Nations and Métis perspective or worldview as an introduction to a variety of viewpoints on sustainability. These lessons incorporate objectives from the unit entitled Life Science: Sustainability of Ecosystems (SE) in the Science 10 Curriculum Guide. These activities could be used as an introduction to the topic of sustainability, or as a closure.

Foundational Objectives

SE1 Explore cultural perspectives on sustainability.
SE2 Examine biodiversity within local ecosystems.
SE5 Investigate human impact on ecosystems.


Timeframe

4 hours plus project development time (for summative assessment).

Resources

All necessary resource material is included.

Background Resources

The following titles are available through the Stewart Resources Centre of the Saskatchewan Teachers’ Federation:


**Online Resources**


**Additional Resources Available from the Stewart Resources Centre**


Cultural Perspectives on Sustainability

Foundational Objectives

SE1 Explore cultural perspectives on sustainability.
SE2 Examine biodiversity within local ecosystems.
SE5 Investigate human impact on ecosystems.

Key Understandings

- There are a variety of perspectives on sustainability, including a First Nations and Métis perspective, an ecological perspective, a conservationist perspective, and a utilitarian perspective.
- These perspectives result from different worldviews.
- There are commonalities within sustainable education and First Nations and Métis perspectives.

Essential Questions

1. What are our roles and responsibilities in looking after the earth?
2. How should we look after the earth?
3. How can we model sustainability in our own lives?

Learning Objectives (LO)

Students will be able to:

SE1 LO4 Communicate questions, ideas, and intentions, and receive, interpret, understand, support, and respond to the ideas of others with respect to sustainability and the environment.

SE1 LO5 Identify multiple perspectives that influence environment-related decisions or issues.

SE2 LO3 Identify biotic and abiotic components of an ecosystem.

SE5 LO4 Compare the risks and benefits to a society and the environment of applying scientific knowledge or introducing a technology.

SE5 LO6 Predict the personal, social, and environmental consequences of a proposed action.

SE5 LO7 Defend a decision or judgment and demonstrate that relevant arguments can arise from different perspectives.
Assessment Evidence

- Circle activity (formative)
- Ranking activity (formative)
- Group discussions (formative)
- Exit slip (formative)
- Performance task (summative)

Notes to the Teacher

The lesson plan that follows is an overview and all activities are explained in more depth. It might be helpful to invite an Elder or a traditional knowledge keeper from your community into your classroom to explain a First Nations and Métis worldview in more detail (See Appendix C - Elders in the Classroom). The perspective shared locally may be slightly different than the one presented here. The following links may help you connect with Aboriginal communities:


Information about how to use an Elder in the classroom and protocol information for inviting an Elder can be found in more detail in the document Aboriginal Elders and Community Workers in Schools (Saskatchewan Education, 2001), which is found on the Saskatchewan Education website, First Nations and Métis Branch, at www.learning.gov.sk.ca/First%20Nations-Metis%20Education (Click on Publications). The document can also be borrowed from the Stewart Resources Centre.

Lesson Plan

Day One
- Talking circle
- Pre-assessment on sustainability (circle activity)
- Introduction to the unit and the essential questions
- Group discussion
- Exit slip

Day Two
- Introduction to a First Nations and Métis worldview
- Overview of living and non-living things from a western and a First Nations and Métis perspective
- Introduction to the concepts of biotic vs. abiotic, and animate vs. inanimate
- Article by Ken Noskiye (included)
- Understanding systems
Day Three
• Considering different perspectives regarding treatment of the earth
• Looking at the earth through different lenses - group assignment

Day Four
• Performance task

Lesson One - Talking Circle Activities

• Invite students to participate in a talking circle to discuss the question: What are our roles and responsibilities in looking after the earth?
• In a talking circle, only one person speaks at a time. A stone or other object is passed from speaker to speaker. Silence is an acceptable response. Conclude by thanking students for their input. (For further information on talking circles, see http://www.saskschools.ca/curr_content/aboriginal_res/). Click on Using This Site and then on Supplemental Resources.
• Divide students into groups of four and give each group one of the following themes:
  o Food, energy, environment, economy
  o Wind, water, trees, animals
  o North, south, east, west
  o Winged ones, four-legged ones, swimmers, plant world
• Hand out pieces of red, white, blue, and yellow construction paper, cut into pie-shapes. When all the pieces come together, they will form a circle.
• Ask groups to discuss each area of their theme in relation to the landscape or environment within their community.
• When students have completed their circle, ask them to summarize by discussing the state of their community.
• Ask groups to consider what needs to be done in order to help the environment in their community.
• Connect this discussion to the guiding questions and this unit.

Exit Slip
• Ask students to complete an exit slip using the following prompt: My responsibility toward the resources of the earth is …
• The teacher can use these responses to gauge the level of understanding of the students.
Lesson Two - Ranking Activity

- Invite students to participate in a talking circle to discuss the question: What are our roles and responsibilities in looking after the earth?
- Hand out envelopes (you will need to prepare these prior to class) containing the following words on individual pieces of paper: sun, planet, plants, insects, animals, and people (see Appendix A).
- Ask students to rank the words in order of importance.
- When students have completed this task, ask them to remove the word plants. Ask them how the planet would be affected as a result of this change.
- Remove the word sun and ask the same question.
- Replace all the words and ask students to remove the word people. Ask them the same question.
- Ask students to discuss the following questions in groups:
  - If we share the western perspective, how would we view and treat the world’s resources?
  - If we share the First Nations and Métis perspective, how would we view and treat the world’s resources?
- Ask the groups to report back to the class.

Living and Non-Living Things

Share the following information with students:

- As we think about the earth, it is sometimes difficult to tell the difference between living and non-living things.
- Biologists generally consider the following characteristics to be features of living things:
  - Living things require food for energy.
  - Living things respire, which means they break down and use energy found in food.
  - Living things respond to their environment.
  - Living things produce waste.
  - Living things are able to repair themselves.
  - Living things grow and reproduce.
  - Living things have limited life spans.
- Living things are called biotic. Anything that does not exhibit these qualities is called abiotic. A biologist would consider rocks, sunlight, water, and wind to be abiotic. Scientists typically take a reductionist approach to viewing the world. This allows for more refined categories for the information. Therefore, anything that has a set of characteristics will be in one category or another.
• Ask students to read *Keeping first language important to culture* by Ken Noskiye (Appendix B).
• Ask students the following question: What do you notice about Ken Noskiye’s perspective about living and non-living things?
• Invite students to share their understanding of this article, and their opinions.
• Share the following information from Elder Stuart Prosper with students, or, alternatively, invite an Elder from your community to discuss a holistic approach to viewing the world. Discuss the differing classifications with students.

Information on Worldview from Elder Stuart Prosper

The Cree people have a holistic approach to viewing their world. First Nations and Métis peoples acknowledge the interconnectedness of relationships and natural systems as being interdependent. They see everything on the Earth that has life as being imbued with energy and also as having spirit. It is understood that all of nature is connected to a living energy called the cycle of life. The Cree language classifies nouns as either animate or inanimate. Animate nouns usually refer to living things such as animals or birds. Stones, rocks and celestial bodies are also in this category. In addition, some items of clothing, some body parts, and some machines are also animate. The non-living items that are classified as animate are often important to the cultural beliefs of the Cree people. First Nations’ language groups interpret some of these words differently. Invite an Elder from your local district to discuss these terms and worldview with your class.

Examples:

<table>
<thead>
<tr>
<th>English</th>
<th>Cree</th>
<th>Scientific Classification</th>
<th>Cree Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man</td>
<td>nāpēw</td>
<td>biotic</td>
<td>animate</td>
</tr>
<tr>
<td>Tree</td>
<td>mitos</td>
<td>biotic</td>
<td>animate</td>
</tr>
<tr>
<td>Wind</td>
<td>utin</td>
<td>abiotic</td>
<td>animate</td>
</tr>
<tr>
<td>Sun</td>
<td>pīsim</td>
<td>abiotic</td>
<td>animate</td>
</tr>
<tr>
<td>Water</td>
<td>nipi</td>
<td>abiotic</td>
<td>animate</td>
</tr>
<tr>
<td>Drum</td>
<td>tēwēhikan</td>
<td>abiotic</td>
<td>animate</td>
</tr>
<tr>
<td>Rock</td>
<td>asiny</td>
<td>abiotic</td>
<td>animate</td>
</tr>
<tr>
<td>Fire</td>
<td>skotew</td>
<td>abiotic</td>
<td>animate</td>
</tr>
<tr>
<td>Pipe</td>
<td>ospwākan</td>
<td>abiotic</td>
<td>animate</td>
</tr>
<tr>
<td>Bead</td>
<td>mikis</td>
<td>abiotic</td>
<td>inanimate</td>
</tr>
</tbody>
</table>

Stuart Prosper - June 9, 2008

Share the following information with students:

The four elements that are essential to give life are Wind, Water, Rock, and Fire. Without these there would be no life. For this reason the sun is also included as animate. In Science a set of interrelated components forms a *system*. An *ecosystem* joins the word system with the Greek root *Ekos* which means home. This term means the set of interrelated components that work together to make your *home* or where you live. When
science looks at an ecosystem, it sees the biotic and abiotic components both as *limiting factors*. These *limiting factors* determine the level of life or “*carrying capacity*” that can live in an ecosystem. If an area has lots of water, soil, and sun, it can have many plants which in turn can support many animals as a rainforest does. If an area has limited amount of the life-giving components, there can be little life such as in a desert.

- A set of interrelated components forms a *system*.
- The living and non-living components of a biological community and their interrelationships form an *ecosystem*.
- Non-living components (sunlight, temperature, wind, water, and rock) of an ecosystem are *abiotic*.
- Living components (animals and plants) of an ecosystem are *biotic*.
- Classifying is a systematic procedure developed by humans to impose order on collections of objects or events.
- Classification systems are not fixed. They change over time as new information is discovered and new techniques are developed.
- Interpreting data means to find patterns in data collections that can lead to generalizations about the data.
- Scientists use models to represent objects, events, or processes.

Ecologists use systematic and random (but not arbitrary) sampling techniques to examine representative portions of an ecosystem. First Nations and Métis people have always recognized the importance of all factors for life as being interrelated. In light of the understanding of the interrelationships of all things, balance is foremost with all things in life. People walk on this earth with the understanding of this balance and try not to disrupt this balance. Science views the factors in the ecosystem as separate and studies them individually, out of their original context.
Lesson Three - Perspectives on the Environment

- Inform students that they will be looking at the environment from a number of different perspectives. To learn about an ecosystem requires study. One of the most effective practices is to experience the environment first hand. First Nations and Métis peoples and ecologists would agree that to understand nature, you must experience it. Both groups would agree that there is a required ethic for visiting nature.
- Ask students to consider the perspectives of the groups listed below in regard to using nature:
  - **First Nations and Métis Ways of Being**
    - We respect and honour our Mother Earth. We give thanks for the gifts she gives us. We take only what we need and will use (Stuart Prosper).
  - **Ecologist**
    - We must respect nature. We must leave an area as good as, or better than, when we found it.
  - **Utilitarian**
    - As human beings, everything placed on the earth is ours to use as we wish, and for any purpose that we wish. We do not need to apologize or to answer to anyone.
  - **Conservationist**
    - It is important for us to know what the world looked like before we used it as we wanted to. We will develop certain areas that are untouched so that those who come after us can see what it used to look like. As long as we do this, we can use the other parts.

**Activity**

- Divide students into groups and give each group one of the previously-mentioned perspectives - First Nations & Métis, Ecologist, Utilitarian, and Conservationist - for the following activity.
- Provide a series of pictures for students of the environment, such as oceans, mountains, rivers, a garbage dump, a mining area, etc. Pictures of Saskatchewan landscapes can be found on Courtney Milne’s website - http://www.coolscapes.sk.ca/index.php; Allen Sapp’s art - Through the Eyes of the Cree and Beyond - is another resource. Other sites of interest:
  - http://www.planetark.com/envpicshome.cfm
  - http://www.braaschphotography.com/
  - http://www.acclaimimages.com/search_terms/environment.html
You may also have some photographs in your school or community library.
• Ask groups to explain, through the lens of one of the perspectives, what the pictures represent to them. For example, a mining area might be destruction from a First Nations and Métis perspective, money from a utilitarian perspective, and ecologists might want to develop a park on top of the mine.

• Ask students to report back to class.

• Discuss the different perspectives in regard to the merits and drawbacks of each perspective, and the personal, social, and environmental consequences of the actions taken by people of each perspective.

• Debrief by explaining to students that each of these perspectives may also have a continuum of interpretations, so that all of those people who view themselves as ecologists, for example, may not all have exactly the same beliefs. There are also many differing views among First Nations and Métis people.

• Ask students to complete the following questions in their groups:
  o How would each of the four perspectives respond to the following:
    • a garbage dump?
    • wind turbines?
    • nuclear energy?
    • an inner city area?
Lesson Four - Demonstrating Understanding

Students will respond to the following performance tasks as a summative assessment. Time for research and preparation will be necessary. The teacher can ask students to choose one of the following two scenarios, or can determine which group will cover which task. Another option would be for the teacher to ask groups to take just one perspective. The product could be a presentation, a written report, a PowerPoint slideshow, or any other format.

Performance Tasks:

1. A big oil company from Holland wants to drill for oil on land in your community. You have been asked to prepare a report for the big oil company that will help them understand the background issues. Consider the issue through the lens of First Nations and Métis people, ecologists, utilitarians, and conservationists.

2. An area close to your community has lost its water source due to the river drying up. Residents need to find a new source of water quite urgently. One proposal that has been suggested is to build a canal to move water from the local recreational lake to the sub-division. Because of geography, this new canal will have to cross a Ducks Unlimited marsh. In your groups, develop a position on this proposal from all four perspectives. (Note: An explanation of the goals of Ducks Unlimited may be necessary - http://www.ducks.ca)

Culminating Activity:

The teacher could choose to conclude the lessons in any of the following ways:

- A talking circle where students are asked to share one thing from these lessons that they have found particularly meaningful.
- Development of a class letter to the editor of a local newspaper on an aspect of sustainability.
- A journal response on the topic: The future of the earth as I see it.
- Development of individual action plans in the area of sustainability.
- A visual journal on the topic: Finding my place in the cycle of life.
**Evaluation Rubric**

<table>
<thead>
<tr>
<th></th>
<th>Level 4</th>
<th>Level 3</th>
<th>Level 2</th>
<th>Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Four sustainability perspectives</strong></td>
<td>The student demonstrates complete understanding of the four perspectives on sustainability. Each of the four perspectives has been addressed fully.</td>
<td>The student demonstrates understanding of at least three of the four perspectives on sustainability. Three of the four perspectives have been fully addressed.</td>
<td>The student demonstrates understanding of at least two of the four perspectives on sustainability. Two of the four perspectives have been addressed.</td>
<td>The student demonstrates some understanding of at least one of the four perspectives on sustainability. One of the four perspectives has been addressed.</td>
</tr>
<tr>
<td><strong>Risks and benefits to society and to the environment</strong></td>
<td>The student has fully explained the risks and benefits to society and to the environment in a practical and realistic manner.</td>
<td>The student has explained some of the risks and benefits to society and to the environment in a practical and realistic manner.</td>
<td>The student has explained some of the risks and benefits to society and to the environment, but these may be neither practical nor realistic.</td>
<td>The student has attempted to explain the risks and benefits to society and to the environment, but not in a practical or a realistic manner.</td>
</tr>
<tr>
<td><strong>Predictions of personal, social, and environmental consequences</strong></td>
<td>The student is fully aware of the personal, social, and environmental consequences of the action, and has explained all of these aspects of the intended action.</td>
<td>The student is aware of the personal, social, and environmental consequences of the action, and has explained most aspects of the intended action.</td>
<td>The student may be aware of the personal, social, and environmental consequences of the action, and has explained at least one aspect of the intended action.</td>
<td>The student is unsure of the personal, social, and environmental consequences of the action, but has attempted to explain at least one aspect of the intended action.</td>
</tr>
</tbody>
</table>
Photocopy the following page of terms and cut into separate pieces of paper. Prepare an envelope with a complete set of terms for each group in your class.
Keeping first language important to culture

Cree is my first language. There is a phrase that has never been

taken from me is my Cree. Sure there were a few times I almost
totally succumbed to assimilation but I managed to hang on to my
first language.

In many ways I am lucky as I did not learn how to start speaking

English until I was eight years old. Up until that period, all I spoke
was Cree. I grew up in a northern traline and all my parents spoke
Cree. My mother still speaks only Cree, with only the occasional
word in English. Because the world outside of our traline was

foreign to me, I basically had to

learn everything when we moved
to our reserve. The one thing that
came easy, for some reason, was
learning English. I had a lot of
help though, not only from my
school but also from people
around me.

I can safely say all the teachers I
had during my education have
been kind and understanding.
And, believe me, I was not the easi-
est kid to teach. But for some rea-
son there was always a teacher
there, either formally or informally,
who saw potential and encour-
gaged me. Throughout my learning

of the English world, I can not
remember any teacher who was
rude or impatient. This is especially

unique because in junior high I
was the only First Nation student
in my school. Throughout it all, I
managed to keep my first language

and I am thankful for that.

In Cree, things are either ani-
mate or inanimate. Which basically
means things either have spirit
or do not have spirit. All things
made by man are inanimate and
all “things” within the Earth are
animate. Objects such as televi-
sions, cars and buildings are inani-
mate. All of Earth’s children (from
those who fly to those who swim) have spirit. However, it goes
beyond that.

“Things” like a river, rock or a
tree are referred to as a third per-
son in Cree. It’s really hard for me
to call a tree an “it.” There’s

almost a mental block for me not to refer to that tree as third person.
And when I see a forest it is a
group of living spirits that I see,
not only visually but spiritually
too. It is this connection of the lan-
guage and the land that is special.
This is especially true during
spring, when the Earth blossoms
and the living spirits of Her chil-
dren shine. Cree, by the way, is one
of the easiest First Nation lan-
guages to learn.

Noskiye can be reached at
noskiye.kellee.sympatico.ca

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APPENDIX C

Elders in the Classroom
by
Anna-Leah King

It is the Elders’ responsibility to guard sacred knowledge and to maintain the ceremonial oral tradition of knowledge transmission. In Saskatchewan, the territory is home to four First Nations, namely Cree, Saulteaux, Dene, and Oceti Sakowin - Dakota/Nakoda/Lakota.


All of these First Nations have a home here and it is entirely appropriate to represent any or all of these First Nations when approaching curriculum content. The Elders bring with them traditional knowledge and perspective passed down from generation to generation through the oral tradition. The reference to Elders’ wisdom has lately been termed “Indigenous knowledge” or “traditional knowledge.” Their traditional knowledge and wisdom will give insight to teachers willing to reshape curriculum and validating First Nations content and perspective.

Inviting the Elders

Protocol

The Elders would expect to be approached in the traditional way, respecting traditional protocol. They are given a small offering of tobacco in exchange for their commitment to invest their time and energy into the work at hand. They can be asked to lead the gatherings with prayer and ceremony. First Nations gatherings always begin with prayer and ceremony. It is entirely appropriate to ask this of them. It may not be what you are familiar with, but you will soon realize the benefits of respecting First Nations protocol and ceremonial practice. The Elders may want to begin with a smudge on the first gathering and offer prayer for the task at hand and the team that has been brought together. The Elders are well aware that any given group put together is there to learn from one another and so blessings towards this endeavour are prayed for. Sometimes, depending on the size of the project, a pipe ceremony may be requested. Each Elder may have a slightly different approach to opening and closing ceremony. Some may speak for a while. Others will ask you to share so they can become more familiar with everyone. Simply inviting them with an offering of tobacco and asking that they open and close the gatherings is enough. The Elder will take it from there.
Elder Expectation

When you invite Elders, it is important that you are clear on what you expect from them. If you are asking them to contribute with their knowledge, wisdom, and guidance, then say so. They may not all be familiar with education and what teachers and curriculum writers are trying to do, so explaining what curricula is and what is needed of them is essential to a good working relationship. You want them to contribute First Nations and Métis content and perspective. The Elders need to feel confident that they will be of assistance. Let them know that you see their role as wisdom keepers and they need to draw upon their personal experience, cultural knowledge, and teachings to contribute to the process. The Elders will share what is acceptable and give caution for what they view as sacred knowledge that is only to be shared in the context of ceremony.

Elders need time to think before they answer. Do not be impatient and feel they are not answering soon enough, as they will answer your questions in time. Some Elders are reflective, philosophical thinkers. They will review holistically what you have asked of them. A concept that you think is simple and straightforward has many different dimensions to a First Nations speaker, and they must put the concept into the context of the whole and analyze the dimension of its interrelatedness. Sometimes they translate what you are saying to themselves in their language. They think things out in their mother tongue first and then find the words of closest approximation in English. Not all words and concepts are readily translatable. That is why letting the Elder know what is expected of them beforehand is important because it gives them time to think it over and to find some area of common ground.

Elder Care

Elders do not expect anything but it would be nice to assign one person to see to their needs. Offer them a comfortable seat and debrief them on the expectations for the gathering. Introduce them to everyone and generally make them feel welcome. See to it that they have water, juice, coffee, or tea. It is good to have a snack for them at coffee break. Invite them to pray over the food before you eat. Allow them to be first in line for lunch or let them know you will serve them. This is an example of First Nations protocol. These are small things, but kind gestures go a long way with Elders. They appreciate when younger people make efforts to lighten their load. These gestures make the Elder feel welcome and cared for in a respectful way.

Gifts

It is appropriate to have a small gift for the Elders. If they are paid for their time, this would be considered the gift. Some give a small gift in addition to the honorarium, such as a basket of teas or jams.

• Further information can be found in the document: *Aboriginal Elders and Community Workers in the Classroom*, available from the First Nations and Métis Branch of the Ministry of Education.