



From Mission to Action: Lessons on Sustainability of Ecosystems to Support Science 10

by
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**Teaching Materials
from the
Stewart Resources
Centre**



**Government of
Saskatchewan**



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 A). Further information can be found in the Saskatchewan Learning document: *Aboriginal Elders and Community Workers in Schools*.

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Overview

These lessons incorporate objectives from the unit entitled Life Science: Sustainability of Ecosystems (SE) in the *Science 10 Curriculum Guide*. After an examination of ecological footprints, students will create their own mission statement.

Foundational Objectives

- SE1** Explore cultural perspectives on sustainability
- SE5** Investigate human impact on ecosystems

Source: This and other objectives are found in the following document:
Saskatchewan Learning. (2005). *Science 10 curriculum guide*.
Regina: Saskatchewan Learning.

Timeframe

5 hours.

Resources

Gibb, T., et al. (2002). *Science 10: Concepts and connections*. Toronto: Nelson Thomson Learning.

Grace, E. et al. (2000). *Sciencepower 10: Science, technology, society, environment*. Toronto: McGraw-Hill Ryerson.

A mission statement is provided here as an example for students from the Cree Nation of Wemindji. Teachers are encouraged to find mission statements from the reserves and bands in their respective communities.

Aboriginal Canada Portal. (2007). *All Aboriginal communities in Saskatchewan*. Retrieved December 12, 2007, from www.aboriginalcanada.gc.ca/acp/community/site.nsf/en/sk-fn-r.html

Additional Resources That May Be Helpful:

Cajete, G. (2005). *Spirit of the game: An indigenous wellspring*. Skyland, NC: Kivaki Press.

Saskatchewan Indian Cultural Centre. (1993). *Practising the law of circular interaction: First Nations environment and conservation principles*. Saskatoon, SK: Author.

The books listed above are all available from the Stewart Resources Centre of the Saskatchewan Teachers' Federation.

From Mission to Action

Note: In these lessons, the word *Aboriginal* includes First Nations, Métis, and Inuit peoples.

Foundational Objectives

SE1 Explore cultural perspectives on sustainability.

SE5 Investigate human impact on ecosystems.

Key Understandings

- A First Nations and Métis perspective on the earth supports and promotes the health of the environment.
- An *Aboriginal* or *earth-based* perspective on nature will help influence one to make good choices that protect and promote the health of the environment.
- Our social view of earth influences the large and small daily decisions we make.

Essential Questions

1. Why has climate change become a theme for environmentalism and sustainable education?
2. Why is a statement of belief regarding sustainability important?
3. How might a mission statement of our beliefs in regard to sustainability help us to focus our actions?
4. How might a perspective of sustainability lead to a change in attitudes?
5. In what ways can we learn from the values of First Nations and Métis people?

Learning Objectives (LO)

Students will be able to:

SE1 LO1 Explain cultural perspectives on sustainability.

SE1 LO2 Examine how various cultures view the relationships between living organisms and their ecosystems.

SE1 LO3 Explain changes in the scientific worldview (paradigm shift) of sustainability and human's responsibility to protect ecosystems.

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 Demonstrate how society's needs and functions, as well as the global economy, affect one's community.

SE5 LO1 Predict the personal, social, and environmental consequences of a proposed action.

SE5 LO2 Propose a course of action on social issues related to sustainability, taking into account human and environmental needs.

Assessment Evidence

The assessment will be the development and implementation of the action plan and the personal mission statement of each student. After the mission statement is completed, each student is responsible for implementing at least one of his/her ideas. Rubrics and evaluation forms that teachers may share with their students are attached.

Notes to the Teacher

The context for this activity forms a part of a larger series of lessons that lead finally to a mission statement that students create. The lessons begin with the Earth Day Footprint quiz. Students examine the ecological footprints of other regions of the world, as well as their own. After students examine their own ecological footprints in relation to other places, a discussion on different cultural perspectives ensues. Students are invited to explore the Aboriginal perspective through a guided activity.

Lesson Plan

1. Jigsaw - Needs and Wants
 - a. Students reflect on their own needs and wants and determine how their needs and wants impact the earth.
 - b. Students determine how they might reduce their impact on the environment.
2. The Cree Nation of Wemindji
 - a. Students examine an example of a mission statement.
 - b. Questions are provided that help students understand what a mission statement is. (Note: Teachers are strongly advised to use a mission statement from a Saskatchewan First Nations or Métis group.)
3. Creating a Mission Statement
 - a. Students develop their own mission statements on the environment containing personal action plans. Teachers may wish to invite a local Elder to come and speak on his/her band's perspective on the earth, to create background knowledge for students. (See Appendix A - Elders in the Classroom.)
4. Action Plan
 - a. Students take their perspectives of the environment, determine one attainable goal, and create an action plan to reach that goal. (Note: An example of an action plan is included.)

Flowchart of Organization:

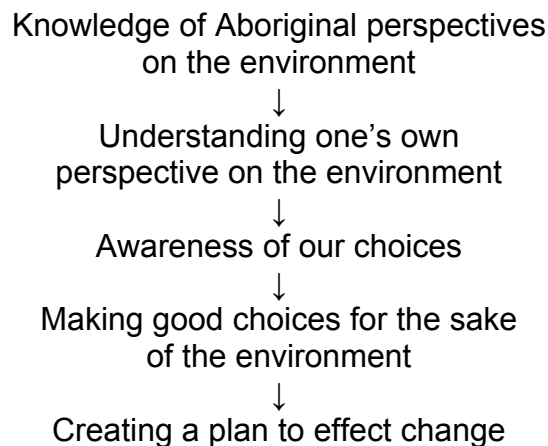
Earth Day Footprint quiz → discussion of ecological footprints in relation to other places in the world → Aboriginal perspectives → discussion of needs and wants → Cree Nation of Wemindji → personal mission statement → action plan → assessment of action plans.

Earth Day Ecological Footprint Quiz:

If time permits and students have computer access, ask students to visit <http://www.earthday.net/footprint/> and to complete the Ecological Footprint Quiz. Be sure students choose Canada as their home country before they begin the quiz.

Rationale:

The connection between the activity and the objectives lies in the tie between perspective and action. While it is important to understand the ecological philosophy of any First Nations group, the key is to help foster attitudes that will take a similar or a shared philosophy and move it into the realm of action where our choices reflect the impetus to help produce a sustainability of the earth.



Possible Extensions:

- “What is Sustainability?”
 - Grace, E. et al. (2000). *Sciencepower 10: Science, technology, society, environment*, p. 67.
- “How Many Potatoes are Enough?”
 - Gibb, T., et al. (2002). *Science 10: Concepts and connections*, p. 112.
- “Can We Create a Sustainable Fishery?”
 - Gibb, T., et al. (2002). *Science 10: Concepts and connections*, p. 152.

Further Reading:

- Sustainable Development
 - Grace, E. et al. (2000). *Sciencepower 10: Science, technology, society, environment*, p. 68.

Activity 1: Jigsaw - Needs and Wants

Objective

In this activity, students will draft their personal philosophy on the environment. This philosophy will be used to create an action plan.

Concepts

A perspective or a philosophy of the earth is a way we view nature, both the living and non-living systems. The way we perceive nature impacts the ways in which we treat it. An understanding of needs and wants helps us to develop this perspective. Through an appreciation of the impact that needs and wants have on the earth, we can make choices that reduce our impact on the environment.

Needs are essential to our survival, while wants, though they may improve the quality of our lives, do not impact our immediate survival. For example, while food is a need, certain types of foods are wants, and are not particularly important to our continued existence. Locally-grown foods from farmers' markets and community gardens could supply us with the vital fruits and vegetables that we need. On the other hand, junk food, soft drinks and alcohol are not essential to our survival. Consider a hamburger from any fast food restaurant. The amount of water, land, grain, energy, resources, infrastructure, and manpower needed to make a single burger leaves a greater ecological footprint than carrots grown in our own gardens do.

Instructions

- Distribute *Student Handout - Needs and Wants* to the class.
- Divide students into separate groups by giving each student a number from 1-4. This will be their home group number. Now invite all number 1s to move into a large group, all number 2s, etc.
- Group #1 will discuss the items listed in Row 1 of the chart on the handout; group #2 will discuss the items in Row 2, etc.
- All groups will examine the items on their list and classify each one as either a need or a want, and determine why. They will also answer the questions on the lower half of the handout as they relate to their items.
- When students are finished their discussion, they will return to their home groups and share their information in numerical order.
- As a home group, students will then determine whether or not they agree with the classifications developed by the large group, and explain why or why not.

- Home groups will then develop a group statement on the environment using the following sentence starters:
 - The environment is/is not in danger from society's wants because ...
 - As a society, we need to/do not need to change our lifestyles by ...
- Home groups will then share with the class.
- In home groups, students will then brainstorm their own needs and wants using the *Student Handout - Needs and Wants Brainstorming Worksheet*, and will answer the questions on the lower half of the handout.
- Groups will share their responses to the questions with the class.



Student Handout - Needs and Wants

NAME _____

GROUP # _____

Instructions:

Examine the list below. Classify these items as needs or wants, giving a reason for your decision. Then decide what characteristics make each item or substance either a need or a want. Finally, answer the questions below.

1	water	hamburgers	cell phone	shelter	vitamins
2	car	vegetables	clothing	jewelry	toys
3	television	X-box	iPod	meat	basic toiletries
4	utilities	heat	electricity	air conditioning	air

Questions:

1. From the list, which items are needs? Which items are wants?

2. In what ways might the list of needs impact the environment?

Student Handout - Needs and Wants Brainstorming Worksheet

NAME _____

GROUP # _____

Instructions:

- Use this sheet to record and to brainstorm your needs and wants.
- In the column on the left, record both needs and wants.
- In the column on the right, provide reasons that explain why you classified the items you mentioned as either needs or wants.

Needs	Explain Why
Wants	Explain Why

1. In what ways might our wants impact our environment?

2. Consider your wants. In what ways might we minimize the impact that our wants and needs have on the environment?

Activity 2: Cree Nation of Wemindji Vision and Mission

The following is an excerpt from the webpage “Cree Nation of Wemindji” found at <http://www.wemindji-nation.qc.ca/vision1.html>. Wemindji is a community located on the east coast of James Bay in northern Quebec, with a current population of 1,200 residents.

Read the excerpt from their mission and vision statement and answer the questions that follow.

The Vision We Hold for Our People and Community

We are capable and proud Eeyouch

Wemindji Eeyouch recognize that we are the children of the Creator, and we respect this relationship, and the duties it places upon us to maintain harmonious, happy and healthy relations among ourselves, with other people, and with all living things.

We must also ensure the survival of our People, the Eeyouch. We must constantly revitalize, respect, practice, maintain and celebrate our Cree language, culture and traditions. It is the Eeyouch way to hold the utmost respect for our Creator, and the natural environment and all living things around us. It is our way to always put others before ourselves. When making decisions, we think in terms of the future, our Children, and we fully consider the long-term consequences.

For generations, Cree people have learned by listening, watching and doing things alongside our teachers and Elders, and we continue this process and relationship between our Youth and Elders.

Our Vision ensures that we will maintain our Cree Culture by practicing our traditional activities, and speaking our language in our daily lives and work, thereby passing this precious heritage on to our Children.

We recognize and respect our distinct history as Wemindji Eeyouch, including the traditional roles of our Tallymen, that are consistent with natural law.

A healthy environment and Land, and respect for our Tallymen

The Creator gave us Eeyou Istchee, and with it, he gave us special duties. We are required to keep the Land and all of our environment in a healthy and clean state, for ourselves, our future generations, and all living things that share our Territory with us. It is part of our obligation as Elders, Grandparents, Parents and Community Leaders to provide a good example in this way, and to teach the Youth.

Whenever we think of developing our Territory, we must also respect our duty to keep the environment – our Land, the waters, and the air – clean and healthy, and to repair any damages we may cause.

Our Tallymen play a unique and traditional role in guiding and teaching us in the safe keeping and well-being of Eeyou Istchee. It is they who guard Eeyou Istchee, controlling who will have access, and under what conditions. We respect the knowledge and authority of these men, and consult with them in all matters pertaining to the Land.

Guiding Questions for This Article or Any Related Piece

Note: It is suggested that teachers use mission statements from their local First Nations and Métis communities.

1. Based on your reading, what kind of relationship is evident between the community and the earth?
2. What key words from the excerpt indicate that this First Nation has developed a statement of belief about sustainability in their mission statement?
3. How does a statement of belief guide this First Nation in decisions that concern the earth?
4. In what ways does a western society operate with a sustainable outlook similar to that of the First Nations people? In what ways do western views differ from the beliefs of the Cree Nation of Wemindji or the First Nations and Métis people of Saskatchewan?

Activity 3: Creating My Mission Statement

A mission statement describes the purpose of an organization. In this case, a mission statement is a description of your beliefs that you can put into action.

You will not create a personal mission statement that will help you create an action plan. For your mission statement, you might want to interview members of your community, elected representatives, Elders, or family members for their personal views on the environment. This will help you understand the worldview from which you come. It will help you determine what underlying values shape your perspective on the environment. Your mission statement will be your perspective about nature and what you believe is your relationship to the earth. Your mission statement will be the first step in the development of an action plan.

My name is _____ . I am a member of
_____ (the Band or Reserve, Treaty area, Métis locale, or community that you belong to).

- Note: While you may not be a treaty or status Aboriginal person, each Canadian citizen is part of a treaty area, if a treaty has been enacted in your area. In essence, all Saskatchewan people are treaty people.
- Further information can be found in the following resource:
 - Office of the Treaty Commissioner. (2007). *Teaching treaties in the classroom*.

The following values and principles are important to me:

I view the natural world environment as:

In what ways can my beliefs and values help me make a difference to the environment and the natural cycles?

What steps can I take to make a difference in my local environment?



Activity 4: Action Plan

Pick one of the ideas you have identified in your mission statement and create an action plan. The action plan must be achievable, and must relate to your school or your community. It must contain a timeline, a description of the plan, and a way for you to evaluate if you are successful. You will carry out your action plan and report back to the class.

Here is an example of an action plan created by Mrs. Heather Haynes McDonald, a teacher from Miller High School in Regina (shared with permission).

- Students in her classroom examined the contents of a bag of garbage that came from the student commons area.
- Students decided which items could be categorized as needs and which could be labeled wants.
- A closer examination revealed cans, bottles, and other recyclables that had been discarded.
- Her classroom created an action plan to collect and to transport cans and bottles to SARCAN for recycling. Her team managed the money, created collection schedules, and devised their own system to assess the effectiveness of the plan.
- The money collected from the action plan was used to create a recycling program at Miller High School.



Action Plan Expectations

Action Plan

- In your action plan, write a paragraph to describe what you plan to do.
- Your action plan should have two or three attainable goals.
- Your action plan should include a timeline with specific dates that show what will be accomplished on those dates.
- Your plan must be signed and approved by the teacher.
- You must record your progress in your journal.
- Your proposal will be evaluated in a formative fashion on the following criteria:
 - Your goal is attainable (your goal is achievable in the allotted amount of time).
 - Your paragraph describes your goal clearly.
 - The plan you create to achieve the goal shows how your goal will be reached.
 - Your timeline is attainable and realistic.

Journal

- Your journal must have at least five entries.
- Your entries must describe what actions you are taking to achieve your goals.
- Your entries must show what you have learned.
- Your entries must be consistent.
- You will be evaluated on the following criteria:
 - Your entries are consistent and complete.
 - You give your thoughts on your project.
 - Observations are kept.
 - The journals are written daily or consistently.
 - The journals show growth in your understanding of your project over time.
 - You indicate what you are learning.

Formal Presentation of Your Project

- Give an explanation of what you did to accomplish your goals.
- Describe the insights that you gained from your project.
- Using what you learned from your project, give three practical changes you can make to live a sustainable life.
- Explain your philosophy on the importance of a sustainable future.

Note: Use the Action Plan Checklist and the Action Plan Rubric to assess your performance.

Action Plan Rubric

Criteria	1	2	3	4
Understanding	An understanding of the cultural perspectives on sustainability is not evident. An understanding of human impact on ecosystems is not evident.	A list of observations is given, but no thoughts or analyses are given.	Some observations are followed by thoughts and analysis. The journals begin to show personal growth.	Students give their thoughts as well as their observations in all cases. The journals show growth over time.
Action Plan goals and trial	A goal is present, but it is not clear. A work plan is in place, but it is not aligned with goals. Limited documentation of progress in the journal. The goal is not attained.	A goal has been attempted, but it may not be attainable. A workable plan has been attempted. An attempt has been made to document progress regularly. The goal is not attained.	Students determine a clear goal. Goal is attainable and workable. A work plan is in place, but some deadlines are not reached. Documentation may be inconsistent. The goal is attained.	A clear goal is set and is attainable. A workable plan that includes dates and deadlines is in place. Documentation is consistent and well done. The goal is attained successfully.
Explanation of the project	Insight is limited due to a limited action plan. Practical changes are limited or not evident. An explanation of the importance of a sustainable future may be attempted.	One or two insights are explained. One or two practical changes are explained. An explanation of the importance of a sustainable future is given.	Two or three insights are explained. Two or three practical changes are evident and applicable. An explanation of the importance of a sustainable future is given and shows an understanding of the objectives of this unit.	Three insights are explained clearly. Three practical changes are evident and applicable. An explanation of the importance of a sustainable future is given which shows an understanding of the objectives of this unit, and which is relevant and applicable.



Action Plan Example

1. From your mission statement, examine the last paragraph which answered the question: What steps can I take to make a difference in my local environment? From your list, identify one commitment that is attainable.
 - Power off campaign. I plan to create a “power off campaign” in my house for my family.
 - This goal is attainable because it is tangible and is achievable in a short time.
 - It is attainable because I can collect and quantify my results.

2. What are some ways that you might be able to achieve this goal?
 - To achieve this goal means that I need to turn the lights off and encourage my family to turn the lights off.
 - I will determine the family’s power usage for a month and divide that by four so that I will know how much power our household uses in one week.
 - I will have a family meeting to educate my family on power usage.
 - I will create some small signs to remind my family to turn off the lights. I might want to create some stickers.
 - I will calculate how much money my family will save from this endeavour. By calculating the savings, I can extrapolate how much less energy we use. The less energy we use, the healthier it would be for the environment.
 - I will call SaskPower to determine how much carbon is used to create a kilowatt hour of energy.

3. How long will it take to achieve this goal?
 - I will conduct a trial for four weeks to determine how much energy we save.

4. How will you be able to determine how successful your action plan is?
 - The habits and attitudes of family members change.
 - Savings of energy and money will demonstrate success or progress.

5. How will you be able to track the success of your action plan?
 - I will keep a journal and create a graph to show the energy savings.

6. Create a timeline in which you will carry out your action plan.
 - Determine how much energy my family uses in one month.
 - List reasons for this project.
 - Enlist the support of my family for this project.

Day 1 Educate my family on the plan and create stickers.

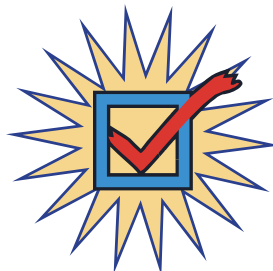
Day 2 to Day 30 Track and monitor usage of power.

Day 7, 14, and 21 Hold family meetings to determine if family members are cooperating with the plan.

Create a report to summarize the findings after the one-month trial. Extrapolate how the savings in energy for one month could result in savings over a year. Consider the extent to which I have decreased my carbon footprint.

Action Plan Checklist

Criteria	Progress/Action Completed	Date
I have written a paragraph to describe what I plan to do.		
My action plan has two or three attainable goals.		
My action plan includes a timeline with specific dates that show what will be accomplished on those dates.		
My plan has been signed and approved by the teacher.		
I have recorded my progress in my journal and have at least five entries.		
My journal entries are written regularly and are written in a regular format.		
My entries describe the actions I am taking to achieve my goals.		
I am indicating what I am learning by the implementation of my plan.		



APPENDIX A

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, Sauteaux, Dene, and Ojibwa - Dakota/Nakoda/Lakota.

Source: Office of the Treaty Commissioner. (2002). *Teaching treaties in the classroom: Participants manual*. Saskatoon, SK: Office of the Treaty Commissioner.

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.