KNOWLEDGE SHARING FAIR:

An Inquiry Approach to Integrating Indigenous Knowledge into the Science Curriculum

Grade 4-8

TITLE PAGE COVER
Four Elements of Life
Samantha
Grade 7
Pencil Crayon
St. Bernard School

Written by Kelli White
Greater Saskatoon Catholic Schools
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What is a Knowledge Sharing Fair?

A Knowledge Sharing Fair (KSF) is an opportunity for students to share knowledge about nature and science they have gained from observations, Elders, literature, and others with expertise in traditional ways of knowing and learning. The KSF is the culminating event students experience after having had various opportunities to research and explore their science topic of interest. Students create presentations (dance, storytelling, drama, art, display boards, etc.) to represent their learning and showcase their projects in a setting filled with their peers, parents, teachers and other school and community members.

Although similar to a conventional science fair, in the process of a Knowledge Sharing Fair, students focus their attention on nature and science topics related to *Indigenous Knowledge*. First Nations, Métis and Inuit peoples have been surviving in their natural environments for thousands of years. Indigenous cultures hold incredible knowledge about the world around them as well as essential skills on how to adapt and live off the land. A Knowledge Sharing Fair provides the opportunity for students to learn about and respect Indigenous Knowledge and Ways of Learning as important to understanding the world they live in.

Preparing for a KSF also differs from a science fair in the process of how the student learns about their topic. In a science fair students follow the scientific process to gain their knowledge (research, formulate questions, develop a hypothesis and procedure). In a Knowledge Sharing Fair, students learn by listening to teachings of Elders and other knowledge keepers, asking questions and reflecting on their learning. Through the process of preparing for a KSF, students carry out the stages of an *inquiry-based learning strategy*. This model of learning is reflective of the process First Nations people have used for centuries to learn about the world, and continue to use today.

This guide will explain how to organize opportunities for your students to learn about traditional ways of knowing and learning using an inquiry-based learning strategy called the “5E learning cycle”. Throughout the process of preparing for a Knowledge Sharing Fair, students will *Engage, Explore, Explain, Elaborate* and *Evaluate* the knowledge they gain related to Indigenous Science. This guide will also provide suggestions on how to plan for a Knowledge Sharing Fair, from the classroom level to a multi-division level experience.

Why is it important to incorporate Indigenous Knowledge into the Science Curriculum?

- Demographics: some projections of statistics state that by 2016, 45% of all students entering Kindergarten in SK will be of First Nations or Métis ancestry.
- Low numbers of First Nations and Métis people going into science disciplines.
- Wealth of Indigenous Knowledge exists to support the curriculum.
- Need to acknowledge and validate Indigenous Knowledge and Ways of Knowing if we want to be inclusive and holistic teachers.
- To build bridge.
- Saskatchewan Learning requires us to.

How does the KSF support the Saskatchewan Curriculum?

The renewed science curriculum (2009) published by the Ministry of Education outlines expectations for teachers to provide opportunities for inquiry-based learning in the science classroom. The process involved in preparing and experiencing a Knowledge Sharing Fair is reflective of the curriculum's Broad Areas of Learning and Cross-Curricular Competencies, which ultimately support the aim and goals of the science curriculum.

Broad Areas of Learning:

- Developing Lifelong Learners
- Developing a Sense of Self and Community
- Developing Engaged Citizens

Cross-Curricular Competencies:

- Develop Thinking
- Develop Identity and Interdependence
- Developing Literacy's
- Developing Social Responsibility

Aim of the Science Curriculum

The aim of K-12 science education is to enable all Saskatchewan students to develop scientific literacy. Scientific literacy today embraces Euro-Canadian and Indigenous heritages, both of which have developed an empirical and rational knowledge of nature. A Euro-Canadian way of knowing about the natural and constructed world is called science, while First Nations and Métis ways of knowing nature are found within the broader category of Indigenous Knowledge.

Goals of the K-12 Science Curriculum in Saskatchewan:

Understand the Nature of Science and STSE Interrelationships – Students will develop an understanding of the nature of science and technology, their interrelationships, and their social and environmental contexts, including interrelationships between the natural and constructed world.

Construct Scientific Knowledge – Students will construct an understanding of concepts, principles, laws, and theories in life science, in physical science, in earth and space science, and in Indigenous Knowledge of nature; and then apply these understandings to interpret, integrate, and extend their knowledge.

Develop Scientific and Technological Skills – Students will develop the skills required for scientific and technological inquiry, problem solving, and communicating; for working collaboratively; and for making informed decisions.

Develop Attitudes that Support Scientific Habits of Mind – Students will develop attitudes that support the responsible acquisition and application of scientific, technological, and Indigenous Knowledge to the mutual benefit of self, society, and the environment.

From Saskatchewan Science Curriculum, 6-9:

Traditional and Local Knowledge

A strong science program recognizes that modern science is not the only form of empirical knowledge about nature and aims to broaden student understanding of traditional and local knowledge systems. The dialogue between scientists and traditional knowledge holders has an extensive history and continues to grow as researchers and practitioners seek to better understand our complex world. The terms “traditional knowledge”, “Indigenous Knowledge”, and “Traditional Ecological Knowledge” are used by practitioners worldwide when referencing local knowledge systems which are embedded within particular worldviews.

Indigenous Knowledge

“Traditional [Indigenous] knowledge is a cumulative body of knowledge, know-how, practices and representations maintained and developed by peoples with extended histories of interaction with the natural environment. These sophisticated sets of understandings, interpretations and meanings are part and parcel of a cultural complex that encompasses language, naming and classification systems, resource use practices, ritual, spirituality and worldview” (International Council for Science, 2002).

What is the role of the Teacher?

The following is an overview of the teacher's role throughout the process of setting up a KSF:

- A significant starting point in regards to the role of the teacher is to be open-minded and support the idea that Indigenous Science is important and a valid method for students to learn about the world they live in.

- Teachers should have an awareness of the Indigenous worldview model of spirituality and relationships (included in this handbook). If this is unfamiliar to the teacher or his/her students, it is strongly recommended that the teacher arrange to have a kehtaya, a FNMIE consultant, or other Knowledge Keeper visit to discuss ideas of how Aboriginal cultures regard and relate to Mother Earth.

- Following the philosophy of inquiry-based learning, the teacher's role is to provide learning opportunities and help facilitate and guide learners to arrive at their own questions. The teacher can motivate and give students direction on the type of projects/topics the student may explore, but it is the student who must arrive at the question they will seek to explore and further understand.

- Teachers work with Elders and other Knowledge Keepers to determine how they will engage in learning opportunities with the students.

- Teachers gather other resources and participation from stakeholders to support the topics and learning needs of their students (parents, community members, books, videos, articles, websites, etc.)

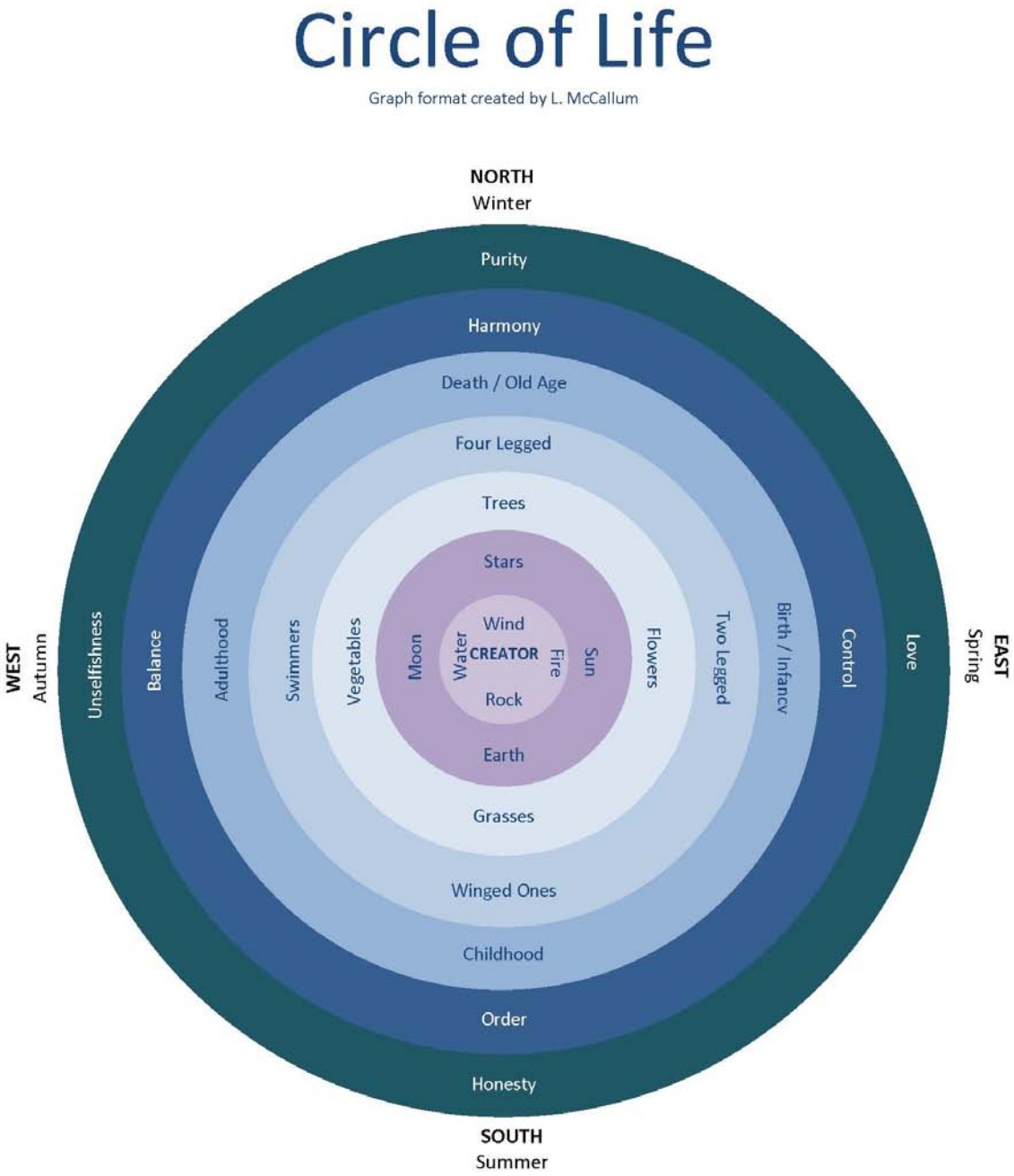
- Throughout the process of preparing for the Knowledge Sharing Fair, the teacher encourages discussion based on the learning opportunities and examples the students become engaged in.

- Teachers will ensure that projects being developed by students reflect First Nations and Métis ways of knowing.

- Teachers provide students with opportunities to reflect on what they are learning and for students to determine new questions they formulate based on their understanding of the topics at hand.

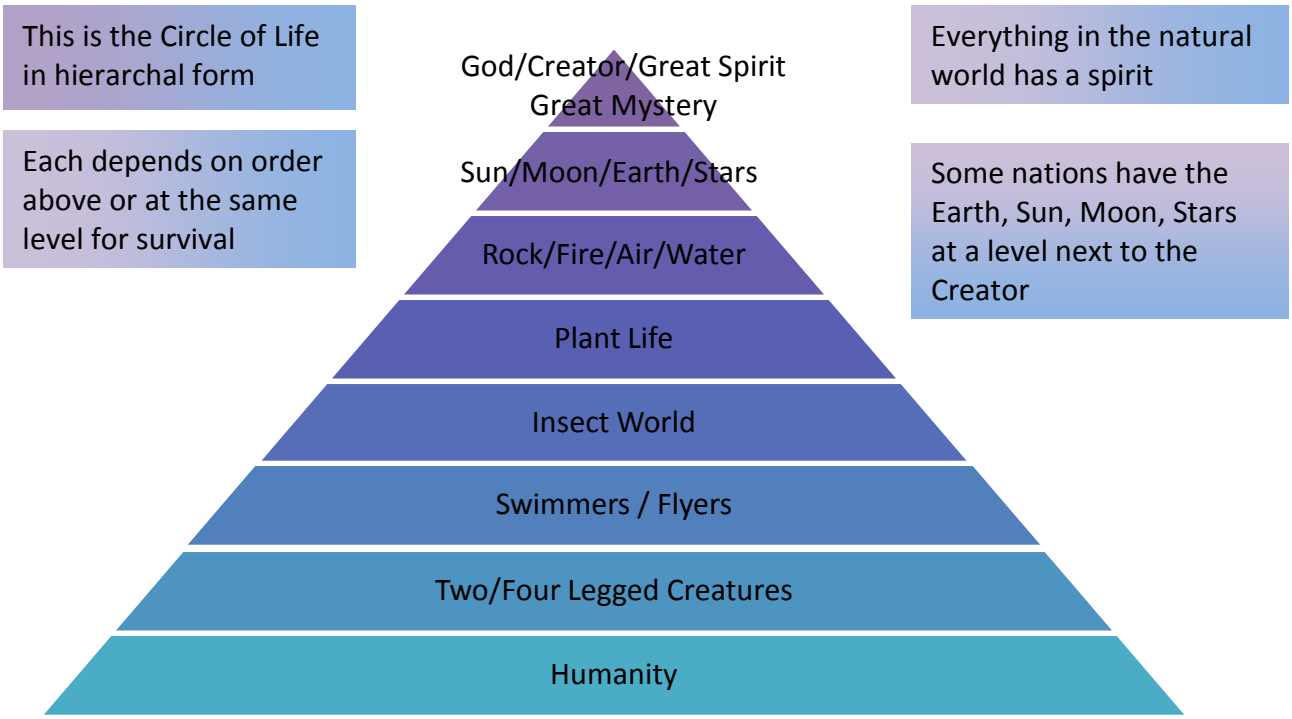
- Teachers organize the opportunity for students to showcase their knowledge with an audience.

Circle of Life



Traditional First Nations Spirituality Order of Creation

Graph and Concept created by L. McCallum



Involving kehtayak (elder/older wiser person) and other Knowledge Keepers?

The key component to the success of a Knowledge Sharing Fair is providing opportunities for students to work with kehtayak and other Knowledge Keepers as a means for the student to ask questions, formulate understanding and gain the knowledge and skills necessary to prepare for sharing their knowledge with others.

The GSCS division employs kehtayak and FNMIE consultants who are available to come into the classroom and work with students. It is important to note that kehtayak and other Knowledge Keepers are not experts in all fields. The teacher needs to discuss the content of the topics students wish to learn about with their guests and seek out the proper people who can provide learning opportunities related to the topics wishing to be explored.

How can teachers facilitate parents and community members' participation?

(The following section is from the article "Circles of Science" by Amendt, Bousquet and Lafond, 2006).

> "It is important that teachers see the parents and members of the First Nations and Métis community as having knowledge and gifts that they may not possess. Most teachers in Saskatchewan will be learning along with their students. It is likely that many First Nations and Métis students may be more knowledgeable than teachers in certain areas. Having a humble approach to parents and community members will be an asset for teachers."

Amendt and Bousquet (2006) suggest a number of practices that are inviting, including:

- Offering tobacco (1 cigarette) to a First Nations and Métis parent when inviting them to help.
- Seeking the advice of an Elder.
- Asking students to identify extended family members that can act as a resource person.
- Hosting a community meeting to seek help.
- Including parents and community members when meeting with Elders.

What is the protocol to invite an Elder? (Bousquet and Lafond, 2006)

> The most common practice when meeting with an Elder is to present them with tobacco (a pouch or a package of cigarettes) at the very beginning of the meeting. Tobacco, like sweetgrass, sage and willow fungus, are ceremonial plants that First Nations consider as sacred. They each have a specific purpose. Tobacco is the typical offering used in following protocol to invite the participation, presence, or wisdom of Elders. Often, a pouch or package of cigarettes, or even a single cigarette, is given. The intention is to approach with humility and respect, and in turn, the Elder uses humility and respect to pray with the tobacco for guidance.
>
> It is appropriate to give the Elder an honorarium also. The tribal council (or school division) in your area will be able to help you decide on an appropriate honorarium. Other gifts, such as wild meat, fish, berries or blankets are also appropriate.

If kehtayak employed by GSCS are visiting your classrooms, an honorarium is not necessary, although the teacher (or a student) may still offer tobacco or other gift to the kehtayak as a sign of respect.

INQUIRY and the 5E Learning Cycle

In October, 2009, teachers employed by GSCS participated in a workshop focused on the 5E learning cycle, an inquiry-based teaching method, as a means to further their understanding of "Inquiry-Based Learning".

Inquiry learning is being promoted as an essential teaching method in all areas of the SK curriculum.

> *Inquiry learning provides students with opportunities to build knowledge, abilities, and inquiring habits of mind that lead to deeper understanding of their world and human experience. Inquiry is more than a simple instructional method. It is a philosophical approach to teaching and learning, grounded in constructivist research and methods, which engages students in investigations that lead to disciplinary, interdisciplinary, and transdisciplinary understanding.*
>
> *Inquiry builds on students' inherent sense of curiosity and wonder, drawing on their diverse backgrounds, interests, and experiences. The process provides opportunities for students to become active participants in a collaborative search for meaning and understanding. (SK Science Curriculum, 6-9)*

This KSF guide follows the processes involved in the 5E learning cycle as this model respectfully supports traditional ways of learning. The 5E learning cycle promotes opportunities for students to explore a topic by investigating (in a variety of ways) to construct meaning, then allows for the student to communicate, create and reflect upon their learning.

Although the phases of the learning cycle are presented in a step-by-step format, it is important to note that this will often be a cyclical process in which students move back and forth between the phases as they develop their understanding and form new questions based on the knowledge they are learning.

Preparing for a Knowledge Sharing Fair: Phases of the 5E Learning Cycle

Phase 1: Engage

The first stage of preparing for a KSF is to engage your students in a topic they are interested in and want to learn more about. This first stage can be the most difficult as the teacher plays a large role in creating interest and activating prior knowledge in an effort to help students decide on a topic they will explore over the next few weeks.

A. Understanding the Traditional Worldview Model of Spirituality and Relationships

Perhaps the most appropriate method of engaging students to learn about Indigenous Knowledge and Ways of Learning is to ensure students have some background knowledge about the ways in which First Nations, Métis and Inuit cultures relate to their world. Teachers who are limited in their knowledge or experience in this area are encouraged to call on resource people to introduce these concepts to their students. Our division employs kehtayak and Aboriginal consultants who are available to come into your classroom to talk about the traditional worldview model of spirituality and relationships with the land.

B. Choosing Topics

When looking at possible topics to present to students for exploration, here are two different approaches a teacher can take:

1) **Focus on a Specific Unit** – in this approach, a teacher chooses a specific unit from the curriculum and provides opportunities for students to explore ideas related to this specific topic. For example, a grade 7 teacher can choose to have his/her students focus on topics related to "Interactions within Ecosystems".

   This approach is helpful for teachers participating in their first KSF. The range of topics will be related and this is helpful when searching for resources, as well as kehtayak who can share their knowledge.

2) **Offer all units** – in this approach students can choose to explore sub-topics related to any of the four units of study within their grade level. (Example: A grade 6 student could research a topic related to Flight, Electricity, Space or Diversity of Living Things.) Student projects will result in a variety of topics, but creates more work for teachers in gathering people and other resources their students will learn from.

C. Providing Initial Learning Opportunities

Regardless of the approach, once the unit(s) have been presented to students, teachers need to create opportunities for their students to understand the different sub-topics involved in the unit as a means for the student to choose a specific topic to explore.

1. Guest Speakers

If the teacher has chosen a specific unit, an effective introduction is to have a kehtayak (or other knowledge keeper) come into the classroom and share their knowledge. For example, a grade 5 class is learning about "Predicting Weather". A teacher can have a kehtayak come into the classroom and discuss Indigenous ways of knowing how to predict weather. This discussion could lead into sub-topics such as moon phases, signs and behaviors of different kinds of animal, arthritis, etc. After the presentation by the guest, students should have the opportunity to reflect on what they learned and choose a sub-topic based on something they became more interested in from this experience.

2. "Book Walk" of Literature Resources

If no one is available to come into the classroom at this point, teachers can brainstorm possible sub-topics with their class using a textbook and other resources related to the unit(s). Doing a "book-walk" through a textbook is an excellent strategy for students to recognize the various sub-topics involved within a unit. (Serafini outlines how to conduct a book-walk in the teacher resource Lessons in Comprehension.) Having students "walk" through the text identifying pictures, headings, charts, table of contents, etc. allows for the student to process the different concepts and find a topic of interest.

3. Learning from Place

In situations where access to the land is available and appropriate to the topic of interest, taking students outside to experience learning first hand is ideal. For example, when discussing weather, taking students outside and having them use their senses to experience, and later explain, different elements involved in weather (wind, precipitation, clouds, etc.) is an effective method of allowing students to experience their topic "hands-on". Blackstrap and Eagle Creek are two excellent resource centers available to teachers within the GSCS division when looking for hands-on / inquiry-based learning experiences for your students.

D. Q-T-L

An excellent method to engage students in the topic they have chosen, as well as in the process of preparing for a KSF, is to have them each fill out a "QTL" (see Appendix B). In this process, students think about the *questions* they have, what they *think* they know and what they *learn* about their topic throughout the process of preparing for their KSF. Having students formulate questions about their topic helps them identify what they want to focus their learning on. A Q-T-L is also effective in activating a student's prior knowledge. (If students are working in small groups, they should each fill out their own Q-T-L.)

Phase 2: Explore

Once a student has chosen the topic they will be focusing on, the "Explore" stage is all about offering students *various opportunities* to investigate and gather information about their topic. This stage is focused on concept development as students explore different ways of learning about their topic. This stage can somewhat overlap the first stage "Engage" as some of the suggestions to offer multiple opportunities to explore topics are repeated. Here are some suggestions:

- Invite kehtayak and other Knowledge Keepers to share their knowledge. If students have not yet had this opportunity, it is strongly recommended that they work with kehtayak prior to moving onto the next stage.
- Encourage students to discuss their topics at home with their parent(s)/guardian(s) and other family members.
- Gather books, magazines and other print material from your library and division resource center for students to read from.
- Show videos/DVD's related to your topic.
- Provide opportunities for your students to observe their topic (if applicable) by going outside or organizing field trips.
- Use Science Resource textbooks and other literature resources to learn about the topic. This can include students conducting experiments outlined in the texts as well. (Remember, an important goal is to *bridge* Western Science with Indigenous Ways of Knowing.)

Phase 3: Explain

This phase involves two stages for the students. First, students *construct meaning* out of what they have learned from the various experiences they've had with their topic. Second, the student determines *how* they will represent and communicate the knowledge they have learned.

When looking at different ways students can present the knowledge they have gained, encourage your students to create presentations that reflect their

interests and styles of learning. Here are some examples: (Note: students may choose to include a variety of ways to communicate their learning by combining two or more of the following or coming up with different ideas all together.) See appendix C: KSF Application form for a resource to help your students outline their plans for their KSF presentation.

- Dance
- Storytelling
- Paintings
- PowerPoint
- Display board
- Model
- Experiment

The following is a list of projects that students have created and presented at past KSF's.

- Grade 4 students presented a play adapted from Keepers of the Earth called, "Gluscabi and the Wind Eagle" as a means to explain why the wind is important. A question / discussion period between the actors and the guests followed each presentation. (see Appendix G for script)

- Students gathered / obtained different types of plants for display and had tea (made from the plants) on hand for guests to sample. They discussed the different plants and their uses with their guests.

- Students learned about snowshoes (Grade 7/8 PAA: Structure and Design) borrowed the snowshoes available from the GSCS resource center and offered their guests opportunities to use the snowshoes in the field beside the school and discussed what they learned about how the snowshoes were designed for their purpose.

- Students have raised tipi (with help from kehtayak) and discussed the design features while the kehtayak discussed the spiritual significance of the tipi.

- Grade 7 Heat and Temperature: using a tort stand, metal mesh, a candle, small paper cup and water, students demonstrated how a paper cup was like the buffalo stomach lining and was used as a pot to heat things up over fire. They put water in the cup and placed the candle underneath and explained why the cup would not burn.

- Students grew similar plants, but gave them different types of water (pure, tap, polluted with oil, etc.) to show the effects of pollution and chemicals on plants/ecosystems. They explained what they learned from kehtayak about how pollution destroys "Mother Earth" and it is our job to protect the Earth.

- Grade 6 Space: Students obtained a "Star Lab" and shared stories about the different constellations Aboriginal people have studied.

See Appendix A: FNMI ways of Knowing in Pearson Saskatchewan Science textbook for ideas relating curriculum units to Indigenous Science.

Phase 4: Elaborate

"Elaborate" is the phase that involves the students presenting their projects to each other, as well as at a Knowledge Sharing Fair. During this process, students not only share what they have learned, but are also encouraged to ask questions of their guests as a means to listen to other people's perspectives and knowledge about their topic.

A Knowledge Sharing Fair is an opportunity for people (students, teachers, guests) to further discuss the topics presented and for all involved to deeper their understanding about science and nature.

Phase 5: Evaluate

Finally, after the KSF is over, students and teachers examine what they have learned about their topics as well as the process of preparing for and presenting at a KSF through self-reflection.

Students can go back to the "L" section of their Q-T-L and fill in what they have learned. A student self-reflection is also included in this handbook (see Appendix D).

For teachers, this is a great opportunity to reflect on how you feel about the stages of preparing the students (and your facility) for the KSF, as well as how you feel about the overall learning experiences for your students. Ask yourself:

- What did you enjoy? What was "worthwhile"?
- What was difficult?
- What supports / resources would have made things easier?
- What would you keep the same and what would you do differently next time?

Evaluating throughout the Knowledge Sharing Fair Process

Throughout the process of preparing for a KSF, using checklists and anecdotal notes on student participation, effort and behavior is an excellent method of assessment. Some handouts teachers can evaluate include the project application form, Q-T-L handout, as well as the student self-reflection after the KSF. In situations where students have worked in small groups, students can complete a peer evaluation pertaining to how well each member participated, completed their share of the work and listened to other group members. See the appendix for samples of these forms.

Evaluation is largely dependent on the needs of the teacher and the types of the projects students present. Having students participate in creating a rubric for their teacher to evaluate their project is more appropriate than a teacher creating the rubric without the input from the student(s).

Facilitating a Knowledge Sharing Fair

As a teacher, you can choose to host or participate in a Knowledge Sharing Fair in a number of ways. You can provide your students the opportunity to present and interact with classmates and guests within a classroom KSF, a multi-class or school-wide KSF, or within a multi-school or division-wide KSF.

Regardless of the "type" of Knowledge Sharing Fair you and your students will be participating in, the following is recommended when facilitating the event.

- Invite special guests (such as parents, other family and community members, kehtayak, other classrooms within the school, school administration, division representatives, etc.) to attend the KSF. The Ministry of Saskatchewan recommends, when holding a larger KSF, four Elders be present at the event.
- Begin with a welcoming ceremony. They should involve everyone who has participated and will be involved in touring the presentations after the opening ceremony. Large spaces such as a school gym or library are appropriate locations to host larger KSF opening ceremonies.
- The lead teacher and other special guests can welcome everyone and acknowledge the work of the students and people who helped them in their learning experiences.
- Prayer, song, drumming and smudge are appropriate ways to start off the event. A lead teacher or student can offer tobacco to a guest to lead in prayer.
- If any students have prepared a dance, play, song or production appropriate to present at a large group setting, have them share their contribution to the KSF at this time.
- After the opening ceremony, students prepare their areas to present and share their work. Guests circulate the displays and interact with the presenters to learn and share their knowledge as well.

The following is an example KSF agenda:

9:30am – Welcoming Ceremony (followed by student presentation(s) such as song, dance, play, tipi raising, etc.)

10:15am – Student displays (guests circulate presentations throughout the room or school)

11:30am – Display clean up.

Appendix A

First Nations, Métis & Inuit Ways of Knowing In Pearson Saskatchewan Science (Grade 6/7)

Teacher Inquiry
- Read the article.
- What does it tell you about the worldview of First Nations/Métis?
- How does this differ from the European/Western worldview?
- How can I incorporate this into my science lessons?
- What aspects of this article can give hope to my students?

GRADE 6

p. 41 Ask a Traditional Knowledge Keeper: Judy Bear: Humanity's Place
How can I become more connected to the land?
How is the Cree "hierarchy of Creation" different from the European one?

p. 95 Ask an Elder: Danny Musqua: the Thunderbird and Waskwanehpigan
In "Rekindling Traditions" it is stated that Aboriginal and Western science "differ in intellectual goals: to co-exist with mystery in nature by celebrating mystery versus to eradicate mystery by explaining it away." How does this article reflect that difference?

p. 160 Crow Brings the daylight
See teacher guide p. 338

p. 166 Ask an Elder: Stewart Prosper: The Winged Ones
How do Elder Stewart's reflections show a "connectedness" to nature?

p. 167-170 Ancient technologies: Spear, Atlatl, Bow and Arrow
See p. 170

p. 245 Ask an Elder: Ken Goodwill: A Lesson From the Stars and the Moon
In what way are we all made of "stardust?"
In many cultures, knowing someone's name gives one power over that person. How is this understanding reflected in the article?

Indicators relating explicitly to First Nations/Métis ways of knowing and related pages in <u>Student</u> text:

Diversity of Life:
6.1 (e) Unit 1 Review, pp 79-80, q. 3, 19, 27
6.2 (d,e) Thing Again, p. 62 Unit 1 Review, pp 79-80, q. 3, 19
6.4 (g) Work on it, p. 38; Unit 1 Review, pp 80, q. 20, 24, 25
6.5 (e) Think Again, p. 73; Communicate, p. 73, q. 2; Unit 1 Review, pp 80, q. 28

Flight
6.1 (b) Crow Brings Daylight, p. 160-161; Unit 3 Review, p. 221-222, q. 6, 7, 23
6.1 (f) Communicate p. 170, q. 1-4; Unit 3 Review, p 221, q. 5

Solar System
6.1 (f) Work On It, p. 244; p. 275; Communicate, p. 276, q. 3; Unit 4 Review, p. 291, q. 6, 7, 10, 12.

GRADE 7

p.23 Careers and Profiles: Herman Michell: All Things Are Connected
What does the title of the article mean?
How would Herman's life have changed in a residential school?
How does Herman bring hope to his people and to all Canadians.
Does "ecology" mean the same thing to First Nations, Métis or Europeans?

p. 76 Ask an Elder: Ivan Moring: Seasons of Change
What impact does changes in the north have on the Dene way of life?
What does Elder Ivan mean by saying, "We need some identity and to keep close to Mother Earth"?

p. 115 Ask an Elder: Yvonne Chamakese: Tanning Hides
What aspects in the process of tanning a hide show technology – the application of science knowledge to achieve a goal?
Why is it important for Cree people to continue tanning hides in this way?

p. 224-230 Traditional Knowledge: Clothing and Shelter
See questions p. 230

p. 231 Ask an Elder: Alma Kytwayhat: The Buffalo
See "Buffalo" in the Treaty Kit Binder

p. 271 Ask an Elder: Isador Pelletier: Stories in the Stones
In what ways can we talk about rock as "living?"

Indicators relations explicitly to First Nations/Métis ways of knowing and related pages in <u>Student</u> text:

Interactions in Ecosystems
7.1 (a,b.c,d) The Seventh Generation
p.7; Our Relationship to the Wolf
p. 15; Check Your Progress
p. 15, 1: Design a Lang-Use Plan
p. 88-90 Unit Review
p. 93-94, q. 2, 8, 20

Appendix B

Q-T-L Worksheet

QUESTIONS you have about _____(topic):
What you THINK you know about _____(topic):
What you LEARNED about _____(topic):

Appendix C -

Knowledge Sharing Fair Project Application Form

Student Name(s): _____

Project Topic: _____

Project Summary: What do you want to learn about this topic?

_____

_____

_____

Elders / Knowledge Keepers / People I/we can talk to:

_____

_____

Style / Type of Presentation:

__ drama __ dance __ storytelling __ display board

__ song __ power point __ model __ art work / craft

__ samples on display __ other (please specify): _____

Materials needed:

Appendix D

Knowledge Sharing Fair Self Assessment

Complete each section describing your ideas and feelings relating to each topic below:

Describe your contribution to the Knowledge Sharing Fair. What did you present? How did you present this information?

People / Books / Elders / Other resources you used to gain knowledge for preparing your contribution to the Knowledge Sharing Fair …

A few main things that you learned about your topic throughout the planning and preparing of the Knowledge Sharing Fair:

How did you feel presenting at the Knowledge Sharing Fair? Describe these feelings in as much detail as possible.

Describe the part of this process that you are most proud of:

Explain something you would do differently next time:

Other comments / suggestions:

Appendix E

Student Self / Peer Group Project Evaluation

On the table below record your name and the names of your group members, assign a mark to yourself and the other members of your group to evaluate how well you all worked together throughout this project. Use the scale below to assign each mark.

4	3	2	1
Always	Usually	Sometimes	Not at all

	Completed their share of the work load.	Listened to other group members' ideas.	Stayed on task during work periods.	Had a positive attitude towards the project.
My Name:				
Group Member:				
Group Member:				
Group Member:				

What did you enjoy about the project?

What did you find difficult or challenging?

What would you do differently next time?

Other comments / suggestions:

Appendix F

Elements of Life – Lesson Plan – Kelli White (2008)

Grades 7: Interactions Within Ecosystems Duration: 40-60 minutes

Learning Objectives:

- Students will explore and compare the 4 elements of life as presented by Western Science and Indigenous perspectives.
- Students will recognize that all living things are a unique combination of these elements and all life is interconnected.
- Students will work cooperatively to gain information validating their own experiences and the experiences of others as a means to share and learn from each other.

Materials: 2 empty shoe boxes, 2 small plastic containers with lids, water, soil, 4 elements of life posters, Science Power 7 texts, timer, 4 elements of life Circle model on a poster board, smart board and/or handout, project application template, self – evaluation forms.

Motivational Set: (adapted from "Boreal Forest Guide")
Inside a shoe box place one sealed container of water and one sealed container of soil. Tape lid on. Tell class (and/or make a sign): "Sealed inside this box are three of the four elements of life. When you open the lid, the fourth and last element will enter the box. What are the four elements of life? Write your answer down and on a piece of paper and place in the second box." Discuss some of the answers given leading to Air, Water, Earth and Sunlight.

Procedures:

1. Open Science Power 7 texts to pg 11 and have students take turns reading the 4 elements of life as described in the text.
2. Think–Pair–Share activity: Ask students to think of one organism they know about and share with their partner how their organism is linked to each element. Set a time limit (3 minutes) and allow students to share their responses with the whole class.
3. Explain to students that many Aboriginal cultures recognize four basic elements of life as well. Look at the poster/handout/ Circle model and have students compare the 4 elements presented in the textbook to the 4 elements on the diagram (air, fire, earth and water). Have students share their ideas. How are they similar? Different?
4. Place posters of the 4 elements in the four directions around the room (air =

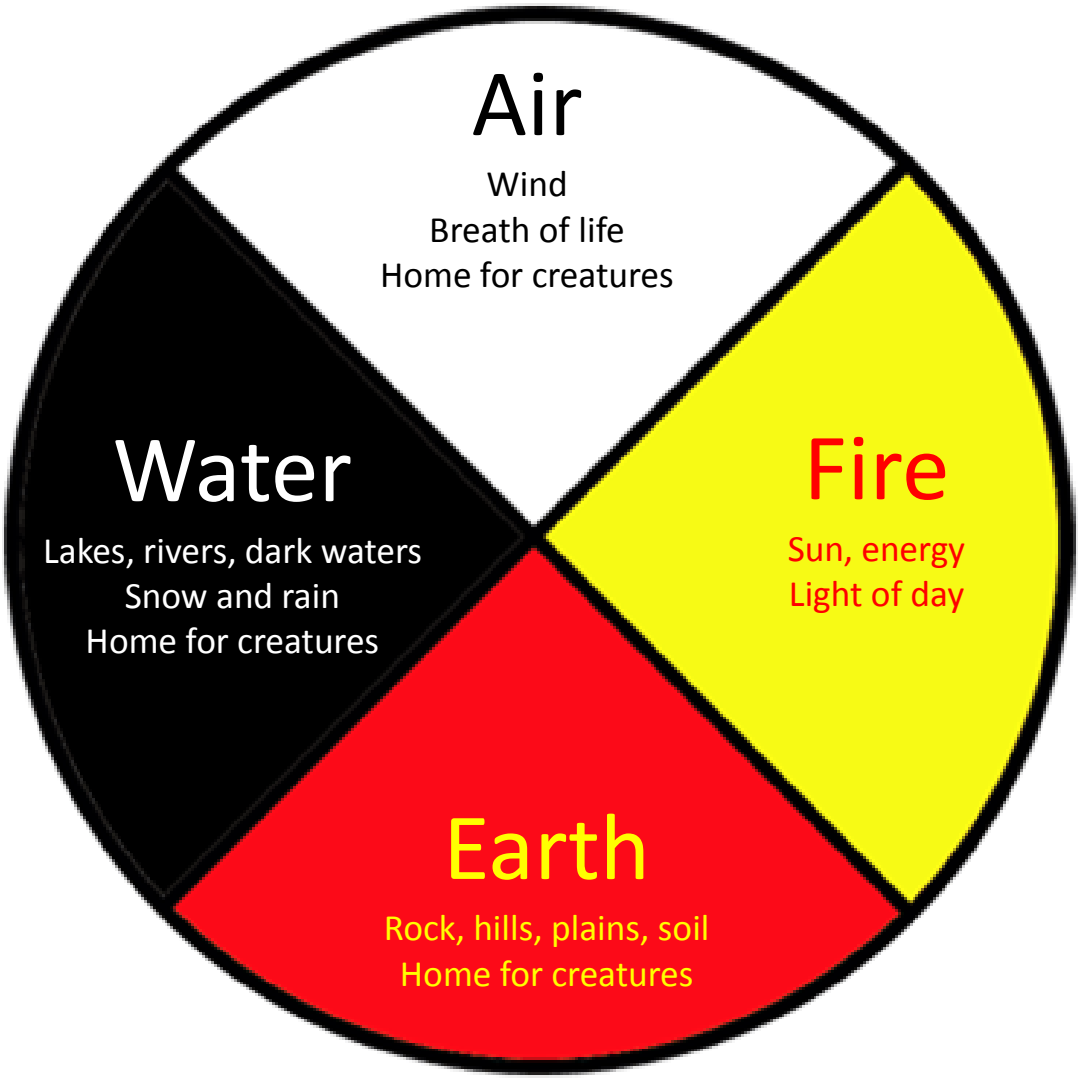
north (white), fire = east (red), earth = south (yellow) and water = west (black)).

5. Group students into 4 groups and give each student a handout (included, double side this handout so students have spots to list ideas for each element) in which they can list examples of the 4 elements. Starting at 4 different locations, students move around the room to each poster. Students take turns reading the poster and sharing examples of how they see and/or experience each element in life around them. They then brainstorm ways in which they could share and present their knowledge to the class.
6. Give groups approx. 5 minutes at each station.

Extension:

- Students can create class presentations individually or in small groups to represent their learning. Ideas include presenting information and examples related to one element or how one organism experiences all 4 elements.
- Encourage the use of music, drama, dance, art, etc. for presentation styles (vs. everyone doing a power point).
- Students can use a project application form to organize and communicate their ideas for their presentation. Give students opportunities to research their topics: invite Elders or other knowledge keepers in, have students observe their topic in nature if possible, encourage students to journal about what they know and what they have experienced with their topic in their life, encourage students to talk to their parents or other family or community members, even other staff members about what knowledge they can share.
- Presentations can be done a class activity, in a knowledge sharing fair format or other ways of presenting.
- Students should complete self-reflection forms for evaluation.
- Rubrics for their research/presentation can be made involving the students. Some suggested criteria: Content of Presentation (info is relevant and appropriate with supportive detail); Creativity (effort, style); Inclusion (all group members creatively involved, enthusiastic and prepared); Resources (a variety of resources, including people were accessed throughout project).

4 Elements of Life – Indigenous Perspective



Air

Your direction is North. Your color is white. You represent the wind which scatters the seed and carries the pollen. You are the breath of every living thing. You are the air where birds and humming insects soar and glide.

Fire

Your direction is East. Your color is red. You represent the sun, the source of energy for every living thing. The leaves and needles of green plants capture your energy and produce food for themselves and others. You are the light of dawn and the beginning of the new day.

Earth

Your direction is South. Your color is yellow. You represent the rocky hills and sandy plains. You are the living soil where roots take hold and plants grow. You are home for many creatures.

Water

Your direction is West. Your color is black. You represent the lakes, the rivers and the dark waters underground. You are the flakes of snow and the thunder clouds which carry the rain. All plants and animals depend upon you but you are the special home for the creatures who swim.

4 Elements of Life

Element: _____

Examples of how we see / experience this element in life	Possible ways we can share the knowledge we learn about this element

Element: _____

Examples of how we see / experience this element in life	Possible ways we can share the knowledge we learn about this element

Appendix G

Gluscabi and the Wind Eagle
(Abenaki – Northeast Woodlands)
- Script adaptation for Readers' Theatre by Kelli White

Characters
Narrator 1, 2, 3
Gluscabi (a young man)
Grandmother Woodchuck (Gluscabi's grandmother)
Wuchowsen, the Wind Eagle

Organization
Students can sit in a chair on stage and stand up when it is their turn to speak. They may wish to incorporate hats or other types of props to add to their presentation.

Narrator 1: Long ago, Gluscabi lived with his grandmother, Woodchuck, in a small lodge beside the big water. One day Gluscabi was walking around when he looked out and saw some ducks in the bay.

Gluscabi *(looking out towards the audience):* I think it is time to go hunt some ducks.

Narrator 2: So he took his bow and arrows and got into his canoe. He began to paddle out into the bay and as he paddled he sang …

Gluscabi: *(paddling)* Ki yo wah ji neh, yo hey ho hey, Ki yo wah ji neh, Ki yo wah ji neh.

Narrator 3: But a wind came up and it turned his canoe and blew him back to shore. Once again, Gluscabi began to paddle out and this time he sang his song a little harder.

Gluscabi: KI YO WAH JI NEH, YO HEY HO HEY, KI YO WAH JI NEH, KI YO WAH JI NEH.

Narrator 1: But again, the wind came up and blew him back to shore. Four times he tried to paddle out into the bay and four times he failed.

Narrator 2: He was not happy. He decided to go and see someone who could give him some answers.

Narrator 3: He went back to the lodge of his grandmother and walked right in, even though there was a stick leaning across the door, which meant that the person inside was doing some work and did not want to be disturbed.

Gluscabi: Grandmother, what makes the wind blow?

Grandmother Gluscabi, why do you want to know?

Narrator 1: Then Gluscabi answered just as every child in the world does when they are asked such a question.

Gluscabi: Because.

Grandmother: Ah, Gluscabi. Whenever you ask such questions I feel there is going to be trouble. And perhaps I should not tell you. But I know that you are stubborn and you will never stop asking until I answer you. So I shall tell you. Far from here, on top of the tallest mountain, a great bird stands. This bird is named Wuchowsen, and when he flaps his wings he makes the wind blow.

Gluscabi: Eh-hey Grandmother. I see. Now how would one find that place where the Wind Eagle stands?

Grandmother: Ah, Gluscabi. Once again I feel that perhaps I should not tell you. But I know that you are very stubborn and would never stop asking. So, I shall tell you. If you walk always facing the wind you will come to the place where Wuchowsen stands.

Gluscabi (*excited)*: Thank you, Grandmother. (*Gluscabi leaves the house and begins walking slowly following the narrator's ques)*

Narrator 2: He stepped out of the lodge and faced into the wind and began to walk.

Narrator 3: He walked across the fields and through the woods and the wind blew hard.

Narrator 1: He walked through the valleys and into the hills and the wind blew harder still. He came to the foothills and began to climb and the wind blew harder.

Narrator 2: Now the foothills were becoming mountains and the wind was very strong. Soon there were no longer any trees and the wind was very, very strong. The wind was so strong that it began to blow off some of his clothes, but he kept on walking.

Narrator 3: Now the wind was so strong that it blew off his hair, but he kept on walking. The wind was so strong that he could hardly stand. He had to pull himself along by grabbing hold of the boulders.

Narrator 1: But there, on the peak ahead of him, he could see a great giant bird slowly flapping its wings.

Narrator 2: It was Wuchowsen, the Wind Eagle.

Gluscabi *(taking a deep breath)*: GRANDFATHER!

Wind Eagle: (*stops flapping his wings and looks around)* Who calls me Grandfather?

Gluscabi: It's me Grandfather. I just camp up here to tell you that you do a very good job making the wind blow.

Wind Eagle: (*puffing out his chest)* You mean like this? *(he begins flapping his wings quickly and Gluscabi falls back)*

Gluscabi: GRANDFATHER … you do a very good job making the wind blow, this is so. But it seems to me that you could do an even better job if you were on that peak over there. *(Gluscabi points to the back of the gym)*

Wind Eagle: (*looking at the back of the gym)* That may be so, but how would I get from here to there?

Gluscabi: *(smiling)* Grandfather, I will carry you. Wait here.

Narrator 3: Then Gluscabi ran back down the mountain until he came to a big basswood tree. He stripped off the outer bark and from the inner bark he braided a strong carrying strap which he took back up the mountain to the Wind Eagle.

Gluscabi: Here Grandfather, let me wrap this around you so I can carry you more easily.

Narrator 1: Then he wrapped the carrying strap so tightly around Wuchowsen that his wings were pulled to his sides and he could hardly breathe. He picked up the Wind Eagle and said …

Gluscabi: Now, I will take you to a better place.

Narrator 2: Gluscabi began to walk toward the other peak, but as he walked he came to a place where there was a large crevice and as he stepped over it, he let go of the carrying strap and the Wind Eagle slid down into the crevice, upside down, and was stuck.

Gluscabi: Now, it is time to go hunt some ducks.

Narrator 3: He walked back down the mountain and there was no wind at all. He waited till he came to the treeline and still no wind blew. He walked down to the foothills and down to the hills and valleys, and still there was no wind.

Narrator 1: He walked through the forests and came back to the lodge by the water, and by now all of his hair had grown back.

Narrator 2: He put on some fine new clothing and a new pair of moccasins and took his bow and arrows and went down to the bay and climbed into his boat to hunt ducks. He paddled out into the water and sang his canoeing song.

Gluscabi: Ki yow ah ji neh, yo hey ho hey, ki yow ah ji neh, ki yow ah ji neh.

Narrator 3: But the air was very hot and still and he began to sweat.

Narrator 1: The air was so still and hot that it was hard to breath.

Narrator 2: Soon, the water began to grow dirty and smell bad and there was so much foam on the water he could hardly paddle.

Narrator 3: He was not pleased at all and he returned to the shore and went straight to his grandmother's lodge and walked right in.

Gluscabi: Grandmother, what is wrong? The air is hot and still and it is making me sweat and it is hard to breathe. The water is dirty and covered in foam. I cannot hunt ducks at all like this.

Grandmother: Gluscabi, What have you done now?

Narrator 1: And Gluscabi answered just as every child in the world answers when asked that question …

Gluscabi: Oh, nothing.

Grandmother: GLUSCABI! Tell me what you have done.

Narrator 2: Then Gluscabi told her about going to visit the Wind Eagle and what he had done to stop the wind.

Grandmother: Oh, Gluscabi, will you never learn? Tabaldak, The Owner, set the Wind Eagle on that mountain to make the wind because we need the wind. The wind keeps the air cool and clean. The wind brings the clouds which gives us rain to wash the Earth. The wind moves the waters and keeps them fresh and sweet. Without the wind, life will not be good for us, for our children or our children's children.

Gluscabi: Kaamoji, Grandmother, I understand.

Narrator 3: Then he went outside. He faced in the direction from which the wind had once come and began to walk.

Narrator 1: He walked through the fields and through the forests and the wind did not blow and he felt very hot.

Narrator 2: He walked through the valleys and up the hills and there was no wind and it was hard for him to breathe.

Narrator 3: He came to the foothills and began to climb and he was very hot and sweaty indeed.

Narrator 1: At last, he came to the mountain where the Wind Eagle once stood and he went and looked down into the crevice.

Narrator 2: There was Wuchowsen, the Wind Eagle, wedged upside down.

Gluscabi: Uncle?

Wind Eagle: Who calls me uncle?

Gluscabi: It is Gluscabi, Uncle. I'm up here. But what are you doing down there?

Wind Eagle: Oh, Gluscabi, a very ugly man with no hair told me that he would take me to the other peak so that I could do a better job of making the wind blow. He tied my wings and picked me up, but as he stepped over this crevice, he dropped me in and I am stuck. And I am not comfortable here at all.

Gluscabi: Ah, Grandfath … er, Uncle, I will get you out.

Narrator 3: Then Gluscabi climbed down into the crevice. He pulled the Wind Eagle free and placed him back on his mountain and untied his wings.

Gluscabi: Uncle, it is good that the wind should blow sometimes and other times it is good that it should be still.

Wind Eagle: Grandson, I hear what you say.

Narrator 1: So it is that sometimes there is wind and sometimes it is till to this very day. And so the story goes.

The End.

Appendix H

List of Resources

Organizations:

- Canadian Council on Learning: Aboriginal Learning Knowledge Center
- Education Authorities in First Nation Communities: Whitecap Dakota Nation, Muskeg Lake Cree Nation, Beardy's & Okemasis First Nation, One Arrow First Nation
- Federation of Saskatchewan Indian Nations
- First Nations University of Canada
- Métis Nation of Saskatchewan
- Saskatchewan Indian Cultural Centre
- Saskatchewan Learning
- Saskatoon Indian and Métis Friendship Centre
- Saskatoon Tribal Council
- School Division Consultants

Books:

Brockman, A., Doepker, C., Stephenson, E., View, T., and Wallace, M. (2009). Pearson Saskatchewan Science 7. Newmarket: Pearson Education Canada.

Caduto, Michael J. & Bruchac, J. (1989). Keepers of the Earth: Native Stories and Environmental Activities for Children. Saskatoon: Fifth House Publishing.

Caduto, Michael J. & Bruchac, J. (1994). Keepers of Life: Discovering Plants through Native Stories and Earth Activities for Children. Golden: Fulcrum Publishing.

Caduto, Michael J. & Bruchac, J. (1994). Keepers of the Night: Native American Stories and Nocturnal Activities for Children. Golden: Fulcrum Publishing.

Johanson, T., Mohr, P., Treptau, C., View, T., and Wallace, C. (2009). Pearson Saskatchewan Science 6. Newmarket: Pearson Education Canada.

Landon, R. & MacDonald, D. (2008). Native Americans Thought of It: Amazing Inventions and Innovations. Annick Press Ltd.

Wallace, M., Boulton, J., Johanson, T., Brockman, A.,View, T. (2010). Pearson Saskatchewan Science 9. Newmarket: Pearson Education Canada.

Websites:

Native Access. www.nativeaccess.com
Offers a program unique within Canada. While other access programs support students who have already made a commitment to post-secondary education, the Native Access focuses on reaching students at the elementary and secondary levels to encourage them to stay in school and keep studying math and science.

Science Alberta Foundation. “How To Build A Tipi”. Wonderville. www.wonderville.ca
Join Hayley, Tommy and Marie as they observe a tipi raising. Experiment with the number of poles, construction materials, alignment and other parameters to learn how a tipi is built in this construction game.

Science on the Leading Edge: Explore the dynamic earth and ocean off Canada’s Pacific coast. “First Nations History - Linking oral tradition with science”. www.oceanlink.info

Year of the Inuit. “2010: Year of the Inuit”. www.inuit2010.ca
2010 Year of the Inuit is an educational campaign spearheaded by Inuit Tapiriit Kanatami, the national organization representing Canadian Inuit. Its goal is to increase awareness among the general Canadian population about issues facing the Inuit of Canada and celebrate Inuit accomplishments and achievements.