

Grade 6 Science

Climate, Climate Change and Earth Systems

Introduction and Learning Map

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Introduction

"Two-Eyed Seeing" refers to learning to see from one eye with the strengths of Indigenous ways of knowing and from the other eye with the strengths of Western ways of knowing and to using both of these eyes together.

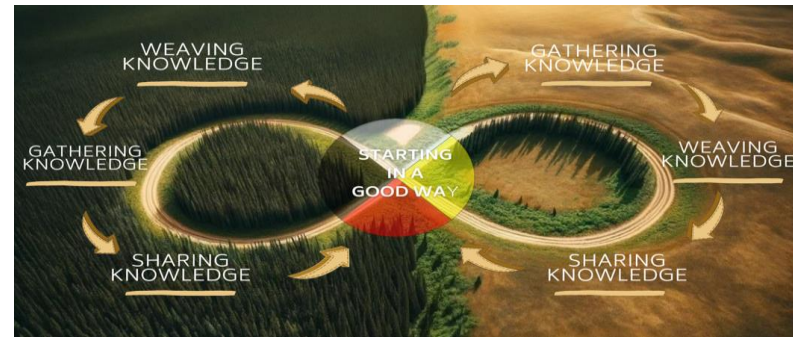
(Mikm'aw Elder, Albert Marshall)

Indigenized Instructional Practices are:

- Holistic
- Collaborative
- Relational

The four pillars of Indigenous Ways of Knowing:

- Storytelling
- Land Based Learning
- Leadership/Language
- Healing



(Elder, Consultant and Educator Donna Ross-Donna is Cree-Métis from Saskatchewan and member of the One Arrow First Nation, Treaty Six territory.)



Instructional Design:

When approaching the specific [Teacher Quality Standards](#) regarding First Nations, Métis and Inuit learning, Alberta teachers are often perplexed as to their level of competency within these areas. It is important for teachers to consider both their pedagogical approach to learning as well as the content and resources being utilized to fully meet the standards. The following series of tasks utilizes a student-centered pedagogical approach along with authentic Indigenous created content to uncover the General Learner Outcomes from the Grade 6 Science Program of Studies and to satisfy the Teacher Quality Standards as set out by Alberta Education.

To fully honor the Indigenized Instructional Practices and the four pillars of Indigenous Ways of Knowing as shown above, this unit of study provides foundational knowledge for teachers and students to begin the process of building a relationship with a local plant relative, the land, and ideally, a local Elder or Knowledge Holder. To create a resource that focuses on one Indigenous communities' culture, language, knowledge and history would not truly reflect the rich diversity of Indigenous Peoples within Alberta. Therefore, multiple groups of Indigenous peoples are represented in this resource that share a common worldview. It is critical for teachers to understand the value of creating relationships with local Indigenous culture, language, knowledge and history. For example, the concept of "Learning from Place" allows us to recognize that one community of Indigenous peoples might have a use of a strawberry plant that differs from another community. It honors the local peoples to know the difference.

"Indigenized" thinking tasks are designed utilizing instructional routines that challenge the traditional power dynamic in a classroom. Students will actively navigate their learning by participating in thinking tasks to generate meaning in an independent and collective manner while teachers are actively listening and observing student knowledge. There is a noticeable shift from "learning about" to "learning from". Students and teachers have the opportunity to focus on learning from the land, and Elder, a picture, or a peer.

Learning Maps

These thinking tasks are designed to be highly inclusive. They follow a UDL (Universal Design for Learning) approach to learning. Possible levels of student achievement within the Grade 6 Science General Learner Outcomes are addressed with the **Learning Map** and then supported with student-led** and Building Thinking Classrooms***style instructional routines. A



teacher should consider their classroom population when observing the learning map prior to the task to ensure it represents the community of students within their classroom.

Both teachers and students have an ongoing opportunity to assess, reflect and report upon the learner outcomes by referring to the Learning Map provided throughout the learning and assessment cycle.

The teacher's role is to ask questions, listen to and observe the learning taking place while students participate in the learning tasks. The teacher can be responsive to the learning that is generated after the learning has taken place during consolidation/sharing times.

This pedagogical approach benefits all students by allowing opportunities for students to think critically and use metacognition to deepen learning. Students will develop skills that lead to agency over their learning. The students will reflect and think about their thinking and share their thoughts with the community.

This pedagogical approach benefits teachers by building the foundation for sound, sustainable instructional and assessment practices.

A teacher may find that many more General Learner Outcomes and Specific Learner Outcomes are being met through the use of these instructional routines if they are followed with fidelity.


As with any routine, it takes time for students and teachers to see and feel the benefits and the purpose of this novel instructional routine.

Each task begins with "Starting in a Good Way". The intention during this time is to get student's minds, bodies, hearts and spirits ready to learn.

As the graphic below shows, learning may be designed to follow one of two paths, by either initially "Weaving Knowledge" (using student's previously learned knowledge) or by "Gathering Knowledge" (providing students with new knowledge). Either way, students will experience prompts to process and generate shared knowledge through the thinking tasks provided.

The daily thinking tasks are designed to fit into a 40 to 60 minute block. The teacher can choose the length of the time required for each section of the learning to suit their schedule.



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1. **Engaging Elders and Knowledge Keepers/Holders:** Elder voice is critical for finding direction and incorporating knowledge into our programming. Our Elders work very hard to support their families within their local communities. While our Elders are eager to provide support to people outside of their local community, they do experience fatigue from their work. Be respectful of their time and ensure that requests made are reasonable and specific. For example, asking an Elder to spend an entire day talking to multiple large groups of students about their experiences in Residential School can be exhausting. Asking an Elder to share knowledge about your local Indigenous communities' relationships with plants can be uplifting for them. Offering protocol and an honorarium, as per your school division's guidelines will demonstrate the willingness for a reciprocal relationship. Respectfully honoring and fostering an *ongoing* relationship demonstrates a commitment to the Truth and Reconciliation Calls to Action.
 2. **Authentic Indigenous Resources:** Authentic Elder and Knowledge Keeper/Holder voice first is always preferable to utilizing online resources. With that, there can be barriers to fostering those relationships. If a teacher must use online resources it is important to ensure that the teacher is aware of the authenticity of the online resources. Who created and is sharing these resources? Does the resource reflect the beliefs, culture and knowledge of your *local* Indigenous Peoples? Does the purpose of the resource match the purpose of the intended learning?
 3. **Place:** Alberta is a province with many Indigenous communities. It is critical that a teacher is aware of what group (s) of Indigenous Peoples makes the land they are on home. It is respectful to ensure that students are aware of the historical relationship the Indigenous Peoples have with the settler community on the land we all walk. When using text and digital resources, note who the author is and attempt to use resources that reflect the local Indigenous Peoples culture, language, knowledge, beliefs, and traditions. Being respectful to local Indigenous Peoples language culture, knowledge and tradition will ensure that pan-Indigenization does not take place.

Learning Map



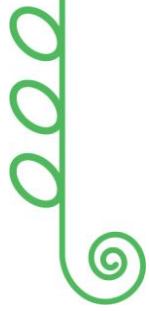
Grade 6 Science Learning Outcome: Students investigate climate, changes in climate, and the impact of climate change on Earth.

	Approaching	Essential	Developing	Confident	Extending
Knowledge	I know the daily weather.	I know climate is the long-term average of the weather conditions.	I know what climate is and how it is different from weather.	I know long term weather data can show <i>regular</i> and <i>irregular</i> climate patterns.	I know we can analyze long term climate data to make hypotheses about climate change.
Knowledge	<p>I know what temperature is.</p> <p>I know what precipitation is.</p> <p>I know the seasons.</p>	I know what temperatures and precipitation types are expected in the seasons where I live.	I know climate can differ across different regions.	I know the world has different climate zones based on location. (polar, tropic, temperate)	I know different climates can impact one another.



Skills and Procedures	<p>I can measure and track the daily local temperature.</p> <p>I can measure and track daily local precipitation.</p>	I can read charts, graphs or climate maps for my local region.	I can compare the local climate over time using charts, graphs or climate maps.	I can explain how a change in one climate area like temperature over time, can impact the levels of precipitation.	I can investigate and evaluate different sources of information about climate change
Understanding	I understand how Earth's systems (air, land, water, living things) are connected.	I understand that levels of greenhouse gases, and the use of fossil fuels, can lead to natural weather events.	I can give examples of how climate change affects ecosystems, people, and places in local and non-local regions.	I can communicate and suggest actions people can take to reduce climate change and protect the Earth	I can evaluate the effectiveness of different climate actions and explain how collective efforts create change





Starting in a Good Way - 5 mins - Random groups of three gather at the vertical non-permanent surfaces. Students will take 3-5 minutes to share with one another their favorite season and why that is. If they finish before the 3-5 minutes is up, they can share with one another their least favorite season and why that is. The purpose of this introduction is meant to foster positive peer relations within the classroom. The teacher has an opportunity here to observe and listen in on conversations.

Weaving Knowledge - 10 mins

“See Think Wonder” at white boards. Students will look at two images of wildfire in Alberta, and answer the prompt collaboratively at the vertical non-permanent surfaces. The teacher has an opportunity here to observe and listen in on conversations. The teacher will have the learning map available to them while listening to and observing student conversation and responses to the prompts to get a better understanding of individual and group strengths.

- In random groups of three, at vertical non-permanent surfaces (white boards), students will view images and respond by recording what they see in the image, what they think is happening in the image and what they wonder about the image.
- See the links below for more information about the thinking task, random groupings and vertical non-permanent surfaces in the classroom.
- Observe and listen to student thinking by visiting the small groups at the student whiteboards.

[See-Think-Wonder Thinking Routine](#)

[Building Thinking Classrooms Practices](#)

Gathering Knowledge - 25 mins [Choice Board](#)

- Choice Boards require student access to an internet connected device to access the resources. Students work *independently* to complete the choice board.
- Should students not have access to laptops or chromebooks, they could use their phones to access resources on the scan code version of the choice boards provided.
- Choice Boards are built to provide student choice while learning. Students can explore three ways to gain further knowledge, by reading, viewing or listening.

- Learn more about the positive impact of providing choice boards to shift from transfer of information to student discovery [here](#).
- [How](#) to create choice boards for students.

Sharing Knowledge - Talking Circle Reflections

- Prompt students to complete these sentence starters - I Used to Think, Now I Think

[I Used to Think, Now I think Thinking Task](#)

Pose the question and ask the student on the left to be the first to respond. The teacher may encounter a variety of levels of knowledge within their classroom community.

- As the teacher is to respond last, summarize what students have shared and consolidate with what the teacher would like the students to know.
- See link below for classroom talking circle guidelines.
- [Talking Circle Pedagogy](#)

While this prompt may seem to disregard the curricular outcomes, the students will have the opportunity to share their previously learned knowledge and the teacher will be able to gain further evidence of where the students are at within the learning map. The teacher may choose to display the learning map for the students to reflect upon their level of knowledge.

*The learning map, when used with clarity, supports highly triangulated assessment practice. This allows teachers to create a sustainable assessment practice.

