Indigenization of Saskatchewan Mining Association Lesson Plans: Mining Inquiry Project

Aerial photo of Gow Lake, northern Saskatchewan. Traditional Trapline of Mr. Simon Eninew & family and meteorite impact structure.

A project by:

Saskatchewan Mining Association (SMA) with funding from: International Minerals Innovation Institute (IMII)

Contents

Introduction

This Mining Inquiry Project is an exciting and opportune way to use an integrative approach to curriculum and infusing First Nations and Métis ways of knowing and perspectives.

Story Telling as a Way of Knowing

Learning in Indigenous cultures is personal. What you learn depends on your prior knowledge, the place you learned and who your teachers are. One way of knowing found in both First Nations and Métis cultures is teaching through story telling such as we have done with Elder Strongarm and Senator Cummings. Stories allow us to construct our own meaning and learn what we need from that teaching. Stories do not require that the teaching is the same everywhere. Different nations and different Elders will hold different knowledge based on their experiences.

Your story is your story. Another person's story might be different. Every family had its own teachings. ~ Elder Sanford Strongarm (Sr)

How to seek knowledge? Listen, participate, and speak less. The old people used to say, "Sit down and listen." ~ Sanford Strongarm (Jr), oskâpêwis

By contrast, a common Eurocentric way of knowing is the idea of universal knowledge, where knowledge is based on facts that are independent of where you learned it or who your teachers are. Universal knowledge may not recognize different perspectives and states knowledge as truth. Our science textbooks are an example of universal knowledge, where all children in Saskatchewan learn the same ideas written as scientific truths.

We are fortunate to be able to blend these two ways of knowing in this resource. The lessons are filled with stories shared by Elders and other resource people, teaching us ideas based on their individual experiences. The lessons are also filled with content that is universal knowledge, part of our shared understanding in Saskatchewan.

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Designing an Inquiry Project: Adapting to Emphasize Curricular Outcomes

Our Saskatchewan curriculum allows us rich opportunities to emphasize different skills and expectations based on grade level or student ability. The following document outlines a core lesson planning sequence. From this foundation, teachers are able to adapt and emphasize those ideas that are unique to their curricula. For example:

- During the BHLesson 2: Researching Habitats,
    - a Grade 4 teacher might emphasize a student's presentation skills (ELA-CC4.2: Create a variety of representations, including displays and ELA-CC4.3: Speak to present ideas and information). The teacher might teach how to organize a presentation and practice public speaking for these outcomes.
    - A Grade 6 teacher might emphasize a student's writing skills (ELA-CC6.7: Write to describe and ELA-CC6.9: Prepare a teacher-guided inquiry report). The teacher might teach how to organize a scientific report and practice descriptive language for these outcomes.

The lessons provided are a jumping off point to include all grades in the deep and holistic knowledge building involved in an inquiry project over time. Adjusting the ability expectations and curricular connections is both honouring to the students you work with and the assessment framework students are expected to achieve in a school year.

Topic 1: Place Matters

Place matters to the people, plants and animals that live there. There are many different ways that we can describe a place in the province of Saskatchewan. We might describe a place by who lives there, or by what the land and water is like. We might even describe a place by the ceremonies or spiritual connection we have with that place. One way we can communicate where places are is to use maps. We can make and use maps that show where the rivers and water bodies are, or maps that show where people live now and where they lived in the past. We can also make and use maps that show where different mineral resources have been found across the province.

Where might this topic fit?

In this topic, a basic lesson plan structure and resources are provided. It is then possible for you to make specific curricular connections to grade-level expectations in science, social studies, mathematics, English language arts, art and career education. The lessons within the ***Place Matters*** topic fit best with the following grades and subject units or curricular strands in Saskatchewan:

- Grade 4:
  - Science – Rocks, Minerals and Erosion
  - Social Studies – Interactions and Independence; Dynamic Relationships; Resources and Wealth
  - English Language Arts – Comprehend and Respond
- Grade 5:
  - Social Studies – Interactions and Independence; Dynamic Relationships; Power and Authority
  - English Language Arts – Comprehend and Respond
- Grade 6:
  - Social Studies – Interactions and Independence; Dynamic Relationships; Power and Authority; Resources and Wealth
  - English Language Arts – Comprehend and Respond
- Grade 7:
  - Science – Earth's Crust and Resources
  - Social Studies - Interactions and Independence; Dynamic Relationships; Power and Authority; Resources and Wealth
  - English Language Arts – Comprehend and Respond
- Grade 8:
  - Science – Water Systems on Earth
  - Social Studies – Interactions and Independence; Dynamic Relationships
  - English Language Arts – Comprehend and Respond
- Grade 9:
  - Social Studies – Interactions and Independence; Dynamic Relationships; Power and Authority; Resources and Wealth
  - English Language Arts – Comprehend and Respond

See the complete Curriculum Correlation for related Outcomes.

Topic Overview

Place Matters includes three distinct lessons. The suggested order for these is:

Lesson Sequence
PMLesson 1: General Map of Saskatchewan
PMLesson 2: Minerals and Mines in Saskatchewan
PMLesson 3: Land, Treaties, and the Métis Homeland

PMLesson 1: General Map of Saskatchewan

Time	**Activity**	Material Prep
50 min	Read Finding Our Way • Ask students to use landmarks to describe how to travel around your classroom. • Ask students to sketch a map of your classroom and use that to describe travelling around your classroom. • How are these two methods the same and different?	Finding Our Way

15 min	Project the map of Saskatchewan using the Place Matters PowerPoint or using the Geological Atlas (GIS) of Saskatchewan.
	• Ask students to locate different places of interest, such as:
	  ○ the town they live in
	  ○ where relatives or friends live
	  ○ places they have visited
	  ○ the most northern place visited by a member of the class
	  ○ the most southern place visited by a member of the class
		Place Matters PPT Slide 2

10 min	What surprises us? Think-Pair-Share • Give students time to think independently about anything that surprises them about the map of Saskatchewan. • Have students work in pairs and discuss those surprises. • Pairs share their ideas back to the whole class. Chart these surprises.	Chart paper Marker

25 min	Sketch a Map of Saskatchewan
	• On a large chart paper or white board, model sketching the basic map of Saskatchewan, including:
	  ○ River systems
	  ○ Major centres
	  ○ Community you live in
	• Students sketch their own map of Saskatchewan including the same features as your teacher model.
		Chart paper
		Marker

Where to go for more information

- GeoScape Saskatchewan - posters and lesson plans from the Saskatchewan Geological Society.

Finding Our Way

As told by Elder Sanford Strongarm (Sr), Kawacatoose First Nation

Years and years ago, the old people did not need maps to find their way. They used many clues to find their way. The North Star was a guide and there are clues from nature like moss growing on the north side of a tree.

Sakahïkan means body of water in Cree. All the sloughs were used as landmarks. They all have names, so people knew where hunting and trapping were. They would tell them where to go using the Cree names of the sloughs. In the past, there were rocks, tree, sloughs, and bush. The farmers have changed much, but the sloughs remain. My Uncle Bill is creating a map of all the Sakahïkan with their Cree names for our Kawacatoose history book.

You will also find sacred areas that are landmarks. Dr. Ernie Walker from Saskatoon has been studying Medicine Wheels and how they all connect. There is a medicine wheel at Wanuskewin. This would have been a landmark used in the past to describe locations and directions.

As told by Sanford Strongarm (Jr), oskâpêwis Kowacatoose First Nation

When I travel north to Ile-a-la-Crosse to spend time hunting with my wife's family, they use the islands as landmarks rather than the sloughs. All the islands have names. Hunters also use the sun to help guide them when they are trying to find a place.

They do not have maps and it is like they have an internal compass; they just know where to drive and walk through the bush to get to where they want to go.

PMLesson 2: Minerals and Mines in Saskatchewan

Time	**Activity**	Material Prep
20 min	Project the Saskatchewan Resources Map in the Place Matters PowerPoint. • Run the animation on slide 4 that overlays the Minerals and Resources map over the general map of Saskatchewan. • Have students draw conclusions about the relative locations of mineral deposits across Saskatchewan. • Compare it to the map of Saskatchewan so that students see the relative locations of mineral deposits and mines.	Place Matters PPT Slides 3-5
Variable	Extend understanding of the relative location of mineral deposits and mines in Saskatchewan and how minerals were deposited by exploring the information sheets included in following SMA lesson plans: • Mineral Potential and Mines in Saskatchewan • Potash – What Is It? • Coal: Surface Strip Mining	

30 min	Sketch of Saskatchewan: Mineral Deposits and Mines
	• Model adding mineral deposits to your basic map of Saskatchewan, including:
	  ○ General locations of potash, uranium, coal, gold, and diamonds.
	  ○ Mines that are located close to your community.
	  ○ Other minerals that are located close to your community.
	• Students sketch their own map of Saskatchewan including the same features as your teacher model.
		Resource Map of Saskatchewan

40 min	Read Healing Waters of Manitou • Have students identify the key ideas of the story. • Complete the activities identified.	Healing Waters of Manitou

Where to go for more information

- GeoExplore Saskatchewan – a virtual resources map and website that allows you to see the geoscientific features of Saskatchewan. This is a digital version of the printed Geological Highway Map.
- Geological Atlas of Saskatchewan – an interactive GIS mapping tool for middle years and high school.

Healing Waters of Manitou

Manitou Sakahïkan (Little Manitou Lake), is an important spiritual place for Indigenous people. The lake was carved out by glaciers and is fed by springs that release magnesium, potassium, silica, iron oxide, calcium and sulphate, giving it the highest mineral content of any lake on Turtle Island (North America).

A legend is told by Ochankuga'he, a young Nakoda (Assiniboine) man whose name was changed to Dan Kennedy when he was forced to attend the Lebret Residential School. Ochankuga'he and his people were moved from their territory between Swift Current and Moose Jaw to a new reserve east of Regina. He describes this new land as "littered with the remains of skulls and skeletons" from the 1840's Smallpox epidemic.

The legend states that there were two large Cree nations that lived on the land that became the Carry-the-Kettle Reserve. Almost two thirds of the people who wintered there died. In the spring, the survivors began walking towards the South Saskatchewan River, hoping to escape the disease. Three young men got sick and the group camped near Manitou Sakahïkan when they were no longer able to walk. Knowing the group of survivors needed to continue, leaders built the young men a shelter and left, knowing they would never see each other again. One man crawled to the edge of the lake to drink and bathe in the water to cool down. Exhausted, he fell asleep by the lake. He woke up in the morning and his fever and illness were gone! He helped his two friends go to the lake so that they could be cured. A few days later, the three men caught up to the others. Imagine how shocked they were to see the men again!

1. Find Carry-the-Kettle Nakoda Nation on a map. How far did the group of Cree survivors walk to get to Little Manitou Lake?
2. How much further did they need to walk to get to the closest point of the South Saskatchewan River?
3. What mineral resources are near Little Manitou Lake? How might these resources be related to this legend of the lake?
4. EXTENSION: In 2019, the village of Manitou Lake hosted "The Big Float" and had 1642 people floating at the same time because they can't sink! Try this: put 1 can of Diet Coke and 1 can of Coke into a bucket or sink. Fill with water until both cans are covered by at least 2 cm of water. You will notice that the Diet Coke floats, and the Coke does not! This is because the Coke with sugar is denser than the Diet Coke with Aspartame. Your challenge is to try to make the Coke float! Pour table salt into the water and stir well. Keep adding until the Coke floats. What does this tell you about the amount of salt and minerals dissolved in the water of Manitou Sakahïkan?

See the Appendix: Legend of Manitou Resource List for links to references for this legend.

PMLesson 3: Land, Treaties, and the Métis Homeland

Time	Activity	Material Prep

30 Min	What land are we on right now?
	• Ask students if they know
	  ○ What treaty land they are on right now.
	  ○ What traditional Métis communities are they close to right now?
	• If students do not know what land they are on right now, use the PowerPoint slides to help them find where they are.
		Place Matters PPT
		Slides 6 - 10

50 min	Métis and First Nations Perspectives on Land • Read "The Road Allowance People" as told by Senator Nora Cummings, Métis Elder. • Read "The Treaties are a Sacred Covenant" as told by Elder Sanford Strongarm (Sr) of Kawacatoose First Nation. • Discuss the key ideas for both readings. How are they different?	The Road Allowance People The Treaties are a Sacred Covenant
20 min	Land acknowledgements • Discuss why we acknowledge the land we are on. For more information, access First Nations Protocol for Traditional Territory by Indigenous Corporate Training. • Your class might already do land acknowledgement as part of your classroom routine. If not, consider doing one at this time.	
30 min	Project the Treaty Map beside the Resources Map. • Run the animation on slide 11 that overlays the General Map of Saskatchewan, Resources Map and Treaty Map. • Project slide 12 that shows all maps side by side. • Have students do a Notice and Wonder strategy. Brainstorm as a class and chart these ideas: What do you notice? What do you wonder? • Go through the questions with your class and identify which ones they will answer through future lessons. ○ Answering student questions does not need to be limited to the lessons outlined in this unit of study.	Place Matters PPT Slides 11-12 Chart paper Marker

30 min	Sketch of Saskatchewan: Treaty Territories
	• Model adding Treaty territories to your Saskatchewan map, including:
	  ○ Boundaries
	  ○ Dates signed
	Students sketch their own map of Saskatchewan including the same features as your teacher model.	

Where to go for more information?

- Social Studies Connections:
  - Gee meeyo pimawtshinawn (It Was a Good Life): Métis Road Allowance Memories.
  - Canadian Geographic: Movement of People
  - Treaty Implementation: Fulfilling the Covenant
  - Indigenous Peoples Atlas of Canada
    - Métis
    - First Nations

The Road Allowance People

As told by Senator Nora Cummings, Métis Elder

The Métis are recognized as a nation of people. Within our nation there are different language groups. I speak Michif, which is a blend of French and Cree languages. Many people ask me how the Métis became a nation of people. A nation has its own land, language, and culture. We have our own identity.

My family is from Round Prairie, which is just south of Saskatoon. My family had scrip for land there. The land was very rocky and could not be farmed, so men had to go away from our community to work to earn a living as farm hands doing work such as rock pickers, wood cutters or labourers for the farmers. Men worked for farmers all summer. Women stayed home to keep the family and home operational but also like picked berries and canned food for winter. There is still a cemetery at Round Prairie, with our people buried in the bush.

When my mom was 14 years old, her family moved to Saskatoon. She heard stories of people buying the script land they received from the government for $5 from the Métis people in the area. These people, and my mom and family moved onto the road allowance in what is now the Nutana area of Saskatoon. The road allowance was crown land that no-one was living on or using. Our high wall tents and shacks were in the square from Taylor Street to 3rd Street area. Clarence Avenue, which is in this area once was an old highway. This was all bush land.

The Nutana area community was very important. We made a community garden right where Aden Bowman Collegiate is. I remember we had cupboards made of orange boxes, and we would dig a hole and put containers in the ground to keep stuff cold. We dug giant underground barns for our horses that could hold many teams of horses. This kept them sheltered from the weather. We shared community and meals on special occasions like New Years, which was one of the most special times for us to celebrate. We shared our cooking areas and stoves and helping each other out when we could.

We loved our land, we built our own recreation, our own community gardens, our own homes, and underground barns for horses. There were Agents like on the reserves. If Métis families were caught feeding visitors or others in the community, the agents would say we had too much food and they would take away our rations tokens. This undermined our sense of generosity and community. If someone visits your home, you give them tea and food. They are honouring you by coming to visit and they get a gift in exchange.

The Treaties are a Sacred Covenant

As told by Elder Sanford Strongarm (Sr), Kawacatoose First Nation

Most people think of the Treaties as a contract between two groups, the First Nations signatories, and the Crown. In fact, the Treaties are a sacred covenant among First Nations, the Crown, and the Creator. When we sat down as peoples of this land, we all understood that we were given the gift of prayer and understanding of medicines and our connections to the land.

Our first chief, Kawacatoose, was Cree, Soto, and Dakota. His name means lean man, or starving man. He was very knowledgeable in ceremonies. When we as a people sat down with the crown, it took a lot of time to make this deal and the treaties. There was a pipe ceremony when the Treaties were created, which so that good talk could take place. The pipe ceremony makes sure that everyone is truthful and respectful and will abide by the decisions and agreements that take place. We had to negotiate what they wanted and what we wanted. People sat and prayed. If you are going to do something, do it in a good way. As part of the ceremony, our Chiefs asked for direction from the Creator. They went through a ceremony and gave gifts. The treaties were created with the guidance of the Creator and are protected by the Creator.

Chief Kawacatoose

Chiefs who negotiated treaties were hereditary chiefs, chosen by the people and taught to be the leader from birth. Our first chief was Kawacatoose, which translates to Poorman, or Lean Man. Kawacatoose was Cree, Soto, and Dakota. His name means lean man, or starving man. He was originally from the Mosquito area near North Battleford. He left his brother, Kanocees, there and travelled to the Wanuskewin area. It was good hunting before he continued on to the Touchwood Hills area.

Topic 2: Building a Habitat or Ecosystem

A habitat is the natural home or environment of plants, animals and other living things, while an ecosystem is the community of living things that live in and interact with each other within that environment. Everything that people do has impact on habitats and ecosystems. Understanding what living things are present in an area and how they are interconnected can help people reduce those impacts. Environmental sustainability is important for everyone to consider so that we have a healthy world in the future.

Where might this topic fit?

In this topic, students will research habitats and ecosystems with their grade-level terminology in mind. They will then build a habitat or ecosystem in three dimensions to be used for Topic 3: Mining Exploration. The lessons within the Building a Habitat or Ecosystem topic fit best with the following grades and subject units or curricular strands in Saskatchewan.

- Grade 4:
  - Science – Habitats and Communities; Rocks, Minerals and Erosion
  - Social Studies – Interactions and Independence; Dynamic Relationships; Resources and Wealth
  - English Language Arts – Comprehend and Respond; Compose and Create
  - Art – Creative/Productive
- Grade 5:
  - Social Studies – Interactions and Independence, Dynamic Relationships; Resources and Wealth
  - English Language Arts – Comprehend and Respond; Compose and Create
  - Art – Creative/Productive
- Grade 6:
  - Science – Diversity of Living Things
  - Social Studies – Interactions and Independence; Dynamic Relationships
  - English Language Arts – Comprehend and Respond; Compose and Create
  - Art – Creative/Productive
  - Career Education – Connections to Community; Life and Work Plan
- Grade 7:
  - Science – Interactions Within Ecosystems
  - Social Studies – Dynamic Relationships
  - English Language Arts – Comprehend and Respond; Compose and Create
  - Art – Creative/Productive
  - Career Education – Connections to Community; Life and Work Plan
- Grade 8:
  - Social Studies – Dynamic Relationships
  - English Language Arts – Comprehend and Respond; Compose and Create
  - Art – Creative/Productive
  - Career Education – Connections to Community; Life and Work Plan

- Grade 9:
    - Social Studies – Interactions and Independence; Dynamic Relationships
    - English Language Arts – Comprehend and Respond; Compose and Create
    - Art – Creative/Productive
    - Career Education – Connections to Community; Life and Work Plan

See the complete Curriculum Correlation for related Outcomes.

Topic Overview

Building a Habitat includes four distinct lessons. The suggested order for these is:

Lesson Sequence
BHLesson 1: What does Living Mean?
BHLesson 2: Observing Habitats and Ecosystems
BHLesson 3: Researching Habitats and Ecosystems
BHLesson 4: Creating a 3D Art Project

BHLesson 1: What does Living Mean?

Time	**Activity**	Material Prep
10 min	Think-Pair-Share: What does it mean to be alive? • Have students reflect on this question on their own first, then talk to a partner before sharing a as whole group.	
15 min	Read Everything Has Spirit • How does Elder Sanford's teaching add to what we know about what it means to be alive?	Everything Has Spirit
10 min	Read the scientific Characteristics of Living Things • How does this article add to what we know about what it means to be alive? • How is the concept of energy different in First Nations teachings and a scientific view of living things?	Characteristics of Living Things

Everything Has Spirit

As told by Elder Sanford Strongarm (Sr), Kawacatoose First Nation

Spirit is the energy that comes from Mother Earth. Everything has spirit, including the rocks and trees and wind. Everything is living in First Nations culture. Spiritual energy does not end. Trees are part of the teachings given to me by my grandfather. He said that you are just like a tree. The spirit of a tree tells a story and has connections. When a branch falls, it is one of your relatives. What is under the tree is important, that is the knowledge that is passed on. Every day you learn something new, you meet new people. You have another branch on your tree. We are all reflected in the world around us.

When I was a young boy, we were not allowed outside at night in the winter. Grandfather wind had to heal the land. He would blow, taking care of all the sicknesses. The spirit needed to do its work. If we were outside playing, we were not helping him, we were in his way. You might get sick, so our parents kept us inside. In the summertime, the Northern Lights spirits worked at night. They were like a fog, cleansing the water.

BHLesson 2: Habitats and Ecosystems

Time	**Activity**	Material Prep
20 min	Introduce the idea of habitats or ecosystems. • Use terminology that is relevant to the grade you are teaching. • Ask students what they already know about this idea using a KWL Chart. • Have students identify what kinds of habitats they know of. Brainstorm this list into your KWL Chart. Look to your curriculum guide for examples.	Large KWL Chart Marker
40 min	Prepare to walk through nature. • Read Respect for Mother Earth and discuss how your class will walk through nature in a good way. • Invite an Elder or knowledge keeper to teach your class about the land. Be aware of protocols for accessing their traditional knowledge.	
Variable	Walking the Land • Listen to the teachings of the Elder or knowledge keeper. • When you return, be sure to share your gratitude with the Elder or knowledge keeper and thank them for their knowledge. • Discuss with your students what you learned about the land and Mother Earth.	

Protocols for Asking Elders and Knowledge Keepers to Share Knowledge

- An Elder or knowledge keeper has spent many years seeking and gathering knowledge.
- When approaching an Elder or knowledge keeper to share their knowledge, it is respectful to offer them something that is a necessity of life. If you are unsure what you should offer, ask them what they might need. This might include:
    - Sacred tobacco that they might use in ceremony or to give back to Mother Earth.
    - Coloured cloth that they might use in prayer.
    - A blanket.
    - A small gift.
    - An honorarium.
- Ask an Elder or knowledge keeper what you are seeking so that they can teach you. If the knowledge you are seeking is sacred knowledge or something that is not their right to share, they will let you know that they cannot teach you.
- Discuss with your class what it might look like and sound like to be respectful to the Elder or knowledge keeper when they join your class.

Knowledge is a Gift

As told by Sanford Strongarm (Jr), oskâpêwis, Kowacatoose First Nation

When you ask someone to share their knowledge, you are asking them to give you a gift of knowledge. It is respectful to give them a gift in return. This gift might be tobacco, but it doesn't have to be. It just has to be something meaningful. When you seek knowledge, it is important to participate and speak less. The old people used to say, "Sit down and listen."

As told by Elder Sanford Strongarm (Sr), Kawacatoose First Nation

When I was younger, I would find pieces of willows together that was coloured with natural stuff from the ground. These were the prayers of the people before me. The four colours were the colours of the four directions. When the Europeans came, they brought cloth. Over time, cloth replaced coloured sticks for prayer. That is why giving cloth can be a meaningful gift for an Elder or knowledge keeper.

Respect for Mother Earth

As told by Senator Nora Cummings, Métis Elder

Wildflowers are very important to Métis people. You can see them represented in our beading and artwork. The Métis people look after the wildflowers by not trampling them, they are Mother Earth's creations. When we went into the bush to cut trees in the winter, they had to be dead and dried already to bring back. When we pick berries, we do not break a branch. Mother Earth is feeding us, we must look after her well.

As told by Lisa Ewack, Striped Blanket Educational Consultant

When we walk the land, we need to be respectful to Mother Earth. Mother Earth provides us with food and clean water and all the material things in our homes. She provides us with our languages, our cultures, and our wisdom so that we can live in a good way. We can show respect for Mother Earth by walking on a path, observing and not taking things we do not need. If we are picking something like sage, we pick it without pulling the root, and offer tobacco to the Mother.

As First Nations People, our spirits are connected to the land we belong to. We were having a youth gathering last September. One young woman approached me and wanted to know where White Bear was. Knowing where that land was helped her to have a sense of belonging. It was her home nation, but she did not live there. Where we are from matters.

I had the experience a few years ago when a group of us travelled to Hawaii. When we stepped on that land, our spirits felt unsettled and restless. So, we smudged and offered prayers to the Creator. This helped our spirits make connections to that land and we felt like we were able to be more settled.

BHLesson 3: Researching Habits and Ecosystems

Time	Activity	Material Prep

15 min	Assign the Research Task: Researching and Representing a Habitat or Ecosystem
	• Determine how much time you will give students to complete their projects.
	• Have students work in groups of 3 or 4 to complete their project.
	• Students will share their representations with the class to help lead others' learning.
	• Assign habitats or ecosystems commonly found in Saskatchewan.
	  ○ In younger grades, assign more general terms such as grasslands, forests, deserts, lakes, rivers, tundra, or Canadian Shield.
	  ○ In older grades, you might want to assign more specific terms such as the 11 Ecoregions found in Saskatchewan.
		List of habitats being assigned

20 min	Model Research: Habitat or Ecosystem not in Saskatchewan
	• Choose a habitat or ecosystem not in Saskatchewan, like mountains.
	• Do a think aloud to show how you might
	  ○ search for information on this topic,
	  ○ take jot notes,
	  ○ organize the information you find,
	  ○ find pictures related to your topic, and
	  ○ cite references.
		Computer

30 min	Co-construct Criteria for success.
	• As you model the research process, make a list of expectations and criteria.
	• Expectations will include things like:
	  ○ What content to include:
	  ▪ types and how many living things they should include,
	  ▪ Water systems,
	  ▪ People who live in or near the area, and
	  ▪ Significant businesses and industry in the area.
	  ○ What format to present information in, such as:
	  ▪ An oral presentation,
	  ▪ A poster,
	  ▪ A written report,
	  ▪ A video, or
	  ▪ A PowerPoint or visual presentation.
	  ○ Guidelines such as length, number of slides/photos, etc.
	• Criteria for assessment will come from your curricular expectations for your grade level. Some ideas include:
	  ○ Defining what makes a ___ good.
	  ○ Providing exemplars.	

Variable	Provide mini lessons for the ELA skills being focussed on. They might include: • paraphrasing and organizing information • speaking, including voice, emphasis, speed • representing, including clarity of message, visual cues • writing, including language use, transitions, and organization	
50 – 100 minutes	Research and Work Time • Remind research groups about the spirit of teamwork. Everyone has a task and participates in the research and presentation.	
60 min	Student Presentations • Remind student groups of presentation criteria. • Consider the audience filling in a graphic organizer of key ideas from student presentations. • Each group presents their own research.	
20 min	Revisit the KWL Chart • What answers do students now have to the questions posed at the beginning of this topic? • Summarize key points onto your KWL Chart.	KWL Chart

Where to go for more information?

- Sask Outdoors - Habitats and Ecosystems

BHLesson 4: Creating a 3D Art Project

Time	Activity	Material Prep

30 min	Introduce the 3D Art Project
	• Have students work in the same groups as they were in for the research project.
	• Outline the 5 required elements for their Art Project:
	  ○ At least 10 trees (forest)
	  ○ At least one form of water
	  ○ Grasslands
	  ○ A hill, mountain, or elevation point
	  ○ Canadian shield or rock area
	• The team can add any other elements to their project that they would like, including plants and animals.
	• Refer to previous habitat research projects as references.
	• Reinforce that this is a creative activity and they will not be given any hints as to how they might build any of the elements required.
	• Remind them that they need to continue to build team together and everyone needs to have a job and contribute to the project.
	• Have each group create a team name that relates directly to their relationship to their habitat. Their name must be meaningful and demonstrate their growing understanding of the lands and habitats they are learning about. Mark their names on the bottoms of their cardboard squares.
		40 cm x 40 cm cardboard
		
		Paint, paper, pipe cleaners, glue, tape, other art supplies

60 – 120 min	Student Art Project Construction • Promote teamwork and encourage good use of time. Provide as much time as you think is necessary, somewhere between 1 and 3 class periods. • Encourage creativity. • Use their team name when you are referring to any team member.	

30 min	Art Project Presentations
	• Each team will describe their representations of the 5 required elements listed above.
	  ○ Explain why they placed each element where they did.
	  ○ Discuss the mediums used for their 3D art creation.
	  ○ Why they chose their name and how it is related to their way of thinking, believing or understanding habitats or the lands around them.	

50 min	Create a Topographical Map
	• Each student makes one ledger-sized map of their habitat showing:
	  ○ Elevations (mountains, valleys, height of land)
	  ○ Water systems (rivers, lakes, streams)
	  ○ Vegetation (trees, fields)	

	○ Names for each feature – what is your mountain called? Lake? Forest? ○ Create a square grid system that overlays the physical features of your map. ○ You can extend this mapping activity to show contours and elevations. • Student groups will use their topographical maps later in Topic 3.	

Where to go for more information

- Creating a Topographic Map - Natural Resources Canada's Topographic Maps: The Basics

Topic 3: Mineral Exploration & Mining

Saskatchewan's land is rich in resources. People living here have used these resources for thousands of years. Stones were important and sacred for early societies, as living entities to be respected and as tools for hunting and ceremonies. Stones were gathered and traded over 9000 years ago. The first formal mining began in Saskatchewan in the 1800's and continues to this day. Mining companies use many different methods to find minerals across Saskatchewan. Like every human activity, mining has an impact on the environment. Companies use methods to reduce that impact and ensure the environment returns to its natural state after mining operations are done.

Where might this topic fit?

In this topic, students will create a mining simulation using a cake filled with 'minerals'. Just like a mine in the real world, their mine will exist within the habitat that they created in Topic 2: Building a Habitat or Ecosystem. As students are working through the four stages of the Mining Cycle, they will be asked to develop various aspects of their mining company to help them have a deeper understanding of all that is involved in the mining industry.

As students are mining, they will experience:

- Grid Mapping and Mineral Exploration
- Government regulation

There are notes throughout Topic 3 lessons to indicate where you might place a guest speaker or information sheet to have your students experience creating their own mining company. The lessons within the Mining Exploration topic fit best with the following grades and subject units or curricular strands in Saskatchewan.

- Grade 4:
    - Science – Habitats and Communities; Rocks, Minerals and Erosion
    - Social Studies – Interactions and Independence; Dynamic Relationships
    - English Language Arts – Comprehend and Respond
- Grade 5:
    - Science - Forces and Simple Machines
    - Social Studies – Resources and Wealth
    - English Language Arts – Comprehend and Respond
    - Mathematics – Statistics and Probability
    - English Language Arts – Comprehend and Respond
- Grade 6:
    - Science – Diversity of Living Things
    - Social Studies – Interactions and Interdependence; Dynamic Relationships; Resources and Wealth
    - Mathematics – Number
    - English Language Arts – Comprehend and Respond
    - Career Education – Connections to Community
- Grade 7:
    - Science – Interactions within Ecosystems; Earth's Crust and Resources
    - Social Studies – Dynamic Relationships; Resources and Wealth

    - English Language Arts – Comprehend and Respond
    - Career Education – Connections to Community
- Grade 8:
    - Science – Water Systems on Earth
    - Social Studies – Dynamic Relationships; Resources and Wealth
    - Mathematics – Statistics and Probability
    - English Language Arts – Comprehend and Respond
    - Career Education – Connections to Community; Life and Work Plan
- Grade 9:
    - Social Studies – Dynamic Relationships; Resources and Wealth
    - English Language Arts – Comprehend and Respond; Compose and Create
    - Career Education – Connections to Community

See the complete Curriculum Correlation for related Outcomes.

Topic Overview

Mining Exploration includes five distinct lessons. The suggested order for these is:

Lesson Sequence
MELesson 1: Ancient Stones
MELesson 2: What is Mining?
MELesson 3: Confidential Cake Challenge
MELesson 4: Grid Mapping
MELesson 5: Core Sampling

MELesson 1: Ancient Stones

Time	**Activity**	Material Prep
20 – 40 Min	Understand the importance of rocks and minerals • Have an Elder or knowledge keeper join your class to teach them about the importance of rocks to First Nations people. Follow protocols for asking them to share knowledge with you. • If you are unable to access an Elder or knowledge keeper, have students read Rocks are Sacred to understand the importance of rocks to First Nations people.	Protocols for Asking Elders and Knowledge Keepers Rocks are Sacred
50 min	Explore the Rock Cycle Journey and Mineral Deposits through the following activity: • The Rock Cycle Journey and Mineral Deposits Lesson • Station Labels • Rock Cycle Cubes	Create rock cycle cubes (cardstock) and print station labels
10 min	Find common ground between the scientific view of the rock cycle and Sanford Strongarm (Jr)'s understanding of rocks.	

Where to go for more information

- Unit Plan - Integrating First Nations and Métis Content and Perspectives Grade 4 Earth and Space Sciences: Rocks, Minerals and Erosion

Rocks are Sacred

As told by Sanford Strongarm (Jr), oskâpêwis Kowacatoose First Nation

The land has spirit. Rocks are the most sacred thing I have learned. I am a Pipe Carrier and the pipe that we use here is made of a grey stone. The pipe helps us speak to the Creator.

Rocks are an important part of our spirituality. They have been here for millions and millions of years and have seen so many things. They get bigger over time from Mother Earth. Rocks have lots of stories. Rocks were used a long time ago for cooking, hunting, and the sweat lodge. The rocks were traded. They have stories and are sacred.

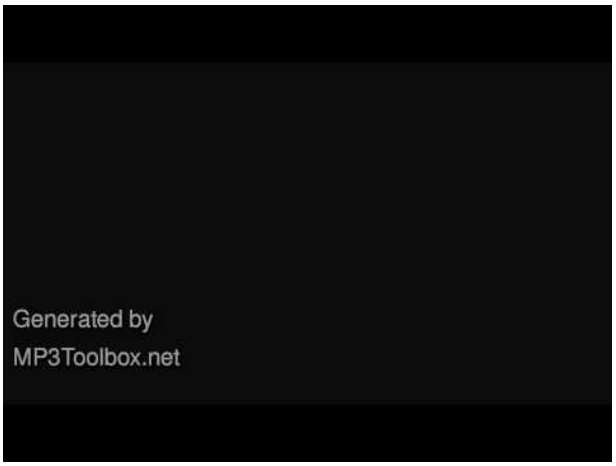
As told by Elder Sanford Strongarm (Sr), Kawacatoose First Nation

We use rocks in a sweat lodge. A sweat lodge is like the womb of Mother Earth. We are rebirthing ourselves. When you leave, you are brand new again. My Dad's family uses 32 rocks in the sweat lodge because we make it with 16 willows. There are 2 rocks for each willow. Other families might have more rocks or fewer rocks depending on their teaching. When we pick rocks for the sweat lodge, we need to avoid the white ones. Those might have water in them. When they get hot, the water inside expands and the rock explodes. We go to the farmers and ask them if we can pick their grey field stones. There are always rocks in farmer's field.

Tunkasila (Grandfather Rock)

The story of Grandfather Rock is one that originates with the Dakota people. Their names mean “friend” or “ally”. They were once part of one large culture group which divided into three language groups, the Dakota, Lakota and Nakota. Each has its own language dialect, or way that they pronounce words. One dialect has the letter ‘L’ in it, while the other does not. When settlers arrived, they called the people by their Ojibwa name “Sioux”, which means little snake.

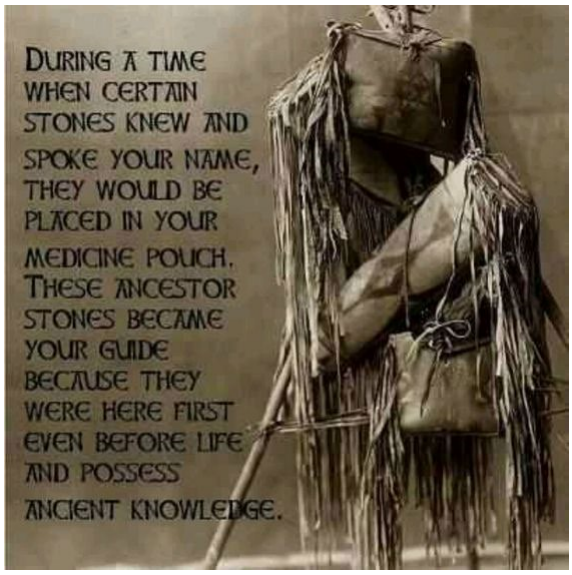
Wakan Tanka (Great Spirit), is the supreme being and creator of the Lakota and Dakota people.



Tȟuŋkášila wamanka yo,
Ampetu ki le úŋšimala yo Makȟá yaka,
omawani wamayanka yo.

A translation could be something like this:
Tȟuŋkášila I´m in front of you
On this day have pity on me
Come and see me as i walk on this Earth

People say the beginning of everything was in the mind of Wakan-Tanka. All things which were to be existed only in spirits, and those spirits moved about seeking a place where they could stay and show themselves.



The spirits travelled first to the sun. This was not a good place for creation to begin because it was too hot. The spirits travelled to the Earth, but it had no land and no life in it. The Earth was just covered in water.

Out of the waters, a great burning rock rose up. It made the dry land appear. Clouds formed in the sky from the steam it created. Then the life on Earth could begin.

So it is that the rock is called Tunkasila (pronounced Tunka-shila), for it is the oldest one. Because of that, the rocks must be respected.

In the sweat lodge, when the water strikes the heated stones and the mist rises once again, it brings back the moment of creation. The people in the lodge sing to Tunkasila, the Grandfather, the old one.

You can learn more about the Dakota, Lakota and Nakota people in the [Indigenous Saskatchewan Encyclopedia].

MELesson 2: What is Mining?

Time	Activity	Material Prep
50 Min	The History of Mining in Saskatchewan • Have students create a timeline of the History of Mining in Saskatchewan using the information sheet. • You might want to have half of the class create a complete timeline from 10000 BC to present day, and half the class complete a timeline from the first commercial mining date (1857) to present day.	History of Mining in Saskatchewan

50 min	Understand the Mining Cycle
	• Have students work in pairs or small groups to create a graphic representation of the mining cycle by reading the following pages of Core Concepts: Mining Cycle:
	  ○ Pg 15: The Mine Discovery Process
	  ○ Pg 5: Mine Types and Technology
	  ○ Pgs 8 – 9: Reclamation and Rehabilitation
		Core Concepts: Mining Cycle Pgs 15, 5, 8, 9

Variable	Explore different types of mining in Saskatchewan. through the following lab activities: • Potash Solution Mining • Coal: Surface Strip Mining	

Where to go for more information

- Geology, Mineral and Petroleum Resources of Saskatchewan
- Girls in the Classroom – Mining Cycle Projects
- Mining Matters – Core Concepts: The Mining Cycle

MELesson 3: Confidential Cake Challenge

Time	Activity	Material Prep

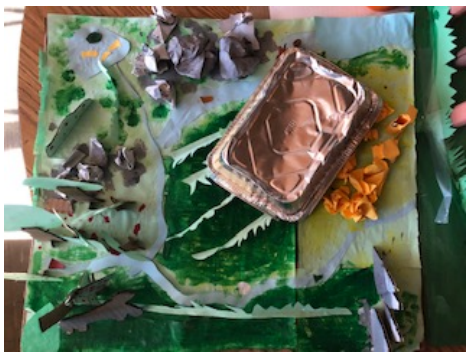
30 min	Have student teams bake a cake
	• Student teams will each bake a cake that will be used for their mining simulation. THEY DO NOT KNOW THIS YET. You might want them to believe that their cakes are to eat later.
	• Use the teams from Topic 2. Remind them about what it means to work as a team.
	• Explain the task – they are to follow the directions on their cake mix (or make from scratch, as it is a great math activity).
	• Some tips:
	  ○ Take pictures of teams working together.
	  ○ Try not to help so they rely on team problem solving.
	  ○ Have each team mark their team names onto their pans.
	  ○ Remind them to clean up thoroughly.
	  ○ Do NOT bake them yet. Remember, from their perspective they have not linked their cake making to a mining project.
		Per team:
		1 cake mix and ingredients
		Mixing tools
		Small tinfoil cake pan

45 min (not student time)	Putting the minerals and resources in the cakes.
	• Put the minerals and resources into the cakes when your students are not in the room. This is a confidential step.
	• Some suggestions for candies to represent minerals:
	  ○ Uranium – Hawkins Cheezies
	  ○ Oil and Gas – chocolate chips or smarties/M&Ms
	  ○ Potash – Hard raspberry candies
	• Add every type of resource into every cake. Have patches with resources and patches without. Make each cake different.
	• If you wish, you can add stones and sticks/bones that will make it difficult to mine around.
	• Bake the cakes. Let them cool before the next step.	

15 min	Starting the simulation – placing the cakes (mines) into their habitats. • The first cake you place will be a bit of a shock to your students. Remember, at this point they think that they are going to eat their cakes, and they have just spent a lot of time constructing a beautiful and complex habitat project. • Have students bring their habitat projects to their team table or desk. Choose one group to go first. Bring their cake to them and with some fanfare, plop it upside down onto their habitat project. Try to place it so that it is over as many habitat elements as possible (water, trees, elevation). See Cake Placement Pictures. • After the first cake is placed, inform the class that they will be developing a mining project over the next few weeks and that this is the land they will be mining. Do NOT tell them that you have put minerals into their cakes at this point.	Habitats from Topic 2 Large garbage bags

Cake Placement Pictures

Here are some samples for you to refer to for cake placement onto habitats.



MELesson 4: Grid Mapping

The remainder of this unit is designed as an exploration and mining simulation. Student teams are creating an exploration and mining company. You, the teacher, are the Mining Leader. The Mining Leader role is fictional and combines several different 'real life' roles, agencies, and organizations. You are generally overseeing all exploration and mining activities, answering questions, and directing student companies through various stages of the simulation.

Bring other experts into your classroom throughout the simulation to guide learning. Refer to the Appendix: Role Play Cards for possible ideas for experts to invite to your classroom.

- An Indigenous community leader might share their perspective on their traditional and historic use and knowledge of the land; the importance of protecting Mother Earth (environment) and the potential social and economic impacts of exploration and mining on their community.
- A government regulator might describe the approval process and agreements that are needed during exploration and mining phases in Saskatchewan.
- An environmental scientist might highlight what needs to be checked to monitor environmental health, and how planning can minimize the impacts of exploration and mining.
- A supply chain supplier might discuss the products and services that they provide to exploration and mining companies, and the careers that are possible to support the mining sector.
- A mining mentor might outline business, hiring, and market ideas to help companies make wise decisions during their exploration and mining phases.

Each expert represents a different aspect of mining – government, environment, First Nations, Métis, Mining Company Mentor. If you know someone in these roles to bring into your classroom, great. If not, you can invite someone to role play. Each role has been provided with a role card that outlines some of the ideas they might introduce, questions they might pose, and tasks they might have your students do as they develop their mining companies.

Time	**Activity**	Material Prep

20 min	Begin the Mining Simulation: Introduce the Mining Leader Role
	• You, the teacher, are the Mining Leader from this lesson onwards. Refer to the Role Card: The Mining Leader. Throughout the simulation, you will take on the responsibilities of different people representing different roles including regulator, supplier, government agency and mentor.
	• Introduce the "Rules of Mining" on chart paper. These can grow over time as you invent new rules. Here is a start:
	  ○ At no time can mining companies touch the surface, samples, or mining area with their hands.
	  ○ Teams must always work together, including:
	  ▪ Everyone always has a job.
	  ▪ Ask questions of the Mining Leader together.
	  ○ In real life, tools and equipment are purchased from a Supply Chain Supplier. This would be a great time to bring someone in to talk to your class about the variety of services and resources that are provided by suppliers to
		Chart paper
		Marker

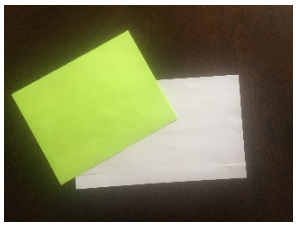
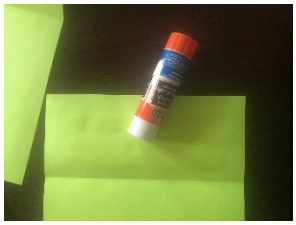
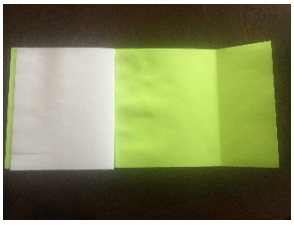
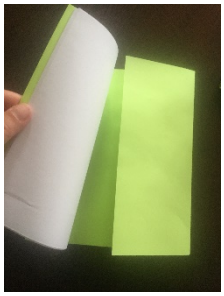
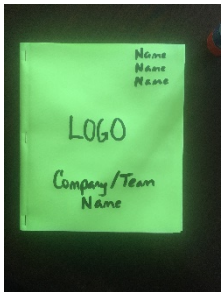
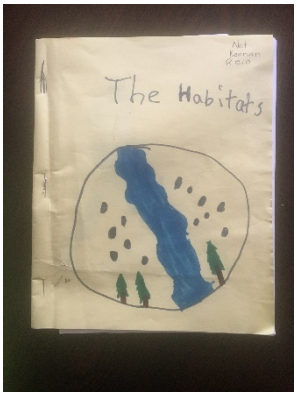
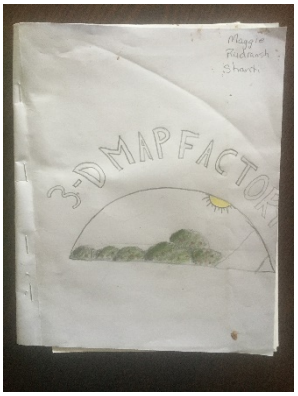
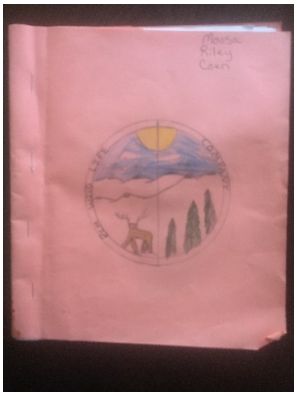
	exploration and mining companies. If you can bring a supplier into your simulation, you can have your students begin purchasing their tools from the supplier. He or she can then delegate their 'selling' authority to the Mining Leader as part of their diverse role. The emphasis is that mining companies must purchase their tools, equipment, and resources from other companies. These companies are part of something called a Mining Supply Chain. ○ All materials must be stored. Nothing can be lost. • At this point in the simulation, your teams do NOT know that you have placed things into their cakes.	
30 min	Invite a Geologist to visit your classroom. • Refer to the Inviting an Expert to Your Classroom overview. • Refer to the Role Card: Geologist to guide what knowledge you are hoping they might bring to your mining project. If you are unable to invite an expert Geologist to your class, • Watch a short video that shows a Day in the Life of a Geologist. • Refer to SMA's two career cards: ○ 2015: Career Profile: Geologist Karina Tyne ○ 2020: Career Profile: Geologist Levi Kalinsky ○ Ask students - How are these two career profiles the same? How are they different? • Read What Does a Geologist Do?	Role Card: Geologist
15 min	Identifying Surface Features of the land. • One of the first things that exploration companies need to know is what surface features exist on the land. There are key surface features that tell geologists that there is a possibility a mineral is present nearby. For example: ○ Kimberlite is an indicator for diamonds. ○ Quartz vein materials are an indicator for gold. • Have student groups look at their topographical maps for their habitats and where the map is now located. What surface features existed where their mine is located?	
30 min	Connecting a Topographical Map and Geological Grid Map • Introduce grid maps as a way for geologists to record the surface features of a habitat. • Use a real example of a grid system using the Grid Mapping PPT, slide 2. ○ What are the key features of this map? Students should be able to see that there is a grid over top of the map and that it has a legend. • Provide a definition of a grid system and example using the Grid Mapping PPT, slide 3. • Have students place a rectangular grid onto their habitat map to show where the mine has been placed. The mine grid should be 5 columns x 4 rows, numbering each box from 1-20.	Grid Mapping PPT

45 min	There are several group tasks that are identified in this lesson. Remind student groups to share the work equally among group members so that everyone contributes to the success of the team.	
	Group Task: Create a Field Book • In the same student groups, have them begin to create a team Field Book. • A field book is a place for teams to collect pictures, observations, letters, maps and important information about their mine project. • Provide the steps for Creating a Field Book if needed. • Each team has already created their team name. Each group will create a visual logo that will fit onto the front of their team's field book. • Students should make a rough draft first so that it can be approved and edited by the team. It can then be placed on the front of the team's Field Book. Optional: Create a Digital Field Book • Almost all field work done by exploration companies is recorded using digital apps and technology. Rather than a paper field book, consider having your students create a digital field book that summarizes their exploration and mining activities. There are several apps that can help students compile their findings, including FlipGrid, blogging sites such as WordPress, or something as simple as shared Google Slides.	Per Team: Creating a Field Book steps Coloured paper White paper (legal size) Drawing and colouring tools
	Group Task: Create a Geological Map • The next step is for part of each student team to create a geological grid map based on the rectangle of space representing their mine. • Have students watch Jam Jar Geology: Mapping Your Garden to gain an understanding of how to create a geology map. • Have students use tracing paper and trace the area and grid representing their mine. This becomes their geological grid map.	Per team: Tracing paper Pencil Ruler
20 min	Putting it all Together. Have student groups work together to build their field book. • add the logo and name of the team to the front cover • write names of all group members to the front cover • affix the topographical map and geological grid maps into the beginning pages of the book	Stapler Glue stick

Where to go for more information

- English River Grid Mapping – Pinehouse Dipper Region Land Use

Creating a Field Book

Step 1: Start with about 8 pieces of white, legal size paper and 2 pieces of coloured letter size paper.		**Step 2**: Fold the stack of white paper in half. Fold the coloured paper so that one side of the paper is slightly larger than the white paper.	
Step 3: Glue one of the small 'flaps' of one coloured piece of paper. Paste the other piece of paper onto the flap to make one long piece.		**Step 4:** Place the stack of folded white paper onto the coloured paper.	
Step 5: Staple to make a booklet with a flap at the back.		**Step 6:** Put your group logo, name and group members on the front cover.	
Some Student Examples			
			

MELesson 5: Core Sampling

Time	**Activity**	Material Prep
10 min	Introduce Core Sampling • Explain to students that they will be taking core samples to determine what minerals exist in their mines. • Let students know that they will need to be very organized with their data collection, as the locations of where they find minerals are important. • They will be recording results of core drilling into their field books	

20 min	What is a Core Sample?
	• Explain to students that they will be taking a core sample from each of the grid squares that they drew in MELesson 4.
	• Have students watch the following:
	  ○ The first two minutes of KSK Geology and Core Sampling Process shows what real core samples look like in the field.
	  ○ Start the video Understanding Earth's History at 4:00 to learn about core sampling with a straw.
	• Have students read about The Discovery by Chief John SkeeBoss.
	  ○ Refer to your timelines for the History of Mining in Saskatchewan. What else was happening in potash mining at that time?
	  ○ Potash is usually about 1000m below the surface of the Earth. How might Chief SkeeBoss have known to have this drilling done in Kawacatoose First Nation?
	  ○ Why do you think Chief SkeeBoss had this drilling done?
	• Deepen understanding of Treaty Land Entitlement and mineral rights by reading Saskatchewan Treaty Land Entitlement.	

10 min	Getting Ready to Make Core Samples ○ Explain to students that they will be pushing the core samples out of their straws with a wooden skewer. They will need to purchase straws, skewers, and core sample display sheet (a blank piece of paper) from the Mining Leader. ○ Have students create a grid that is the same size and numbering system as the grid map they created earlier. ○ They will need to keep their core samples intact, organized and labelled on their core sample display sheet.	Straws Skewers White paper

60 min	Making Core Samples
	• Using the tools teams have purchased, create a core sample for every square in the grid.
	• Once every square has a sample, have students use pages in their field book to record:
	  ○ The grid number that corresponds with their grid map.
	  ○ A written description of what they are seeing.
	  ○ A hypothesis as to what they think the substances are.	

	• Remind them they need to be working as a team and keeping their environment clean or they will be fined or issued a stop work order.
	• After about 15 minutes and once every group has made a hypothesis as to what they think the minerals are that they have found, reveal the following:
	  ○ Red/pink – potash
	  ○ Brown muddy – oil/gas
	• Chalky orange - uranium	

40 min	Role Play: The Government Regulator
	• The purpose of the Government Regulator at this point in the simulation is to inspect/check what activities the exploration/mining company is doing, how they are doing it, and to see if it is consistent with what the government has authorized according to their regulations and policies.
	• As the Mining Leader, you as teacher can determine what teams need to complete before they can resume their core sampling exploration and what they need to complete as they complete Topic 4: Mining the Land. If you know someone who is a Government Regulator, invite them to join your class using the Inviting an Expert to your Classroom guidelines. If you do not know a Government Regulator, ask another person to role play using the Role Card: Government Regulator.
	• A suggestion is that an adult in the role of regulator enters the room and meets with one person from each company who is given their title of Project Manager. The regulator can be given a tour of each project to see how the work is proceeding. The regulator can then outline what specifics they want to see according to their work permit or authorization. The regulator can then assign tasks to each student team to complete before they proceed with more mining activity. Some typical examples that a regulator might be interested in are:
	  ○ How trails and transportation into and out of the habitat are being created to have a minimum impact, including how bush is being treated, the materials used to create a trail, what is happening to the water habitats.
	  ○ What activity is happening near water body shorelines to ensure that fish and waterfowl habitats are protected.
	  ○ How fuel for machinery is being transported and stored, and how that area is being contained in case of leaks.
	  ○ What their fire control plan is, including where equipment such as picks, shovels, extinguishers, and materials for a fire break are stored and where the plan might be posted on the mine site.
	  ○ See The Best Management Practices for Mineral Exploration developed by the SMA Exploration Committee and the Ministry of Environment in 2016.	

	Begin the Mining Proposal
	• Have students designate a portion of their field book to their Mining Proposal that will be submitted to the Government. Over the next weeks, they will include the following:
	  ○ A project description and site name.
	  ○ Their plans to identify and lessen impacts on the environment before, during and after exploration and mining activities – MELesson 5
	  ○ Their health and safety plan – MELesson 5
	  ○ Their plan for engaging with Indigenous communities – MRLesson 1
	  ○ Their reclamation plan – MRLesson 5	

Where to go for more information

- Mineral Exploration: A Short Guide to Understanding the Process
- CNSC 101: Meet the Regulator
- Canadian Nuclear Safety Commission – Uranium Mines and Mills

The Discovery by Chief John Skeeboss

As told by Elder Sanford Strongarm (Sr), Kawacatoose First Nation

Different nations are known for different things. Kawacatoose was known as ceremonial keepers. We helped others with ceremonies. The Grass Dance originated with Kawacatoose.

Another part of our history is that one of the old chiefs, John Skeeboss, was one of the founding Leaders of the Federation of Saskatchewan Indian Nations (FSIN). The original mandate, which still applies today, is the protection, promotion, and implementation of our Inherent and Treaty Rights.

John Skeeboss knew that there might be something under our big hills at Kawacatoose. He had a company come into our nation in 1962 to do some drilling to get core samples from 1000m below the surface of the Earth. They discovered that there is a big basin of potash right under Kawacatoose First Nation.

Treaty Land Entitlement in Saskatchewan

The federal government and First Nations signed Treaties 2, 4, 5, 6, 8 and 10 between 1871 and 1906 in the area that is now Saskatchewan. A treaty map shows the areas covered by the six numbered Treaties. A foundation of these Treaties is the provision of reserve land to First Nations people. Some of these areas are only surface rights, while others include mineral rights. Mineral rights mean that the owner of the land receives royalties from any company or person who is developing oil, gas, or mineral resources on that land.

It has been formally recognized by the provincial and federal governments that 33 Saskatchewan First Nations did not receive the amount of land they were promised under the Treaties. While First Nations and the land reserved for them are a federal responsibility under the terms of the Natural Resources Transfer Agreement, 1930 the provincial government is obligated to help fulfil the federal government's outstanding Treaty land entitlements (TLEs).

In 1992, the provincial and federal governments and 25 First Nations signed the Saskatchewan Treaty Land Entitlement Framework Agreement. It established a framework to address outstanding TLE obligations. Eight subsequent TLE agreements with individual First Nations have since been signed.

When a First Nation has not received the amount of land that they were entitled to under Treaty, the Framework sets out to identify and provide those 'shortfall areas'. When First Nations have the opportunity to select land under the Treaty Land Entitlement Agreement, many have selected lands with oil and gas or mineral potential. The ownership of these lands (reserve lands) are then transferred from the Government of Saskatchewan to the First Nation. Companies wanting to explore or produce from these reserve lands then negotiate for this right with the First Nations, as the land owner. Any money, royalty or taxes related to development of minerals/oil/gas from these reserve lands would be paid by the mining company to the First Nation.

Government of Saskatchewan. (n.d.). *Treaty Land and Entitlements*. Retrieved from Saskatchewan: https://www.saskatchewan.ca/residents/first-nations-citizens/treaty-land-and-entitlements#treaty-areas

Topic 4: Mining Resources

As we learned in Topic 1: Place Matters, communities and mineral resources are often in the same place. When mining companies want to mine resources, it is critically important to know who is around you and what important role the land has in those communities. Companies build relationships and agreements with Indigenous Communities to invest in businesses, community, environment, and people. These agreements are a step towards economic reconciliation, where Indigenous Communities are partners in the development and operation of mines.

For the purposes of this lesson, the location of the mineral property or mine is on Crown land, (i.e. owned by the Province); not Indigenous Reserve Lands. However, this land may also be part of the traditional territories of Indigenous peoples who may still be using the land to exercise their treaty and aboriginal rights to hunt, trap, fish and gather foods ad medicines. A Collaboration Agreement is established with Indigenous communities to respect this continued use of traditional lands.

Where might this topic fit?

In this topic, students will continue their mining simulation, working through developing Collaboration Agreements with Indigenous communities near them, creating a workforce for the mine, and mining the resources. As students who are mining, they will explore:

- Indigenous Perspectives
- Environmental and sustainability aspects
- Human resources and company building

As with Topic 3, there continue to be notes indicating where you might place a guest speaker or information sheet to have your students experience creating their own mining company. The lessons within the Mining Resources topic fit best with the following grades and subject units or curricular strands in Saskatchewan.

- Grade 4:
    - Science – Habitats and Communities; Rocks, Minerals and Erosion
    - Social Studies – Interactions and Interdependence; Dynamic Relationships
    - Mathematics – Number; Patterns and Relations; Statistics and Probability
    - English Language Arts – Compose and Create
- Grade 5:
    - Science – Properties/Changes of Materials
    - Social Studies – Interactions and Independence; Dynamic Relationships; Power and Authority; Resources and Wealth
    - Mathematics – Number; Patterns and Relations
    - English Language Arts – Comprehend and Respond; Compose and Create
- Grade 6:
    - Science – Diversity of Living Things
    - Social Studies – Interactions and Interdependence; Dynamic Relationships; Power and Authority; Resources and Wealth
    - Mathematics – Number; Patterns and Relations; Statistics and Probability
    - English Language Arts – Compose and Create

    - Career Education – Connections to Community
- Grade 7:
    - Science – Interactions within Ecosystems; Mixtures and Solutions
    - Social Studies – Power and Authority
    - Mathematics – Number; Patterns and Relations; Statistics and Probability
    - English Language Arts – Compose and Create
    - Career Education – Connections to Community
- Grade 8:
    - Science – Water Systems on Earth
    - Social Studies – Dynamic Relationships; Resources and Wealth
    - Mathematics – Number; Statistics and Probability
    - English Language Arts – Comprehend and Respond; Compose and Create
    - Career Education – Connections to Community; Life and Work Plan
- Grade 9:
    - Social Studies – Interactions and Independence; Dynamic Relationships; Power and Authority; Resources and Wealth
    - English Language Arts – Comprehend and Respond; Compose and Create
    - Career Education – Connections to Community

See the complete Curriculum Correlation for related Outcomes.

Topic Overview

MRLesson 1: Growing Partnerships
MRLesson 2: Hiring your Team
MRLesson 3: Mining for Minerals
MRLesson 4: Selling Resources
MRLesson 5: Reclamation

MRLesson 1: Growing Partnerships

Time	Activity	Material Prep

80 min	Activate prior knowledge
	• Refer back to the Notice and Wonder ideas that students brainstormed in PMLesson3: Land, Treaties and the Métis Homeland
	If you have not yet introduced the Supply Chain Supplier, this is a great time to bring this role into your simulation.
	• Part of your discussion might be to explain the relationship between Indigenous Economic Development Agencies and the individual suppliers, and the connection to community development.
	• See the Appendix "Indigenous Economic Development Agencies 2020" for a list of Indigenous Economic Development Agencies operating in Saskatchewan. These can be researched further by students to find out
	  ○ What communities the Economic Development Agency serves
	  ○ What types of resources, equipment and services are supplied by local suppliers?
	  ○ The impact of Suppliers on economic development within local communities.
	• Note that in 2017, Mining companies in Saskatchewan purchased over $649,000,000 from Indigenous-Owned businesses. This economic relationship is good for mining companies, as goods and services are provided locally. This economic relationship is also good for Indigenous Communities, as it brings economic and career development to community members.	

40 min	Introduce the importance of partnerships between mining companies and Indigenous people. • Read Respectful and Responsible Relationships and discuss the different views on relationships between mining companies and indigenous people. • View the Whistle Mine Story (start watching at 8:20 if you are short on time) Mining and Indigenous People – New Cooperation • Discuss the importance of relationships and agreements between mining companies and Indigenous People.	
60 min	Have students each write a persuasive letter to invite an Indigenous Community Leader to meet with their mining team. • Teach students how to write a persuasive letter using tools such as this video on Persuasive Writing and How to Write a Business Letter • Their goal with writing this letter is to have an Indigenous Community Leader want to visit and build relationship with their company. • The body of their letter should include:	

	○ A description of the mineral project the team would like to pursue. ○ An indication of what minerals are present using core sample data. ○ The types of things they would like to talk about, including a collaboration agreement and the importance of the land. • Have students write this letter formally or type it if you have access to technology. • Add a copy of the letter to their Field Book and a copy of the letter in an envelope to be mailed.	
40 min	Role Play: The Indigenous Community Leader • The purpose of the Indigenous Community Leader is to ensure that relationships and agreements are established before the mining companies begin to mine. • A suggestion is that when the adult enters the room, they refer to students' invitation to come to meet with their mining company. • The Indigenous Community Leader will help the mining companies understand what knowledge their community can share with the mining company, and what they want the mining company to consider sharing with the community • Consider using Natural Resources Canada's Aboriginal Participation in Mining to outline some of the ways that Indigenous people might be involved with mining companies.	
40 min	Create a Collaboration Agreement • Introduced the task of Create a Collaboration Agreement. This agreement can be included in their Field Book. • Share some examples of existing Collaboration Agreements on Cameco's website. • To see where Collaboration Agreements exist across Canada, ○ Interactive Map: Indigenous Mining Agreements Map ○ Print Map: Agreements Between Mining Companies and Aboriginal Communities or Governments	

Where to go for more information

- Writing Resources:
  - How to write a persuasive letter
  - How to address an envelope
  - Business letter auto fill template
- First Nations and Métis Directory
- Natural Resources Canada - Exploration and Mining Guide for Aboriginal Communities
- Government of Saskatchewan – Northern Benefits Summary

Respectful and Responsible Relationships

As told by Senator Nora Cummings, Métis Elder

Even though our Métis community no longer lives at Round Prairie, we have connections to that land. There is a company making a gravel pit out at Round Prairie, I guess that is a type of mining. The company has been very respectful. As Métis people, we want companies to make sure there are no chemicals that go into the land, the water, or the air. We need them to understand what land has special meaning to us. The companies need to go to the old people in the community and build relationships and connections. That is all we are asking.

As told by Elder Sanford Strongarm (Sr), Kawacatoose First Nation

Mother Earth provides a lot for us every day. The old people believe that we can only take so much from Mother Earth. We also need to think about what we are releasing from the depths. What might Mother Earth do to heal when we are out of equilibrium?

Kawacatoose First Nation is part of the Touchwood Tribal Council, along with three other First Nations. Years ago, back in the 1940's there were no protocols or communication between First Nations and mining companies. We did not feel that there was sharing or respect. There were no opportunities for our people to share the wealth from the land. In the 1960's that started to shift when there was maybe one First Nation that started working with potash companies. There were two past chiefs of our people who decided to do some better thinking for how to approach those companies. We had to build a process to find out what was on our land, to document it in a more European way of knowing so that we could proceed with building connections with the mining companies. We had a map maker come from Australia to map all our traditional uses on Kawacatoose lands. The map shows where we hunted and gathered food important to our traditional ways. Kawacatoose has three fishing stations on different lakes and rivers. We crossed our T's and dotted our I's and got all our ducks in a row to best represent our people and our needs.

I remember years ago when a mining company wanted to start building a project near our lands. They tried to do things in a good way, but they didn't understand protocols. They tried to arrange for meetings through the Tribal Council receptionist with the Chief and Council to agree that the company could build their mining project. They did not know that they needed to meet with the Elders. The Chief and Council are only elected for a short time. It is the Elders who have knowledge about our people and our land. We met with the mining company for our consultation process. We showed them our map and made sure they understood so they were not overstepping into our sacred and traditional use areas. In 2010, we used this better thinking to make our agreement to respectfully share the wealth of the land.

Respectful and Responsible Relationships (continued)

As told by Carolanne Inglis-McQuay, Denison Mines Corp.

There are many First Nations who are mapping their traditional land use because it is important to preserve that knowledge. The challenge for mining companies is that they also need to know the scope of how the land is being used right now. We need to acknowledge the past and the present. Current maps are as important as the historical view.

As mining companies, we are moving to a new generation of agreements with First Nations that are not based on loss of land use. Agreements will recognize both traditional rights and treaty rights. Our presence on land is owed a responsibility to have relationship and partnership. It is about responsibility not just accountability. We need to understand that even if current practices are not to visit a piece of land, it is enough that a First Nation asserts that it is traditional territory. We also need to understand the disruptions that a mining project might have to people's livelihoods. The land is still connected.

As told by Glenn Lafleur, Orano Canada Inc

Each Collaborative Mining Agreement is unique to each relationship. There are things that are the same in our processes and the things we negotiate with each community. For each community, we need to consider:

- Business development – how do we invest in and use local businesses to provide services to our company when we are building, operating, and decommissioning a mine?
- Community investment – how might we support important infrastructure (buildings, roads, equipment) and programming that the community sees is important?
- Workforce Training – what types of training programs might we invest in so that we have skilled workers from local communities?
- Environmental Stewardship – how do we work with community members to understand the environment, monitor its health, and make sure we are not harming the environment?

Collaboration agreements are built by each company in a different way, and they are signed by the Chief and Council. We hire a trust administrator who is usually from a financial company and form a committee from each community to oversee the trust and determine how the money is being used. The trust is an investment in the future and is meant to last longer than the mine as an ongoing support for the community and its people.

Truth & Reconciliation Commission

The Truth & Reconciliation Commission released its report in 2015 with 94 recommendations. The commission calls for meaningful consultation, long term sustainable opportunities from economic development projects as well as education and training for managers on the history of Indigenous people, intercultural competency, human rights, and anti-racism.

Truth and Reconciliation Commission: Call to Action #92

We call upon the corporate sector in Canada to adopt the United Nations Declaration on the Rights of Indigenous Peoples as a reconciliation framework and to apply its principles, norms, and standards to corporate policy and core operational activities involving Indigenous peoples and their lands and resources. This would include, but not be limited to, the following:

i. Commit to meaningful consultation, building respectful relationships, and obtaining the free, prior, and informed consent of Indigenous peoples before proceeding with economic development projects.
ii. Ensure that Aboriginal peoples have equitable access to jobs, training, and education opportunities in the corporate sector, and that Aboriginal communities gain long-term sustainable benefits from economic development projects.
iii. Provide education for management and staff on the history of Aboriginal peoples, including the history and legacy of residential schools, the United Nations Declaration on the Rights of Indigenous Peoples, Treaties and Aboriginal rights, Indigenous law, and Aboriginal–Crown relations. This will require skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism.

Indigenous Works, formerly the Aboriginal Human Resource Council, has identified several things for companies to consider when responding to the TRC's Calls to Action:

How will your company respond to this call to action?

- What kind of education opportunities could be provided through online learning, instructor-led courses, and webinars? Where are your knowledge gaps?
- How will your response help your company to improve your Indigenous inclusion workplace performance and your engagement with indigenous communities, people, and businesses?
- How will you position your company's response to the TRC report to achieve positive media and community profile?

Indigenous Works. (n.d.). *TRC Call to Action*. Retrieved from Indigenous Works: https://indigenousworks.ca/en/partnership/what-does-intersection-mean/trc-call-action

Create A Collaboration Agreement

Collaboration agreements may exist between Indigenous Communities and Mining Companies. In some places in Canada, this may also be called an Impact Benefit Agreement. Your mining company is owned by shareholders, who invest in (finance) your company and then receive financial benefit when your company is profitable. Your company uses profits to; reinvest in the mine operation, invest in new operations; provide financial benefit to shareholders and others, including Collaboration Agreement Partners.

Your task as a mining company is to create a Collaboration Agreement between you and the Indigenous Community near your mine site. A trust is created that helps to fund things that are important to communities. Decide how you might share the benefits within each of the four main areas:

Business Development

- A supply chain is all of the businesses who sell goods and services for a mine to operate. By investing in and supporting businesses, mining companies create jobs and bring money into local communities. See the Supply Chain Supplier role and Indigenous Economic Development Agencies 2020 for more information.
- Some examples of businesses that might be needed include:
    - Catering companies
    - Environmental services
    - Trucking companies
    - Road building companies
    - Building trades: electrical, plumbing, carpentry, welding
    - Aviation companies
    - Technology companies
- What local businesses might be part of the supply chain for your mine? What percentage of net profit might support these local businesses?

Community Investment

- Some examples of community projects might include:
    - Building or renovating community facilities: arena, playground, fire hall, community center; shelters
    - Youth programming: culture camps, sport camps, school nutrition programs
    - Education programming: literacy camps, early learning programs, scholarships
    - Community events: Festivals, Elders gatherings, Community celebrations
- What community projects might your mining company help fund? What percentage of net profit might support local community projects?

Workforce Development

- Some examples of workforce training programs might include:
    - Safety training
    - Journeyman training and testing for trades (carpenters, mechanics, electricians, welders, pipefitters)
    - Academic upgrading
- What skills do workers need to work for your mining company? What programs might need to be developed to train them. What percentage of net profit might support workforce development?

Community Engagement and Environmental Stewardship

- What are the concerns that community members have regarding the environmental impact of mining?
- What might community members want to be updated on regularly by your company?
- How might community members help your company understand and mitigate potential environmental impacts?
- What percentage of net profit might be used to support environmental stewardship?

MRLesson 2: Hiring your Team

Time	Activity	Material Prep
25 min	What are the Careers in Mining? • Have students brainstorm the types of careers they think they will need to have in their mining company. • Have students look through the Careers in Mining overview and check off all of the careers that they had predicted would be on the list. What careers were not checked off? Are there any careers that mining teams are surprised are on the list?	

30 min	Who Works in Mines?
	• Give each team a copy of each of the Career Profiles listed on the Saskatchewan Mining Association's Explore a Career in Mining page
	• Ask the teams to cluster the cards into logical groups. Ask students to identify:
	  ○ What would each group of cards be named?
	  ○ What are the characteristics of each?
	• Ask each team to report their categories back to the large group.	

30 min	Develop your Hiring Plan
	• Have mining teams refer to their Collaboration Agreement. What are their commitments to hiring people from local communities?
	• Create a Human Resources Policy that outlines how their company will
	  ○ Train local community members
	  ○ Hire local community members	

Where to go for more information

- Refer to Nutrien's Diversity Practices:
  - Nutrien Supplier Diversity Video
  - Nutrien Diversity Play Book
- Mining Career Development Information
  - Mining Industry Human Resources Council
  - Saskatchewan Mining Labour Market Information

MRLesson 3: Mining for Minerals

Time	Activity	Material Prep
10 min	Getting Ready to Mine • As the Mining Leader, begin to go through the 'rules of mining' for your class. Refer to Role Card: The Mining Leader	
40 min	Role Play: The Environmental Scientist • The purpose of the Environmental Scientist at this point in the simulation is to provide expert knowledge to the project on the possible impacts, and help companies to plan to monitor and reduce that impact before, during and after mining operations. • Students may be aware of some of these ideas if they have had other 'visitors' in the class. Glance through the Role Card: The Environmental Scientist to determine what is most relevant to where your students are at right now. • A suggestion is that the environmental scientist appears just as teams are beginning to mine. • If you know someone who is an Environmental Scientist, invite them to join your class using the Inviting an Expert to Your Classroom guidelines. One of the main roles of the Environmental Scientist is to outline the need for each mining company to create a reclamation plan. The details of this plan are outlined on the Role Card: The Environmental Scientist.	

20 min	Role Play: The Mining Supplier
	Purchasing Tools
	• Part of the mining supply chain is tools and machinery for mining companies. Have student groups research the different Indigenous Economic Development Corporations to find out who they might be able to purchase equipment from.
	• Set up a supplier in your classroom where you sell mining tools that teams can purchase. This might also be a good opportunity to bring in a Supplier to your classroom. If not, as the Mine Leader you can explain that you are either taking on the role of Supplier or assign it to a student in your class. Keep track of purchases in the back cover of their field book.
	• Tools might include paper clips, stir sticks, spoons, storage containers… find common things that might help them mine according to the 'rules':
	  ○ No hands touching the minerals or land.
	  ○ Remember the environmental impact study - keep the environment clean.
	  ○ Teamwork is always important.
	  ○ Remember the reclamation plan - no materials can be lost, and the land needs to go back to its original state.
	  ○ Clean and store the minerals to be sold later.
	  ○ Contaminated minerals cannot be sold.
		Paper clips

40 min	Ready to Mine!	

	• Ask students what commodity they are mining. Remind them of the types of mineral resources in Saskatchewan by referring to the Saskatchewan Mineral Resources Map. • Ask students what type of mining they are performing – remind them of the types introduced in MELesson 2: What is Mining • Allow student teams to mine for minerals for about 30 minutes. Remind them that they need to organize their mined resources and their tailings. They cannot lose any materials. • Monitor teams to ensure that they are following the rules and regulations you set out.	

Where to go for more information

- Video: A Day in the Life of an Environmental Scientist
- Mineral Development: A Short Guide to Understanding Process
- Denison Mines Mine Design – Wheeler River Project

Supplier website (SIMSA) here – information on Saskatchewan-owneded businesses that provide goods and services to the mining sector.

MRLesson 4: Selling Resources

Time	Activity	Material Prep

5 min	Set up your Commodity Rates *
	• At the end of this portion of the activity, your goal is that most companies will have a profit. Consider the magnitude of fines and payments that companies have been had levied through the simulation so far. It might be that commodities are then sold at the following price:
	  ○ Potash – 1 g is $200,000
	  ○ Oil – 1 g is $3,000,000
	  ○ Uranium – 1 g is $10,000,000	

20 min	Provide time for students to finish cleaning their commodities, as the Mining Leader will not accept dirty minerals.
	• Explain to the mining companies that any impurities are adding to the weight of the commodity. Remind students that:
	  ○ Ore is the commodity that is valuable
	  ○ Waste is not valuable but is needed for reclamation. Waste might contain some ore, so it needs to be stored somewhere safe so that it does not leach into clean soil if it rains. This might be a special container or pad.
	• Each company weighs each commodity.
		Weigh scale
		Containers or pad for waste storage.

30 min	Create an Income and Expenses Summary • Each mining company is to prepare a final summary of expenses and income. Expenses have been listed in the back of their Field Book. • This might extend into using Excel to calculate, or some other type of table of values in the Field Book. • Companies make a conclusion that includes their final net income. This should be included in the Field Book.	Calculator or Excel

50 min	Honour Collaboration Agreement
	• Each company will use their respective Collaboration Agreements to determine how much of their net profit will be shared with Indigenous Communities to support:
	  ○ Business Development
	  ○ Community Investment
	  ○ Workforce Development
	  ○ Community Engagement and Environmental Stewardship
	• The net profit must also ensure that the shareholders receive a fair return of the profits for the risk of investing their money in the mining venture; that the company has sufficient money to pay ongoing operating and capital costs, and that they have sufficient money to make new investments that grow the company.
	• Companies will outline projects and funds used in their Field Book.
		Calculator or Excel
		Collaboration Agreement

*Note: for the purpose of this exercise, the commodity prices are fictitious, and commodities are being sold by a consistent unit (ie. g). In commercial trade, potash is typically sold by the tonne (t), oil by the barrel (bl) and uranium by the pound (lb).

MRLesson 5: Reclamation

Time	**Activity**	Material Prep
10 min	Remind mining teams about their requirement to decommission their mines and reclaim the land according to plans approved by the Government Regulator. • Show them the original pictures of their habitats and mines. • Remind them of the definition of reclamation from MELesson 2: *Reclamation: The physical stabilization of the terrain (dams, waste rock piles), landscaping, restoring topsoil, and the return of the land to a useful purpose. This process, like rehabilitation, also involves removing all the buildings or physical property, but also includes treating the mine tailings or wastewater, stabilizing the underground workings, and closing the mine shafts and tunnels.*	
40 min	Reclaiming the Land • Mining teams attempt to put their habitats and cake back to their original state, including the metal cake pan.	Pictures of habitats and mines
Variable 20 – 60 min	Reflecting on Mining and Reclamation – complete in team Field Books • How might you have worked through your mining simulation to make reclamation easier? • What tool might be invented that could improve your reclamation efforts? • What was the most challenging part of reclaiming your land? • Did you follow your reclamation plan as outlined in MRLesson 3? If not, how did you change it? Why? • What is your biggest learning around reclamation? • What is something you learned about how communities engage in the mining cycle, from exploration to mining to reclamation? • Are there any additional laws or rules that should be created to guide mining companies in the future?	
80 min	Extension: Complete a formal report that summarizes the economic, environmental, and social impacts of mining. Each team member can take on a different perspective and write the report from the viewpoint of: • A Mining Company Executive • An Indigenous Community Leader • An Environmental Scientist • A Government Regulator	

Role Play Cards

Inviting an Expert to Your Classroom

Having an expert come to your classroom is a great way for students to learn more about types of careers, including:

- What types of jobs they might have?
- What education they need and where to go to school.
- How much money they earn?
- The good and bad parts of their job.

As well, an expert can help your students learn about their curriculum. For example:

- Geologist
    - Identifying rocks and minerals
    - The geological history of Saskatchewan – how rocks and minerals have formed
    - The importance of rocks and minerals in our daily lives
    - The stages of exploring for minerals:
        - Reconnaissance
        - Prospecting
        - Discovery
    - How to create a grid map
    - What a core sample is and how to make one
- Mining Industry/Company Expert
    - The mining cycle
    - The steps they take to become a mining company and open a mine
    - How they work towards protecting the environment and employees
    - What products their mine provides materials for
    - How they get permission to build a mine
- Environmental Scientist
    - How they monitor the health of the environment, including water quality, air quality, wildlife, and plant diversity.
    - How they help to protect the environment
    - What they do if they find that something is causing environmental damage
    - What the rules are around environmental sustainability and protection
- Government Expert
    - How regulations (rules) have changed over time and why
    - What rules help to protect the environment
    - What rules help to protect the employees, people and communities
    - What rules are for starting a new mining company or mine
    - How the government works with mining companies
    - How the government consults with Indigenous communities regarding a projects impacts on treaty and aboriginal rights.
- Community Leader (Mayor, Chief)
    - How were you involved in the exploration and mining project?

    - How did the exploration and mining activity affect your community?
- Supply Chain Supplier
    - What resources or services do you provide to the mining industry?
    - How does mining impact your business in Saskatchewan?
    - What types of workers do you need to supply these resources and services to the mining industry?
    - What training do you provide for local workers from communities near exploration and mining sites?

If you don't know who to contact to arrange for an expert to come to your classroom, go to the Saskatchewan Mining Association website at http://saskmining.ca/ or refer to the following websites for more information:

- Natural Resources Canada
- Government of Saskatchewan
- Prospectors and Developers Association of Canada
- The Mining Association of Canada
- Crown-Indigenous Relations and Northern Affairs Canada

Role Card: The Mining Leader

Your role is to ensure that all mining teams are following the rules, or regulations, as set out, monitoring progress, issuing stop work orders, monitoring proper use of tools, answering questions, and issuing fines or stop work orders when rules are not followed. The Mining Leader role is fictional and combines several different 'real life' roles, agencies, and organizations. Have fun with this role and remember mining is in the magnitude of millions of dollars!

- Take pictures of every group's habitat and mine before they begin. This will give you a reference for what it needs to look like after they shut down the mine and they decommission it. This gives teams a goal for reclamation.

Check in on team processes for:

- Creating a grid map.
- Collecting, displaying, and organizing core samples.

The Role of the Regulator: Issue stop work orders and fines and record on the back page of their field book.

- Touching the mining area with fingers not tools. Fines often start at $1,000,000 and may increase from there.
- Not working as a team. Fines often start at $100,000 and increase over time.
- Not keeping a clean workspace. Fines might begin at $500,000.
- If a team is facing a fine, give them the opportunity to teach another group about the thing they were doing wrong to have their fine reduced by half.

The Role of a Mining Company Executive: Pay teams for great performance and record on the back page of their field book.

- Great teamwork
- Exceptional ideas
- Innovations
- Work that they do to impress you: keeping their mine site clean, lending a hand to another team, show great improvements in team building, innovative ideas.

The Role of a Mining Company Supplier: Selling tools needed, recording fees on the back page of their field book. Set the price of each tool, but equipment prices might change over time:

- Straw, skewer, paper clip, spoons, other tools
- White paper (core sample display sheet)

Role Card: The Indigenous Community Leader

Your role is to check that mining companies are acting responsibly on the land, are creating economic benefits for your community, and are putting the land back to its natural state after the mine closes. Your community will remain in this place long after the mine leaves.

When creating a fair and responsible Collaboration Agreement with your First Nations, Inuit or Métis community, you and the mining company will focus on four main areas:

- Business Development
- Community Investment
- Workforce Development
- Community Engagement and Environmental Stewardship

You can read more about these on the Create a Collaboration Agreement information page.

Some Elders might remind you that "you need to cross your t's and dot your i's to make sure that you negotiate fair terms for the agreement". You will want the company to understand the importance of the land to your people historically and at the present time. Consider outlining

- The hunting, fishing, and gathering that has happened in the past and is still happening now in your area.
- The sacred areas that are near your communities.
- The areas that people have special connections to.
- The water supplies and natural areas important to animals that are on the land permanently or migrate.

Consider your community's potential workforce and business development that can be impacted in a positive way, and what community projects might be needed in the near future. Have some ideas for possible community or business development that can benefit the whole community.

Think about the unique knowledge that community members can contribute to the mining company's planning for lessening the environmental impact of their operations. What knowledge might Elders and those members of the community who hunt, fish and

Role Card: The Environmental Scientist

In real life, an Environmental Scientist might work for a mining or exploration company, a government regulatory body, or be part of a company hired as a consulting agency during exploration, mining, or remediation. In each case, environmental scientists have the knowledge to advise and monitor best practices for protecting the environment and monitor and minimize the effects of mining operations on the environment before, during, and after mining operations. Some of the activities that environmental scientists are involved in include:

Mining companies need to plan for Reclamation before they can mine. Reclamation is when they put the land back to a similar productive state it was in before they began mining. They must

- provide the government with funds/financial security to cover the cost of reclaiming the land back according to the government approved reclamation plan.
- have a reclamation plan that includes
    - How they are going to mine with reclamation in mind.
    - How to put the land back to its original state.
    - Whether they are going to reclaim different aspects of their mine site along the way, or if they are going to reclaim the entire site after they close their mine.

Mining companies are required to manage their mine tailings. Tailings are the waste created by a mining operation. They must

- plan for how to store and dispose of their tailings. Some ideas from existing mines are:
    - Using the old underground mine to store tailings.
    - Selling the waste salt from potash as road salt.
    - Using a mine-out pit re-engineered/re-purposed to store waste.

Mining companies must study what environmental impact they might have and have a plan to monitor, mitigate (avoid), and reduce that impact. They must

- identify how their mine might impact the plants and animals in their habitat. How might they mitigate or reduce their impact?
- have a plan to ensure that there is no mining waste in the habitat.
- have a monitoring plan to check the land, the water, and the air to make sure

Role Card: The Mining Company Mentor

Your role is to help to guide these new mining companies as they build their businesses. As a mentor, you have much experience in Saskatchewan and can be a mentor/helper, as you want them to succeed. Some of your time can be spent simply answering questions. Some of your advice might be around:

Finding Money to Start

- As a mining company, you will spend decades exploring, A uranium company might take 15 to 20 years to move through exploration and developing a mine before they have any production. How might a company find investors so they can pay for all their activities before they have product to sell?
- Some ideas for guiding the discussion might come from The Money Behind Mineral Exploration and Development in Canada

Engaging and Building Relationships with Communities

- Mining companies consider themselves to be part of economic reconciliation. Refer to the TRC Call to Action to guide mining team thinking. How might they play a part in economic reconciliation?

Designing Your Mine

- Mining companies need to decide what type of mine they are going to build. This depends on the type of mineral they are mining, where it is located, and the newest technologies and innovations around the world. An example is Denison Mine's newest Uranium project in Northern Saskatchewan, the Wheeler River Project.
- What type of mine are you going to design?

Finding People for Your Company

- A mining company needs to have many different types of workers with different skills and backgrounds. Some of your employees need to have training before they come to work for you, while others will receive their training on the job. What types of careers will your company have when it is in production? How do you find employees locally? How much are you going to pay your employees?
- You might have the Mining Mentor introduce the Mining Careers activity in

Role Card: The Government Regulator

To simplify the many roles associated with government, they have all been combined into one, the Government Regulator. Your role is to introduce the simplified 'rules' that mining companies need to adhere to. Be aware that regulations are constantly changing based on economic, scientific, and environmental factors. Your role as the Government Regulator is to introduce the following so that each mining team can create a plan.

Leasing the Land

- Ask teams for the permit and leasing agreement from the provincial government that gives them permission to build a mine and use it temporarily.
- In exchange for using the land, mining companies pay the government money.

Reclamation – this ranges from a few million dollars to over $100,000,000.

- See the Role Card: Environmental Scientist for details regarding the reclamation plan.
- Ask teams what their reclamation budget is, and details of their plan to put the environment back to its original state. Often, companies will engage in ongoing reclamation, and include budget for soil and plant relocation, heavy equipment and people to run it.

Safety

- Ask teams to review their workplace safety and training plan, including the following:
    - Training staff.
    - Introducing new people to their mine site.
    - Monitoring safe practices on their mine site.
    - Tracking and reporting injuries.
- Contacting the Saskatchewan Mining Association for safety statistics for mining.

Transportation and Road Creation/Use

- Ask teams for their plan for how they are going to get equipment and materials to their mine, and products out of their mine, including building roads and other modes of transportation, managing their environmental impact

Environment

- Ask teams for their plan for managing their waste and their environmental impact including waste from the mine, waste from people living there, and how they are going to monitor the health of the animals, plants, water, soil, and air.

Role Card: The Supply Chain Supplier

There are many different companies that are part of the Mining Supply Chain. A supply chain is how exploration and mining companies purchase the equipment, materials, and services they need to support people and projects. Suppliers are a very important part of mining and are a main contributor to economic development within communities and growth of Indigenous businesses.

Saskatchewan exploration and mining companies purchase goods and services from Indigenous-owned businesses. These business relationships provide mining companies with much-needed resources, equipment, and expertise, and provide Indigenous communities with career and economic development.

Your role as a Supplier might be to outline:

- What resources or services do you provide to the mining industry?
- How does mining impact your business in Saskatchewan?
- What types of workers do you need to supply these resources and services to the mining industry?
- What training do you provide for local workers from communities near exploration and mining sites?

Part of your Supplier role is to have students understand the important and diverse role that the Supply Chain plays in Saskatchewan mining, and the role that mining plays in community economic development. Part of your discussion might be to explain the relationship between Indigenous Economic Development Agencies and the individual suppliers, and the connection to community development. See the Appendix "Indigenous Economic Development Agencies 2020" for a list of Indigenous Economic Development Agencies operating in Saskatchewan. These can be researched further by students to find out

- What communities the Economic Development Agency serves
- What types of resources, equipment and services are supplied by local suppliers?
- The impact of Suppliers on economic development within local communities.

SMA Lesson Plan Correlation

Project Lesson	Topic	SMA Lesson/Resource Correlation
PMLesson 1	General Map of Saskatchewan	
PMLesson 2	Minerals and Mines in Saskatchewan	Mineral Potential and Mines in Saskatchewan
PMLesson 3	Land, Treaties, and the Métis Homeland	
BHLesson 1	What does Living Mean?	
BHLesson 2	Habitats and Ecosystems	
BHLesson 3	Researching Habitats and Ecosystems	
BHLesson 4	Creating a 3D Art Project	
MELesson 1	Ancient Stones	The Rocky Cycle Journey and Mineral Deposits
MELesson 2	What is Mining?	Potash Solution Mining: Model Coal Mining – Surface Strip Mining Finders Miners
MELesson 3	Confidential Cake Challenge	
MELesson 4	Grid Mapping	Gold Exploration
MRLesson 1	Core Sampling	Mineral Exploration and Core Sampling Exploring for Minerals in Saskatchewan: Stream Sediment and Soil Sampling Exploring for Minerals in Saskatchewan: Geophysics – Using Magnetics to Find a Mine
MRLesson 2	Growing Partnerships	
MRLesson 3	Hiring Your Team	Investigating Careers in the Minerals Industry
MRLesson 4	Mining for Minerals	Sustainability – Decision Making
MRLesson 5	Reclamation	Cookie Mining

Curriculum Correlations

Grade 4 Curriculum Correlation

	Saskatchewan Curriculum Outcomes	Place Matters	Building a Habitat	Mining Exploration	Mining Resources
Science	Habitats and Communities				
	HC4.1 – Interdependence of living things		✱		
	HC4.3 – Effects of activity on habitat			✱	✱
	Rocks, Minerals and Erosion				
	RM4.1 – Physical properties of rocks and minerals		✱	✱	✱
	RM4.2 – How humans use rocks and minerals			✱	✱
	RM4.3 – How we understand landforms	✱		✱	
Social Studies	Interactions and Independence				
	IN4.1 - How First Nations and Métis shaped Saskatchewan	✱	✱	✱	✱
	IN4.2 – Origins of cultural diversity in Saskatchewan			✱	
	IN4.3 – Influence of Sask people on Canada			✱	✱
	Dynamic Relationships				
	DR4.1 – Impact of the land on lifestyles and settlements		✱	✱	
	DR4.2 – Relationship of First Nations and Métis with land	✱	✱	✱	✱
	DR 4.3 – Implications of Treaty relationships	✱			✱
	Resources and Wealth				
	RW4.1 – Strategies to meet challenges of environment		✱		
	RW4.3 – Impact of resources and innovations	✱		✱	
Mathematics	Number				
	N4.1 – Whole numbers to 10000				✱
	N4.2 – Addition and Subtraction to 10000				✱
	N4.3 – Multiplication of single digit numbers				✱
	N4.4 – Multiplication of 2- or 3- digit by 1-digit numbers				✱
	Patterns and Relations				
	P4.1 – Patterns as charts, tables or diagrams				✱
	Statistics and Probability				
	SP4.1 – Data, bar graphs and pictographs				✱
ELA	Comprehend and Respond				
	CR4.2 – visual and multimedia texts, incl. maps, charts, graphs	✱	✱		
	CR4.3 – auditory information to summarize, conclude	✱	✱		
	Compose and Create				
	CC4.1 – Create on identity, community, social resp		✱		✱
	CC4.2 – Variety of representations, inc displays		✱		
	CC4.3 – Speak to present ideas and information		✱		
	CC4.4 – Writing descriptive, narrative and expository		✱		✱
Art	Creative/Productive				
	CP4.7 – Visual art that expresses ideas		✱		
	CP4.8 – Variety of visual art concepts		✱		

Grade 5 Curriculum Correlation

	Saskatchewan Curriculum Outcomes	Place Matters	Building a Habitat	Mining Exploration	Mining Resources
Science	Properties/Changes of Materials				
	MC5.2 – Reversible and non-reversible changes				✱
	MC5.3 – Production, use and disposal of material/products				✱
	Forces and Simple Machines				
	FM5.2 – Characteristics of simple machines			✱	
	FM5.3 – Effects of forces and simple machines			✱	
Social Studies	Interactions and Independence				
	IN5.1 – Aboriginal heritage of Canada	✱	✱		✱
	Dynamic Relationships				
	DR5.1 – Relationship between people and the land	✱	✱		✱
	DR5.2 – Impact of the environment on people's lives		✱		✱
	Power and Authority				
	PA5.3 – Nature of treaty relationships	✱			✱
	Resources and Wealth				
	RW5.1 – Sustainable environmental management		✱	✱	✱
	RW5.2 – Future economic changes				✱
Mathematics	Number				
	N5.1 – Numbers to 1000000				✱
	N5.2 - Develop mental math strategies for multiplication				✱
	N5.4 – Estimation and computation strategies				✱
	Patterns and Relations				
	P5.1 – Patterns using charts, tables, models, expressions				✱
	Statistics and Probability				
	SP5.1 – First-hand and second-hand data			✱	
ELA	Comprehend and Respond				
	CR5.1 – Read Texts on identity, community, social resp		✱	✱	
	CR5.2 – visual and multi-media persuasive texts		✱		
	CR5.3 – auditory information from cultural traditions	✱	✱		✱
	CR5.4 – read fiction and non-fiction from various cultures		✱		✱
	Compose and Create				
	CC5.1 – Create on identity, community, social resp		✱		
	CC5.2 – Representations, including illustrated reports		✱		
	CC5.3 – Speak to present ideas and information		✱		
	CC5.4 – Multi-paragraph narrative, expository, persuasive		✱		✱
Art	Creative/Productive				
	CP5.8 – Variety of visual art concepts		✱		

Grade 6 Curriculum Correlation

	Saskatchewan Curriculum Outcomes	Place Matters	Building a Habitat	Mining Exploration	Mining Resources
Scienc	Diversity of Living Things				
	DL6.1 – Appreciate diversity of living things and careers		✱	✱	✱
	DL6.2 – Understandings of diversity of living things		✱		
	DL6.3 – Characteristics and behaviours of animals		✱		
Social Studies	Interactions and Interdependence				
	IN6.4 – Explore aspects of change over time	✱	✱	✱	✱
	Dynamic Relationships				
	DR6.1 – Impact of natural environment on ways of life	✱	✱	✱	✱
	DR6.2 – How land affects settlement, social organization	✱	✱	✱	✱
	DR6.3 – How societies oriented themselves in time and space	✱			
	DR6.4 – Relate contemporary issues with historical events	✱			✱
	Power and Authority				
	PA6.1 – Connect personal and others' power and authority	✱			
	PA6.2 – Distribution of power and privilege	✱			✱
	PA6.3 – How some affected by injustice or abuses of power	✱			
	Resources and Wealth				
	RW6.1 – Factors contributing to quality of life	✱		✱	✱
	RW6.2 – Change in local and global sustainability			✱	✱
Mathematics	Number				
	N6.1 – Numbers greater than 1000000 and less than 0.001				✱
	N6.4 – Multiplication and division with decimals				✱
	N6.5 – Understanding percent				✱
	N6.9 – How First Nations and Métis uses quantity			✱	
	Patterns and Relations				
	P6.1 – Patterns as tables and graphs				✱
	Statistics and Probability				
	SP6.1 – Data analysis, including line graphs, data collection				✱
ELA	Comprehend and Respond				
	CR6.1 – Read Texts on identity, community, social resp		✱	✱	
	CR6.2 – before, during, after strategies		✱		
	CR6.4 – First Nations and Métis visual and multi-media		✱		
	CR6.5 – Listen purposefully	✱	✱		
	CR6.6 – Interpret First Nations and Métis fiction, poetry, plays		✱		
	CR6.7 – Information texts		✱	✱	
	Compose and Create				
	CC6.1 – Create on identity, community, social resp		✱		✱
	CC6.2 – Strategies to convey meaning before, during, after		✱		
	CC6.3 – Use cues to communicate meaning		✱		✱
	CC6.4 – Representations to communicate information		✱		

Saskatchewan Curriculum Outcomes		Place Matters	Building a Habitat	Mining Exploration	Mining Resources
	CC6.5 – Speak with others in pairs, small and large groups		✱		
	CC6.6 – Present information orally		✱		
	CC6.7 – Write to describe, narrate, explain and persuade		✱		✱
	CC6.8 – Experiment with text forms and techniques		✱		
	CC6.9 – Prepare teacher-guided inquiry report		✱		
Art	Creative/Productive				
	CP6.12 – Increased skills in variety of visual art media		✱		
Car Ed	Connections to Community				
	CC6.1 – Investigate careers and their requirements			✱	✱
	CC6.2 – Ways work contributes to individuals and community		✱		✱
	Life and Work Plan				
	LW6.1 – Effective practices that are important to one's career		✱		
	LW6.2 – Interrelationships of life roles		✱		

Grade 7 Curriculum Correlation

	Saskatchewan Curriculum Outcomes	Place Matters	Building a Habitat	Mining Exploration	Mining Resources
Science	Interactions within Ecosystems				
	IE7.1 – Key ideas of Indigenous knowledge of ecosystems		✱		✱
	IE7.2 – Living organisms within ecosystems		✱	✱	
	IE7.4 – Changing ecosystems and reducing impacts			✱	
	Mixtures and Solutions				
	MS7.2 – Separation methods for mechanical mixtures				✱
	Earth's Crust and Resources				
	EC7.2 – Locations and processes for extracting resources	✱		✱	
	EC7.3 – Surface geology and land use	✱		✱	
Social Studies	Interactions and Independence				
	IN7.2 – Effects of globalization on people	✱			
	Dynamic Relationships				
	DR7.1 – Various types of maps	✱			
	DR7.2 – Impact of humans inhabitation on environment	✱	✱	✱	
	DR7.3 – Relationship between current and historical events	✱	✱		
	Power and Authority				
	PA7.1 – Sources of power for individuals, nations, regions	✱			
	PA7.2 – Structures and processes for government				✱
	Resources and Wealth				
	RW7.2 – Influences of resources on economic conditions	✱			
	RW7.3 – Ecological stewardship of economies	✱		✱	
Mathematics	Number				
	N7.2 – Operations with decimals inc. order of operations				✱
	N7.4 – Understanding percent				✱
	Patterns and Relations				
	P7.1 – Patterns in words, charts, graphs, and expressions				✱
	Statistics and Probability				
	SP7.1 – Measure of central tendency and sets of data				✱
	SP7.2 – Circle graphs				✱
ELA	Comprehend and Respond				
	CR7.1 – Read Texts on identity, community, social resp		✱	✱	
	CR7.2 – before, during, after strategies		✱		
	CR7.3 – use cues to construct meaning		✱		
	CR7.4 – View visual and multi-media with complex ideas		✱		
	CR7.5 – Listen critically		✱		
	CR7.6 – Interpret First Nations and Métis fiction, poetry, plays		✱		
	CR7.7 – Informational texts		✱	✱	
	Compose and Create				
	CC7.1 – Create on identity, community, social resp		✱		

Saskatchewan Curriculum Outcomes		Place Matters	Building a Habitat	Mining Exploration	Mining Resources
	CC7.2 – Prepare teacher-guided inquiry project		❋		❋
	CC7.3 – Strategies to convey meaning before, during, after		❋		
	CC7.4 – Use cues to communicate meaning		❋		❋
	CC7.5 – Create and present representations of information		❋		
	CC7.6 – Speak with others in pairs, small and large groups		❋		
	CC7.7 – Share information orally		❋		
	CC7.8 – Write to narrate, explain or persuade		❋		❋
	CC7.9 – Experiment with text forms and techniques		❋		
Art	Creative/Productive				
	CP7.10 – Visual art that expresses ideas about place		❋		
	CP7.11 – Use various art forms to express ideas about place		❋		
Car Ed	Connections to Community				
	CC7.1 – Knowledge and skills transfer to future life and work		❋		❋
	CC7.2 – Contributions of work to individuals and community		❋	❋	❋
	Life and Work Plan				
	LW7.1 – Personal qualities and abilities to seek, obtain work		❋		
	LW7.2 – Stereotyping and discrimination impacts on life		❋		

Grade 8 Curriculum Correlation

	Saskatchewan Curriculum Outcomes	Place Matters	Building a Habitat	Mining Exploration	Mining Resources
Scien	Water Systems on Earth				
	WS8.1 – Impact of changes to water ecosystems	✱		✱	✱
	WS8.3 – Factors affecting productivity and water species			✱	
Social Studies	Interactions and Independence				
	IN8.2 – Influence of immigration on cultural diversity	✱			
	Dynamic Relationships				
	DR8.1 – Importance of land on the Canadian identity	✱	✱	✱	✱
	DR8.2 – Influence of treaty relationship on Canada	✱			✱
	DR8.3 – How historical events influence present Canada	✱			✱
	Resources and Wealth				
	RW8.3 – Critique approaches to environmental stewardship			✱	✱
Mathem	Number				
	N8.2 – Percents greater than or equal to 100%				✱
	N8.3 – Rates, ratios and proportion				✱
	Statistics and Probability				
	SP8.1 – Analyze data and conclusions			✱	✱
ELA	Comprehend and Respond				
	CR8.1 – Read Texts on identity, community, social resp		✱		
	CR8.2 – Before, during, after strategies		✱		
	CR8.3 – Use cues to construct meaning		✱		
	CR8.4 – View visual and multi-media with complex ideas		✱		
	CR8.5 – Listen critically		✱		
	CR8.6 – Interpret First Nations and Métis fiction, poetry, plays		✱		
	CR8.7 – Informational texts	✱	✱		✱
	Compose and Create				
	CC8.1 – Create on identity, community, social resp		✱		
	CC8.2 – Prepare group inquiry project		✱		
	CC8.3 – Strategies to convey meaning before, during, after		✱		
	CC8.4 – Use cues to communicate meaning		✱		✱
	CC8.5 – Create and present representations of information		✱		
	CC8.6 – Speak with others in pairs, small and large groups		✱		
	CC8.7 – Share complex information orally		✱		
	CC8.8 – Write to describe, narrate, explain, and persuade		✱		✱
	CC8.9 – Experiment with text forms and techniques		✱		
Art	Creative/Productive				
	CP8.11 – Art forms to express ideas about social issues		✱		
C	Connections to Community				

Saskatchewan Curriculum Outcomes		Place Matters	Building a Habitat	Mining Exploration	Mining Resources
	CC8.1 – Lifelong learning connected to career pathways		❋		❋
	CC8.2 – Work and work alternative contributions		❋	❋	
	Life and Work Plan				
	LW8.1 – Individual skills influence future career choices		❋	❋	❋
	LW8.2 – Life roles and possible changes over time		❋		

Grade 9 Curriculum Correlation

	Saskatchewan Curriculum Outcomes	Place Matters	Building a Habitat	Mining Exploration	Mining Resources
Social Studies	Interactions and Independence				
	IN9.1 – What constitutes a society	❋			
	IN9.2 – Factors that shape worldviews	❋	❋		
	IN9.3 – Ways worldview is expressed in everyday life		❋		❋
	IN9.4 – Influence of worldview on choices and interactions	❋			
	Dynamic Relationships				
	DR9.1 – Challenges in finding information about past societies	❋			
	DR9.2 – Significant historical events in societies	❋			
	DR9.3 – Relationship between environment and society	❋	❋	❋	❋
	DR9.4 – Influence of past societies on contemporary life	❋			❋
	Power and Authority				
	PA9.1 – Concepts of power and authority in governance	❋			❋
	PA9.2 – Impact of empire-building on indigenous societies	❋			❋
	Resources and Wealth				
	RW9.1 – Acquisition and distribution of wealth	❋			❋
	RW9.2 – Significance of trade and transportation on societies	❋		❋	❋
ELA	Comprehend and Respond				
	CR9.1 – Read Texts on identity, community, social resp		❋	❋	
	CR9.2 – before, during, after strategies		❋		
	CR9.3 – use cues to construct meaning		❋		
	CR9.4 – View visual and multi-media with complex ideas	❋	❋		
	CR9.5 – Listen purposefully to understand	❋	❋		
	CR9.6 – Interpret First Nations and Métis fiction, poetry, plays		❋		
	CR9.7 – Information texts	❋	❋	❋	❋
	Compose and Create				
	CC9.2 – Prepare individual inquiry project		❋	❋	
	CC9.3 – Strategies to convey meaning before, during, after		❋		
	CC9.4 – Use cues to communicate meaning		❋		❋
	CC9.5 – Create and present representations of information		❋		
	CC9.6 – Speak with others in pairs, small and large group		❋		
	CC9.7 – Share complex information orally		❋		
	CC9.8 – Write to describe, narrate, explain, and persuade		❋		❋
	CC9.9 – Experiment with text forms and techniques		❋		
Art	Creative/Productive				
	CP8.10 – Visual art expressing ideas about social issues		❋		
	CP8.11 – Art forms to express ideas about social issues		❋		
Car Ed	Connections to Community				
	CC9.1 – Use career information to make a career plan			❋	❋
	CC9.2 – Societal and economic needs influence work		❋	❋	❋

Resource lists

Healing Waters of Manitou

- The Legend: Manitou Springs
  - https://manitousprings.ca/the-legend/
- Healing Waters
  - http://www2.uregina.ca/education/saskindianresidentialschools/ochankugahe-daniel-kennedy/
- Facebook Manitou Indigenous Peoples Day
  - https://www.facebook.com/Watrousmanitou.tourism/photos/manitou-is-cree-for-great-spirit-first-nations-and-indigenous-peoples-from-all-a/1722017861166864/
- The Catholic Register: Canada's "Dead Sea" is Alive with Legend
  - https://www.catholicregister.org/item/25704-canada-s-dead-sea-is-alive-with-legend
- Atlas Obscura: Little Manitou Lake
  - https://www.atlasobscura.com/places/little-lake-manitou
- Nakoda (Assiniboine)
  - https://teaching.usask.ca/indigenoussk/import/nakota_assiniboine.php
- Carry-the-Kettle Nakoda Nation
  - http://cegakin.com/index.php/about/
- Ochankuga'he – (Daniel Kennedy)
  - http://www2.uregina.ca/education/saskindianresidentialschools/ochankugahe-daniel-kennedy/
- Watrous Heritage Manitou
  - http://watrousheritage.ca/ManitouBeach.php
- Saline systems of the Great Plains of western Canada: an overview of the limnogeology and paleolimnology
  - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1315329/
- Manitou Big Float
  - https://panow.com/2019/07/15/more-than-1000-participate-in-manitou-beachs-big-float/

Linked Resources by Lesson

Lesson	Description	Link
PMLesson 1	Geological Atlas (GIS) of Saskatchewan	https://gisappl.saskatchewan.ca/Html5Ext/index.html?viewer=GeoAtlas
	GeoScape Saskatchewan	https://sgshome.ca/outreach/geoscape-saskatchewan
	Resource Map of Saskatchewan	http://saskmining.ca/ckfinder/userfiles/files/97534-ResourceMap2019.pdf
PMLesson 2	GeoExplore Saskatchewan	https://skgeolhighwaymap.maps.arcgis.com/apps/MapSeries/index.html?appid=a845cbb370f7401597806887318e2676
PMLesson 3	First Nations Protocol for Traditional Territory	https://www.ictinc.ca/first-nation-protocol-on-traditional-territory
	Notice and Wonder Strategy	https://johansonconsulting.files.wordpress.com/2020/01/meaning-making-techniques-notice-and-wonder.docx
	Gee meeyo pimawtshinawn (It Was a Good Life): Métis Road Allowance Memories	https://issuu.com/heritagesask/docs/rap_booklet_-_web
	Canadian Geographic: Movement of People	http://www.canadiangeographic.com/educational_products/activities/ipac_gfm/MovementofPeople_EN.pdf
	Treaty Implementation: Fulfilling the Covenant	http://www.otc.ca/public/uploads/resource_photo/55757_TreatyWeb.pdf
	Indigenous Peoples Atlas of Canada: Métis	https://indigenouspeoplesatlasofcanada.ca/section/Métis/
	Indigenous Peoples Atlas of Canada: First Nation	https://indigenouspeoplesatlasofcanada.ca/section/first-nations/
BHLesson 1	Science Learn Characteristics of Living Things	https://www.sciencelearn.org.nz/resources/14-characteristics-of-living-things
BHLesson 2	Facing History: KWL Charts	https://www.facinghistory.org/resource-library/teaching-strategies/k-w-l-charts
BHLesson 3	Virtual Saskatchewan 11 Ecoregions	https://www.virtualsk.com/maps/ecoregions.html
	Reading Rockets: Think Aloud	https://www.readingrockets.org/strategies/think_alouds
	Saskatchewan Outdoors: Habitats and Ecosystems	https://saskoutdoors.org/resources/habitats-and-ecosystems
BHLesson 4	Natural Resources Canada's Topographical Maps: The Basics	https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/topo101/pdf/mapping_basics_e.pdf
MELesson 1	Unit Plan: Integrating First Nations and Métis Content and Perspectives Grade 4 Earth and Space Sciences: Rocks, Minerals and Erosion	https://www.spiritsd.ca/learningresources/FNM%20Resources/GR4%20Rocks%20Minerals%20and%20Erosion.pdf
	Indigenous Saskatchewan Encyclopedia Dakota/Lakota	https://teaching.usask.ca/indigenoussk/import/dakota__lakota.php
MELesson 2	History of Mining in Saskatchewan	http://saskmining.ca/fileLibrary/0_History%20of%20Mining%20in%20Saskatchewan.pdf
	Mining Matters Core Concepts: The Mining Cycle	https://miningmatters.ca/docs/default-source/mining-matters---ttsp-documents/core-concepts-mining-cycle.pdf?sfvrsn=a6f2b298_2

	Girls in the Classroom: Mining Cycle Projects	http://www.girlsintheclassroom.org/MiningCycle
	Geology, and Mineral and Petroleum Resources of Saskatchewan	https://publications.saskatchewan.ca/api/v1/products/7534/formats/36407/download
MELesson 4	Crushing & Quarrying World: Understanding Supply Chain Management in Mining Industry	http://www.crushingnquarrying.com/2019/03/13/understanding-supply-chain-management-in-mining-industry/#:~:text=Supply%20Chain%20Management%20(SCM)%20is,the%20distribution%20of%20finished%20goods
	A Day in the Life of a Geologist	https://www.youtube.com/watch?v=3uXyZ3FGTCo
	Career Profile: Geologist Karina Tyne	http://saskmining.ca/ckfinder/userfiles/files/EFM-Career-Profiles/efm-geologist.pdf
	Career Profile: Geologist Levi Kalinsky	http://saskmining.ca/ckfinder/userfiles/files/Levi%20Kalinsky%2C%20Cameco%20Corp.pdf
	What Does a Geologist Do?	https://www.careerexplorer.com/careers/geologist/
	Diamond Mining and Prospecting: Kimberlite	https://www.qcc.cuny.edu/BiologicalSciences/Faculty/rscal/gems/diamprosp.html
	Eight Natural Geologic Signs Pointing Toward Gold	https://www.minelab.com/community/treasure-talk/eight-natural-geologic-signs-pointing-toward-gold
	Elements of a Field Book	https://www.isc.ca/About/History/LandSurveys/FieldBooks/Pages/Elements.aspx
	Jam Jar Geology: Mapping Your Garden	https://www.youtube.com/watch?v=uGK9tXwIpcY
	Pinehouse Dipper Region Land Use	http://www.environment.gov.sk.ca/adx/aspx/adxGetMedia.aspx?DocID=643,641,621,247,94,88,Documents&MediaID=266&Filename=pinehouse+dipper+land+use+study.pdf
MELesson 5	KSK Geology and Core Sampling Process	https://www.youtube.com/watch?v=31qQYzb2Lhc
	Understanding Earth's History	https://www.youtube.com/watch?v=xFe_nIRJDKg
	The Best Management Practices for Mineral Exploration	http://saskmining.ca/ckfinder/userfiles/files/BMP%20August%202016_Draft.pdf
	Mineral Exploration: A Short Guide to Understanding the Process	https://newagemetals.com/mineral-exploration-a-short-guide-to-understanding-the-process/
	CNSC 101: Meet the Regulator	http://www.nuclearsafety.gc.ca/eng/pdfs/cnsc-101/CNSC-101-presentation-package-2015-eng.pdf
	Canadian Nuclear Safety Commission – Uranium Mines and Mills	http://nuclearsafety.gc.ca/eng/uranium/mines-and-mills/index.cfm
	Saskatchewan Treaty Land and Entitlements	https://www.saskatchewan.ca/residents/first-nations-citizens/treaty-land-and-entitlements#treaty-areas
	Treaty Map	https://www.aadnc-aandc.gc.ca/eng/1100100020616/1100100020653#chp1
	Saskatchewan Treaty and Entitlement Framework Agreement	https://publications.saskatchewan.ca/api/v1/products/67033/formats/74396/download
MRLesson 1	The Whistle Mine Story: Mining and Indigenous People – New Cooperation	https://www.youtube.com/watch?v=74B6DFbiuPk
	Video: Persuasive Writing	https://www.youtube.com/watch?v=hD9arWXIddM

	How to Write a Business Letter	https://www.wikihow.com/Write-a-Business-Letter#Beginning-the-Letter
	Natural Resources Canada's Aboriginal Participation in Mining	https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/mineralsmetals/files/pdf/abor-auto/mining_infosheet_eng.pdf
	Cameco Collaboration Agreements	https://www.cameconorth.com/about/a-sustainable-approach
	Indigenous Mining Agreements Map	https://atlas.gc.ca/imaema/en/
	Agreements Between Mining Companies and Aboriginal Communities or Governments	https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/mineralsmetals/files/pdf/abor-auto/aam-eac-e2013.pdf
	First Nations and Métis Directory	https://www.saskatchewan.ca/residents/first-nations-citizens/saskatchewan-first-nations-Métis-and-northern-affairs-directory
	Exploration and Mining Guide for Aboriginal Communities	https://www.nrcan.gc.ca/mining-materials/aboriginal/bulletin/7823
	Government of Saskatchewan Northern Benefits Summary	https://www.saskatchewan.ca/business/first-nations-Métis-and-northern-community-businesses/economic-development/northern-socio-economic-benefits-summary
	Indigenous Works: TRC Call to Action	https://indigenousworks.ca/en/partnership/what-does-intersection-mean/trc-call-action
MRLesson 2	Saskatchewan Mining Association's Explore a Career in Mining	http://saskmining.ca/Mines-in-Saskatchewan/EFM-Career%20Profiles
	Nutrien Supplier Diversity Video	https://www.nutrien.com/suppliers/supplier-diversity
	Nutrien Diversity Play Book	https://www.nutrien.com/sites/default/files/uploads/2020-05/Nutrien_Diversity_Playbook.pdf
	Mining Industry Human Resources Council	https://mihr.ca/career-development/
	Saskatchewan Mining Labour Market Information	http://saskmining.ca/ckfinder/userfiles/files/Labour-Market-Reports/2014-SMA.pdf
MRLesson 3	Saskatchewan Mineral Resources Map	http://saskmining.ca/ckfinder/userfiles/files/97534-ResourceMap2018_English.pdf
	A Day in the Life of an Environmental Scientist	https://www.youtube.com/watch?v=iFp7QujrwS0
	Mineral Development: A Short Guide to Understanding Process	https://newagemetals.com/mineral-development-a-short-guide-to-understanding-the-process/
	Denison Mines Mine Design: Wheeler River Project	https://www.denisonmines.com/projects/core-projects/wheeler-river-project/
General	Saskatchewan Mining Association	http://saskmining.ca/
	Natural Resources Canada	https://www.nrcan.gc.ca/maps-tools-publications/publications/minerals-mining-publications/18733
	Government of Saskatchewan	http://www.environment.gov.sk.ca/Default.aspx?DN=932b6eaa-b38e-4adc-8d6b-83a404328042
	Prospectors and Developers Association of Canada	https://www.pdac.ca/
	The Mining Association of Canada	https://mining.ca/

Role Cards	The Money Behind Mineral Exploration and Development in Canada	https://newagemetals.com/the-money-behind-mineral-exploration-and-development-in-canada/

Examples of Indigenous Economic Development Agencies 2020

Indigenous Economic Development Agencies		
Agency	Website	First Nation/Community Affiliation
Athabasca Basin Development	https://athabascabasin.ca/	Hatchet Lake Development LP Black Lake Venture LP Fond du Lac First Nation LP Northern Hamlet of Stony Rapids Northern Settlement of Wollaston Lake Northern Settlement of Uranium City Northern Settlement of Camsell Portage Athabasca Basin Development Corporation
Clarence Campeau Development Fund	https://clarencecampeau.com/	The Métis Society of Saskatchewan Inc.
Des Nedhe Development	https://desnedhe.com/	English River First Nation
FHQ Developments	https://www.fhqdev.com/	**File Hills Qu'Appelle Tribal Council:** Nekaneet First Nation Wood Mountain Lakota First Nation Piapot First Nation Muscowpetung Saulteaux Nation Pasqua First Nation Standing Buffalo Dakota Nation Little Black Bear's Band of Cree & Assiniboine Nations Okanese First Nation Star Blanket Cree Nation Peepeekisis Cree Nation Carry-The-Kettle Nakoda Nation
First Nations Power Authority	https://fnpa.ca/	
George Gordon Developments Ltd	https://www.ggdevelopments.com/	George Gordon First Nation
Kitsaki Management LP	https://kitsaki.com/	Lac La Ronge Indian Band
MLTC Industrial Investments	http://mltcii.com/	**Meadow Lake Tribal Council:** Birch Narrows Dene Nation Buffalo River Dene Nation Canoe Lake Cree Nation Clearwater River Dene Nation English River First Nation Flying Dust First Nation Makwa Sahgaiehcan First Nation Ministikiwin Lake Cree Nation Waterhen Lake First Nation
PBN Pinehouse Business North	http://pinehousebusinessnorth.ca/	Pinehouse Community
Peter Ballantyne Group of Companies	https://pbgoc.com/	Peter Ballantyne Cree Nation

Sakitawak Development Corporation	http://www.sakitawakdevelopmentcorporation.ca/	Village of Ile-à-la-Crosse
Saskatchewan River Business Corporation	https://www.facebook.com/saskriverbusiness/	Cumberland House Cree Nation
Saskatoon Tribal Council Economic Development Services	https://www.sktc.sk.ca/about-stc/economic-development/	**Saskatoon Tribal Council:** Kinistin Saulteaux Nation. Mistawasis First Nation. Muskeg Lake Cree Nation. Muskoday First Nation. One Arrow First Nation. Whitecap Dakota First Nation. Yellow Quill First Nation.
STC Industrial Contracting	https://stcindustrial.ca/	
Whitecap Development Corporation	https://whitecapdevcorp.ca/	Whitecap Dakota First Nation

Additional Resources for Indigenous-owned businesses:

Saskatchewan First Nations Natural Resource Centre of Excellence

Saskatchewan Chamber of Commerce Indigenous Business Directory