

Bachelor of Education (Elementary) & Bachelor of Education (Secondary) STEM/BETT Lesson Plan

Lesson Title: First People's Traditional Separation and Extraction Methods Lesson # 8 Date: Oct. 15th 2024
Name: Georgina Wilson Subject: Science Grade(s): 6

Rationale:

This lesson is important because it introduces students to First Peoples' traditional methods of extracting essential substances like oil from eulachon, pigments from plants, and medicines from natural resources. Students will research one of these methods, then write a well-organized paragraph summarizing their findings, linking Indigenous knowledge with scientific concepts of separating mixtures. This lesson is vital for fostering an understanding of Indigenous knowledge systems, promoting Indigenization, reconciliation, and decolonization within the science curriculum. By incorporating traditional practices, students learn that Indigenous knowledge has long provided sustainable and effective methods for working with natural resources. Aligned with the First Peoples' Principle of Learning, which emphasizes recognizing the consequences of one's actions, the lesson helps students reflect on the environmental impact of resource use. Students will build on prior knowledge of mixtures and local Indigenous groups, like the Secwepemc people, gaining a deeper appreciation for these cultural practices and their relevance in modern sustainability. Through this, the lesson challenges Western-centric views, honours Indigenous science, and supports the reconciliation process, while encouraging ongoing reflection on current environmental challenges.

Core Competencies:

Communication	Thinking	Personal & Social
I contribute purposefully to discussions and conversations. I synthesize, deepen, and transform my own and others' thinking. I can weave multiple messages into my communications; I understand that my audience will use their own knowledge and experiences in making meaning. I show understanding and control of the forms and technologies I use; I can assess audience response and draw on a repertoire of strategies to increase my intended impact. I can acquire, critically analyze, and integrate well-chosen	Creative Thinking I can get ideas that are groundbreaking or disruptive and can develop them to form a body of work overtime that has an impact in my community or beyond. I challenge assumptions as a matter of course and have deliberate strategies (e.g., free writing or sketching, meditation, thinking in metaphors and analogies) for getting new ideas intuitively. I have a strong commitment to a personal aesthetic and values, and the inner motivation to persevere over years if necessary to develop my ideas.	Personal Awareness & Responsibility I am aware of my personal journey and reflect on my experiences as a way of enhancing my well-being and dealing with challenges. I can advocate for myself in stressful situations. I can take the initiative to inform myself about controversial issues and take ethical positions. I take ownership of my goals, learning, and behaviour. I act on what is best, over time, in terms of my goals and aspirations. I recognize the implications of my choices and consult with others who may be affected by my decisions. I can

<p>information from a range of sources.</p>	<p>Critical and Reflective Thinking I can determine my own framework and criteria for tasks that involve critical thinking. I can compile evidence and draw reasoned conclusions. I consider perspectives that do not fit with my understandings. I am open-minded and patient, taking the time to explore, discover, and understand. I make choices that will help me create my intended impact on an audience or situation. I can place my work and that of others in a broader context. I can connect the results of my inquiries and analyses with action. I can articulate a keen awareness of my strengths, my aspirations and how my experiences and contexts affect my frameworks and criteria. I can offer detailed analysis, using specific terminology, of my progress, work, and goals.</p>	<p>identify my potential as a leader in the communities I belong to. I sustain a healthy and balanced lifestyle.</p> <p>Positive Personal and Cultural Identity I can identify ways in which my strengths can help me meet challenges, and how my challenges can be opportunities for growth. I understand that I will continue to develop new skills, abilities, and strengths. I can describe how aspects of my life experiences, family history, background, and where I live (or have lived) have influenced my values and choices. I understand that my learning is continuous, my concept of self and identity will continue to evolve, and my life experiences may lead me to identify with new communities of people and/or place.</p> <p>Social Awareness and Responsibility I build and sustain positive relationships with diverse people, including people from different generations. I show empathy for others and adjust my behaviour to accommodate their needs. I advocate and take thoughtful actions to influence positive, sustainable change in my communities and in the natural world. I can analyze complex social or environmental issues from multiple perspectives and</p>
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		understand how I am situated in types of privilege. I act to support diversity and defend human rights and can identify how diversity is beneficial for the communities I belong to.
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Big Ideas (Understand)

Everyday materials are often mixtures.
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Learning Standards

(DO)	(KNOW)
Learning Standards - Curricular Competencies	Learning Standards - Content
<p>Questioning and Predicting:</p> <ul style="list-style-type: none"> - Demonstrate a sustained curiosity about a scientific topic or problem of personal interest. <p>Processing and Analyzing Data and Information:</p> <ul style="list-style-type: none"> - Identify First Peoples perspectives and knowledge as sources of information: <p>Communicating:</p> <ul style="list-style-type: none"> - Communicate ideas, explanations, and processes in a variety of ways. 	<ul style="list-style-type: none"> • Mixtures: - Local First Peoples knowledge of separation and extraction methods

Instructional Objectives & Assessment

Instructional Objectives (students will be able to...)	Assessment
<p>Students will be able to:</p> <ul style="list-style-type: none"> • Research and identify traditional Indigenous methods of extracting oil, pigments, or medicines from natural resources. • Write a well-organized paragraph that includes a clear topic sentence, supporting details, and a concluding sentence. • Use at least two reliable sources to gather information about Indigenous extraction methods and cite them correctly. • Demonstrate an understanding of the significance of Indigenous knowledge in resource extraction and its connection to sustainability. 	<p>Observation: I will monitor students during their research to ensure they are finding and using reliable sources, and I will observe their organization and engagement while writing.</p> <p>Conversation: I will engage students in discussions to assess their understanding of the chosen extraction method and its significance, conducting informal check-ins to clarify their thinking and support their progress.</p> <p>Product: students will be assessed based on the written paragraph, evaluating the clarity of the topic sentence, the strength of supporting details, the inclusion of a concluding sentence, and the correct citation of sources. Additionally, I will assess their ability to connect Indigenous knowledge to sustainability and resource use.</p>

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<ul style="list-style-type: none">• Reflect on the environmental and cultural impact of traditional Indigenous practices, connecting them to modern-day resource use.	
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Prerequisite Concepts and Skills:

<ul style="list-style-type: none">- Understanding of mixtures and basic separation techniques (e.g., filtration, evaporation).- Familiarity with the idea that mixtures can be separated into different components.- Basic awareness of local Indigenous groups (e.g., Secwepemc people) and their cultural connection to the land.- Understanding of Indigenous land stewardship and sustainability practices.- Ability to write a structured paragraph (topic sentence, supporting details, and conclusion).- Experience using multiple sources for research and synthesizing information in their own words.
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Indigenous Connections/ First Peoples Principles of Learning:

<p>"Learning involves recognizing the consequences of one's actions."</p> <p>By teaching students about traditional Indigenous extraction methods, we are not only highlighting the sustainability and respect embedded in these practices, but we are also encouraging students to reflect on the modern-day implications of resource extraction. This principle connects to the understanding that Indigenous communities have long been caretakers of the land, using sustainable methods that minimize harm and ensure resources are available for future generations. This lesson encourages students to think critically about the environmental and social impacts of resource use today, fostering a sense of responsibility.</p>
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Universal Design for Learning (UDL):

<p>Multiple Means of Representation:</p> <ul style="list-style-type: none">• I will provide a variety of resources for research, including articles, videos, and visual aids, to support different learning styles.• I will use a visual organizer (like a paragraph structure template) to help students plan their writing. <p>Multiple Means of Action and Expression:</p> <ul style="list-style-type: none">• I will allow students to choose how they present their research, such as writing a paragraph, recording a verbal explanation, or creating a visual representation alongside the paragraph.• I will provide sentence starters and graphic organizers to support students who may struggle with structuring their writing. <p>Multiple Means of Engagement:</p> <ul style="list-style-type: none">• I will offer students a choice in their research topic (oil, pigment, or medicine extraction) to pursue a subject that interests them.• I will incorporate collaborative research opportunities, enabling students to discuss their findings with peers.
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Differentiate Instruction (DI):**Content:**

- I will provide differentiated research materials with varying levels of complexity, allowing students to choose articles or videos that match their reading level and comprehension skills.
- I will offer support through pre-selected sources for students who may need guidance in finding reliable information.

Process:

- I will allow flexible time for students who need more time for research or writing, while providing extension activities for those who finish early.
- I will offer one-on-one or small group support to students who may need help organizing their research or structuring their paragraph.

Product:

- I will adjust expectations for students with writing challenges by allowing alternative formats, such as audio recordings or diagrams with explanations.
- I will modify the required length of the paragraph or the complexity of the research for students who need additional support, focusing on quality over quantity.

Materials and Resources

- Google Slides presentation of extraction methods
- White board and projector
- Chromebooks for research
- Printed research articles on traditional extraction methods
- Writing and note-taking worksheets

YouTube videos of extraction methods:

- <https://www.youtube.com/watch?v=I9fHkpznMzY&t=1s>
- https://www.youtube.com/watch?v=p3nv_kZfkjk
- https://www.youtube.com/watch?v=TSL7HEtrj_Q

Community partners:

- If possible, I want to involve local Indigenous knowledge keepers, Aboriginal education workers, or community Elders to provide firsthand perspectives on traditional practices and help bridge connections between the classroom and real-world Indigenous knowledge.

Lesson Activities:

Teacher Activities	Student Activities	Time
<p>Introduction (anticipatory set – “HOOK”):</p> <p>I will begin by reviewing the concept of mixtures and how they can be separated, linking to prior lessons (e.g., filtration, evaporation, etc.). I will ask students to recall examples and processes they have explored in previous lessons.</p> <p>I will then introduce the idea that Indigenous peoples have used traditional methods to</p>	<p>Students are participating in discussion.</p>	

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<p>separate and extract materials from nature for thousands of years. I will briefly explain how these methods are rooted in deep knowledge of the land and resources.</p> <p>I will explain that students will choose one of three topics related to traditional Indigenous extraction methods:</p> <ul style="list-style-type: none">- Oil/grease extraction from eulachon (oolichan) fish- Pigment/dye extraction from plants- Medicine extraction from plants <p>I will discuss these extraction methods through Google Slides and play three YouTube videos of each extraction method.</p>	<p>Students are listening.</p> <p>Students are watching the videos.</p>	<p>10 min</p>
<p>Body:</p> <p>I will explain that their task today is to choose one of the three prompts to research and write a paragraph on it.</p> <ol style="list-style-type: none">1. What are the traditional methods that Indigenous people use to extract oil/grease from eulachon/oolichan) fish? What is the oil used for?2. What are the traditional methods that Indigenous people use to extract pigments/dyes from plants? What are the dyes/pigments used for?3. What are the traditional methods that Indigenous people use to extract medicines from plants? What plants are used? For what purposes? <p>I will display the writing criteria and structure, ensuring students understand the expectations: a well-organized paragraph with a topic sentence, supporting details, and a concluding sentence. Emphasize the use of at least two sources and writing in their own words.</p> <p>I will distribute Chromebooks and provide a research worksheet for students to take notes and list their sources.</p>	<p>Students are listening.</p> <p>Students are researching.</p>	<p>15 min</p>

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<p>Once students have completed their research, they will organize their notes using the writing template provided (with sections for the topic sentence, supporting details, and conclusion).</p> <p>Students will begin writing their paragraphs, ensuring clarity and coherence.</p>	<p>Students are completing the paragraph structure worksheet.</p> <p>Students are writing their paragraphs.</p>	<p>30 min</p>
<p>Closure:</p> <p>I will facilitate a class discussion on the different methods students researched. I will ask volunteers to share key points from their paragraphs.</p> <p>I will highlight the diversity of Indigenous knowledge and the importance of respecting and preserving these practices, particularly in relation to environmental sustainability.</p>	<p>Students are participating in class discussion.</p> <p>Students are listening.</p>	<p>5 min</p> <p>Total: 60 min</p>

Organizational Strategies:

<ul style="list-style-type: none">- I will begin the lesson by explicitly stating the learning objectives, so students understand what they are expected to achieve by the end of the lesson (research, write a paragraph, and understand Indigenous extraction methods).- I will break the lesson into clearly defined sections: a 10-minute introduction, 20 minutes for research, and 30 minutes for writing. I'll use a visible timer or classroom clock to help students manage their time effectively.- I will provide students with a graphic organizer to plan their paragraph, including sections for a topic sentence, supporting details, and a concluding sentence.- I will ensure Chromebooks, worksheets, and research materials are prepared in advance. Students will have easy access to both digital and printed resources to minimize distractions or delays.- I will arrange the classroom to allow easy access to technology and create an environment conducive to research and writing, with quiet areas for focused work and spaces for collaboration.- I will provide written and verbal instructions, reviewing them as a class before research begins. I'll also check in with students at regular intervals during the lesson to ensure they are on track.- I will provide scaffolding tools, like sentence starters and note-taking sheets, for students who may need extra support with writing and organizing their research.- I will set expectations for behavior during independent research and writing, ensuring students know when they can collaborate and when they should be working quietly.
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Proactive, Positive Classroom Learning Environment Strategies:

<ul style="list-style-type: none">- I will set clear expectations for behavior, such as listening respectfully, staying on task, and using Chromebooks appropriately. As well as consistent routines, like how to transition between activities, will help create a structured and predictable environment.

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- I will acknowledge and praise students for their effort, focus, and participation. I'll use specific feedback like "I really appreciate how you're staying on task during research" to encourage positive behavior.
- I will encourage peer-to-peer learning by allowing students to work together during the research phase. This fosters a sense of community and helps students feel supported by their classmates.
- I will offer students choice in where they work (e.g., sitting at their desk, working in pairs, or sitting at a table in the quiet corner), giving them a sense of ownership and control over their learning environment.
- I will encourage a growth mindset by reminding students that challenges in research or writing are part of the learning process. I'll celebrate effort and progress, not just the final product, fostering resilience and persistence.
- I will create an inclusive environment by integrating Indigenous perspectives and ensuring students feel respected and valued. I will use land acknowledgments and draw connections to local Indigenous knowledge, encouraging students to respect different worldviews.
- I will encourage them to use reliable sources (teacher-suggested websites, library resources, or printed materials).
- I will circulate the room, offering help to those needing support with research or finding sources and to assist with paragraph organization, grammar, and staying on task.
- I will create a calm down corner in the classroom where students can take a break if they are feeling overwhelmed, allowing them to self-regulate and re-engage with the lesson when ready.

Extensions:

- Students can extend their learning by researching traditional Indigenous extraction methods used by other Indigenous groups across Canada or worldwide. This could include how different cultures extracted resources like salt, clay, or minerals, comparing their techniques to those learned in this lesson.
- Students can participate in a hands-on activity where they attempt to replicate a traditional Indigenous extraction method, such as separating oil from seeds or plants using natural methods (under safe and guided conditions). This would provide a tactile learning experience and deeper understanding of these traditional practices.
- I could arrange for an Indigenous Knowledge Keeper or community partner to visit the class and share firsthand accounts of traditional resource extraction methods, along with their cultural and environmental significance.
- Students could investigate how Indigenous knowledge and traditional extraction methods relate to modern-day sustainability practices. They could create a project or presentation connecting these practices to current environmental challenges, such as oil spills or deforestation, highlighting how traditional methods could inspire modern solutions.
- In art, students could explore how Indigenous pigments were traditionally used in artwork, creating their own natural paints or dyes to complete an Indigenous-inspired art project. In science, students could further investigate the chemistry behind how plants or natural materials are used for medicine or dyes.
- Students can write a reflection on how traditional Indigenous knowledge of resource extraction complements or contrasts with modern scientific methods. This could lead to discussions on the importance of integrating Indigenous knowledge into scientific research today.

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Reflections (if necessary, continue on separate sheet):

Developing this lesson has inspired me to reflect deeply on my own position and biases. I recognize the need to approach Indigenous content with humility and an open mind, as I am an outsider to these cultures. In creating this lesson, I had to challenge my own preconceived notions about science, recognizing that Indigenous knowledge is not an "alternative" but a valid and vital form of understanding the world. I also had to confront the discomfort that comes with acknowledging the historical and ongoing marginalization of Indigenous peoples. It is essential for me to be mindful of not appropriating or misrepresenting Indigenous practices. I want to ensure that I approach these lessons with respect and seek input from Indigenous voices whenever possible, whether through consultation with knowledge keepers or collaboration with Aboriginal education workers. I am committed to ongoing learning and reflection in my teaching practice, acknowledging that this process is ongoing and requires continual effort to avoid falling into the trap of tokenism or superficial engagement with Indigenous content.

By reflecting on my role in creating this lesson, I aim to make space for Indigenous voices and perspectives, ensuring that students not only learn about these practices but also gain a deeper respect for the cultures they come from.

(Handouts for this Lesson on next page)

Name:

Source #1:
Notes:
Source #2:
Notes:

Paragraph Planning Page

<u>Title:</u>
<u>Topic Sentence:</u>
<u>Supporting Idea:</u>
<u>Supporting Idea:</u>

Name:

Supporting Idea:

Concluding Sentence:

Title: