

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

Lesson Title: Salmon and Sustainability **Lesson #** **Date:**
Name: Danielle Belliveau **Subject:** Science **Grade(s):** 9

Rationale:

Understanding the connectedness of the earth's cycles, including the cycle of life, and the flow of energy throughout species starting from plants to apex predators helps students understand the value and importance of conservation, sustainability, and maintaining healthy ecosystems. First Peoples have utilized their knowledge of sustainability and interconnectedness of the earth to their advantage since time immemorial, and their knowledge must be used when coming up with strategies regarding the land and species local to this area.

Salmon are keystone members of several ecosystems as they travel through their 4-year journey from birth to death, so they function as a great example to teach interconnectedness and sustainability. Additionally, salmon are an integral member of many First Nations communities and are specifically important to several First Nations communities in Secwepemcúlcw. Teaching students about the significance of salmon to First Nations communities helps them appreciate and understand the cultural diversity that exists in Canada and view the importance of interconnectedness from an indigenous lens. This lesson will also help students think critically about the relationships between all living and non-living things on earth and the importance of sustaining habitats and ecosystems.

Core Competencies:

Communication	Thinking	Personal & Social
<u>Collaborating:</u> <ul style="list-style-type: none"> Students will be working together at various points in this lesson and will be required to listen to and value the opinions and thoughts of their peers and to work together toward a common goal. They will need to be able to understand that their actions have consequences and to be able to act responsibly and appropriately to contribute to the best interests of their group. 		<u>Personal Awareness and Responsibility:</u> <ul style="list-style-type: none"> Learning about interconnectedness and sustainability will help students self-reflect on their own way of life and how the actions they take affect beings around them. This lesson will hopefully motivate students to think critically about sustainability, especially considering ecosystems close to home, and to make ethical decisions for themselves and others.

Big Ideas (Understand)

The biosphere, geosphere, hydrosphere, and atmosphere are interconnected, as matter cycles and energy flows through them.

Learning Standards

(DO)	(KNOW)
Learning Standards - Curricular Competencies	Learning Standards - Content
<ul style="list-style-type: none"> • Demonstrate an awareness of assumptions, question information given, and identify bias in their own work and secondary sources • Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information • Communicate scientific ideas, claims, information, and perhaps a suggested course of action, for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions, and representations 	<ul style="list-style-type: none"> • First Peoples knowledge of interconnectedness (everything is connected, from local to global; First Peoples perspectives on interconnectedness) and sustainability (First Peoples perspectives on sustainability of systems) • sustainability of systems

Instructional Objectives & Assessment

Instructional Objectives (students will be able to...)	Assessment
<ul style="list-style-type: none"> • Students will be able to explain the importance of interconnectedness and sustainability in regards to maintaining habitats and population numbers for vital species. • Students will be able to research the relationship between salmon and one other living or non-living aspect within an ecosystem and be able to identify or predict what would happen if salmon were removed from the equation. They will also be able to research and think critically of the importance of conservation and identify one conservation/sustainability strategy that has been developed with the inclusion of First Peoples opinions and knowledge. Students will be able to summarize their findings in an accurate, concise, and creative manner. • Students will be able to share their knowledge and engage with their peers during class discussions in this class (and then formally in whatever format they decide to do their project in at the end of the unit). 	<ul style="list-style-type: none"> • Observational/conversational assessment. It will be mostly formative. Are students engaged in any class discussions? (engaged does not necessarily mean they are speaking up). Are they able to communicate their thoughts and ask questions pertaining to the content? • Observational/conversational/product-based assessment. Are students working well with their group members? Are they focused? Are they able to explain their thoughts in regards to what direction they decided to do their research in? Do they have questions I can address? Evaluate their research skills (one of the curricular competencies). • Observational/conversational. Are they including First Peoples perspectives and understandings of local ecosystems, sustainability, and conservation efforts in class discussions?

Prerequisite Concepts and Skills:

- Understanding of basic terms related to the unit (sustainability, interconnectedness, ecosystems, conservation, etc.)
- Understanding that there are relationships that exist between components of ecosystems and that taking away a part or parts of ecosystems can lead to an unravelling of the web that holds everything together.
- Ability to conduct research using reliable sources.

Indigenous Connections/ First Peoples Principles of Learning:

FPPL #1: Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.

The lesson activity is centered around thinking about interconnectedness and the roles that species play in their ecosystems. By understanding the ripple effects that climate change, extinctions, habitat destructions, etc. will play on our world and livelihood, students can recognize that learning about these things can support the wellbeing of themselves, the land, and the people around them.

FPPL #4: Learning involves generational roles and responsibilities.

Conservatory efforts are often made too late for the people who implement them to see significant improvement, but that does not mean that they shouldn't try. Likewise, many of the conservation efforts made to bring back populations may not be evident for several salmon runs, but it is important to take measures now. Everyone has a part to play in maintaining our earth for those who come after us. This also relates to the lifecycle of the salmon, who give their entire selves to the next generation of salmon whom they will never see.

FPPL #5: Learning recognizes the role of indigenous knowledge.

The unit assignment assigned today will involve students researching conservation or sustainability efforts made to preserve salmon populations that have been made by or in collaboration with First Nations groups and knowledge.

Universal Design for Learning (UDL):

The content will be delivered in various ways – we will have class discussions, there will be videos, we will go through an interactive website together, etc.

The unit assignment assigned today gives room for students to showcase their strengths and perhaps work on their weaknesses – they will have the choice to present their findings in any creative way that they would like to.

Differentiate Instruction (DI):

If there are students who need differentiated instructions, adaptations will be made to the lesson to accommodate for their learning experience. If they have IEPs, changes would be made according to them.

Materials and Resources

Chromebook Cart
Pencil crayons/crayons/markers/etc.
Poster paper

Lesson Activities:

Teacher Activities	Student Activities	Time
<p>Introduction (anticipatory set – “HOOK”):</p> <p>Frontload the topic and outline of the day</p> <p>Coyote and Salmon (link page 135)</p> <p>And video of the importance and lifecycle of salmon</p> <p>Talk about interconnectedness (they learned about it in the previous lesson) and the Coyote and Salmon story (it ties into interconnectedness and living sustainably). Encourage a class discussion/brainstorm on how they think salmon contribute to various ecosystems and some things that might affect salmon populations, as well as how other parts of ecosystems are helpful to salmon (it is all a big circle!).</p>	<p>Students will be listening. If students wish to volunteer to read the story or part of it, they can.</p> <p>Students will be watching the video.</p> <p>Students will be participating in a class discussion. We will discuss what they thought of the story and what it meant to them. Guiding comments on the document.</p> <p>They will brainstorm together in groups ways that they think salmon contribute to various ecosystems during their remarkable journey and then each group will share one thing they came up with.</p>	<p>~5 min</p> <p>~3 min</p> <p>~10 min</p>
<p>Body:</p> <p>Together, go through the Pacific Salmon Foundation State of Salmon Report. It is an interactive website with many features, highlighting the decline in salmon populations across BC and the Yukon. Show them the Pacific Salmon Strategy Initiative statement that the Government of Canada released. Highlight that the strategies and propositions will include collaboration with Indigenous communities (video?).</p> <p>Students will be introduced to the unit assignment: They will be in groups of 2 or 3 (randomly assigned), and asked to research some role that salmon play in an ecosystem, what would happen if salmon were removed from the ecosystem, as well as conservation efforts made to preserve the species (find First Peoples methods of sustainability or strategies that have involved First Peoples knowledge and opinions for this) – there are lots of examples. They are encouraged to be creative with their assignment and will be required to share their results with the class, whether that be through a video, drawing, poster, presentation, etc. (at</p>	<p>Students will be listening and engaging as we go through the websites.</p> <p>Students will arrange themselves with their group members and grab a Chromebook/other materials they might need for their unit assignment. If students require other material, this is where they can come up with a plan and ask me to bring additional things if I don't have them. Students will be working collaboratively with their group on their unit assignment.</p>	<p>~10 min</p> <p>~35 min</p>

the end of the unit). Along with their main assignment, students will have to submit a one-page synopsis of what they have learned. Rubrics for the assignment will be posted on the Google Classroom. The sharing of their findings will be done on the final day of the unit (day 4). There will be a simple thumbs up/thumbs down check for understanding after the outline is given.		
<p>Closure:</p> <p>Students will be asked to share, as a group, one or two cool things they've learned in their research for the day – any discussion from other groups relating their findings to other groups is encouraged.</p> <p>Students will be reminded that a packing list for the following day is posted on the Google Classroom (field trip to the Adam's River Salmon Run at Tsútswechw Provincial Park).</p> <p>Chrome books away, any art supplies put away, students can pack up.</p>	<p>Students will be sharing one or two interesting or surprising things that their group learned today during their research.</p> <p>Students will be packing their stuff up for the end of class.</p>	~12 min

Organizational Strategies:

<ul style="list-style-type: none"> - Groups will be randomly assigned ahead of to avoid taking class time to organize groups and to avoid exclusion - Chrome books will already be in the classroom ready for when students start their project - Supplies students may need will be ready to go - Materials printed and ready to be handed out/online materials preloaded - All material, instructions, etc. will be posted on the Google classroom for students who missed this day or who are unsure of what to do.

Proactive, Positive Classroom Learning Environment Strategies:

<ul style="list-style-type: none"> - As always, it will remain a place for students to openly share their thoughts and opinions in class without judgment - Randomly assigned groups (possibly with some modifications) to prevent exclusion
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Extensions:

In the chance that students finish ahead of time, they could be given a research task to design a way that they could help preserve some species (can be any species) with an outline of what they would do and their reasoning as to why they think it will help (complete with sources to back them up). They can get creative here with budget, materials needed, etc. It does not have to be financially feasible or even physically possible, but they need to justify why they think it will work. This assignment would be given individually, and it would get students doing higher order thinking according to Bloom's Taxonomy.
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Reflections (if necessary, continue on separate sheet):

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Notes:

This lesson plan could be converted to a more intricate and in-depth lesson plan for life sciences 11, earth sciences 11, environmental science 11&12 (ideas @ [FNESC UNIT 6](#))

This unit can be done without a field trip, but if it is a year of a dominant sockeye salmon run, then there is the option of visiting the Salute to the Sockeye at Tsútswecw Provincial Park. They have free educational interpretive programs for grades 2-5, do they offer them for a fee for other grades ([link](#))? Alternatively, there are also several videos and virtual tours online that we can watch and learn from.