

Ocean Sense Program



Lesson 1

Module:

Science and Fishing

Time:

60 minutes

Learning pillars:

- Indigenous knowledge
- Ocean science
- Data exploration

Grade & curriculum connection:

- **BC Science 9**

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

Created in partnership with:



Aboriginal Education School District 52
Prince Rupert, Wap Sigatgyet

Many Ways to Fish

Explore a variety of fishing techniques historically and currently used by people in **Ts'msyen Territory** by reading and listening to passages from local knowledge holders about spear and **luulp** traditional fishing methods. Examine how salinity varies in different locations around **Ts'msyen Territory**, thus impacting fish species habitats and fishing methods employed based on location.

Traditional fishing methods were developed based on the species, habitat (river, estuary, or ocean), and time of year the species preferred. Most marine species have preferred ranges of salinity and temperature which determine where they can be found in the water column. The Ts'msyen knowledge of seasonal cycles and fishes' depth preferences helped people harvest effectively, with different fishing methods and tools being used based on the specific situation.

Learning objectives

- Experience and interpret the local environment
- Identify First Peoples' perspectives and knowledge as sources of information
- Express and reflect on personal, shared, or others' experiences of place

Materials

- Computer with internet connection
- Projector and screen
- Slide deck: **Science and Fishing**
- Activity 1: *Accounts from Different Voices*
- Pen and paper (1 per student)
- Worksheet: *Making Connections to Accounts from Different Voices*
- Access to **Ocean Sense dashboard: Science and Fishing**

Teacher preparation

- Print slides 5-12 and/or display the slide deck provided
- Copy the worksheet
- Preload the [Ocean Sense dashboard: Science and Fishing](#)

Classroom instructions

Hook

1. Share slides 2-4, discussing the prompt, “Where do we get our food today?”, on slide 4 in order to connect to self, the past, and the future.

Step-by-step process

2. Complete the activity Accounts from Different Voices using slides 5-10 and the worksheet Making Connections to Accounts from Different Voices.
3. Highlighting knowledge Alex Campbell shared on slide 8, explore how salinity varies in Ts’msyen Territory by using the *Ocean Sense dashboard: Science and Fishing*. Discuss the questions on slide 11:

- a. What units is water salinity measured in?

Answer: Practical salinity units or psu. One gram of salt per 1000 grams of water is defined as one practical salinity unit or one psu.

- b. How does the salinity compare between the Digby Island and the Atlin Terminal underwater platforms?

Potential answer since data are live and change slightly each day: Digby Island observatory is saltier (~30-32 psu) than the Atlin Terminal observatory (~20-30 psu).

- c. What could account for these differences?

Potential answer: The Digby platform is located at 24m depth, while the Atlin platform is located at 7m depth. Deeper water is often saltier than shallower water, because salty water is more dense than freshwater. Digby Island is also closer to the open ocean and Dixon Entrance whereas the Atlin Terminal is closer to sources of freshwater.

4. Share slide 12 that highlights traditional knowledge from Alex Campbell about how species and fishing methods were specifically chosen based on knowledge of water properties, including salinity.
5. Return to the questions on slide 4, focusing on the final two questions. Ask students, based on what everyone has learned, do answers to B and C change? Why or why not? Allow students to discuss their learning with these guiding questions.

Modifications and adaptations

- Complete the activity Accounts from Different Voices as a guided, rather than personal reflection.

Final remarks to the educator

In these passages, observation and knowledge of specific events and water properties informed how people gathered fish. Remember, these are historical examples told in the past tense, but Ts’msyen people continue to fish on their traditional territory today.

Assessment

- Collect the students' responses in the worksheet.

Extensions

- Help students find other passages from their area, or share passages related to their own experiences.
- Add additional questions related to salinity and the data dashboard. Some examples include the following:
 - If there is 1 gram of salt in 1000 grams of water for 1 PSU, how many grams of salt are there in 1000 grams of water at Digby Island?
 - Why do you think the salinity value keeps going up and down throughout the day? Why does it change so much?
 - Where do you think the water is saltier? In a river, estuary, or in the ocean? Near the surface of the ocean or deeper in the ocean?

Glossary

Estuary: Where a large river meets the ocean, and that area is impacted by tides.

Gaff: A stick or pole with a large hook on the end for catching fish.

Luulp: A circular trap made of boulders and built up to the height of about three to four feet, covering a very wide area.

Ebb tide: Lowering tide as the water goes out; the opposite is a flood tide as water comes in.

Lax Kw'alaams: A village located on the northwest coast of British Columbia; the name, Lax Kw'alaams, is derived from Laxlgw'alaams, which means "place of the small roses" in the Sm'algyax language."

Practical salinity units (psu): One practical salinity unit (psu) is one gram of salt per 1000 grams of water.

Tide: The rise and fall of the ocean, usually twice a day at a particular location, that results from the gravitational pull of the moon.

Ts'msyen Territory: Located on the northwest coast of British Columbia, including the cities of Terrace and Prince Rupert; there are five Nations of Ts'msyen people, and Ts'msyen means "inside the Skeena River"; may also be spelled "Tsimshian."

References

Beynon, W. (1999). *Luutigm Hoon: Honouring the salmon: An anthology told in the voices of the Tsimshian*. Tsimshian Nation, School District 52 (Prince Rupert).

Campbell, K. (2005). *Persistence and Change: A History of the Ts'msyen Nation*. Prince Rupert, British Columbia: Tsimshian Nation and School District 52.

Dunn. (2000-2024). ts'mluulp.wav [Audio recording]. In *Sm'algyax*. FirstVoices.<https://www.firstvoices.com/smalgyax/search?q=Ts%E2%80%99mluulp&domain=both&types=word%C3%9Bphrase%C3%9Bsong%C3%9Bstory>

Lax kw'alaams band. (n.d.). Lax Kw'alaams Band. Retrieved February 3, 2023, from <https://laxkwalaams.ca/>

Making connections. (n.d.). Read Write Think. Retrieved January 24, 2024, from <https://www.readwritethink.org/classroom-resources/printouts/making-connections>

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Activity 1

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Accounts from Different Voices

In **Ts'msyen Territory**, a variety of fishing techniques have been and continue to be used. New fishing technologies have been introduced throughout **Ts'msyen Territory** over time to suit the developments and needs of large-scale industrial fishing, while many of the traditional Ts'msyen fishing methods continue to be used today. In these passages, students will read two examples of traditional methods and respond to them.

Materials

- Computer with internet connection
- Projector and screen
- Slide deck: [Science and fishing](#)
- Pen and paper (1 per student)
- Worksheet: [Making connections to accounts from different voices](#)
- Passages attached at the end of the activity

Teacher preparation

- Print slides 6-10 and/or display the slide deck provided
- Copy the worksheet

Procedure

1. Read the passages in a manner that works best for the students, either by sharing slides 6-8 or printing out the passages.
 - a. If displaying the passages with the slidedeck, be sure to play the audio recording of the word ts'mluulp by pressing the speaker icon at the top of the slide.
2. Have the students respond to the passages using the worksheet *Making Connections to Accounts from Different Voices*.

3. Gather back as a whole group for the discussion questions on slide 9.
- What do these accounts tell us about how the Ts'msyen people traditionally fished?

Potential answer: Careful observation of the tides and changes in water properties would inform people how to best interact with their environment without putting themselves at undue risk.

Potential answer: Although it could be challenging to catch fish, traditional knowledge helped Ts'msyen people catch fish safely, sustainably, and effectively.

- What does this tell you about people's ability to observe and utilize their environment?

Potential answer: These passages highlight how observation and knowledge of specific events and water properties informed how the Ts'msyen people gathered fish.

- What questions does this inspire for you?

Answers will vary

- Based on the passages, what skills do you think are needed to be a successful fisher?

Potential answer: Observations and knowledge can help us make informed decisions about how to safely and sustainably harvest fish.

4. In a manner that works best for the students, check the students' understanding to ensure that the following details are highlighted:
- Observation and knowledge of specific events and water properties informed how the Ts'msyen people gathered fish.
 - Careful observation of the tides and changes in water properties would inform people how to best interact with their environment without putting themselves at undue risk. This was seen in the second passage, Ts'mluulp, Stone Trap, where it's described that people would use canoes to guide fish into the stream at ebb tide.
 - Although it could be challenging to catch fish, traditional knowledge helped Ts'msyen people catch fish safely, sustainably, and effectively. Today, similar observations and knowledge can help us make informed decisions about how to safely harvest fish.

Conclusion

5. Share slide 10 featuring a quote from Alex Campbell about fishing methods and seasonal cycles.

Passage 1: Fishing with spears

"The last salmon that run up the river they call steelheads. They are just like trout, and they are pretty large. They come late in the fall, and the way they catch them they get long poles and they make at the end something like clamps or tongs, and they have a gaff at the end so they get the whole salmon, and they pull it back. They have one on the end of the tongs and it goes into the flesh of the fish. It was made of very thin and springy boards. That is the way they caught trout sometimes. And they used very this [sic] trap at night. They would take a torch cut out of pitch wood and they could see into the water to spear the fish, and they would load up the boat, and in the morning they would give the fish away. They didn't smoke them, they just ate them fresh."

Sidney Campbell, Metlakatla, Alaska, 1917 (Beynon, 1999, p. 50)

Passage 2: Ts'mluulp, Stone Trap

"In the olden days it was with the greatest difficulty that the people were able to catch salmon before these went to the streams and rivers. In the rivers they could use traps made of pliable split cedar saplings and basket-like. They could only use those when the salmon headed for the streams. They also used weirs, a fence-like trap.

On the coast they made a luulp, a circular trap made of boulders and built up to the height of about three to four feet and covering a very wide area. The operation was very difficult. As the salmon approached in schools the many canoes on the water would endeavour to direct or force these schools of salmon into this enclosure, choosing a time of the falling ebb tide. Once the school was over the enclosure, it had to be kept there and long poles from the many canoes were used to shy the fish in whatever direction they were to be led. This was done until the tops of the luulp showed and thus the salmon would be trapped and when the tide left the luulp completely dry, then the salmon would be gathered up. Very nearly every salmon stream had a luulp."

Saelaban (John Tate), Gispaxlots (Beynon, 1999, p. 51)

Passage 3: Traditional fishing methods

"Traditional fishing methods were developed and used based on the species of fish that was being harvested, where the fish was both in terms of habitat (river, estuary, or ocean) and depth the species preferred (Salmon being known as a 'deep' fish), as well as the specific time of year. Most marine species have preferred levels of salinity and temperature which determine where they can be found in the water column. The Ts'msyen knowledge surrounding seasonal cycles and depth preferences (based on salinity and temperature) for fish were used to help people fish effectively, with different fishing methods and tools being used based on the specific situation."

Alex Campbell, Ts'msyen Nation, Lax Kw'alaams, British Columbia, personal communication, June 2016

Name: _____



Making connections to Accounts from Different Voices

As you read the passages in Accounts from Different Voices, record what you learned and a connection you’ve made to that learning. Use the three types of connections as you record what you’ve learned: text-to-self, text-to-text, and text-to-world connections.

Text-to-self

Connect the passages to something in your own life.

😊

Text-to-text

Connect the passages to other non-fiction reading (book) or viewing (video) you’ve experienced.

📖

Text-to-world

Connect the passages to something that has happened or is happening in the world.

🌍

What I learned	Connection I made	Type of connection (circle)
		😊 📖 🌍
		😊 📖 🌍
		😊 📖 🌍
		😊 📖 🌍