Lesson Guide: Trout

Vocabulary:

1. Trout / Wawa'lam (Nez Perce)
2. Kooyit (First Foods Feast)
3. Traditional Ecological Knowledge
4. Anadromous
5. Food Sovereignty
6. Treaty Rights
7. Riparian Ecosystem
8. Keystone Species
9. Tribal Co-Management
10. Bioavailability
11. Omega-3 Fatty Acids
12. Cultural Genocide

Engage:

- Students read a story passage about trout, rivers, and tribal relationships to First Foods. After reading, they complete a reflective writing prompt:
- Prompt: "How do the Nimiipuu and Ojibwe demonstrate sustainability practices grounded in TEK, and how do these practices compare to modern fisheries science?"

Explore and Explain:

- **Activity 1: Indigenous Language Vocabulary**
  - Students use a worksheet to define seven key vocabulary terms, connect them to the story, and add translations from their own language or research Nimiipuu (Nez Perce) terms.
  - This activity builds academic vocabulary, strengthens language connections, and helps students understand how cultural knowledge and meaning are embedded in words.

- **Activity 2: TEK vs. Modern Fisheries Science (Venn Diagram)**
  - Students create a Venn diagram to compare **Traditional Ecological Knowledge (TEK)** from the Nimiipuu and Ojibwe with **modern fisheries science** approaches.
  - This activity helps students identify similarities and differences in management practices, knowledge systems, and sustainability principles, reinforcing how both frameworks inform contemporary fisheries co-management

Elaborate:

- **Activity 3: Carrying Capacity — Aquatic Ecosystems**
  - Students investigate five key environmental factors that influence trout carrying capacity and compare how **Traditional Ecological Knowledge (TEK)** and modern management respond to each limiting factor.
  - This activity strengthens ecological reasoning by helping students identify how habitat conditions, human impacts, and management decisions shape the long-term stability of trout populations.

- This activity strengthens quantitative reasoning and highlights how TEK and modern fisheries science both aim to balance harvest with long-term ecosystem health.

- **Activity 4: Sustainable Fisheries & Tribal Co-Management**
    - Students analyze a historical case study of the Snake River dams to understand how infrastructure, fish population decline, and treaty-protected rights intersect in fisheries management.
    - This activity helps students connect ecological data, TEK, and policy by examining how tribal nations use scientific evidence and cultural knowledge to advocate for sustainable and sovereign fisheries.

Evaluate

- **Activity 5: Traditional Ecological Knowledge and Modern Science**
    - Students read a documented research excerpt from the Chippewa Ottawa Resource Authority (CORA) and analyze how scientific monitoring of contaminants and omega 3 fatty acids supports, complements, and validates Traditional Ecological Knowledge (TEK).
    - This activity deepens understanding of how treaty rights, cultural significance, and modern scientific data intersect in tribal fisheries co management, helping students connect long term research to Indigenous food systems and sovereignty.
- **Exit Ticket: Connecting it all together; TEK, Treaty Rights and Fishery Science**
    - Students write a brief reflection responding to a prompt that connects the day's learning about TEK, treaty rights, and fisheries science.
    - This exit ticket gives students an opportunity to synthesize key ideas and demonstrate how their understanding of Indigenous knowledge and modern science has grown.
    - The exit ticket allows students to synthesize learning from the day's activities and demonstrate understanding of TEK–science relationships.

Suggested Lesson Activities:

- Indigenous Vocabulary
- TEK vs. Modern Fisheries Science (Venn Diagram)
- Carrying Capacity — Aquatic Ecosystems
- Sustainable Fisheries & Tribal Co Management
- Traditional Ecological Knowledge and Modern Science
- Exit Ticket

Additional Educator Resources:

-Nez Perce (Nimiipuu) Fisheries & Treaty Rights

- **Nez Perce Tribe – Department of Fisheries Resources Management** The tribe's own fisheries department page — covers hatcheries, harvest management, co-management of the Snake Basin, and the department's history as one of the largest tribal fisheries programs in the U.S. Excellent primary source for Activity 4.
- **Nez Perce Tribe DFRM Management Plan 2013–2028 (PDF)** The tribe's actual fisheries management plan, including Nimiipúu timpt (Nez Perce language terms), oral traditions, treaty fishing rights, spawning data, co-management forums, and dam impacts. Ideal for advanced students and for the Activity 4 Snake River case study.

- **U.S. Fish & Wildlife Service – Nez Perce Tribe Partnership** Covers the 1974 Boldt Decision and treaty-reserved fishing rights — provides accessible federal context for the legal history discussed in the lesson narrative.
- **Columbia River Inter-Tribal Fish Commission (CRITFC)** The tribal commission representing Yakama, Warm Springs, Umatilla, and Nez Perce tribes. Covers salmon as a keystone species, treaty rights, co-management, and ecological restoration from a tribal science perspective. Directly relevant to the lesson's co-management and treaty rights themes.

-Ojibwe (Anishinaabe) Fisheries, Treaty Rights & the Voigt Decision

- **Great Lakes Indian Fish & Wildlife Commission (GLIFWC) – Educator's Corner** GLIFWC's dedicated classroom page with posters, publications, treaty rights materials, and indigenous language resources. Specifically supports Wisconsin Act 31 and Minnesota IEFA standards. Directly supports Activities 1 and 5.
- **GLIFWC – About the Commission & Treaty History** Explains the 1983 Voigt Decision (*Lac Courte Oreilles v. Voigt*), how GLIFWC was formed, and how Ojibwe treaty rights are exercised and managed today — exactly what the lesson narrative covers in Part IV.
- **Chippewa Ottawa Resource Authority (CORA) – 1836 Treaty Fishery Overview (PDF)** The actual CORA publication explaining the 1836 Treaty fishery, tribal commercial fishing, and the regulatory structure — the primary source behind the Activity 5 research excerpt.
- **CORA Omega-3 & Contaminant Research – PubMed Peer-Reviewed Study** The peer-reviewed 2018 journal article ("Fatty Acids in Ten Species of Fish Commonly Consumed by the Anishinaabe") that the Activity 5 excerpt is drawn from. Appropriate for 11–12th grade students exploring how scientific data validates TEK.
- **Full-Text Version of CORA/NIH Contaminant & Fatty Acid Study – PMC** Open-access full text of the mercury, PCBs, selenium, and omega-3 study from CORA's 1991-onward monitoring program. Useful for students analyzing how tribal co-management agencies conduct and publish scientific research.

-Snake River Dams & Fish Population Data (Activity 4)

- **Trout Unlimited – Lower Snake River Dam Science & Policy** Clear, well-cited summary of why the four lower Snake River dams are driving salmon and steelhead toward extinction, with data on smolt-to-adult ratios and habitat loss. Accessible for high school students.
- **American Fisheries Society – Statement on Snake River Dam Removal** The formal scientific position statement from the nation's leading fisheries science organization. Excellent for helping students understand how scientific consensus is reached and communicated to policymakers.
- **University of Washington – "Why Give a Dam About the Snake River?"** A rigorous but accessible academic essay from the UW School of Marine and Environmental Affairs covering the ecological case for dam removal, sediment flow, riparian restoration, and comparisons to the successful Elwha River dam removal. Ideal reading-level for 9–12.

-Traditional Ecological Knowledge (TEK) — Background & Integration

- **NOAA Fisheries – Sovereign Relations on the West Coast (Tribal Co-Management)** NOAA's own explanation of the government-to-government relationship with Pacific Northwest tribes, co-management authority, and treaty rights — useful federal agency perspective for comparing with tribal perspectives.
- **USDA Climate Hubs – Tribal Food Sovereignty and Climate Change in the Northwest** Federal resource covering how climate change is intersecting with tribal food sovereignty,

with specific attention to salmon, the Columbia River Intertribal Fish Commission, and Muckleshoot/Swinomish restoration efforts.

- **High Desert Museum – Food Gathering, First Foods, and Food Sovereignty (Educator Resource)** Oregon-focused educator resource connecting First Foods ceremonies (including the kooyit), the CTUIR First Foods Management Framework, and CRITFC — directly tied to the lesson's Nimiipuu narrative and vocabulary.
- **Northwest Indian Fisheries Commission – Fisheries Management & Video Resources** Includes a 10-minute classroom-appropriate video on tribal fishing practices, salmon migration, and co-management with Washington State. Strong visual supplement for Activities 2 and 4.
- **NATIFS – Indigenous Food Sovereignty Lesson Plan** A structured lesson on Indigenous food sovereignty from the Native American Traditional Indigenous Food Systems organization — complements the exit ticket essay prompt and food sovereignty vocabulary term.

Rivers of Memory: The Nimiipuu, the Ojibwe, and the Sacred Fish

For Grades 9–12: A Narrative Integrating Documented Cultural, Ecological, and Political History

Please feel free to modify these materials as needed to meet the needs of your students and community.

Source Transparency for Educators: This narrative is grounded in documented historical, ecological, and ethnographic sources. The Nez Perce (Nimiipuu) First Foods Ceremony ('kooyit'), treaty fishing rights (preserved in the 1855 Walla Walla Treaties and subsequent agreements), the practice of weir fishing with deliberate fish passage gaps, bone return rituals, and the role of women in fish processing are all documented in tribal cultural records and academic ethnography. Ojibwe (Anishinaabe) ice fishing traditions, fish clan structures, and treaty rights (including the 1836, 1837, and 1842 treaties with the U.S. government) are documented in historical and legal records. The cutthroat trout's cultural name in Nez Perce is 'wawa'lam.' All scientific claims about trout nutrition, ecology, and population are evidence-based.

Part I: The First Fish — Ceremony, Ecology, and Knowledge

On a plateau between the Rocky Mountains and the Cascades, where the Snake, Salmon, and Clearwater rivers drain thousands of miles of mountain terrain, the Nimiipuu people have fished for generations beyond documented memory. Their relationship with fish, particularly the salmon and cutthroat trout ('wawa'lam'), is not an artifact of history. It is a living, treaty-protected right, a central element of their cultural identity, and a sophisticated ecological management system that modern fishery science has increasingly validated.

The Nimiipuu, like other Plateau peoples, organized their fishing practices within a framework of reciprocal obligation. Fish were not owned or commodified; they were understood as relatives who chose to sacrifice themselves for the people. This understanding carried practical consequences: it meant that each fishing decision carried moral weight. To waste fish was to dishonor a sacrifice. To harvest beyond need was to break trust with the fish and jeopardize the relationship. To fail to maintain the river conditions the fish required was to be ungrateful for a gift that could then be withdrawn.

These principles were formalized in the kooyit, the First Foods Feast. The first fish of each season was caught, prepared, and shared communally, with explicit prayers of thanks to the Creator and to the fish. The first fishing of the season was accompanied by prescribed rituals and a ceremonial feast known as kooyit. Thanksgiving was offered to the Creator and to the fish for having returned and given themselves to the people as food. By eating the first fish together before any individual could take their own, the community reaffirmed the collective nature of their relationship with the river. No one profited from what the fish gave before everyone had shared in it.

Part II: Engineering Without Blueprints — The Weir System

Nimiipuu fishers were engineers as much as hunters. Their weirs, structures woven from willow withes, branches, and wooden stakes placed across narrow stream sections, were precisely designed to concentrate fish for easy harvest while ensuring their continued passage upstream. Crucially, weirs were never built to span the full width of a waterway. A fish passage, a gap in the structure, was always maintained.

This practice, which would be called "minimum harvest threshold management" in contemporary fisheries science, ensured that breeding populations could reach their spawning grounds. The result was a self-regulating system: weirs efficiently harvested from the downstream population while protecting the upstream reproduction that regenerated that population each year. Tribes also tracked spawning locations across generations, avoided concentrations of harvest in the same place in consecutive years, and seasonally relocated their weirs in response to observed fish movements.

Women played a central role in processing, splitting, smoking, and drying fish on racks over alder, cedar, or other hardwood smoke. A well-smoked trout or salmon could last through winter while retaining the essential omega-3 fatty acids, protein, and vitamins that sustained families through months of snow and limited foraging. The smoked fish was also a valuable trade commodity, carried overland by horseback to exchange with Plains tribes for buffalo hides, dried meat, and other goods.

Part III: The Ojibwe and the Ice — Parallel Traditions, Shared Principles

Two thousand miles to the east, in the cold depths of the Great Lakes, a parallel story... The Ojibwe (Anishinaabe) people, including the NamekosipiiwAnishinaapek, the "Trout Lake Ojibwe" among them, built their lives around the lake trout and other freshwater fish that filled the greatest freshwater system on Earth.

The Ojibwe's relationship with fish was encoded in their clan system. Fish clans, including sturgeon, pike, catfish, and merman, were not arbitrary totemic assignments. They reflected a deeply practical understanding of social organization: just as different fish occupied different ecological niches in a lake's community, different clans occupied different social and functional roles in human communities. People born into the fish clan "are chosen to help teach and develop skills" according to Ojibwe tradition, a recognition that the fish's qualities (hidden, steadfast, navigating unseen currents) correlated to certain kinds of human leadership.

Ojibwe fishing was a year-round practice adapted to every season. Summer brought open-water spear fishing and netting; autumn brought great communal harvests as fish congregated before winter; winter brought the ice fishers, who cut holes through thick lake ice and dangled carved wooden decoys to attract lake trout and walleye. These decoys were not toys. They were functional tools requiring knowledge of fish behavior, water optics, and predator-prey dynamics that took years of observation and practice to master.

Part IV: When Treaties Were the Last Line

For both the Nimiipuu and the Ojibwe, the 19th and 20th centuries brought existential threats to their fishing traditions. But both peoples had negotiated treaty rights that explicitly preserved their ability to fish, hunt, and gather on lands they ceded to the United States government.

For the Nimiipuu, the 1855 Walla Walla Treaties preserved fishing rights at "all usual and accustomed places," a clause that would require decades of legal defense as dams, irrigation diversions, and private development blocked their access to traditional fishing sites. The construction of dams on the Columbia, Snake, and Clearwater rivers devastated salmon and trout populations, eliminating the fish from stretches of river they had occupied for millennia. Tribal biologists, armed with generations of Traditional Ecological Knowledge about fish spawning locations and migration timing, worked alongside and sometimes in opposition to federal agencies to document the populations' collapse and advocate for restoration measures.

The legal and ecological work of the Nimiipuu Tribe contributed to some of the most significant fisheries policy changes of the late 20th century, including the listing of multiple salmon and steelhead populations under the Endangered Species Act and ongoing efforts to remove dams on the lower Snake River that block fish passage. Today, the tribe operates fish hatcheries, monitors water quality, and participates in co-management agreements with state and federal agencies. Their TEK, records of spawning locations, population trends, and habitat conditions accumulated across generations, is formally incorporated into federal management plans.

For the Ojibwe, treaty rights battles centered on the Great Lakes. The 1837, 1842, and 1854 treaties all preserved Ojibwe rights to fish in ceded territory. Despite this, state game wardens repeatedly arrested Ojibwe fishers for exercising off-reservation rights in the mid-20th century. In the landmark 1983 case Lac Courte Oreilles Band of Lake Superior Chippewa Indians v. Voigt (the "Voigt Decision"), the Seventh Circuit Court of Appeals affirmed that these treaty rights remained in force, triggering years of politically contentious conflict before co-management agreements normalized tribal participation in Great Lakes fisheries management.

Part V: The Nutritional Logic of Traditional Knowledge

Modern nutritional science has confirmed what generations of Indigenous fishers knew empirically: trout and other freshwater fish are among the most nutritionally complete foods available in northern environments. Rainbow trout and lake trout provide complete protein with all essential amino acids, omega-3 fatty acids (EPA and DHA) at levels exceeding 50% of the daily recommended value per serving, vitamin B12 at 118% of daily value per fillet, vitamin D, selenium, phosphorus, and multiple B vitamins, all in a food with relatively low mercury compared to larger predatory fish.

For communities living through cold northern winters, with limited access to fresh vegetables or fruits, the nutrient density of traditionally prepared fish was not merely beneficial; it was survival-critical. The smoking and drying processes that the Nimiipuu and Ojibwe used to preserve fish through winter have been shown to retain most of the fish's protein and omega-3 fatty acid content, even while removing the water weight. Concentrated, lightweight, and calorie-dense, dried smoked trout was a portable and complete food for travel, trade, and winter storage.

A 2018 peer-reviewed study published through the Chippewa Ottawa Resource Authority confirmed the presence of significant omega-3 polyunsaturated fatty acids (PUFA N-3) in Great Lakes fish traditionally harvested by Ojibwe tribes, validating the nutritional foundation of the fishing practices these communities had defended in court for decades.

Name: _____ **Date:** _____

Activity 1: Indigenous Languages Vocabulary Sheet (9-12)

Directions: Look up each vocabulary word. Write the meaning in your own words. Then write the term in your Native or Tribal language or use the Nez Perce examples and research to find others. Practice pronunciation if possible.

Example: Cutthroat Trout, a freshwater trout with a red mark under the jaw, native to Western U.S. river systems; Nez Perce: wawa'lam

Vocabulary Word Indigenous Language / Your Language	Definition (your words)
Trout *Wawa'lam* _____ *Nez Perce*_____	_____ _____
First Foods Ceremony *Kooyit*_____ *Nez Perce*_____	_____ _____
Traditional Ecological Knowledge	_____ _____
Anadromous	_____ _____
Food Sovereignty	_____ _____
Treaty Rights	_____ _____
Riparian Ecosystem	_____ _____

Keystone Species	_____ _____
Anadromous	_____ _____
Tribal Co-Management	_____ _____
Bioavailability	_____ _____
Omega-3 Fatty Acids	_____ _____
Cultural Genocide	_____ _____

Name: _____ **Date:** _____

Activity 2: Sustainable Fishing — Weir Design and TEK Analysis

Activity 2: Compare and Contrast — TEK vs. Modern Fisheries Management

Create a Venn diagram, in the space below to compare **Traditional Ecological Knowledge (TEK)** as practiced by the Nimiipuu and Ojibwe with **modern industrial fisheries management**. Consider: knowledge acquisition methods, time horizon of management, relationship to fish populations, community governance vs. agency governance, and track record of sustainability.

Key concepts to explore:

- TEK is accumulated through intergenerational observation; modern science uses short-term experiments and data collection
- TEK encodes sustainability in spiritual and ceremonial practice; modern management uses numeric quotas
- Both have been validated by outcomes — TEK maintained populations for thousands of years; modern science is still learning from Indigenous practices
- Co-management models now formally integrate both

Analysis of your diagram:

_____

_____

_____

_____

_____

Name: _____ **Date:** _____

Activity 3: Carrying Capacity — Aquatic Ecosystems

Carrying capacity describes the maximum number of individuals an environment can support over time without degrading the ecosystem. In aquatic systems such as rivers and streams, factors like water temperature, stream flow, habitat access, and food availability help determine whether populations, such as trout, can stay healthy.

In the table below, review five factors that influence trout carrying capacity. Compare how Traditional Ecological Knowledge (TEK) and modern management respond to these limiting factors.

Factor	Impact on Trout Population	Traditional TEK Response	Modern Management Response
Water temperature increase	Reduces dissolved oxygen; stresses cold-water species	Protect riparian shade trees along stream banks	Restore riparian vegetation; monitor temperature
Dam construction	Blocks migration to spawning grounds	Oppose or modify through treaty rights advocacy	Fish ladders; dam removal consideration
Overharvest	Reduces spawning stock below replacement level	Weirs with passage gaps; seasonal rotations	Harvest quotas; catch-and-release requirements
Invasive species	Competes with or preys on native trout	Monitor through observation; report to community	Systematic removal programs
Drought / reduced snowpack	Lower stream flow; higher temperature	Seasonal migration to follow fish; adjust harvest	Reduce water withdrawals; restore wetlands

1. Define carrying capacity in your own words.

_____

_____

2. What is a limiting factor?

_____

_____

3. Choose one factor from the table. Explain how it reduces trout carrying capacity.

_____

_____

4. Why is cold water especially important for species like trout?

_____

_____

5. Which factor do you think has the most immediate impact on trout populations? Explain your reasoning.

_____

_____

6. Which factor could have the longest-lasting impact? Why?

_____

_____

7. TEK and modern management sometimes suggest similar actions. Describe one example of a similarity from the table.

_____

_____

8. Describe one difference between TEK and modern management approaches shown in the table.

_____

_____

9. Which system—TEK or modern management—has been practiced for thousands of years?

_____

_____

10. Why is it valuable to consider both TEK and modern management strategies when caring for an ecosystem?

_____

_____

11. Imagine you are responsible for maintaining healthy trout populations in a local river. Choose one factor and propose a management plan that blends TEK and modern science.

_____

_____

Name: _____ **Date:** _____

Activity 4: Sustainable Fisheries and Tribal Co-Management (worksheet below)

Using the knowledge gained about carrying capacity and traditional practices, students work through the Sustainable Fisheries Management worksheet, which applies the same analytical framework as the Mutton unit's grazing management activity to an aquatic ecosystem.

Historical Case Study — The Snake River Dams

Between 1955 and 1975, four dams were constructed on the lower Snake River in Idaho and Washington: Ice Harbor Dam (1962), Lower Monumental Dam (1969), Little Goose Dam (1970), Lower Granite Dam (1975).

Historical salmon/steelhead returns before dams: approximately 1.5–2 million adult fish per year to the Snake River system. Estimated returns after dam construction: 50,000–100,000 adult fish per year (a 90–97% reduction).

1. Calculate: What percentage decline does this represent?

2. The Nez Perce Tribe's treaty rights preserved fishing at 'all usual and accustomed places.' How does a 90–97% population decline affect treaty rights, even when the legal right to fish technically remains?

3. Review the data: Tribal biologists documented spawning locations that government agencies did not have on record. What does this reveal about the value of Traditional Ecological Knowledge in conservation?

4. Modern proposals to remove the four lower Snake River dams project a recovery of 60–80% of historical salmon/steelhead populations over 50 years. What does this suggest about the relationship between infrastructure decisions and food sovereignty?

Part B: Trout Nutrition Calculations

A Nimiipuu family prepares for winter by preserving part of their trout harvest through traditional smoking and drying. Drying removes much of the water from the fish, making it lighter and increasing the concentration of nutrients per gram of food. The total amount of protein remains the same, but the protein becomes more concentrated because there is less water.

Given:

- A family harvests 50 cutthroat trout averaging 2.0 lbs (fresh weight) each
- Total fresh harvest = 100 lbs
- Smoking and drying remove approximately 60% of the fish's weight as water
- Therefore, 2.0 lbs fresh trout → approximately 0.8 lbs smoked trout
- Raw trout contains approximately 21 g protein per 100 g
- Smoked trout contains approximately 35 g protein per 100 g
- Each family member requires approximately 50 g protein per day
- Family size: 6 people
- Winter storage period: 120 days

5. How many pounds of smoked trout does the family produce from their 50-fish harvest?

6. Convert pounds to grams (1 lb = 453.6g). How many grams of smoked trout do they have?

7. How many grams of protein does this represent?

8. How many total grams of protein does the family need for 120 days?

9. Does the 50-fish harvest provide sufficient protein for the winter? Show your calculation.

10. Challenge: If the carrying capacity of their local stream section supports sustainable harvest of 200 cutthroat trout per season, and the family needs 50, what percentage of the sustainable harvest are they using? What happens to the remaining fish?

Name: _____ Date: _____

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Historical salmon/steelhead returns **BEFORE DAMS:**

~1.5–2 million

adult fish per year to the Snake River system

Estimated returns **AFTER DAM CONSTRUCTION:**

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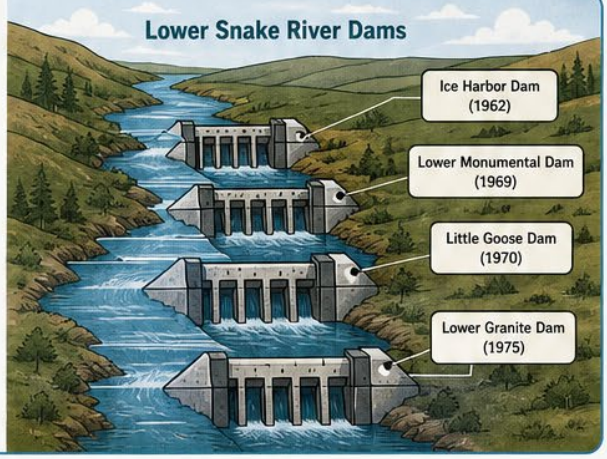

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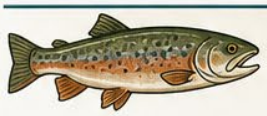

Part B: Trout Nutrition Calculations

A Nimiipuu family prepares for winter storage, processing their trout harvest through traditional smoking. Use the data below to calculate nutritional storage.

Given:

- A family harvests 50 cutthroat trout averaging 2 lbs (fresh weight) each
- Smoking removes approximately 60% of water weight — so 2 lbs fresh = approximately 0.8 lbs smoked
- Smoked trout: approximately 35g protein per 100g; raw trout: approximately 21g protein per 100g
- Each family member needs approximately 50g protein per day
- Family size: 6 members. Winter storage period: 120 days

5. How many pounds of smoked trout does the family produce from their 50-fish harvest?
6. Convert pounds to grams (1 lb = 453.6g). How many grams of smoked trout do they have?
7. How many grams of protein does this represent?
8. How many total grams of protein does the family need for 120 days?
9. Does the 50-fish harvest provide sufficient protein for the winter? Show your calculation.
10. **Challenge:** If the carrying capacity of their local stream section supports sustainable harvest of 200 cutthroat trout per season, and the family needs 50, what percentage of the sustainable harvest are they using? What happens to the remaining fish?

Healthy fish.
Healthy river.
Healthy people.

Working together today for seven generations to come.

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Name: _____ **Date:** _____

Activity 5: Traditional Ecological Knowledge and Modern Science

Read the following excerpt from documented research on Great Lakes tribal fisheries co-management, then answer the discussion questions below.

> **From documented research:** The Chippewa Ottawa Resource Authority (CORA) has monitored contaminant concentrations and fatty acid profiles of lake trout and whitefish in the 1836 treaty-ceded waters of Lakes Superior, Huron, and Michigan since 1991. Their research confirmed significant omega-3 polyunsaturated fatty acids in Great Lakes fish traditionally harvested by Great Lakes tribes, thereby validating a nutritional foundation that Indigenous fishers had relied upon for centuries. The study notes: 'Wild caught fish are an important link to the culture of Great Lakes Native American tribes and important sources of food and omega-3 polyunsaturated fatty acids.' The intersection of legal treaty rights, cultural significance, and nutritional data in a single research program represents what tribal co-management looks like in practice.

Questions

1. In your own words, what is the main purpose of CORA's long-term monitoring program described in the excerpt?

2. What two fish species are highlighted in the research, and why might these species be important to Great Lakes tribes?

3. Define **Traditional Ecological Knowledge (TEK)** and **co-management** based on how they are used in the excerpt.

4. The excerpt mentions “contaminant concentrations” and “fatty acid profiles.” What kinds of scientific methods or data might be used to measure each of these, and why monitor both?

5. How does confirming significant omega-3 polyunsaturated fatty acids in traditionally harvested fish serve as **evidence** that supports TEK? Explain the link between data and tradition.

6. CORA has monitored these measures since 1991. What can long-term datasets show that short-term studies cannot?

Name: _____ Date: _____

Exit Ticket Activity: One Page Essay

"How do the fishing practices and ecological knowledge of the Nimiipuu (Nez Perce) and Ojibwe peoples demonstrate principles of sustainable fisheries management that are now being validated by modern science? What does this history reveal about the relationship between Indigenous sovereignty, food security, and environmental stewardship?"

Include in your writing:

- A clear thesis connecting traditional practices to modern sustainability principles
- Evidence-based analysis incorporating at least three topics from this unit (specific practices, treaty rights history, nutritional science, carrying capacity/aquatic ecology, co-management)
- Critical thinking connecting historical Indigenous practices to current environmental and food sovereignty challenges
- A conclusion synthesizing your main points.