Lesson Guide: Trout

Vocabulary:

- Cutthroat Trout (wawa'lam — Nez Perce)
- First Foods Ceremony (kooyit — Nez Perce)
- Weir
- Watershed
- Stewardship
- Treaty Rights
- Food Sovereignty

Engage:

- Read the story 'The River Remembers: Trout and the Nimiipuu (Nez Perce)' as a class. This story is inspired by the documented traditions of the Nimiipuu (Nez Perce) people, for whom fish, especially the cutthroat trout, were a vital First Food.

  Before reading, have students journal (5 minutes):
  - What do you know about where your food comes from?
  - Can a food be more than just nutrition? Give an example.
  - What does it mean for a community to have 'rights' over a resource?

  After reading, ask students:
  - The Nimiipuu and Ojibwe always left a gap in their weirs so fish could continue upstream to spawn. What does this practice tell us about how they understood the relationship between today's choices and tomorrow's resources?
  - The kooyit ceremony required that the first fish of the season be shared with the entire community — elders first — before anyone ate alone. Why do you think sharing was built into the ceremony itself, rather than being left up to individual families?
  - Have you ever been part of a tradition or celebration centered around food? What did the food mean beyond just eating — and how is that similar to or different from what the wawa'lam means to Nimiipuu peoples?

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 Sustainable Fishing — Weir Design and TEK Analysis**
  - Students examine traditional fish weirs through a video or reading, analyze design features (materials, structure, and fish passage gaps), and create their own labeled weir design.
  - This activity develops critical thinking and engineering skills while helping students understand Traditional Ecological Knowledge (TEK) as a scientific system grounded in sustainability and long-term resource management.

Elaborate:

- **Activity 3: Trout Nutrition**
    - Students analyze a nutrition table for cutthroat trout and complete questions connecting nutrients (protein, omega-3s, Vitamin D, B12) to environmental conditions, preservation methods, and cultural practices.
    - This activity strengthens data interpretation and scientific reasoning while reinforcing how nutrition, environment, and culture are interconnected.

- **Activity 4: Protein Sources**
    - Students compare trout with other traditional foods using a nutrient table, then answer questions about nutrient differences, health impacts, and trade value.
    - This activity deepens understanding of nutrient roles, supports comparative analysis skills, and highlights the real-world consequences of losing access to key food sources.

Evaluate

- **Activity 5: Watershed Map Analysis and CER Argument**
    - Students analyze a watershed map to trace trout migration, identify environmental challenges, and complete a Claim–Evidence–Reasoning (CER) response using the map, story, and nutrition data.
    - This activity builds systems thinking and argumentation skills, helping students synthesize ecological, cultural, and nutritional concepts into evidence-based conclusions.

- **Exit Ticket: Why Trout Matter**
    - Students complete a three-part exit ticket by finishing sentence stems that explain the ecological, cultural, and nutritional importance of cutthroat trout to the Nimiipuu.
    - This activity assesses students' ability to summarize key concepts and demonstrate understanding of how environmental systems, cultural traditions, and nutrition are interconnected.

Suggested Lesson Activities:

- Indigenous Vocabulary
- Sustainable Fishing — Weir Design and TEK Analysis
- Trout Nutrition
- Protein Sources
- Reading the Watershed Map
- Exit Ticket

Additional Educator Resources:

- U.S. Fish & Wildlife Service – Cutthroat Trout
- NOAA Fisheries – Salmonid Life Cycles and Migration
- Trout in the Classroom
- NH Trout Classroom Educators Guide
- Rutgers University Trout in Classroom Activity Guide (8th grade)
- Trout Unlimited Trout in the Classroom Lessons (STEM, Visual and Language Arts, etc.)
- Alaska Dept of Fish and Game Cutthroat Trout
- Idaho Fish and Game Cutthroat Trout

- Oregon Dept of Fish and Game Cutthroat Trout
- U.S. Fish and Wildlife Service
- Westslope Cutthroat Trout
- Bureau of Indian Affairs-Fish, Wildlife & Recreation Program

Rooted in the traditions of the Nimiipuu (Nez Perce) and Ojibwe peoples

Begin by reading the passage 'The River Remembers: Trout and the Nimiipuu' together as a class. Explain that the Nez Perce (Nimiipuu) people have maintained treaty-protected fishing rights along the Snake, Salmon, and Clearwater rivers for centuries — and that trout and salmon are not simply food, but First Foods carrying deep spiritual, nutritional, and cultural significance.

Special Note for Educators: The Nimiipuu (Nez Perce) people have inhabited the plateau lands of present-day Idaho, Oregon, and Washington for thousands of years. Their cutthroat trout (wawa'lam) and salmon are legally protected as First Foods under multiple treaty agreements, including the 1855 Walla Walla Treaties. The 'kooyit' (First Foods Feast), traditionally opens each fishing season with communal thanksgiving and prayer. The Ojibwe of the Great Lakes region maintained parallel traditions of ice fishing, spear fishing, and seasonal weir harvest, with fish clans (including lake trout) serving as important totemic identities.

Before reading, have students journal (5 minutes):

- What do you know about where your food comes from?
- Can a food be more than just nutrition? Give an example.
- What does it mean for a community to have 'rights' over a resource?

The River Remembers: Trout and the Nimiipuu

A Teaching Narrative Rooted in Nez Perce (Nimiipuu) and Ojibwe Oral and Cultural Traditions

There is a river in the plateau country of the Northwest that the Nimiipuu people have fished for thousands of years. Its waters run cold and clear, fed by snowmelt from the mountains, dropping through canyon walls carved by time. In spring, when the ice breaks and the snowmelt floods the tributaries, the river fills with life. And from deep in the ocean, fish — salmon and trout — find their way back to the exact streams where they were born.

The Nez Perce call themselves the *'Nimi'ipuu' (We the People')* and they have always understood that their identity is inseparable from their rivers. The cutthroat trout, wawa'lam, has long been a part of their diet and ceremony. Smaller than salmon but perfectly suited to the clear mountain streams, cutthroat trout could be found in the upper reaches of river systems throughout the plateau, providing food when the salmon runs were over or had not yet begun.

Each spring, when the first fish returned, the Nimiipuu held a ceremony called the kooyit (koy-yit)— the First Foods Feast. The first fish of the season was not sold, not traded, and not eaten by a single person. It was prepared by the community, offered with prayers of gratitude to the Creator and to the fish itself, and shared with every member of the village — elders first, then families, then children. By eating the First Fish together, the people renewed their relationship with the river and asked that fish would return again the following year.

Nimiipuu fishing was sophisticated and sustainable, refined over centuries of careful observation. Fishermen built weirs — intricate fences of woven willow and wooden stakes —

across sections of streams. Fish would swim into the weir and could be harvested easily. Importantly, weirs were never built across the entire width of a river; a gap was always left to allow fish to pass through and continue upstream to their spawning grounds. This was not merely practical — it was law, rooted in the understanding that today's restraint ensures tomorrow's abundance.

Spears, dip nets, and hook-and-line methods were also used, each suited to different seasons and water conditions. Women processed the fish, by splitting, smoking, and drying them on racks in the sun and wind. A well-preserved catch could feed a family through winter. The smoked trout and salmon were so valuable that they were also traded with other tribes far from the rivers, spreading the Nimiipuu's reputation as masterful fishers and food preparers.

Far to the east, along the shores of the Great Lakes, the Ojibwe (Anishinaabe) people had their own deep relationship with trout. Lake trout, a massive, ancient fish that could live for decades in the cold depths of Lakes Superior, Huron, and Michigan were and are central to Ojibwe life and identity. The Ojibwe organized their clans partly around fish: the sturgeon clan, the pike clan, the catfish clan, and others each carried responsibilities and spiritual connections tied to their fish totem.

Ojibwe fishers worked through the seasons: harvesting in open water with nets and spears in summer and cutting holes through the winter ice to fish with carved wooden decoys in the long cold months. Ice fishing was patient, quiet work, requiring deep knowledge of where the fish moved in winter and what lures they responded to. It was also communal families and neighbors worked the ice together, sharing knowledge and harvest.

Like the Nimiipuu, the Ojibwe understood that fish were not simply resources. They were relatives who chose to give their lives for the people. This understanding was encoded in treaty agreements: when the Ojibwe ceded millions of acres to the U.S. government in the 1830s and 1840s, they explicitly reserved their right to fish, hunt, and gather on those ceded lands. These treaty rights, fought for and defended in courts for over a century remain legally binding today.

In the late 19th and 20th centuries, dams built on the Columbia, Snake, and other rivers blocked salmon and trout from reaching their spawning grounds. Overfishing and pollution reduced populations dramatically. For the Nimiipuu and other Plateau tribes, this was not only an ecological crisis, but a cultural and nutritional emergency. Their treaty rights guaranteed access to fish, but the fish themselves were disappearing.

The Nimiipuu Tribe has spent decades working on fish restoration, advocating for dam removal, restoring streamside vegetation, monitoring water quality, and operating their own hatcheries. In the 1990s, their legal efforts contributed to the listing of several salmon and trout populations under the Endangered Species Act, which required federal dam managers to consider fish passage. Tribal ecological knowledge; recording spawning locations, population patterns, and habitat conditions over generations proved invaluable to restoration scientists.

Today, the cutthroat trout remains a species of conservation concern, but tribal and agency partnerships have improved conditions in many river systems. The wawa'lam swims again in waters where it was absent for decades. The kooyit continues to be held each spring, connecting living people to generations of fishers who came before them.

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Discussion Questions After Reading (or to Journal on):

- The Nimiipuu and Ojibwe always left a gap in their weirs so fish could continue upstream to spawn. What does this practice tell us about how they understood the relationship between today's choices and tomorrow's resources?
- The kooyit ceremony required that the first fish of the season be shared with the entire community--elders first before anyone ate alone. Why do you think sharing was built into the ceremony itself, rather than being left up to individual families?
- Have you ever been part of a tradition or celebration centered around food? What did the food mean beyond just eating and how is that similar to or different from what the wawa'lam means to Nimiipuu peoples?

Teacher's Note on Cultural Sensitivity

This story is drawn from the documented oral traditions, treaty history, and living practices of the Nimiipuu (Nez Perce) and Ojibwe (Anishinaabe) peoples. Present it as a living teaching, not a chapter from the past. Many tribal nations continue to fish, hold ceremony, manage hatcheries, and defend treaty rights in courts today. The kooyit First Foods Feast is still held each spring.

When discussing treaty rights, help students understand that these are legal agreements, and the supreme law of the land under the U.S. Constitution, not gifts or special privileges. Treaties were negotiated by tribal leaders in exchange for vast land cessions, and they have been upheld repeatedly by federal courts.

Encourage students to recognize that the Nimiipuu's weir design, seasonal harvest practices, and multi-generational tracking of fish populations are forms of Traditional Ecological Knowledge (TEK)-- a sophisticated science developed by Indigenous people through centuries of careful observation, just as valid as any laboratory-based approach. In fact, tribal ecological knowledge has been formally incorporated into federal fisheries management and Endangered Species Act recovery plans precisely because it captures data no written record can match.

Name: _____ **Date:** _____

Activity 1: Indigenous Languages Vocabulary Sheet (6–8)

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)
Cutthroat Trout *Wawa'lam* *Nez Perce*	_____ _____
First Foods Ceremony *Kooyit* *Nez Perce*	_____ _____
Weir	_____ _____
Watershed	_____ _____
Stewardship	_____ _____
Treaty Rights	_____ _____
Food Sovereignty	_____ _____

Name: _____ **Date:** _____

Activity 2: Sustainable Fishing — Weir Design and TEK Analysis

Many tribes created weirs that were sophisticated, sustainable, and governed by cultural law. Analyze the design and principles behind the weir system, compare it to modern fisheries management, and sketch your own design, after watching the video on Native American weirs, and/or reading the attached passage: *"Shoshone Fish Weir", Meriwether Lewis.*

Analyze the Weir

1. What materials can be used to build weirs, and why do you think those specific materials are or were chosen?

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_____

_____

2. The Nimiipuu and Ojibwe always left a gap in the weir. Explain why this gap was both a practical and a cultural decision.

_____

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_____

3. How does the gap in the weir demonstrate an understanding of carrying capacity and population sustainability? Use what you know from science class in your answer.

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_____

Shoshone Fish Weir, By Meriwether Lewis

This excerpt from Meriwether Lewis's journal describes a Lemhi Shoshone fish weir on present-day Idaho's Lemhi River, a tributary of the Salmon River. After months of travel the Corps of Discovery had finally made their way across the Continental Divide and were descending the Lemhi Valley in search of a route to the Columbia River. On August 21, 1805, a party led by William Clark came across a Shoshone camp consisting of about seven families. The Indians received the strangers warmly, and after being regaled with salmon and chokecherries, Clark visited their weir, a fencelike structure designed to catch fish. In the excerpt reproduced here, Lewis describes how the Indians built the weir, and how it functioned to trap fish going both upriver and downriver. Fish were an important component of the diet of the Northern Shoshone peoples living along the Salmon River and its tributaries. Game was scarce in the mountains where they lived and hostile groups to the east armed with firearms prevented them from hunting buffalo on the Plains. The Lemhi Shoshone took trout and other resident fish throughout the year, but the seasonal runs of salmon made the greatest contribution to their subsistence. Weir technology was widespread throughout the Great Basin, Plateau, and Northwest Coast culture areas. Freshwater weirs like the one described here were located on small and medium sized streams. Coastal weirs were built along the margins of estuaries and were designed to work with the tides to catch herring, salmon, smelt, flounder, and other fish. The remains of many of these structures have been found on the Oregon coast, some more than 2,000 years old. Whether coastal or inland, weirs were often cooperatively built and maintained. Among the Nez Perce, for example, traps and weirs were built by kinship and village groups and were regulated by task leaders who distributed the harvest to the community. Weirs allowed Native peoples to closely monitor salmon fisheries, shaping their harvests in response to annual variations in run size and the demands of upriver communities.

Name: _____ **Date:** _____

Activity 3: Trout Nutrition — What the Science Confirms

Modern nutritional science confirms what generations of Indigenous tribes knew, that cutthroat trout is one of the most nutrient-dense freshwater foods available. For communities living in cold climates with limited winter food sources. In this activity, you will analyze nutrition data and connect it to the cultural and historical significance of trout.

Review the table below carefully. Use this data to answer the nutrition analysis questions (back of page).

Nutrient	Amount per 100g	% Daily Value	Why It Matters for Health
Protein (complete)	21 g	42%	Provides all essential amino acids. Builds and repairs muscle, organs, and immune cells. Critical for growing adolescents and active adults.
Omega-3 Fatty Acids (EPA + DHA)	>1,100 mg	>50% DV	Supports brain development, heart health, and reduces chronic inflammation. Found in very few land-based foods — fish is the primary natural source.
Vitamin B12	3.9 mcg	118% DV	Essential for nerve function and red blood cell production. Deficiency causes fatigue, numbness, and neurological damage. Rare in plant foods.
Vitamin D	~155 IU	~19% DV	Critical for calcium absorption and bone strength. Also regulates immune function. One of only a handful of natural dietary sources. Especially important in northern latitudes with limited sun exposure.
Selenium	~27 mcg	~36% DV	Supports thyroid function and acts as an antioxidant protecting cells from damage. Important in regions with selenium-poor soils.
Phosphorus	~260 mg	~21% DV	Works with calcium to build and maintain bones and teeth. Also fuels energy metabolism in every cell.
Iron	~0.3 mg	~2% DV	Carries oxygen in red blood cells. Heme iron (from animal sources) is more easily absorbed than plant-based iron.
Mercury Level	Very Low	Safe	Freshwater trout is among the lowest-mercury fish. Safe for regular consumption, including by children and pregnant women — unlike many large ocean fish.

Nutrition Analysis Questions

1. Write 2–3 sentences explaining what surprises you about the nutrition of freshwater fish, using the Nutrient table.

2. The Nimiipuu smoked and dried trout to preserve it through winter. Fresh trout is about 75% water and most of that water is removed during drying. Drying removes water and concentrates by approximately 300% (about 4 times the concentration of fresh fish), estimate the amount of protein in 100g of dried smoked trout. Show your calculation.

3. Vitamin D is produced by skin exposure to sunlight and absorbed from a very small number of foods. The Nimiipuu homeland in the plateau country of Idaho, Oregon, and Washington has cold winters with limited sun. Why would fish be especially important in this specific geographic setting?

4. The story says that when fish populations declined due to dams and overfishing, it was ‘a cultural and nutritional emergency.’ Using specific nutrients from the table, explain why the word ‘emergency’ is scientifically accurate, not just culturally accurate.

Name: _____ **Date:** _____

Activity 4: Comparing Protein Sources

The table below compares trout with other protein sources.se Use the table to answer the comparison questions.

Food (per 100g)	Protein	Omega-3s	Vitamin D	Notes
Cutthroat Trout	21g	High (>1,100 mg)	155 IU	Complete protein; very low mercury; rich in B12 and selenium
Venison (deer)	26g	Low (trace)	0 IU	Good protein but no omega-3s or Vitamin D
Bison	25g	Low	0 IU	High iron; still no omega-3s or Vitamin D
Camas root (staple plant food)	2g	None	0 IU	Important carbohydrate and calorie source; not a protein or fat source
Dried berries	1–2g	None	0 IU	Vitamins and antioxidants, but minimal protein or fat
Eggs (when available)	13g	Low-Med	~87 IU	Good but far less omega-3 and Vitamin D than fish

Which two nutrients does trout provide that almost no other food in this table supplies? Why would this make fish irreplaceable, not just convenient, for the Nimiipuu?

_____

_____

_____

If a Nimiipuu family lost access to trout for an entire winter because dams blocked the fish runs, which specific health problems might develop over time? Name at least two, connect each to a specific nutrient, and explain the consequence.

_____

_____

_____

The story mentions that smoked trout was traded with other tribes far from the rivers. Based on the nutrition data, why would other communities value this trade item so highly?

_____

_____

_____

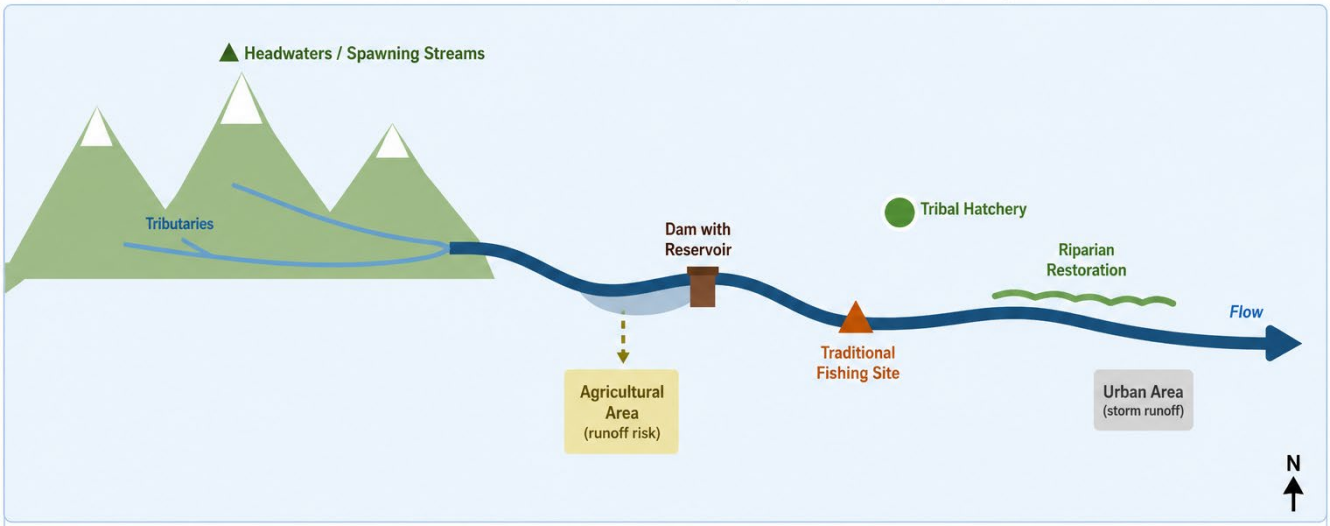
Name: _____ **Date:** _____

Activity 5: Reading the Watershed Map

> *Background: The Nimiipuu (Nez Perce) have always understood that a healthy river is more than a single stream, it is an entire watershed: every raindrop, snowflake, spring, and tributary that drains into a common river system. Healthy cutthroat trout populations depend on the health of the whole watershed, not just the main channel. In this activity you will analyze a watershed map, trace the connections between land use and fish health, and build an evidence-based argument.*

Study the Snake/Clearwater watershed diagram below. Each symbol represents a real feature of this landscape. Answer the analysis questions that follow.

WATERSHED MAP — Snake / Clearwater River System — Nimiipuu (Nez Perce) Homeland



Main River · Tributary / Stream · Dam · Tribal Hatchery · wawa'lam (Cutthroat Trout) (Traditional Fishing Site) · Riparian Restoration · Agricultural Area (runoff risk) · Urban Area (storm runoff)

Map Key — Features on the Watershed:

HEADWATERS & SPAWNING STREAMS (mountains, upper left)	MAIN RIVER thick blue line flowing east to downstream	DAM dark brown rectangle on river with reservoir behind it	TRIBAL HATCHERY green circle downstream of dam	WAWA'LAM (CUTTHROAT TROUT) (TRADITIONAL FISHING SITE) triangle on riverbank	AGRICULTURAL AREA dashed arrow shows runoff to river	RIPARIAN RESTORATION green zone along lower river	URBAN AREA gray box near river mouth
Where the river begins in the mountains and small streams provide cold, clean water for fish to spawn.	The main river that connects all parts of the watershed from the headwaters to the lower river.	A structure that holds back water, forming a reservoir and changing natural river flow.	A place where fish are raised to support healthy fish populations in the river.	A cultural fishing site where people traditionally harvest wawa'lam (cutthroat trout).	Farmland area where rain or irrigation can wash soil, nutrients, and chemicals into the river.	Vegetated area along the riverbank that helps clean the water, prevent erosion, and support wildlife.	Towns or cities where rainwater runs off streets and roofs into the river.

Flow direction: left (mountains) → right (downstream)

Map Analysis Questions

1. Trace the path a cutthroat trout must travel to reach its spawning grounds. List two obstacles it would face on this map and explain the impact of each.

2. The Nimiipuu traditional fishing site is located downstream of agricultural land. How might farm runoff affect the health of fish caught and eaten at that site? Think about both ecology and food safety.

3. Look at where the tribal hatchery is placed on the map. Notice how it is downstream of the dam, upstream of the traditional fishing site. Why is this location strategic? What problem is the hatchery trying to solve?

Claim · Evidence · Reasoning

Using the map, the story “The River Remembers,” and the nutrition data from Activity 3, complete the Claim–Evidence–Reasoning chart below.

ESSENTIAL QUESTION

“Is the loss of cutthroat trout from the Snake and Clearwater rivers an ecological problem, a cultural problem, or a nutritional problem, or all three? Use evidence to support your answer.”

Component	Your Response
CLAIM *Your answer in one clear sentence.*	
EVIDENCE #1	
EVIDENCE #2	
REASONING *Explain how your evidence supports your claim. Use the word "because."*	

Name: _____ Date: _____

Exit Ticket Activity
Directions: Complete each sentence.

1. **Ecological (Environmental):** Cutthroat trout are important to the environment because…

   _____

   _____.

2. **Cultural:** Cutthroat trout are important to the Native people because…

   _____

   _____.

3. **Nutritional:** Cutthroat trout are important for health because…

   _____

   _____.