

The Salmon Game

Why do kids from kindergarten through high school respond to this crazy predator/prey tag game?



High school students are sometimes hard to motivate in a boxed-in classroom. However, take them out to a sunny, wide-open beach on Kodiak and they'll surprise you with their boundless enthusiasm.

Having been asked to be the keynote speaker for Envirothon, a national environmental science competition, I initially experienced a great deal of anxiety when asked to make a presentation at a remote ranch to over one hundred high school students stuffed into a cramped building. What on earth would I say to Alaska's best and brightest students, individuals who will go on to create new knowledge in fields of scientific research, public lands policy and natural resource careers? The minute before I hopped on a plane bound for Kodiak Island, the coordinator of the Envirothon program gave me a call.

"Kay, we're going to have to move you to Abercrombie State Park for your presentation. The ranch idea fell through. Is that ok?"

Abercrombie. The jewel of state parks in Alaska. This glorious stretch of old-growth forest, pristine beaches and abandoned WWII bunkers is one place that I could teach in for eternity.

The park's collective masses of moss are a teaching tool in their own right.

"I adore that place!" I responded. "Alright if I use the beach?"

Thanks to good friends on Kodiak who lead extraordinary Girl Scout programs, I had been able to take an exploratory hike at Abercrombie and knew that the beach, nearby trail and visual panorama of the watershed would offer me the opportunity to teach one of the best educational activities ever: The Salmon Game!

Why do kids from kindergarten through high school respond to this crazy predator/prey tag game that stories the salmon life cycle and challenges they face in their diverse habitats, from mountain streams to estuaries to the open ocean? Because acting like a sea lion is fun. Because tagging your peers with a bear or eagle puppet is ridiculous and brings heaps of laughter to the activity. Because running through the salmon life cycle and avoiding being turned into "sushi" by a dam's turbines is challenging, to say the least. Because, in Alaska, our families and our future depend on a healthy salmon habitat. It's relevant to us all.

The Salmon Game!

Overview

Students investigate salmon life cycle stages and their relationship to parts of the watershed. They mimic salmon to understand predator/prey relationships and to generate questions and ideas, and work cooperatively to research the salmon's life journey through a watershed, answer the questions and gather evidence for their claims. They share and discuss their findings with the class, and demonstrate their knowledge by making a poster, a presentation, a mural, or a habitat for a salmon.

Objectives

Students will be able to describe and demonstrate:

- The salmon's life journey through the mountain streams, wetlands, rivers, estuary, and the sea
- The salmon life cycle stages and where each takes place within the watershed
- Predator/Prey relationships throughout the salmon's lifecycle
- Human Impact on salmon populations and habitat



Activities

1. Students investigate the salmon life cycle, researching their local salmon streams, rivers, wetlands, estuaries, and where the salmon reach the sea. Working in small teams, students create a poster, chalk board art, community or school mural, or a model of the salmon life cycle. **(60 minutes or more)**
2. Using their salmon life cycle knowledge, students split into two groups and play a game mimicking the salmon's story. One half of the students start out as baby salmon on a hillside (representing their natal mountain stream) who must run along the stream (trail or 10' wide path marked out by cones) to the ocean (large area with a toy boat) where they run around the boat four times to represent their four years out at sea. They then have to return to their home on the mountain, walking backward to represent the tough current. If they are tagged by the other half of students (playing the roles listed below), they have to trade roles with the person who tagged them.

Along the way, they face many challenges (played by other students):

- Predators (bear, eagle, lynx, fox, salmon, orca, sea lion)
- Fisherman (noodle and student with foot in bucket holding hula hoop)
- Dam (two responsible students or adults swinging long jump rope)
- Pollution (Caution tape or orange jacket with foot in bucket)

These students have to plant one foot on the outside of the stream, and may tag the young



Essential Questions

- How are we connected to glaciers, rivers and the ocean?
- What is the salmon's life journey through the wetlands, rivers and the ocean?
- What predators, geographic features, and human impacts make the salmon's journey challenging?

Enduring Understandings

- Watersheds, rivers, wetlands, and the one big ocean of the world are an interconnected system.
- Salmon depend on the rivers and the ocean during parts of their life cycle.
- Science is a way to answer questions about the world around us.

salmon as they go by. The recreational fisherman may tag with the noodle. The commercial fisherman in the ocean may “catch” salmon inside his hula hoop (net). The dam is created across the “stream” with a spinning jump rope, and explained to students as the spinning blades of the turbines that create hydroelectric power. Students soon figure out that there is an area between the edge of the “stream” and where the person is holding the rope that they may use to crawl through. This represents a fish ladder. If students can hop the rope or run through unscathed, then they're free to continue out to sea. Pollution starts below the hill and can only move downstream slowly, for their foot is in a bucket. They can tag salmon in the stream.

The game is played for 20-40 minutes, and then students reflect on their experience being salmon. The facilitator needs to check to make sure every student has had the chance to be a salmon before the game ends. Ask students, Is it hard being a salmon? How many salmon made it to their spawning stream up on the mountain? Why do you think so few salmon get to be

adults? How many salmon in real life get to be moms and dads for baby salmon? (1 in 1,000) Did people make their lives harder? How did we do that? What can we do now to help them out? (Fish ladders, limiting catch numbers, protecting habitat, reducing and eliminating sources of pollution) What is one thing you could do this year to help salmon survive?

Adaptations

Given more than 90 minutes, or by breaking the art project up with the game on different days, it may be meaningful to students to play one 20 minute round of the game without human interactions (remove the dam, pollution, and fishermen), and then play another round after that for 20 minutes adding in the trials of human impact. Students may understand the added challenges humans have made to salmon habitat.

Tie in the water cycle with the poster or other visual demonstration of the salmon life cycle. This helps to broaden students' understanding and inquiry into point-source pollution. They can

see the salmon's habitat and how water is cycled within it. When pollution is introduced (use a watershed model and food dye to demonstrate), the watershed that the salmon lives in is affected. *Salmon in the Trees* by Amy Gulick, 2010, records in gorgeous visual detail the connection of salmon to the whole ecosystem. Trees have salmon DNA in them, for the bits of spawning salmon feed many organisms in their habitat. Use this book or another story to develop an inquiry-based scavenger hunt: Have students scavenge around a salmon stream for parts of the ecosystem that are affected by salmon. Have them place them in a circle (or draw pictures of what they couldn't find) and describe how they are interrelated to the salmon life cycle. Ask students, "What isn't connected to salmon in Alaska?"

Evaluation

Create a checklist of desired interactions and inquiry-based actions. While students are playing the game or developing their art projects, check off progress on communication, sharing, offering assistance, teamwork, etc. Journals can detail learning progress and allow for artwork and description.

Materials

Prepare students for the outdoors with warm layers and safety boundaries.

- Rope (at least 15 feet long)
- Hula Hoop
- Buckets (2-3)
- Noodle (5' insulation tube)
- Predator puppets (optional)
- Caution tape or orange jacket
- Student-made lifecycle poster
- Cones (optional)
- First Aid Kit

Science GLEs Addressed

2nd grade:

SA1, SA2, SA3, SB2, SC2, SC3, SD1

3rd grade:

SA1.1, SA1.2, SA2.1, SA3.1, SC1.2, SC3.2, SD2.1, SG4.1

4th grade:

SA1.1, SA1.2, SA2.1, SA3.1, SC1.1, SC2.2, SC3.1, SC3.2

Other GLEs Addressed

Reading, Writing, Math



Vocabulary

Alevin	Predator
Commercial Fishermen	Prey
Fry	Redd
Human Impact	Smolt
Hydroelectric Dam	Spawn
Life Cycle	Watershed
Point-source pollution	

Favorite Resources

Enhance and reinforce student research by reading aloud about salmon, their life cycle, and their habitat from one of the following books:

- *Life Cycle of a Salmon* by Bobbie Kalman.
- *Life Cycle of a Salmon* by Angela Royston.
- *Salmon Forest* by David Suzuki.
- *Salmon Stream* by Carol Reed-Jones.
- *A Salmon for Simon* by Betty Waterton.
- *Swimmer* by Shelly Gill.
- *Red Tag Comes Back* by Fred Phleger.
- *Salmon in the Trees* by Amy Gulick
www.salmoninthetrees.org

Salmon Curriculum Database:

Kay Shoemaker, UAF Assistant Professor
Director, Salmon in the Classroom
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907-786-6345

Project Wet:

www.projectwet.org
Alaska Department of Fish and Game: Resources and curriculum for educators
<http://www.adfg.alaska.gov/index.cfm?adfg=educators.teacherresources>

Rivers to Seas Curriculum:

SeaGrant, NOAA, UAF partnership

The Salmon Migration Game. Board game may be purchased for \$10

“*Trees to Seas: Journey of the Wild Salmon Board Game*” may be printed and laminated for future use.