

## Salmon Food Web

**Purpose:** This lesson provides students with an opportunity to explore the concept of food webs and the ways in which all natural things within an ecosystem are dependent on one another.

Grade 4: It is expected that students will:

- discuss how changes in an organism's habitat can affect the survival of individual organisms and entire species (Life Science)
- relate the growth and survival of organisms to a variety of conditions (Life Science)
- relate the life processes of an organism to its use of nutrients, water and oxygen (Life Science)
- outline the importance of water for life (Earth and Space Science)

Grade 5: It is expected that students will:

- identify living resources in the local environment (Life Science)
- describe the known and potential environmental impacts of using B.C.'s living resources (Life Science)
- describe the environmental impacts of using non-living resources (Earth and Space Science)

Grade 7: It is expected that students will:

- describe all organisms in terms of their roles as part of interconnected food webs (Life Science)
- describe ways in which species interact with each other (Life Science)
- determine the limiting factors for local ecosystems (Life Science)
- outline factors that influence the length and quality of life (Life Science)

Time: 1-2 hours

**Materials:** string or twine, cut into 2 m lengths (2-3 per student), name tags (see templates for tags at

the end of this lesson)

**Resources:**

- Salmon Facts (see menu): "What is?" and "Life Cycle"
- additional print and non-print resources related to salmon--see recommended resources for B.C.

**Preparation:** Please review the procedures and resources used in this activity. You may also wish to prepare the food web name tags ahead of time.

**Procedure:** (If you have not conducted the Salmon Life Cycle lesson) Begin with a class discussion of what students already know about salmon. Encourage students to volunteer any experiences they have had with salmon (e.g., seeing salmon swimming in a river, visit to a hatchery, family fishing trip). Use a KWL chart (Know, Wonder, Learn) to record students' responses. Use prompts as necessary to encourage students to think about the different aspects of the topic, such as:

- the different species of salmon
- animals that rely on salmon for food
- salmon habitat requirements
- human use of salmon.

Record what students know to be facts in the Know column. Record questions in the Wonder column. Save this chart and add to it throughout the unit as students learn about salmon.

Introduce the topic of "interdependence." Begin by asking students to think about all the people with whom they interact over the course of a typical week -- family, friends, teachers, schoolmates, store clerks, bus drivers, doctors, etc. Have them create a simple web illustrating themselves in the centre and all the other people around them. (Note: be aware of privacy issues when discussing students' homes and families.)

Debrief by asking students to suggest the ways in

which the people around them help them get what they need in life. Distinguish between what we can do on our own and what we can only do in cooperation or coexistence with others.

Next, ask students to suggest ways in which they interact with natural elements in our environment. For example:

- using plants and animals for food and clothing
- using water for drinking, recreation
- using trees for shelter, fuel, paper
- providing care for garden plants
- providing food and water for wild birds.

Remind students of the basic survival needs of all animals, including humans: food, water, and shelter.

Review what students already know about food chains and food webs. Ask students to brainstorm some food items they have eaten recently. Select one food item and draw a simple food chain on the board to illustrate. For example, a food chain for chicken:

grain > chicken > human

Continuing with the same example, ask students how this simple food chain becomes a food web. What other animals eat the grain? What other foods do chickens eat? What other animals eat chicken? As students suggest answers, add to the food web on the board.

Next, ask students to consider what a salmon food web might look like. What do salmon eat? What animals eat salmon?

Refer students to the resources in Salmon Facts (see menu), and have them read the information on Ecosystems, Food Sources, and Predators, focussing on the predators and prey of salmon during various stages of their life cycle. Once students have read the information, ask if they can think of any species

missing from the list (answer: humans).

Introduce the term ecosystem. Explain that the ecosystem for any animal species includes not only the other animals in its food web, but the physical habitat in which the species lives. Introduce the terms biotic and abiotic: biotic elements are living, and abiotic are non-living. Using the first food chain example, add an abiotic element:

sunlight > grain > chicken > human

Ask students to brainstorm additional abiotic and biotic items in a salmon's ecosystem. For example:

- stream/river
- ocean
- marsh/estuary
- trees
- grass & weeds
- sunlight
- rain.

Help students understand that the environmental conditions in the ecosystem are extremely important to the salmon's survival. If the water becomes too warm, too polluted, or too muddy, the salmon will suffer. If the food they eat dies off, the salmon will also die off.

Write the name of each salmon ecosystem element on a name tag, and assign these to students. Repeat items as necessary to include all students. Distribute one piece of string to each student.

Have students stand in a circle. Then ask the "salmon" student to stand in the middle of the circle. Ask this student to name one item that a salmon needs to survive, and then give the other end of her or his string to the student with that item. The second student then names an item that he or she needs to survive or something that relies on her or him for survival, and joins strings with that person. Continue until all students are connected in some

way. Ask if any additional connections can be made, and add new strings as necessary.

With students still holding their strings, select one student to pull his or her strings. What other students felt the pull? What does this say about how the items in the ecosystem are connected?

To illustrate what would happen if one of the elements disappeared from the ecosystem, select one student to be removed from the web, letting go of her or his strings. Then, have everyone who is linked to that student let go of their strings in sequence. What happens?

Debrief the lesson by asking students about their own role in ecosystems: What do they do that affects other species? Are these positive or negative effects? What can they do to help protect salmon ecosystems? Have students use their learning logs to reflect on the experience.

**Assessment:** Have students draw a salmon food web. Look for evidence that their webs illustrate the various species that interact with the salmon. To assess students' understanding of interdependence, select one item, and ask students what the effect would be if that item were removed from the ecosystem