

# What's in a Stream?

## FYI

In addition to fish, many living things make up a pond or stream habitat. As a way to understand their relationship, the interactions among the organisms that populate a stream can be arranged in a **food chain**. A food chain is a model to depict energy flow through an ecosystem. Any ecosystem is much more complicated than a single food chain or even a group of food chains—called a food web—can demonstrate. However, a food chain is a useful model for learners to begin to understand the interrelationships in ecosystems. (In lesson 6A, learners study the different ways aquatic invertebrates obtain food. Both the way they obtain food and the type of food they eat define their role in the habitat.)

A food chain in an aquatic habitat might seem to begin with **phytoplankton** or **algae**, which create energy through photosynthesis. However, these plants need nutrients too. Decomposers—bacteria and other microbes—break down dead plants and animals so they are recycled back into the aquatic system as nutrients. In salmon streams, the decomposing bodies of spawned-out salmon are crucial for returning nutrients to the ecosystem. These nutrients are important not only to the stream, but to the surrounding uplands as well.

In an aquatic food chain, small animals called **zooplankton**, which feed on phytoplankton, might come next. **Salmon fry**, which have absorbed their yolk sacs, feed on the zooplankton. The salmon fry may be eaten by a variety of predators including trout, raccoons, and belted kingfishers.

Salmon are an example of how complicated ecosystem study can become. Pacific salmon do not spend their lives in the home stream of their birth. They live in the whole watershed, traveling down to the Pacific Ocean and then returning home to spawn. All the ecosystems within the watershed and the ocean affect salmon on their journey.

## Materials

### Part 1

- What's in a Stream? activity page (page 53), one copy for each learner

### Part 2

- Stream Web of Life cards (Appendix II), one set
- Two lengths of poly-rope

## Oregon benchmarks

### Benchmark 1

- Describe a habitat and the organisms that live there.

### Benchmark 2

- Describe the relationship between characteristics of specific habitats and the organisms that live there.

## National Science Education Content Standards

### Grades K–4

- Organisms and environments

### Grades 5–8

- Populations and ecosystems
- Diversity and adaptations of organisms

## Content objectives

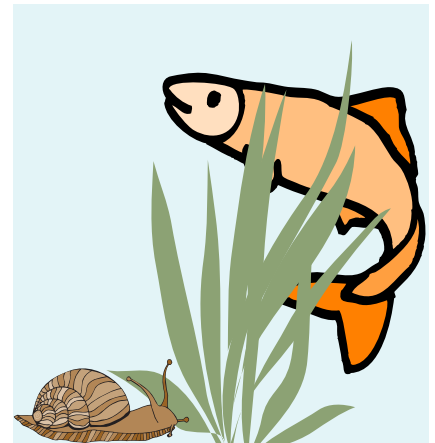
Learners will be able to do the following:

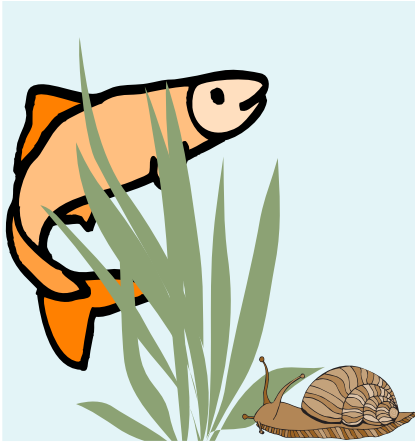
- Diagram and explain the interrelationships of a food chain and a food web.

## Process objectives

Learners will be able to do the following:

- Make observations.





## Preparation

Copy the Stream Web of Life cards masters onto card stock.

## Procedure

### Part 1

Pass out a copy of the What's in a Stream? activity page to each learner. Using the information in the "Background" and "FYI" sections and from earlier lessons, lead the learners to define a stream habitat. What are some of the nonliving things that are part of an aquatic habitat? Ask learners to list these on the four lines provided around the outside of the oval on the page. Learners might list water quality characteristics such as the temperature or amount of oxygen, the amount of water, the types of stream bottom coverings such as boulders and gravel, and the logs and sticks that would make up other components of stream structure and provide pools and places for fish to hide.

In the center of the oval, ask learners to write down three to four components of a simple aquatic food chain. A food chain typically begins with a plant and then moves to an animal that eats that plant, followed by an animal that eats the first animal, and so on.

Two examples of food chains follow:

- (1) phytoplankton, (2) zooplankton, (3) juvenile salmon, (4) belted kingfisher
- (1) algae, (2) snails, (3) crayfish, (4) raccoon

When learners have completed the activity page, discuss their answers. What other organisms might be added to create a stream food web?

### Part 2

For this activity, you will need a large area where learners can spread out. There are 30 cards in the Stream Web of Life set. If you have fewer learners, remove some of the cards from the set. Be sure you use all six of the habitat component cards each time you demonstrate the activity. (Habitat component cards are the Sun, Salmon carcass, Riffles/runs/gravel, Woody debris, Silt, and Water quality.)

Young learners may have trouble with the vocabulary used on the cards. The leader may need to read the cards for the learners as the activity proceeds.

Ask learners to stand in a circle. Pass out one Stream Web of Life card to each learner. Ask the six learners with habitat component cards to take two steps back from the main circle of learners. Position the six learners so they will be able to hold one of the lengths of poly-rope in a circle around the outside of the remaining circle of learners. Ask each learner with a habitat component card to read his or her card aloud in turn as you pass the rope around

the group. It is helpful to begin and end this outside circle with the Sun, as it is the logical starting point for the next part of the activity.

Hand one end of the second length of rope to the learner with the Sun card. This learner now holds the beginning and ending sections of the first rope and the beginning of the second length of rope. Now, ask the Sun to pass the second coil of rope to a learner with a plant card. For example, Sun might pass the rope to Phytoplankton.

The Phytoplankton reads its card to the group, then passes the rope on to one of the components listed on the card. Learners may pass the rope to any other learner who is not yet in the web. They may pass the rope to something they eat or use or to something that eats or uses them. As each learner receives the rope, he or she reads the card aloud to the group.

Each learner continues to hold his or her section of rope until all learners are holding a piece of rope and a web design has been created in the middle of the circle. Be sure the rope is passed across the circle to form a web, not just around the edge. (It is easiest for the leader to facilitate this activity from the center of the circle.)

Ask learners where people fit in the web. (People eat crayfish, frogs, and salmon.) What would happen to the web if there were no more insects? Ask learners who have insect cards to drop their section of the rope. What happens to the web?

Lead a discussion with learners about how they might design a web of life for the habitat area pond. From what they have learned in previous lessons, which animals and insects live in the pond? Where might learners find other habitat webs? Do forests or meadows have webs of life? Older learners may do research and report on webs found in other habitats. Use arts activities from *A Palette of Fun* to illustrate the selected webs.

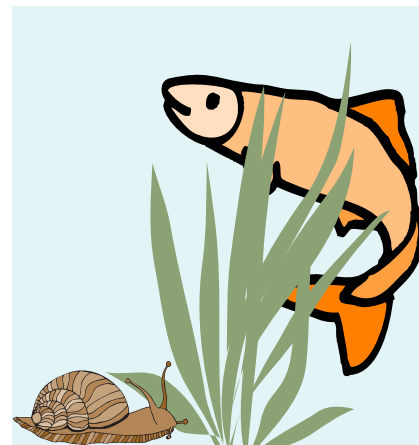
### Part 3

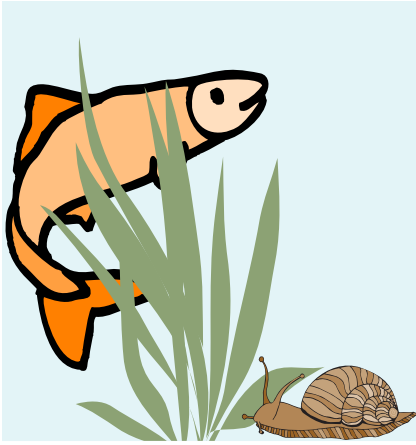
Inventory the school habitat and another local pond or stream. What are the impacts of human activities that learners can observe? How might human activities be changed at the school and/or local pond or stream to improve the habitat for wildlife?

## Extend the learning

*A Palette of Fun* (4-H 713L), Pop-Up Pizzazz; Mural Madness; Batik Of People and Fish, Oregon 4-H Natural Science and Cultural Discovery Program (4-H 3811L)

This curriculum is available from OSU Extension and Experiment Station Communications. For price and ordering information, see the online catalog (<http://eesc.oregonstate.edu>) or fax (541-737-0817), e-mail ([puborders@oregonstate.edu](mailto:puborders@oregonstate.edu)), or phone (541-737-2513). For a supporting kit of materials, call the Oregon 4-H Education Center (541-371-7920).





This is a combined science and social science curriculum that covers the following chapters: Fish Fundamentals, Pacific Salmon Life Cycles, Native American Salmon Life Ways and Legends, The Corps of Discovery, A History of People and Fish, Fishing Tools and Techniques, and Salmon for the Future.

*Project WILD Aquatic Education Activity Guide*: Fashion Fish; Fishy Who's Who; Micro Odyssey

### **Reference**

This lesson was adapted from *Of People and Fish*, Oregon 4-H Natural Science and Cultural Discovery Program (4-H 381 1L), "Activity 1B—What's in a Stream." Oregon State University Extension Service, July 2003.