

Spinning a Food Web

Outcome:

4-1-13: Predict, based on their investigations, how the removal of a plant or animal population may affect the rest of the community.

Materials:

- string or yarn

Teacher's Instructions:

1. Ask students to sit in a circle. Assign roles to students that represent different organisms in an aquatic food web. (Note: More than one student can be assigned to each role. Example: A few students can be plants, some can be primary consumers like snails or insects, some carnivores like walleye, pike, and goldeye, some omnivores like catfish and sturgeon, and some scavengers like crayfish.)
2. Pass a ball of yarn or string back and forth across the circle (see diagram on page 2), connecting the students to show predator-prey or consumer-producer relationships.
3. To demonstrate who or what would be affected by the loss of a particular organism in the web that was formed, start by choosing a student who is a plant to be the organism that has disappeared from the web. Ask the 'plant' pull on the web (yarn) with short gentle tugs.
4. As the other 'organisms' feel the tugs, they too tug gently until all of the plants and animals in the web can feel the tugs.
5. Repeat the exercise by having a fish disappear, algae, a clam, a crayfish, leech, etc.

Teacher Background Information:

A food chain is the transfer of food energy from plants (producers) through a series of animals (consumers), each being eaten by another animal. Food energy supplied from plants ultimately comes from the Sun.

Most animals eat and are eaten by several different organisms. A food chain is only one path that energy can take. If you trace all the paths, you have a food web.

If you look at the food chains of Manitoba fish species (see "Food Chains" under Outcome 4-1-10), many fish, and the organisms they consume, eat the same things. For example, small fish, clams, snails, and some aquatic insect larvae all eat tiny plant material such as algae or phytoplankton. If the water is too dirty for these plants to grow, the animals that eat them will also not be able to survive. The fish and other animals that eat the algae, the clams, and the insects, also will not be able to survive. And so on - all the way up the food chain.

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Teacher Background Information (Cont'd.):

Aquatic insect larvae are an important part of the diets of catfish, sturgeon, and goldeye. Some minnow species and leeches also eat aquatic insect larvae. Loss of insect larvae will affect all of these organisms.

While humans may find the "rafts" of mayflies lying near the shores of a river in early summer a nuisance, their abundance is actually an indicator of the health of the aquatic ecosystem. Dirty, sluggish water in a polluted stream will produce few mayflies. Goldeye, walleye, small fish, and other insects which eat mayflies or mayfly larvae will all be affected by the loss of this food source. In turn, those organisms that depend on other animals that eat mayflies will also be affected by a loss in mayfly populations.

Higher up the food chain, the loss of a predator, such as a walleye or northern pike, can have a different effect. For example, humans and other animals that like fish, may remove too many fish from a lake or river. If too many predators are taken out, the smaller fish that the big fish eat will increase in number until there are not enough insects or other food to support them all. With no insects, the number of small fish will decline.

Thus, removing any organism from a food chain eventually affects all the other organisms in the chain and its associated food web.

