



Science Unit: *Temperate Forest*

Lesson 14: *Forest Food Chains and Webs**

School year: 2004/2005

Developed for: Lord Selkirk Annex Elementary School, Vancouver School District

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Grade level: Presented to grades 1 - 2; Appropriate for grades 1 – 5 with age appropriate modifications.

Duration of lesson: 1.25 hours

Notes: *This lesson is based on Canadian Parks and Wilderness "Who Am I?" and "Weird Webs" from <http://www.cpawscalgary.org/education/free-resources/lessons.html#5min>

Objectives

1. Learn to classify forest components into ecological roles.
2. Learn to construct and describe a forest food chain and web.

Background Information

All living things require energy and nutrients to live and grow. Some organisms get these from non-living things and are called producers. The most common producers are green plants, which make their own food from energy from the sun and nutrients from the soil and air. Consumers are organisms which feed themselves by eating other organisms or dead organic matter. Consumers can be herbivores (plant eaters), carnivores (animal eaters), omnivores (eaters of both plants and animals) or detritivores (eaters of dead plant/animal matter). The pathway of nutrients and energy flowing from producers to herbivores to carnivores to top predators is called a food chain. There are many food chains in a single ecosystem, and all these food chains connect to make a food web. All living things are connected via the food web. The web is a model of who eats what, showing the flows of nutrients and energy through organisms in an ecosystem.

Vocabulary

<u>Food web:</u>	A network of many food chains in an ecosystem which are connected to each other.
<u>Food chain:</u>	A chain which shows the transfer of energy from plants to animals that eat them, and then to the predators which eat those animals.
<u>Producer:</u>	Organism which makes its own food/energy from non-living materials (e.g. Plants, algae).
<u>Consumer:</u>	Animal which obtain its food from other organisms (plants, animals).
<u>Herbivore:</u>	A plant-eating animal.
<u>Carnivore:</u>	A meat-eating animal.
<u>Omnivore:</u>	An animal which eats plants and animals.
<u>Detritivore:</u>	An organism which eats dead plants and animals (e.g. fungi, earthworms).
<u>Primary consumer:</u>	An animal which eats plants.



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Secondary consumer: An animal which eats plant-eating animals.

Top predator: An animal at the top of a food chain, which hunts and kills other animals for food. (e.g. lions, tigers, bears, large sharks, killer whales, wolves).

Materials

- ball of string or yarn (100 m at least)
- index cards with different forest organisms, drawn and labeled, with neck string attached, including the following:
 - sun
 - carnivores
 - top predators
 - plants
 - omnivores
 - herbivores
 - decomposers

In the Classroom

Introductory Discussion

Ask students to name living organisms in a forest ecosystem. Then discuss what the organisms eat. Use the blackboard or flip chart to draw a simple food chain and incorporate vocabulary words into the discussion. Another more complex food chain can be discussed. Discuss why food chains are important to an ecosystem.

Science Activity/Experiment

1. Students close their eyes and the teacher hangs a forest organism index card on their back. After they open their eyes, they must ask questions to each other with yes/no answers. The object of the game is to determine what forest organism you are. The teacher may be the sun card, as it is essential to all other life forms.
2. Start with asking questions such as:
 - Am I a producer? Herbivore? Carnivore? Top Predator?
 - Do I live in the soil? In a tree? On the forest floor? In the water?
 - Am I smaller/larger than a raccoon?
 - Do I have scales, fur, feathers?
 - Am I an insect? Fish? Mammal? Bird?
3. Once everyone has guessed correctly who they are, they can flip their index cards to the front. Students can then get into ecological groups: producers, herbivores, carnivores, omnivores, decomposers, top predators.
4. Have everyone mix themselves up and then sit in a large circle, showing their cards, with the teacher (sun) in the center of the circle.
5. Explain to students that they are going to make a food web. The sun (teacher) must begin because the sun is the source of life for all things. He/She has a ball of string, holds on to the end and then passes it to the tree (plant) saying, "I am the sun and I give the tree energy, the tree needs me!"
6. Tell the students they can pass the ball of string (holding on to one end) to another organism in the circle, **only if it needs you, or you need it to survive.** For example, the chipmunk could give the



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ball of string to the tree (which it needs to survive) or the owl (which needs it to survive). During each pass, the student must tell the others who they are and why and who they are passing the string to. All organisms in the circle must be connected so no person is left out. It is useful before starting to rehearse a few times so that each person (organism) can point to another person (organism) that he/she needs or is needed by. Some organisms/elements may be included more than once (e.g. the sun, green plants, fungi, bacteria).

7. After every organism has been connected and you have an elaborate-looking web, ask students to pull the string gently until it is taut. What pattern have the students made with the string? This pattern shows the interconnections between only some of the organisms living in the forest. All the interrelationships between organisms in an ecosystem are often called a web of life. Tell students that in a real forest or other ecosystem, the web would be much more complex.
8. Tell students that a logging company has come to cut down the trees in this forest. The tree person(s) can let go of his/her string. After the string is released, ask if anyone felt a change in the tension of their string. Who was directly affected by the loss of the tree? Ask these students to let go of their string now. Now what remaining students were affected (or could feel the slackening of the string)? And so on. Students will realize that any change in the ecosystem is felt throughout the web.

Closure Discussion

Review vocabulary and let students give examples of simple food chains.

References

1. B.C. Ministry of Forests. 1999. Forests in Focus. Pp. 130-137. ISBN 0-7726-3966-3
2. Greenaway, Theresa. 2001. Food Chains: Cycles in Nature. Raintree Steck-Vaughn Publishers.
3. Nadeau, Isaac. 2002. Food Chains in a Forest Habitat. PowerKids Press. New York.
4. Wallace, Holly. 2001. Food Chains and Webs. Heinemann Library. Chicago.
5. www.cpawscalgary.org/education/free-resources/lessons.html#5min [Who Am I?, Weird Webs]

Forest Food Chains

Name: _____

Make a forest food chain. Draw the organisms in the circles and label.








