Understanding Food Webs

Overview of Lesson – Students will learn about the concept of a food web; how animals and plants are connected.

Minnesota Science Standards

3.4.1.2 Identify common groups of plants and animals using observable physical characteristics, structures and behaviors. For example: Sort animals into groups such as mammals and amphibians based on physical characteristics. Another example: Sort and identify common Minnesota trees based on leaf/needle characteristics.

5.1.1.4 Understand that different models can be used to represent natural phenomena and these models have limitations about what they can explain. For example: Different kinds of maps of a region provide different information about the land surface.

5.4.1.1 Describe a natural system in Minnesota, such as a wetland, prairie, or garden, in terms of the relationships among its living and nonliving parts, as well as inputs and outputs. For example: Design and construct a habitat for a living organism that meets its need for food, air and water.

Time Needed – 45 Minutes
Ages – 3rd to 5th
Season - Any
Materials – Crayons, paper, yarn, food chain sheets

Lesson Outline

I. Introduction to food chains and vocab – 10 minutes
II. Assign and draw parts of the food web – 10 minutes
III. Food web activity – 20 minutes
IV. Debrief – 5 minutes
Background Information:

Every living organism derives energy from something. Plants make their own energy using energy from the sun; they are called producers because they produce their own energy. Some animals eat plants to get energy; if they only eat plants, they are called herbivores. Some animals others feed on other organisms. Animals that only eat other animals are carnivores. Some organisms feed only dead or decaying plants and animals; these are decomposers. Since everyone thing gets their energy from somewhere, we can create a food wed to see how every creature in a system is connected to the others through what they eat.

Each member of the food web plays an important role. The sun is the beginning of most food webs on Earth. Plants, as producers, make their own food from energy input from the sun. Primary consumers, herbivores and decomposers, eat producers. Primary consumers are in turn are eaten by secondary consumers; omnivores, carnivores and decomposers.

You can also think of this web as various levels, called trophic levels. Energy is transferred through the web inefficiently so a balanced food web typically supports many producers, at the lowest trophic level. There will be fewer primary consumers and decomposers, and only a very small number of secondary consumers. The secondary consumers are the top predators; they are at the top of the food chain. Eagles are top predators.

Vocabulary

• Carnivore - an animal that derives its energy and nutrient requirements from animal tissue through predation or scavenging
• Decomposer - organisms that break down dead or decaying organisms
• Herbivore – an animal that derives its energy and nutrient requirements from a plant diet
• Omnivore – an animal that derives its energy and nutrient requirements from a diet consisting of plants and animal tissue.
• Predator - an animal or bird that hunts and feeds on other living organisms
• Predation – hunting and killing another animal for food
• Prey - an organism that is hunted by predator, food source for predators
• Producer – also known as autotrophs, organisms that produce their own food; for example plants
• Scavenger - an animal that feeds on dead or decaying animal or plant material

Prior to Teaching:

Locate all the materials needed.
Choose a location where the class has room to stand in circle.

When assigning the students roles in the food web, suggested breakdown for a class of 20 students is:

1 sun, 5 producers, 4 herbivores, 4 omnivores, 2 carnivores and 4 decomposers
Lesson Outline:

I. Introduction (10 minutes): Introduce students to consumers, decomposers, producers, and the sun as parts of the food web. Use the images provided at the end of the lesson on the floor or board to help students visualize the food web chain.

Sun → Producer (milkweed) → Herbivore (porcupine) → Omnivore (black bear) → Carnivore (bobcat) → Decomposer (millipede)

After going through the terms, have students brainstorm specific examples for each category.

II. Draw an Animal (10 minutes): Assign each student a role in the food web – depending on the class you may assign the general term or a specific animal. Students should draw a picture of the assignment.

III. Food Web (20 minutes): Have the entire class stand in a circle. Each person in the web will roll the ball of yarn to a student directly connected to them in the food web. Hand a ball of yarn to the student assigned to be the sun. The sun will begin the food web by rolling the yarn ball to a producer. The student receiving the yarn ball should hold on to the string with one hand and then roll the ball to someone they are directly connected to in the food web. Continue this until everyone has had the ball of yarn at least once.

a. For example: The sun would roll the yarn to a plant (producer), who could roll it to an herbivore or a decomposer.
b. While doing this activity, it is important for students to hold onto the yarn the whole time and that the hand holding the string remains still.
c. After everyone has the string, have students share observations

With everyone still in a circle, pick one student to give a tug on the yarn. The people connected to that person should feel the tug. Have students share their observations.

IV. Debrief and Discussion (5 minutes): What would happen if one link were removed? Choose one group, e.g. decomposers, and have them let go of the string. Students should make observations of what happened to the food web.

Extensions:

• Have students create their own food web in a journal or on a piece of paper

Resources:

National Eagle Center glossary - http://www.nationaleaglecenter.org/learn/glossary/
All photographs from wiki commons
SUN