Food Chains on the Nature Trail

Lesson Summary

When to use this lesson
Use this when the classroom curriculum focuses on the flow of energy through an ecosystem.

Objective
Students understand the flow of energy through food chains and that food chains are connected. Students understand how a missing food chain link affects habitat.

Materials
Clipboard for each student
Worksheet for each student
Pencil for each student
Magnifiers optional

Estimated Duration
45 minutes

Ohio Standards Connections

Science – Life
• Characteristics and Structures of Life A1: Explain that animals need air, water, food, living space, and shelter.
• Characteristics and Structures of Life B2: Identify that there are many distinct environments that support different kinds of organisms (habitats).
• Characteristics and Structures of Life B3: Explain why organisms can survive only in environments that meet their needs.
• Diversity and Interdependence of Life B5: Explain that food is a basic need of plants and animals, animals eat plants and/or other animals for food, and is important because it is a source of energy.
• Diversity and Interdependence of Life B8: Compare the activities of Ohio’s common animals during the different seasons by describing changes in their behaviors and body coverage.

Science – Scientific Inquiry
• Doing Scientific Inquiry B7: Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers, timers, rulers, balances, calculators, and other appropriate tools).

About Food Chains
• Explain that students will look for evidence of food chains on the nature trail. Ask students what a food chain is. A food chain is the order of how living things get energy. Be sure to
emphasize that food chains transfer energy up the links in the chain. Compare this to students eating food to have energy to play, to work, to concentrate.

• Does each consumer only eat one kind of food? No, food chains can overlap when consumers compete for the same food sources. Ask them if they know the name of many connected food chains – a food web, like the connected threads in a spider’s web. A food web is the flow of energy through food chains that are connected within a habitat.

• Ask students to name a favorite food. Trace it back to its source. You should be able to trace all foods back to a plant.

• What is the energy source for the plant? Plants get energy from the sun to make food that helps them to grow.

• Each student receives a worksheet, clipboard, pencil, and magnifier. Review the columns on the worksheet. What is a producer? They are the living things that produce their own food – plants. What is a consumer? A consumer consumes or eats a plant or animal. What is a decomposer? A decomposer is a special kind of consumer that eats dead plants and animals and returns their nutrients to the soil. True decomposers are fungus and bacteria. Consumers like worms, pillbugs, sowbugs, and others that eat dead plants and animals are not true decomposers, but are scavengers that help the process of decomposition.

• Look for signs of food chains like holes in leaves, chewed leaves, animal tracks, insects and other invertebrates, holes in tree trunks, lichens, fungus. Determine whether the food source is a producer, consumer, or decomposer.

• Create a food chain around your observation. If an organism is a decomposer, mark a “D” by the name. Only record plants and animals that are possible in our area. Do this four times.

• Wrap up by explaining that all of the food chains on the paper create part of the food web in the forest habitat. Are there overlapping energy sources? What do healthy habitats provide for living things? Air, water, shelter, food, living space. Discuss what happens as you remove certain parts of the chains or the web. Species die if energy sources cannot be found. Species may attempt to relocate – like deer, raccoon, skunks. Species may not be healthy enough to reproduce.

Notes to guide your discussion

• A habitat is the place where an organism lives and finds food, water, living space, and shelter. Ask students if they recall the kind of forest we have. It’s an example of an eastern deciduous forest. Ask students what deciduous means. Along your walk ask for characteristics of the forest.

• An adaptation is a trait or behavior that improves an organism’s chances of survival and reproduction. Discuss some adaptations of the plant, fungus, and animals that live in a deciduous forest.

• Lichens release a weak acid that breaks down wood or rock over time. Lichens are decomposers in the fungus kingdom. They are not plants. They are created when spores from fungus and spores from algae in a mutually beneficial relationship. The fungus provides shelter. The algae produce food through photosynthesis to feed itself and the fungus. Deer, insects, snails, slugs eat lichen. It is also nesting material for hummingbirds. Lichens are used to dye wool, as scents in perfume and soaps, and in litmus paper. Lichens are sensitive to pollution.
• **Fungi** are decomposers. They are not plants because they do not produce their own food. A fungus sends out hair-like structures called hyphae that tangle together into a structure called the mycelium. This occurs in the wood under the surface. The mycelium secretes enzymes to break down the wood and the fungus absorbs food from the bark. Fungi are food for slugs, snails, bacteria, insect larvae.

• Animals that chew through wood include termites, bark beetles, carpenter ants, pillbugs, sowbugs, and wood roaches. Bark beetles eat through the tree layer just under the bark. They leave intricate patterns of tunnels. The tunnels permit water, air, spores from fungus to enter the tree.

• Worms, pillbugs, sowbugs and millipedes are among the animals that help decomposition by feeding on logs and leaf litter. Centipedes and spiders are some of the animals that eat the animals feeding on logs and leaf litter. Birds and skunks come to the log to eat animals that include centipedes, spiders and the decomposers.

**Some examples of food chains**
Green leaves – larva/caterpillar – bird
Dead leaves – earthworm – centipede – skunk
Tree – nuts – squirrel or raccoon
Rotting log – insects – mole – snake – hawk
Rotting log – fungus (d) – slug – box turtle
Lichen – small slug – harvestman – spider – bird
Wild strawberry – box turtle – raccoon

**Sources**
In science we learn that animals get energy from the foods they eat and that food sources depend on the conditions in their habitat. Today we made observations about food chains that exist in our eastern deciduous forest. We learned that energy transfers from link-to-link up the food chain and that food chains connect in a forest food web. Ask your student what happens if a link is missing. Email Granny to join our class for our next garden experience!