



Lesson Overview: Energy Flow through Ecosystems

Grades 2-5

Big Idea/Learning Goal

Energy flows through ecosystems in food chains from the sun, producers, consumers, and decomposers. Organisms depend on each other to gain enough energy to survive in their habitats.

Essential Questions

- How do different organisms obtain energy to survive, grow, and reproduce?
- How is energy transferred in ecosystems through food chains?
- How do different organisms, including humans, affect food chains?

Objectives

- Students will **investigate** how different organisms obtain energy.
- Students will **identify** producers, consumers, and decomposers in their schoolyard.
- Students will **demonstrate** how energy flows through an ecosystem in food chains.

Assessments

- Ecological role presentations
- Ecological role identification in schoolyard scavenger hunt
- Ongoing discussions and questioning
- Backyard Food Chain assignment

Background

All organisms need **energy** in order to survive, grow, and reproduce. They obtain this energy in a variety of ways. Ultimately, the energy in an ecosystem comes from the sun, and flows through an ecosystem from one organism to another through complex ecological relationships. Some organisms can use the sun's energy to produce their own food; while others like humans need to eat food (consume) in order to gain energy; still others break down (decompose) dead material for energy. We call these organisms producers, consumers, and decomposers, respectively.

In order for organisms to survive, they must obtain energy either from the sun or by consuming or decomposing other organisms through a **food chain**. Each step of the food chain provides energy for the next step. The arrows show the direction of energy flow from one to another.

Sun → Grass → Grasshopper → Toad → Hawk → Fungi

The grass uses the sun's energy to produce its own food. The grasshopper eats the grass, the toad eats the grasshopper, and the hawk eats the frog. After the hawk dies, it provides energy to decomposers, such as fungi, which break down the organism and return its nutrients to the system.

Vocabulary

Carnivore: An animal that eats meat

Consumer: An organism that obtains energy by consuming another organism; includes carnivores, herbivores, and omnivores

Decomposer: An organism that obtains energy by breaking down dead organic material

Energy flow: The transfer of energy through a food chain from one organism to another

Food Chain: The flow of energy in an ecosystem beginning from the sun to a primary producers (plant) to a consumer to decomposers.

Herbivore: An animal that eats plant materials

Inference: A conclusion reached based on evidence and reasoning from observations

Observation: The process of carefully examining or looking at something in order to gather information

Omnivore: An animal that eats both plant materials and meat

Predator: An organism that hunts another organism

Prey: An organism that is hunted by a predator

Producer: An organism that obtains energy through photosynthesis: sunlight, carbon dioxide, and water

Activities

1. [Predators and Prey](#)
2. [Producers, Consumers, Decomposers](#)
3. [Building Food Chains](#)
4. [Food Chains Rummy](#)

Next Generation Science Standards

5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.

5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

**3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

**In Activity 2, relevant when discussing that animals may herbivores, omnivores, carnivores, scavengers at different life stages.



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