

Invent a Forest Creature

N°. 20

JUNIOR/INTERMEDIATE

Science | English/Language Arts | Fine Arts



LESSON SUMMARY

To understand and appreciate the concept of an ecological niche within the forest community by identifying the needs and habitats of a particular plant or animal.

Activity Information

Estimated Duration: 2.5 hours

Materials: Art supplies, model building materials (e.g. paint, strings, nails, flatboards)

Setting: Indoors

Key Vocabulary: Habitat, ecological niche, food chains, food webs, predator, decomposer.

Teacher Background

“Habitat” is the arrangement of food, water, shelter or cover, and space suitable to animals’ needs. The way a plant or animal behaves, or its role in the community, is called its “ecological niche.” For instance, a red squirrel spends much of its time searching for nuts and seeds, builds its nest in trees and is a food source for the great horned owl. What an animal feeds on, where it lives, what feeds on it, and its effect on the environment all describe its niche.

All living things have specific and individual habitat needs – a beaver requires an abundant supply of trees, preferably poplar and birch, near a water supply. Plants need differing amounts and types of light, soil, water, shelter and a certain amount of space in which to in which to grow. Cedars grow best in moist soils where the underlying rock is limestone. Pines are more commonly found in soils that are sandy or gravelly.

There are numerous interactions between plants and animals in a forest community. One way of looking at these interactions is by examining “food chains” and “food webs.” The dependence of plants and animals on each other for food makes up a food chain. The sun transfers energy in the form of light to green plants. The energy stored in a plant is transferred to a plant-eating animal when it eats the plant and so on.

In most natural situations, the flow of food material is more complicated than in a simple food chain. Many animals eat a number of different foods, depending on their abundance and availability. When many different species of plants and animals are interdependent, we speak of food webs rather than food chains. Nature works to keep a balance within the food web.

ACTIVITY

Activity #1

Step 1 In preparation for the activity on inventing a forest creature (Activity #2), ask your class what plants and animals need to live and grow in a forest environment. Brainstorm a list of requirements or have students create their own methods for finding the answers (with partners or on their own). Encourage them to ask such questions as:

- How do plants and animals depend on each other?
- What are some of the webs or chains of relationships that exist in the forest?
- How could we demonstrate some of these relationships (e.g. using word models comparing the relationships in a forest community or ecosystems to their own neighbourhood community; painting a food web on a flat board and connecting the elements in the web using nails and string; reports; drawings; computer-generated flow charts)?

Step 2 Assist your students in conducting their chosen activity that demonstrates the interrelationships in a forest community.

Activity #2

Step 1 Divide your class into small groups. Assign each group the task of inventing a new animal or plant that is able to live somewhere in a forest. To begin, suggest that they ask questions such as:

- What does the animal or plant look like?
- What are the climatic and environmental conditions where it lives?
- What does it eat and what are its enemies?

Step 2 Have students record the specific features of their creature and its immediate environment. For example, they could describe:

- The general forest environment (climate, animals, other plants);
- The habitat and niche of their creature;
- A description of physical characteristics that help it survive (e.g. beaks of birds and claws of tree dwellers);
- A description of behavior that helps it survive (e.g. hibernation, feeding habits);
- How it reproduces and how it interacts with other species.

Step 3 Another way of describing their creature is according to its ecological niche. The ecological niche of an organism has to do with its function or role, or way of life (e.g. as “predator” – an organism that hunts, kills, and eats of animals; or “decomposer” – animals, plants and bacteria that chemically break down dead organisms, releasing important materials for use by other living things) – and how it performs that function. Habitat is relatively static; “niche” is a dynamic condition referring to the activity relationships of a living thing to its environment. Have students describe their creatures according to the following elements that determine their ecological niche:

- The role played by the organism in its biological community (e.g. predator, decomposer);
- Its food requirements;
- Its position in the food chain;
- Its requirements for shelter;
- Its behaviour;
- The timing of its activities (e.g. nocturnal or diurnal).

Step 4 Have your students find creative ways of introducing their creatures to the rest of the class. They could use drawings, simulations of its sounds, simulated scientific reports on its environmental needs, or role-playing (e.g. interviews with naturalists familiar with the organism). They could even design and wear a costume of their creature and have a classmate interview them.

Step 5 Have students draw a diagram or cartoon strip or write a story that illustrates the interrelationships that exist between their creature and the rest of the forest community. If appropriate, make connections with the hypothetical creatures invented by other groups.

Extensions

Ask your students to predict the impact of a particular change in their creature's environment (e.g. the effect of a drought on a water lily). Have them use any method they wish to express the change and its effect – role-playing, illustrations, interviews. How much change do they think their creatures could adapt to?

Have the class develop a realistic food web for a local forest area or park

Resources

Andrews, W.A. Investigating Terrestrial Ecosystems. Toronto; Prentice-Hall 1986.

Atlantic Science Curriculum Project. SciencePlus 8. Toronto; Harcourt Brace Jovanovich, 1988.
Provides more information on food chains and food webs.

The Temperate Rain Forest. A 16-min. film examining the life cycle and food chain of a northwest coastal rain forest where highly acidic soil results in a specialized plant community and an abundance of amphibians and reptiles. NFB: # 106C 0183 002. Available from your local NFB office or through many public libraries and educational film libraries. Quote the film title and film number when ordering.