



RIDE THE WILD LEAF CYCLE

GRADE LEVEL: 4-5

SUBJECT: Science

NATIONAL STANDARD(S):

(3-5) SC: 4.1-2; 6.1-2;

THEME: Forestry

FOOD AND FIBER TOPIC: II-E, III-A

LEARNER OBJECTIVES:

The student will understand that leaves provide food for new trees and plants.

VOCABULARY

canopy—the uppermost layer in a forest, formed by the crowns of the trees. Also called *crown canopy*

cycle—(a) A single complete execution of a periodically repeated phenomenon: A year constitutes a cycle of the seasons; (b) A periodically repeated sequence of events: the cycle of birth, growth, and death.

decomposer—An organism that breaks dead plants and animals down into single inorganic elements which can be returned to the atmosphere and soil.

ecology—The science of relationships between organisms and their environments.

forest litter—Organic material, such as leaves, animal waste, and dead animal bodies, which builds up on the floor of the forest and provides nutrients to the soil through decay.

inorganic—Having to do with things not usually classified as organic.

mineral—A solid, inorganic material that occurs naturally in the earth's crust.

nutrient cycle—The process by which organisms that die feed organisms that are alive so those organisms can produce new organisms and then, in turn, die to feed the new organisms.

organic—Having to do with living things.

understory— (a) The layer formed by the crowns of smaller trees in a forest. (b) The trees beneath the forest canopy.

BACKGROUND

We are part of a living and dying world. Plants and animals grow and die. Other plants and animals will take their places after they die. As each living thing dies, it decomposes and returns nutrients to the soil. Soil provides water, minerals, and anchorage for plant growth. One plant's death may make it possible for new plants to grow where they could not grow before.

Additionally, leaves and needles that fall from the canopy of old growth forests and understory vegetation during the year are a very important part of the forest ecology and nutrient cycle. The point of interaction between one growth cycle and the next is the accumulated leaf litter on the forest floor. Here decomposers, or tiny organisms like fungus and bacteria, convert the litter formed in one cycle (leaves, animal waste, and dead animal bodies) into nutrients for use in the next growth cycle.

Moisture is also needed for decomposition to take place. The rain and snow which falls throughout the year keep the litter moist so the decomposers can do their work. The earth itself is a living substance, which further transforms the nutrients into usable substances. The root systems of plants transfer the nutrients from the soil back into the vegetation in preparation for the next growth cycle. (Other forests, such as the coniferous forests and temperate rain forests follow similar cycles of decomposition and regeneration of nutrients.)

STEP-BY-STEP INSTRUCTIONS

1. Hand out student worksheets and share background information.
2. Have students read about the leaf cycle on worksheet A and look at the picture on worksheet B.
3. Have students cut out the leaves on worksheet A and glue them on the appropriate number on worksheet B.

RELATED ACTIVITIES

1. Ask the custodial staff to let students rake leaves during the fall and make a large pile in an area where they won't be disturbed. Then have students periodically dig into the pile to observe and record any changes in the leaves.
2. Have students collect different types of leaves and make leaf rubbings. Students should peel the paper from color crayons and use the crayons to make rubbings on white sheets of paper placed over the leaves.
3. Provide students with reference books and divide them into groups of four or five students to create a class notebook. Have each group identify all the different types of leaves they have collected. Each group is responsible for developing one page of information about a leaf and its' tree. For example, where it is located and growth habits. Then, laminate the pages with the appropriate leaf attached. Bind the book with yarn.
4. Provide a microscope for students to examine the molds and fungus growing on the leaves in their leaf pile.

RESOURCES

Student Books

- Bourgeois, P. (1990). The Amazing Dirt Book. Addison-Wesley.
- Buscaglia, L. (1982). The Fall of Freddie the Leaf. Charles B. Slack.
- Cobb, V. (1981). Lots of Rot. HarperCollins.
- Dickinson, J. (1983). All About Trees. Troll.
- Hughey, P. (1984). Scavengers and Decomposers: The Cleanup Crew. Atheneum.
- Thornhill, J. (1992). A Tree in a Forest. Simon and Schuster.

Teacher Resources

- Soil Conservation Service, USDA, P.O. Box 2890, Washington, DC 20013
- Forest Service: USDA, Auditors Building, 201 14th Street, Washington, DC 20250.

Related Internet Websites

- USDA Forest Service Homepage. <http://www.fs.fed.us/>
- Understanding Forestry Terms -- A Glossary for Private Landowners. Provided by the North Carolina Cooperative Extension Service. <http://www.ces.ncsu.edu/nreos/forest/woodland/won-26.html>

Forest Patterns and Processes: The Eternal Living Braid. By Harry White. Permission to freely distribute and reproduce the intact document is granted. Support the Sound Science Initiative of the Union of Concerned Scientists.

<http://www.connix.com/~harry/forest.htm>

EVALUATION

Students should glue leaves in the following order: 1) Dead leaves fall to the ground; 2) Decomposers break down the leaves; 3) Water and air penetrate the soil; 4) Rocks break up into tiny particles; 5) The decomposed leaves release nutrients into the soil; 6) New trees and other plants grow and new leaves grow on old trees.

ACKNOWLEDGMENT

This lesson adapted from the Oklahoma Ag in the Classroom, Department of Agricultural Education, Communications and 4-H Youth Development, Oklahoma State University, Stillwater, OK 74078.

Name _____

Ride the Wild Leaf Cycle

A

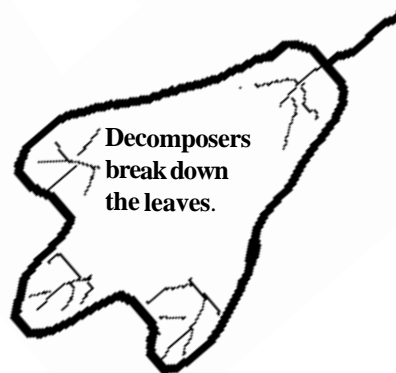
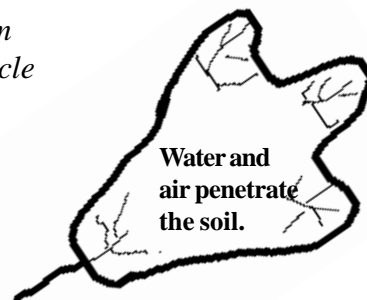
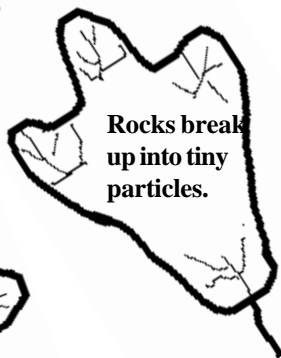
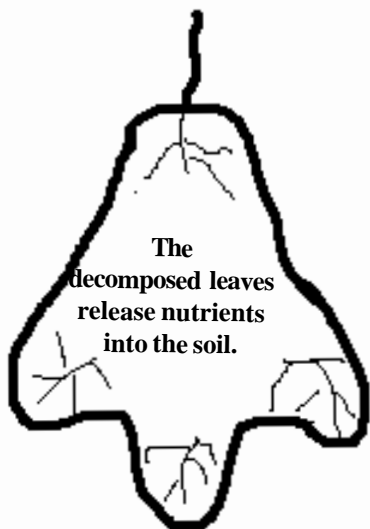
Read the story about the leaf cycle. Then number the leaves to show the correct order of steps in the leaf cycle. Color the leaves in autumn colors.

The Leaf Cycle

What happens to the leaves when they fall to the ground in the autumn? Left undisturbed, they go through the cycle of nature.

After the leaves fall to the ground, decomposers go to work, breaking the leaves down into food for the soil. Rain and snow help the decomposers do their work. Air enters the soil to help with decomposition. Minerals to enrich the soil come from rocks buried deep beneath the soil surface. Over hundreds of years, the rocks break up into tiny particles.

The decomposers release nutrients from the leaves into the soil. The soil becomes food for new plants and trees. It helps the old trees grow new leaves in the spring. Those leaves fall to the ground in the autumn, and the leaf cycle keeps on turning.



Cut the leaves out, and glue them where they belong on the leaf cycle on worksheet B.



Name _____

Ride the Wild Leaf Cycle

B

Color the picture. Cut out the leaves from student worksheet A, and glue them over the correct number below. You may turn the leaves any way you wish to make them fit.

