

**TEACHING KATE
TEACHING KIDS ABOUT THE ENVIRONMENT**

MICROENVIRONMENTS IN A JUG

Grade Level: 4-8

Time Required: 1 class period

SC Science Standards

This lesson plan was correlated with only the grade level specified unless otherwise noted.

Grade 4:

- I. A. 1. a
- I. A. 4. a
- I. A. 5. a
- I. B. 1. a, b, d, e
- II. B. 2. a, b
- II. B. 3. a

Grade 5:

- I. A. 1. a
- I. A. 4. a
- I. A. 5. a
- I. B. 1. a, b, d, f
- II. B. 1. b
- II. B. 3. a, b
- II. B. 4. a, b, c, d, e

Grade 6:

- I. A. 1. a. 1
- I. A. 1. d. 1
- I. A. 2. b, h
- I. A. 7. a
- II. C. 1. d

Grade 7:

- I. A. 1. a. 1
- I. A. 1. d. 1
- I. A. 2. b, h
- I. A. 7. a
- II. B. 1. a, b
- II. D. 2. a, c

Grade 8:

- I. A. 1. a. 1
- I. A. 1. d. 1
- I. A. 2. b, h
- I. A. 7. a
- II. A. 3. a, b, c

Purpose

Students will observe a microenvironment and hypothesize where living things obtain their energy.

Skills

Creativity, discussion, group interactive learning, interpretation, monitoring, observation.

Concepts

Interrelationship between plants and animals; how interrelationship functions in acquiring energy in the microenvironment.

Materials Needed

2-liter size plastic jugs	potting soil
pen	spray bottle
potted plant	aluminum foil
small animals (worms, snails, pill bugs, etc.)	

Definition of Terms

<u>Chlorophyll</u>	The green pigment material where photosynthesis occurs in plants.
<u>Ecosystem</u>	The biotic community and its abiotic environment functioning as a system.
<u>Microenvironment</u>	A very small environment that has all the components to maintain life as an ecosystem.
<u>Photosynthesis</u>	The process by which a plant can make its own food by using light energy.
<u>Respiration</u>	The process of combining food and oxygen to produce energy.
<u>Variables</u>	The components of an experiment that can change or be changed. (Examples: type or amount of soil or amount of water that can be used in the experiment.)

Before the Session

Gather all materials needed for the group. Make copies of worksheets and materials. You may need help from your students in gathering animals.

Background Information

It is important to understand how living things affect one another in an environment. Natural environments adapt to most changes so they can remain in balance and continue to support most parts of the ecosystem. The ecosystem is a delicate balance of nature, when this balance is upset all parts of the system are affected. People have upset balances in the ecosystem for years by growing crops at the expense of native vegetation. Man has domesticated some animals, driven some away and eradicated others from some areas. Recently man has tried to restore ecosystems by passing laws to protect animals, land and even entire ecosystems.

Suggested Lesson Plan

1. Divide students into groups of three.
2. Give each group Definition worksheets.
3. Begin the exercise by cutting the top off the plastic jug (bottle). Using pen punch several holes in the bottom of the container.
4. Put about 12 centimeters of soil in the bottle. Place plant roots in the soil in the container. Place one or more small animals in the bottle. Moisten the soil and plant with water from spray bottle.
5. Cover the top with aluminum foil and punch several holes in the foil.
6. Using the spray bottle water the plant each day for a week.
7. Direct each student group to record their observations on the recording sheet. (Handout sheet.)
8. Discuss and identify variables in the activity.

Application

Lead students in a discussion of the diversity of microenvironments. Students will begin to understand how the created microenvironment changed at the end of the week. Students will have an understanding of the needs of living things in an environment. After observing the microenvironment for a longer period do students see any changes? This is a relatively sterile environment, what else might the plant or animals require to survive and reproduce that is not being provided? Potting soil is normally sterilized and may not contain nutrients which will keep

earthworms alive. Snails may not find certain plants to their liking. Even the plant cannot survive on water alone. The students should acquire an appreciation for the complexity of a natural system, and an understanding of why (especially in very fragile systems) changing the composition of an area can drastically affect the ecosystem. They should also understand, however, that it is possible in most ecosystems to manage an area in order to meet human goals with minimum impact to the ecosystem.

Extension

1. Experiment with different kinds of soil. Check for any differences.
2. Experiment with different amounts of water. Make one microenvironment a desert environment by giving it very little water.

Resources Available

Destinations in Science. 1995. Addison-Wesley Publishing Co.

Elementary and Middle School Environmental Science Source Book. University of South Carolina.

Project Learning Tree. 1994. American Forest Foundation, 1111 19th Street N.W., Washington, D.C. 20036.

Project Wild. 1986. Western Regional Environmental Education Council, Bethesda, Maryland.

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MICROENVIRONMENT IN A JUG

WORKSHEET

Name:

Date:

I. Do you think you have provided the organisms with everything they need for survival?

II. Discuss the things you think living organisms need for survival.

III. My definition of an ecosystem is:

IV. My definition of a microenvironment is:

V. List any differences in:

a. Soils-

b. Plants-

c. Animals-

d. Water-

WORKSHEET - CONTINUED

Name:

Date:

VI. Do you think organisms of some environments are likely to be more successful in other environments?

Why?

VII. How did the microenvironment change?

Why?

VIII. What did the living organisms in your microenvironment need to survive?

IX. Is your model like a forest?

How?

X. How is it different from a forest?