

**TEACHING KATE
TEACHING KIDS ABOUT THE ENVIRONMENT**

ECO-SURVEY OF SMALL AREA

Grade Level: 6-8

Time Required: 8-10 class periods

SC Science Standards

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

Grade 6:

- I. A. 1. a 1
- I. A. 1. d 1
- I. A. 2. c
- I. A. 3. a
- I. A. 7. a

Grade 7:

- I. A. 1. a 1
- I. A. 1. d 1
- I. A. 2. c
- I. A. 3. a
- I. A. 7. a
- III. A. 2. b

Grade 8:

- I. A. 1. a. 1
- I. A. 1. d 1
- I. A. 2. c
- I. A. 3. a
- I. A. 7. a

Purpose

Students will survey plant and animal populations of a study area and become aware of the physical factors affecting these populations as well as the impact that the populations have on the environment.

Skills

Comparing, estimating, mapping, measuring, observing, sampling, surveying.

Concepts

Types and numbers of populations of plants and animals living in an area are dependent on the biological and physical factors; living and non-living things constitute an ecosystem where all parts are constantly interacting.

Materials Needed

bulletin board paper	markers
measuring tape	ribbons
scissors	small jars
string	stakes
thermometers	soil thermometers
soil composition kit	digging tools
soil pH kit	worksheets/activity sheets
microscopes	stereoscopes
distilled water	
reference books or keys on soil microorganisms	
soil population kit (or small jar, funnel, screen wire and goose neck lamp)	

Definition of Terms

<u>Clay</u>	Soil particle measuring less than 0.002 mm.
<u>Ecosystem</u>	A group of living things and their non-living environment.
<u>Environment</u>	Everything living and non-living surrounding a living thing.
<u>Habitat</u>	The specific surroundings within which an organism normally lives and grows.
<u>Limiting Factors</u>	Influences in the life history of any organism which restrict growth and reproduction.
<u>Macroorganism</u>	Organism large enough to be seen with the naked eye.
<u>Microorganism</u>	Organism which is too small to be seen with the naked eye.
<u>pH</u>	A measure of the relative acidity or alkalinity of a substance.
<u>Physical Factors</u>	Components of the environment that are not man made. These include air, water, sunlight, temperature and soil.
<u>Population</u>	All of the members of a single species.
<u>Sand</u>	Soil particle measuring 0.05-2.0 mm.

Soil A mixture of weathered rock and decayed organic material.

Silt Soil particle measuring 0.05-0.002 mm.

Before the Session

Find and mark various types of ecosystems near campus. Gather materials needed. Make copies of worksheets and activity sheets. Discuss the scope of the unit. Plan a trip to various areas where there is a diversity of life.

Background Information

Changes are always taking place among living things and their environment. Plants, animals and their physical environment constantly interact with each other.

The physical factors of the environment include soil, water and temperature. Whenever there is a change in any living or physical factor, other changes may occur in the environment.

Suggested Lesson Plan

Lesson 1

1. Introduce students to the concept of ecosystem by placing the word on the board. Record and discuss student responses.
2. Have students come up with a definition for the term.
3. Have students name various kinds of ecosystems.
4. List various kinds of ecosystems on the board.
5. Assign each small group of 4-5 students a different ecosystem.
6. Pass out markers and a large piece of bulletin paper to each group.
7. The students will write the name of their group ecosystem on the sheet and brainstorm and list as many bits of information about it as they can. Have each group report to the class.

Lesson 2- Outdoor Activity

1. Walk with students around the school setting.
2. Have students make a list of the various kinds of ecosystems observed and the types of living things they would expect to find living there.
3. Return to the class setting and have a class discussion on the observations. Ask students to explain the criteria used to derive their answers.
4. Discuss habitat.
5. Discuss possible limiting factors in each of the areas found.

Lesson 3- Outdoor Activity

1. Assign small groups.
2. Assign an ecosystem/study area to each group.
3. Pass out materials. (Tape measure, string, stakes, scissors, thermometer and soil thermometer.)
4. Pass out work sheets for surface population.
5. Students will measure and stake out a plot in their study area. (4 feet X 4 feet.)
6. Have groups complete surface population worksheets for their study area.
7. Discuss group summaries.

Lesson 4

1. Assign groups.
2. Teacher will show students how to set up a soil critters collection apparatus. (Use prepared kit or a small jar with a small amount of distilled water, a funnel, and a goose neck type lamp. Place the funnel over the jar wide end up, place light source over funnel. Place a piece of screen wire in funnel to hold soil in place. Place soil in funnel, turn on light and leave overnight.) Complete this activity the following day.
3. Pass out the soil pH kits and a small paper cup.

4. Pass out the soil pH activity sheets.
5. Have each group follow the directions on the kit and test the pH of the soil in their study area.
6. Each group will collect a cup of soil and place in the funnel of their soil critter collection apparatus. Leave the light on for the next 24 hours.
7. Discuss the class data on soil pH.

Lesson 5

1. Pass out microscopes and stereoscopes.
2. Pass out activity sheet for soil population count.
3. Have groups complete microscope study of the organisms found in the water in the jar of the soil critters collection apparatus.

Lesson 5

1. Pass out soil composition kit.
2. Pass out soil composition and texture worksheet.
3. Have each group determine the composition and texture of the soil in their study area.
4. Discuss the types of soil found in the various study areas and how the soil type affects the population there.

Lesson 7- Summary Lesson

1. Discuss and review with the class the physical factors found in any environment.
2. Assign each group a final project depicting creatively their study area and the information that they gained from their survey.

Application

All living things are dependent on their physical environment. The success of a population may also depend on other living things. Farmers, hunters, gardeners, homeowners and many others who utilize plants and animals in any way need to be aware of the interactions among the living

and non-living parts of the environment. This knowledge will allow optimum use our resources by better plant and animal management. Farmers and gardeners, for example, need to be aware of the composition and chemistry of their soil in order to optimize crop yields. They also need to be knowledgeable about any insects within the soil which may be harmful or beneficial to their crops.

Extension

1. Have class make a list of all the species found, from all study areas, and create a graph showing the results.
2. Create various habitat areas on campus.
3. Find out about different ecosystems in the community.
4. Visit natural habitat areas in the community.
5. Invite personnel from various agencies (United States Department of Agriculture, botanist and or entomologist from local university, Natural Resource Conservation Service, Land Resources Division of the South Carolina Department of Natural Resources) to visit.

Resources Available

Elements of Ecology, 3rd edition. 1992. R. L. Smith. Harper Collins Publishers Inc., New York, N.Y.

Natural Resource Conservation Service.

The Local Environment, Fast 1. 1992. Francis Pottenger, III and Don Young. University of Hawaii, Honolulu, Hawaii.

Prepared by: Barbara W. Jones

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ECO-SURVEY OF SMALL AREA

SURFACE POPULATION WORKSHEET

Name:

Date:

I. Describe your ecosystem (where located, amount of light, etc.).

II. Survey the macroorganisms in your staked plot.

Macroorganism	Number Found

III. Following the directions on the soil thermometer, find the temperature of your soil.

IV. Is your soil wet or dry?

V. What is the air temperature around your plot?

Summary

What is the relationship between the macroorganisms found in this study area and the physical factors?

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ECO-SURVEY OF SMALL AREA

DETERMINING SOIL pH ACTIVITY SHEET

Name:

Date:

Materials Needed:

soil pH kit
soil samples

I. Following the directions on your soil pH kit determine the pH of the soil in your study area.

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ECO-SURVEY OF SMALL AREA

SOIL CRITTERS ACTIVITY SHEET

Name:

Date:

Directions

- I. Remove the jar from soil critters collection apparatus.
- II. Place one drop on a microscope slide, observe and list all microorganisms found.
- III. Draw and identify microorganisms.

Summary

Discuss the relationship between the soil critters found and the physical condition of your study area.

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ECO-SURVEY OF SMALL AREA

SOIL CRITTERS ACTIVITY SHEET

Name:

Date:

Materials Needed:

- shaker jar
- soil from study area
- sheet of white paper
- hand lens

Directions

- I. Rub a clump of soil from your study area between your thumb and forefinger. Record the feel (sandy, slippery, etc.).
- II. Place a sample of soil from the study area in your jar.
- III. Replace the top and shake well separating the grains.
- IV. Pour contents on a piece of white paper.
- V. Using the hand lens, examine and record the percentage of different soil particles found.

Results

- I. Soil texture _____
 - II. Soil particles
 - a. % sand _____
 - b. % clay _____
 - III. Describe your soil type _____
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