

Elements of an Ecosystem

GENERAL INFORMATION

THEME

Ecosystems are made up of many factors that keep the entire system running like a well-oiled machine.

SUB THEMES

1. Each ecosystem is different with its own set of unique abiotic and biotic factors.
2. Complex relationships between plants and animals help keep the system balanced.

VOCABULARY

Ecosystem, biotic factors, abiotic factors, competition, predators, prey, microclimate

ACTIVITY MATERIALS

Thermometers, anemometers, soil color chart, soil texture samples, spoons, metal cans, bottled water, stop watches, flagging, flags, data sheets, pencils, clipboards

METHODS

INTRODUCTION

Introduce yourself and state the title of the activity. Preview the main points of the activity and give students an idea of what they will be doing. Conversationally state the theme and sub themes. Ask: **What is an ecosystem** (it is the combined living and non-living things that interact within a specific area)? Invite students to provide some examples (forest, grassy area, pond, lawn, etc). Ask: **What are some of the non-living things in an ecosystem** (rocks, soil, wind, sunlight, water, etc.)? Explain that these are called abiotic factors. Discuss how living things interact with the non-living things in an ecosystem. Use an example such as a snake living in the rocks of a cliff or a bird finding a tree in which to hide when it is very windy outside. **What are some of the living things in an ecosystem** (plants, animals, insects, spiders, etc.)? Explain that these are called biotic factors. Discuss how living things also interact with each other. Introduce the concept of predator/prey relationships. Ask: **If we examined several different types of ecosystems, do you think we would find the same abiotic and biotic factors in each ecosystem?** Explain that different ecosystems have different microclimates and soils that are not good for all types of plants and animals. Thus, the plants and animals found in one type of ecosystem may not be found in another type of ecosystem. This also affects the predators that are found in an

Teacher's Corner

Grade Level(s)

6th

State Performance Indicators

SPI 0607

- Inq.2: Select tools and procedures needed to conduct a moderately complex experiment.
- 2.1: Classify organisms as producers, consumers, scavengers, or decomposers according to their role in a food chain or food web.
- 2.2: Interpret how materials and energy are transferred through an ecosystem.
- 2.3: Identify the biotic and abiotic elements of the major biomes.
- 2.4: Identify the environmental conditions and interdependencies among organisms found in the major biomes.
- 8.4: Interpret meteorological data to make predictions about the weather.

Elements of an Ecosystem

INTRODUCTION (cont.)

ecosystem. If the ecosystem is not good for certain prey animals, then certain predators will not likely be found because there is not enough food for them. It is important to stress how all of the biotic factors of an ecosystem are dependent upon each other and upon the abiotic factors for survival. Stress the connections.

ACTIVITY

There will be four prepared sites of equal size in four different habitat types: grassy, creek-side, lawn, and gravel road. Divide the group of students into three teams and provide each team with their materials, data sheets, pencils, and clipboards. Each team will measure a different set of characteristics at all four sites. Students will spend 10-12 minutes collecting their data at each station. The first team will measure soil characteristics, the second will measure ambient characteristics, and the third will document the types of organisms present.

SOIL: (1) Soil moisture – at each site there will be a metal can with several holes punched in the bottom. The students will fill the can to a predetermined level and then time how long it takes for the water to drain; (2) Soil color – the students will compare the color of the soil with a prepared chart; (3) Soil odor – the students can smell the soil and describe any scent that they detect; (4) Soil texture – the students will compare the texture of the soils with prepared samples. (5) Soil temperature – the students will use a thermometer to determine the temperature of the soil.

AMBIENT: (1) Sunlight penetration – the students will determine if there is full sunlight, partial sunlight, or no sunlight reaching the ground; (2) Temperature – the students will measure the air temperature; (3) Wind speed – using an anemometer, the students will measure the wind speed.

ORGANISMS: In each site, this team will document the type of plants and animals in broad categories. Remind students that the air column above the ground is included.

When finished, all teams will present their data and compare results. Discuss how the biotic and abiotic factors compare in the different ecosystems and how all factors affect each other.

DISCUSSION

Review the following points: Which plot had the most plants/animals and the highest/lowest measurements of each abiotic factor? Did you find different organisms in each plot? Do the organisms present affect the abiotic factors or vice versa? How might the sunlight affect the plant life and animals present? What factor seems to be the most important in determining the type and amount of life present?

WRAP-UP

Let the group know that the activity is coming to an end. Conversationally review the theme and sub themes. Collect the data sheets.

BRINGING IT TO THE CLASSROOM

Prepare an aquarium for the students to observe an ecosystem on a daily basis. Include abiotic factors such as rocks, sand, and water and biotic factors such as snails and plants.

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