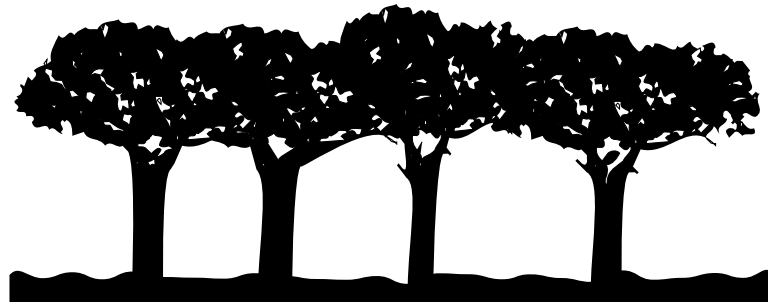


The Rainforest Community



Objectives

- ▶ design a self-sustaining, miniature ecosystem
- ▶ explore the principles and processes that occur in all ecosystems

Vocabulary

biome

community

population

biosphere

ecosystem

Background

Ecology is the study of the relationships of living organisms to each other and to their environment. In ecology, organisms can be classified into categories such as population, community, biome, and biosphere.

Population refers to a group of the same organisms living in a common environment, such as the rainforest. Several populations coexisting in that environment are referred to as a community. Communities coexisting in that environment form a biome or ecosystem. Though the terms biome and ecosystem are often used interchangeably, scientists generally use biome when they classify communities according to the plant and animal life within them. They use ecosystem when they classify areas by how living organisms and their environment function as a unit.

The Australian rainforest is a terrestrial ecosystem. When scientists study the ecosystem, they examine the interrelationships of its soil, climate, water, plants, insects, birds, and other animals. All ecosystems together make up the biosphere, those parts of the earth where life exists. These include the atmosphere, lithosphere (the solid outer part of the earth), and hydrosphere (the earth's water).

Materials

2 or 3 liter clean plastic soda bottle
charcoal
sand or gravel
small rocks
potting soil
masking tape

neotropical rainforest plants, such as:
Dracaena, Philodendron, ferns,
liverworts, mosses, prayer plants,
and bromeliads (from local nursery)

Activity

1. Discuss with students the meaning of the term ecosystem. Make sure they understand that an ecosystem is a balanced arrangement of plants, animals, soil, and climate and that it is a stable unit, with the decay of dead organisms providing the food for those that are growing.
2. Tell students that they will be creating a miniature rainforest ecosystem, a terrarium, that should require relatively little care. Ask: What materials will you need to create your ecosystem? (soil, plants, animals)
3. Have students work in pairs to create an ecosystem. Follow these steps:
 - a. Cut off the tops from the plastic soda bottles. (Save the tops.)
 - b. Cover the bottom of the bottle with two inches of sand.
 - c. Cover the sand with a thin layer of charcoal or gravel.
 - d. Cover the charcoal with two inches of potting soil.
 - e. Place rainforest plants in small, pre-moistened holes, leaving enough room for them to grow.
 - f. Water the plants. (The soil should be moist, not soggy.)
 - g. Cover the terrarium with the top of the bottle and tape to make a nearly airtight seal.
 - h. Place the terrarium where it will receive morning sunlight.

4. Explain that the system will need a source of nitrogen. Ask students what they can add to supply that source (example: plant-eating insects, such as ladybugs). Balance their plant-eating by introducing some insects or other small animals that eat the plant-eaters.
5. Have students explain how the continuous flow of energy and food in the ecosystem allows it to sustain itself. Ask: Is the ecosystem self-sustaining, or does it get energy from outside? Is this a balanced system? What is the energy source? (sunlight) Why is an energy source necessary? (allows plants to take in carbon dioxide to grow and produce oxygen) How are the organisms interdependent? How do insects get the oxygen? How do plants get the nutrients they need?

Extend the Activity

Have students design a zoo exhibit to house plants and animals from the rainforest ecosystem.