



Science Lesson 17: Modeling Biological Communities

Hawaii DOE Content Standards:

Science standards: 1, 2, 3, 4, 5

Key concept:

Each biological community has their own unique needs and sustainable environment.

Performance indicators: After completing this unit, students will . . .

- list the components of a sustainable ecology
- describe the different interactions between communities of organisms

Note to the Student:

“When you have completed this lesson, you will be able to take care of an aquarium, and select an appropriate group of organisms to stock the habitat.”

Activity at a glance:

Build and maintain an aquarium using water quality meters, and through the design of a natural filtration system.

Time: Four class periods, on-going monitoring

Prerequisite skills: Collect and interpret data, identify organisms

Skills to be introduced:

Model a natural system based on environmental quality information and organism compatibility

Assessment:

Journals and life logs, survival rates for organisms

Vocabulary:

Ecosystem, nutrient, plenum layer, life log, pollution, environmental health

Materials:

Twenty gallon aquarium and aerator, collection nets, buckets, working gloves, identification books, water quality meters, thermometer

Activity Overview

1. Introduce students to the idea of a balanced ecology, with a focus on environmental parameters of primary concern such as temperature, pH, dissolved oxygen, and nutrient levels.

2. Demonstrate the construction of an aquarium habitat with a plenum layer and diverse habitat.
3. Review suitable species and predator-prey relationships.
4. Have students construct their own aquariums in groups, and allow them to collect and monitor several organisms with particular focus on life logs and environmental quality.
5. Alternately, design virtual habitats with paper and paint, or digital modeling, and allow students to write out several potential life log scenarios.

Cultural Values

Kokua

Taking initiative, service, clean up maintenance

Lokahi

Unity, harmony, leadership skills

Adaptations/ Extensions

Discuss difference between percent saturation and milligrams per liter measurement of dissolved oxygen.

Safety

Be aware of harmful organisms, and if needed, use identification books or a knowledgeable individual to identify them. Do not carry an aquarium with water. It may crack due to water pressure. Wear working gloves when handling coral or objects with rough or sharp edges.

Obtain necessary permits before collecting marine or fresh water aquatic organisms.

