

ENVIRONMENTAL ENCOUNTERS

Lesson Plans for the Science of Water



Ecosystem Biodiversity

Suggested grade level:

High School Earth Science Systems

Objective:

Students will discuss the biotic and abiotic elements of ecosystems and how changes in water may affect the elements of an environment, including biodiversity.

Curriculum ties:

√ High School Science Earth Science Systems Standard 2 Objective 2 a-c, e, Objective 3 a-b, e

Time needed:

- √ Prep: 1 hour
- √ Pre trip: 1-2 hours
- √ Garden: 1-2 hours
- √ Post trip: 4-6 hours

Materials needed:

- √ An ecosystem for the students to observe, like an aquarium, terrarium, or flowerbed
- √ pH strips
- √ Microscopes
- √ Resources for students to research about biodiversity in Utah

Teacher notes:

In this activity students will learn about and observe the elements in different ecosystems. Students should know that there are biotic (living - like plants, animals, and insects) and abiotic (nonliving - like water, temperature, pH, and light) features of ecosystems. Variations in these can affect the health of an ecosystem. They should also understand that biodiversity means having a variety of living organisms in an ecosystem. Ecosystems that are biologically diverse are healthier ecosystems.

Procedures:

Preparation

Call 801-565-4314 to schedule your visit to the Conservation Garden Park at Jordan Valley.

In the classroom

Have the students observe a small ecosystem and record their observations. Ecosystems can be observed in a small environment such as a terrarium, aquarium, or flowerbed. Students can measure the pH of the water with pH strips. Note things like light, temperature, exposure to wind and snow, and notice the living elements of the environment, including microbes (if microscopes are available), worms, plants, bugs, etc. Have the students write about what would happen if some of these elements changed (i.e., less water, more acidic or alkaline soil or water, more or less sunlight or heat, etc.). Ask the students what elements in an ecosystem might encourage biodiversity.



Field trip

With the help of a Garden guide, students will note which biotic and abiotic elements they find in the Garden and will compare those found in the various ecosystems they visit. Good ecosystem comparisons can be found in the “High Mountain Desert Landscape,” “Woodland Landscape,” various turf areas, and the “Perennial Landscape.” Students will record the amount of diversity they observe in each ecosystem and hypothesize about what factors are influencing diversity in each ecosystem, and especially how water may be affecting the ecosystem.

Follow up

Students will research and present reports on how biodiversity can be maintained in Utah, especially in regards to conserving water resources.

Assessment:

The students’ reports will indicate whether or not they understand the interactions between elements of the environment and biodiversity.