ENVIRONMENTAL ENCOUNTERS

Lesson Plans for the Science of Water

Conservation Garden Park

Human Impacts on Watersheds and Ecosystems

Suggested grade level:
High school biology

Objective:
Students will be able to report on how people affect the ecosystem.

Curriculum ties:
- √ High school Science Biology Standard 1 Objective 2 b-d, Objective 3 c-e

Time needed:
- √ Prep: 1 hour
- √ Pre trip: 2 hours over the course of a week
- √ Garden: 1-2 hours
- √ Post trip: 4 hours in or out of class

Materials needed:
- √ A small glass or see-through plastic bowl
- √ Salt
- √ Liquid fertilizer (i.e. MiracleGro)
- √ Cooking oil
- √ Colored drink mix
- √ Tin foil
- √ A potted plant
- √ Resources for students to research how people affect the ecosystem

Teacher notes:
In this activity students will learn about human impacts on the watershed. Students should know what ecosystems and microclimates are and some factors that affect these like biodiversity, pH, and temperature. Students should understand that a watershed is an area where all the water drains to a single source, like a lake or the ocean. Watersheds can be small, like a park that drains into a pond, or large, like the entire Colorado River system. They should also know what the water cycle is and how evaporation works.

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

In the classroom
Show the students a map of northern Utah (or your local watershed) and ask the students to identify the watershed. They should point out the rivers that flow down into the Salt Lake Valley then identify roughly where those rivers start. This defines the boundaries of the watershed. They should also recognize that

the Great Salt Lake is the final destination of the water in the watershed. Point out that the Great Salt Lake is so salty because salt stays behind when the water evaporates. Tell the students you are going to do an experiment to learn about what happens to pollutants in our watershed as the water evaporates. Ask them, based on what happens to the salt in Salt Lake, what they expect to find.

Create a basin out of a small plastic or glass container. Put water in your basin, and then explain to the students that you are adding pollutants as you add salt, liquid fertilizer, and powdered drink mix. Discuss how plants can help to clean water as it moves through a watershed by filtering out pollutants, and how paved areas like parking lots create even more runoff. To simulate parking lot run-off, get some tin foil and put a drop of cooking oil on it, then pour water over it and watch the water and oil drain into the basin. You can compare this to water that moves through plants and soil by putting some colored drink mix on top of the soil of a potted plant and watering it until the water runs out the bottom. Very little "pollutant" will filter through. Then, leave the model, with the water in the basin, in a hot location so the water evaporates over the course of a week or so and discuss the results with the students.

What is left behind when the water is gone?
What things do people do that affect the watershed?
How does the watershed affect the local ecosystem?

Field trip
From the Garden guide, learn about and record the choices that people in Utah can make that will affect water use and quality and the local ecosystem. Observe the ecosystems in the Garden (particularly the "Rain Gardening," "Composting" and "Outsmarting Invaders" exhibits), and record observations such as biodiversity, pH of soil and water, and temperatures and develop a hypothesis about what might change these factors from one microclimate to the next.

Follow up
Students will research and write about a positive or negative choice that people are making that affects the local environment, such as water use, pollution, revegetating stream banks, or conservation efforts.

Assessment:
The students' reports will indicate their understanding of the relationship between humans and their ecosystem.