

# ENVIRONMENTAL ENCOUNTERS

## Lesson Plans for the Science of Water



### Plant Adaptations to Climate

**Suggested grade level:**

High school biology

**Objective:**

Students will write about how the structures of plants make them more or less adapted to Utah's climate and then classify plants according to their evolutionary adaptations.

**Curriculum ties:**

- √ High school Science Biology Standard 3 Objective 1 a-d, Objective 2 a-e, Standard 5 Objective 3 a-c

**Time needed:**

- √ Prep: 2 hours
- √ Pre trip: 3 hours, spread out over several weeks
- √ Garden: 1-2 hours
- √ Post trip: 2-3 hours in or outside of class

**Materials needed:**

- √ Examples of plants native to different climates, such as a cactus, tropical house plant, garden plant like roses or tomatoes, and a native plant.
- √ Pictures of these plants at different times of the year, such as in flower or during dormancy, would also be helpful.
- √ A container for watering that is marked with ounces or milliliters, such as a marked pitcher or a liquid measuring cup
- √ Notebooks for recording water amounts and hours of sunlight
- √ A book that tells students a little bit about each plant, like a simple plant encyclopedia, would also be useful
- √ Plant collection log page (attached)

**Teacher notes:**

In this activity students will learn about how native plants are adapted to Utah's climate. You will need to present the students with basic information about Utah's climate, like average days of sunlight, average inches of rain, and average number of days below freezing. This information can be found at <http://www.utahweather.org/>.

Students will need to know about the basic structures of plants, like roots, leaves or needles, flowers, fruits, and vascular systems and what their functions are. They will also need to understand that plants are adapted to the climate where they are native.

**Procedures:**

Preparation

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

### In the classroom

Students will compare the structure of plants from a variety of ecosystems, such as cacti, tropical plants (such as house plants), garden plants, and native plants. Students should observe the leaves of each of the plants. How are they different? How are they the same? What about the flowers? (Pictures may be necessary.) Keep records of how much water and sunlight each needs to be healthy over the course of several weeks if possible. Compare this to Utah's climate. Based on this comparison, which plants do you think are best adapted for Utah's climate? Which are worst? Find out where the plants are from originally, and guess what the climate must be like there for the plants to be well adapted to their native climate.

### Field trip

The Garden guide will tell students more about Utah's climate and which plants are best adapted to it, especially in regards to water usage. Using the Plant Collection Log, students will observe and diagram the structures of various plants that they find at the Garden and classify them based on their adaptations. Relevant areas of the Garden are the "High Mountain Desert Landscape" and the "Woodland Landscape." If the group is relatively small, a large display of indoor plants can be seen in the Administration Building. Students will use a key, available at the Garden, to identify some of the plants.

How are each adapted to survive?

Which are best adapted to Utah's climate?

### Follow up

Students will write about why using plants that are adapted to Utah's climate is an advantage, and which plants they would suggest people use in Utah, based on their suitability for the climate. The Garden web site can be used as a resource: <http://www.ConservationGardenPark.org>.

### **Assessment:**

The students' Garden observations and written reports will indicate their understanding of native plants' adaptations to Utah's climate.