

## **Introduction to Plant Collection and Identification**

### **Learner Outcomes**

The learner will

- Define the role of plants in the reclamation of Chihuahuan Desert communities.
- Use standard methods for collecting and preserving plant samples.
- Work individually and in teams while learning the characteristics of 20 or 25 native and introduced plants.
- Compare the characteristics of native and introduced plant species.

### **Background**

Based on above- and below-ground characteristics all plants are assigned a first and last name. The first name is the genus, and the second name is the species. In this lesson students will: (1) assess biological differences between commonly occurring Chihuahuan Desert plants, (2) collect and mount plants, and (3) with the aid of the teacher and trained state and government employees, students will learn common and scientific plant names.

Activity #1  
**Pre-Test**  
25 minutes

### **Materials**

- Supplement numbers 2.1, 2.2

### **Assessments**

- Pre-test

### **Procedure**

The teacher will

- Administer and score the pre-test.

Activity #2  
**Introduction to the Reclamation Project**  
1.5 class periods

### **Materials**

- Supplement numbers 2.3, 2.4, 2.5, 2.6
- Photographs of common Chihuahuan Desert plants, plant samples or drawings
- Plant identification books
- 3 x 5 inch plant cards with scientific name on the front and common names on the back

### **Assessments**

- Completed Venn diagram
- Plant matrix

## **Procedure**

The teacher will

- Identify the project purpose.
- Discuss individual and group activities, and the roles of teacher and students.
- Interpret the importance of obtaining landowner permission when collecting plants.
- Assess and evaluate scientific procedures and scientific application.
- Identify and evaluate course work implications.
- Discuss student assessments.
- Divide students into groups of two or three. You may want them to assign rolls of the recorder, reporter and the plant handler.
- Introduce students to plant identification by providing them with various plants for each of the classifications.
- Instruct students to look carefully at each of the plants and determine three common classifications based on the common characteristics for each classification.
- Explain to students that they will identify the characteristic unique to each classification, then overlapping characteristics between two classifications and then the characteristics common to all three classifications on the Venn diagram. (Do this as students are beginning to sort the plants and provide the groups with a Venn diagram and the plant.)
- Instruct students to record interesting facts about their identified plants on the plant matrix. This will be used later on their plant mounts.
- Provide each group with a field guide to the plants and have group members check their classifications and characteristics of the plants common to each.
- Provide students with a clean Venn diagram to make any changes or revisions.
- Remind students to identify interesting facts about the plants as they locate them in the field guide and record them on the plant matrix.
- Roam among groups to insure proper identification and name pronunciation, as students practice plant names.
- Ask students to think about what was learned in view of plant classification, how they learned it, why this learning is important and how this will relate to the revegetation project and objective.
- Ask the reporter of each group to share their findings and their learning.
- Have students write the common name on the front of a 3 X 5 inch card, and the scientific name on the back of the same card. They may practice name recognition and spelling individually or in groups.

Activity #3

### **Plant Press Assembly**

1 class period

## **Learner Outcomes**

The learner will

- Construct and assemble a plant press.
- Correctly place samples in the press.
- Dry samples.

## Materials

- Supplement number 2.7
- Two pieces of half or three-quarter inch plywood, 12 X 19 inch or 30.5 X 48.5cm
- Twenty to thirty pieces of cardboard, 12 X 19 inch
- Thirty to fifty pieces of newspaper (full sheets) folded in half, 12 X 19 inch
- Two cotton straps with locking buckles or cotton rope, a minimum of 1 X 72 inch
- Drying oven-circulating

## Assessments

- Observation of plant press with plants inside
- Field journal

## Procedure

The teacher will

- Instruct students to construct a plant press following the procedures outlined in the supplement number 2.7.

Activity #4

## Plant Identification, Classification and Collection

2 to 4 class periods

## Materials

- Field Journal and a pen or pencil
- Camera or drawing paper
- Gloves
- Shovel

## Assessments

- Field notes
- Illustrations or pictures

## Procedures

The teacher will

- Teach students the field protocol in growing plants during a field visit. Students will apply what they learned in the class lesson by identifying distinguishing plant characteristics, and by repeating common and scientific plant names.
- Make arrangements for a nursery to bring plants to the classroom or for the class to visit a nearby nursery, for additional student exposure.
- Have students collect personal plant samples with a shovel. Use gloves to protect skin from thorns or spines.
- Have students take photographs to aid in plant identification.
- Ask students with artistic skills to draw plants to aid in plant identification.
- Instruct students to use a shovel to loosen and/or remove soil around the base of small plants.
- Instruct students to use their hands, protected by gloves, to remove a sample from large plants.
- Tell students that when possible, to attach a flower, fruit or root sample to the plant

sample.

- Have students place the plant sample in the center of the folded newspaper sheet, with the remaining half of the sheet folded over the sample.
- Warn students not to press succulents (cactus) with non-succulents (grass, forbs shrubs and trees). If the two types are mixed, mold will destroy all the samples
- Store the press in a well-ventilated area where air can circulate through the corrugated edges of the cardboard and remove moisture from the plant sample.
- If samples are unusually moist, place the press in a circulating drying oven. Oven temperatures should vary from 30 to 35<sup>0</sup>C.
- Have students open the press weekly to determine if samples are dry.

Activity #5  
**Native and Exotic Plant Research**  
3 to 5 class periods

### **Learner Outcomes**

The learner will

- Determine differences between native and exotic plants using reference sources.
- Identify botanical characteristics that can be used to classify plants.
- Correctly identify plants and draw pictures illustrating botanical characteristics.
- Identify plant characteristics responsible for plant adaptation.

### **Materials**

- Supplement numbers 2.8, 2.9
- Filled in plant matrix
- Plant identification books that include photographs
- A field notebook
- 3 X 5 inch photographs - black and white or color
- Scientific journal
- Plant identification keys
- Two provided scientific publications on *Lehmann lovegrass* and exotic plants from the Kalahari Desert in Southern Africa (2.8, 2.9)
- Computer and internet availability

### **Assessments**

- Teacher observation on the quality and content of the documentary

### **Procedures**

The teacher will

- Make plant identification books and photographs available and have students use the books to determine general characteristics of exotic plants.
- Identify a site where exotic plants are present.
- Instruct students to record in a field notebook the location (km or miles) from a known point to the observation site. Also have students record soil texture, exposure (direction: east, west, north or south), elevation, plant abundance (plant

numbers) and plant phenology (green or dry leaves only, leaves plus seedheads, location in relation to other plants).

- Instruct students to use scientific journals and internet sites to research the history of the exotic plant. Topics should include: (1) the location where the exotic plant occurs naturally or where the plant originated, (2) how the plant came to North America, (3) where the plant is located in North America and the current area of distribution, and (4) what adaptations make it possible for the plant to invade new sites in North America and other sites throughout the world.
- Instruct students to write and produce a television documentary on an exotic plant. Topics should include items 1 - 4, plus an evaluation of positive and negative benefits associated with the species.

Activity #6

### **Mounting Plant Samples**

1 class period

#### **Learner Outcomes**

The learner will

- Identify the quality indicators associated with a plant mount
- Develop a list of materials
- Mount three to five plant samples
- Evaluate and assess individual and group mounts

#### **Materials**

- Supplement number 2.10
- Elmer's glue
- Twenty or thirty mounting sheets or construction paper, 11.5 X 16.6 inch
- Samples of completed quality mounts
- Overhead projector

#### **Assessments**

- Rubric (Supplement number 2.10)

#### **Procedure**

The teacher will

- Have students place plant samples on mounting sheets or construction paper, and modify plant size to fit on sheet or paper. Apply glue at three to five locations to secure the plant to the paper.  
Note: It may be necessary to use paperweights or other heavy objects to shape the plant on the paper before applying glue.
- Instruct students to include on the bottom corner of each plant sheet the following information: scientific name, both genus and species; date of collection; site of collection; and the name of the collector.
- Distribute copies of the rubric.
- Review the rubric and the grading procedure using an overhead projector.
- Identify materials needed to complete the assignment.
- Provide sample mounts.

- Have students identify quality indicators.

Activity #7  
**Culminating Demonstration**  
2 class periods

### **Learner Outcomes**

The learner will

- Demonstrate presentation skills.
- Accurately identify and label 5 mounted plants, including scientific name, common name and classification as a forb, grass, shrub or tree.
- Identify the adaptation method to the Chihuahuan Desert climate.
- Include at least 3 interesting facts about each plant.
- Provide self-assessment and feedback to teacher and peers.

### **Materials**

- Supplement number 2.10
- Student mounts

### **Assessments**

- Rubric provided on mount, content and presentation
- Optional student video

### **Procedure**

The teacher will

- Review the rubric with students.
- One day before activity, have students sign up for a ten minute slot for either of the two days. Remind students to practice ahead of time in front of small audience. Suggest that a parent or a peer do an assessment using the rubric and do a self-assessment before presentation day.
- Remind students to bring the rubric to class and to come to class prepared with visuals and notes.
- Explain to students that they need to be prepared to offer and receive constructive critiquing—specific comments on what was done well and what needs improvement.

The presenting group will

- Give rubric to the teacher and set up presentation. The next group prepares themselves to do the same.
- Give presentation and conclude with “Are there any questions of our group?”; “Are there any comments?”

The students will

- Provide feedback on what was done well and suggestions for improvement.
- Ask the teacher to summarize critique.

The teacher will

- Fill out the rubric during the presentation.
- At the conclusion, ask the group what they will do differently the next time they present.