

Key to Survival: adaptations for an extreme environment

What types of plants are in a wetland? Use a dichotomous key to classify different types of plants found in Ballona Wetlands.

Concepts

- A dichotomous key is a helpful tool for classification.

Objectives

Students will:

- Use a dichotomous key.
- Practice classifying objects (different types of plants).
- Name and recognize several wetland plants.

Duration

30-60 minutes in classroom; at a wetland, as much or as little as you choose.

Method

Use dichotomous keys to identify wetland plants.

California Science Content Standards

3. Evolution

Biological evolution accounts for the diversity of species developed through gradual processes over many generations. As a basis for understanding this concept: 3.d. Students know how to construct a simple branching diagram to classify living groups of organisms by shared derived characteristics and how to expand the diagram to include fossil organisms.

Materials

1. Pictures of wetland plants
2. Copies of plant keys
3. "Leaf Shapes and Arrangements" handouts
4. Field Guides
5. Hand lenses

Preparation

Collect images of the wetland plants for a classroom discussion; make photocopies of the handouts for each

Background

At Ballona Wetlands, there are several smaller ecosystems that work together to form a healthy coastal habitat. These are called "supporting habitats", and each has their own special plants which help us to identify them. The wet, salty, sunny, and changing conditions in a saltmarsh means that plants must have special adaptations to live there, such as being salt tolerant, or "halophytes". Wetland plants are important for the proper functioning of the wetland in improving water quality. They also provide food and cover for numerous species of animals. In the hot sandy dunes next to the Ballona saltmarsh, plants have developed unique adaptations to survive almost year-long sunshine and very little water. These plants have shades of green and silver that we do not often find in garden plants. They have taproots that extend deep into the sand, and hair to prevent loss of moisture and protect the leaves, and smaller leaves for the same purpose. Many wetland and dunes plants are truly unique and fascinating! Plants are often used in identifying an area such as a wetland or coastal dunes, but an area is still a wetland or dunes, even if the plants have been removed (such as if the "wetness" and wetland soils are still there). It is important for us to look at the unique and valuable habitats that we have in the Los Angeles area as part of our natural heritage. As we learn about the special and wonderful species of plants that are native to Ballona, we learn about the foundation for rare and special species of insects, reptiles, mammals, and birds, some of which may not exist in other areas of the planet!

Learning to identify Ballona plants can be fun! It can also be complicated, but we'll leave that to the scientists.

Procedure

Show students pictures of different types of plants. Ask them to describe some of the features of each plant: What does it look like? What shape is it? How tall is it? What kind of leaves does it have? What color is it? Does it have flowers? If they can tell from the picture, is it a soft (herbaceous) plant or a woody plant (twigs and stems are like wood, like a shrub or tree)? Describe where it is growing. Try to get students to describe each plant in as much detail as possible – to practice studying plant features for using the keys.

To identify plants, they will also need to know the following facts:

A plant does not always look the same – it may change with the seasons. In winter, most soft plants "die back" though some leave behind woody stalks (e.g. a cattail). Many trees and shrubs do not have leaves in the winter, while some do (needles are considered leaves, too). What do we call a plant that keeps its leaves all winter? (an evergreen) (a plant that loses leaves is deciduous)

Many plants do grow flowers, though we do not call a plant “a flower.” Flowers appear before fruits develop on the plant. Seeds come from the fruits. Even lawn grass gets flowers, if it’s not mowed.

Leaves and twigs are arranged in different patterns on different plants. They may be opposite, which means they grow out of the same place on the stem, but on opposite sides of the stem. Alternate leaves sprout at different places on the stem, alternating from one side of the stem to the other. Whorled leaves grow out of the same place on the stem all the way around the stem, like the spokes of a wheel.

Leaves may be simple (one leaf on a stem) or compound. A compound leaf has several leaflets on a stem, arranged in the shape of a hand (called palmate) or like a feather (pinnate).

The shape and edges of leaves are important features in identifying plants: leaves may be round, oval, long and pointy, lobed, etc; edges may be smooth (called entire), hairy, toothed (jagged like a steak knife), wavy, etc. Look very closely at the leaves.

Activity

“What type of plant is it?” demonstrates how to use a dichotomous key (series of alternate choices leading to the identity of an “unknown”).

Have students identify types of plant growth from images by utilizing the categorization process of the dichotomous key. When students have had ample practice at using the keys, go out to a wetland and try to identify some of the types of plant growth. Use the “Leaf Shapes and Arrangements” handouts in order to identify species characteristics.

Additional Resources

Classification of Wetlands and Deepwater Habitats
www.npwrc.usgs.gov/resource/wetlands/classwet/classwet/

Series: California Natural History Guides, University of California Press
<http://www.ucpress.edu/books/CNHG.ser.html>

Friends of Ballona Wetlands: www.ballonafriends.org

California Native Plant Society: www.cnps.org

[Beyond The Beach Blanket: A Field Guide To Southern California Coastal Wildlife](#)
by Marina Curtis Tidwell

What Type of Plant Is It?

This is a practice key that will help you to learn to use a dichotomous (dī • kōt' • uh • muss) key. The word dichotomy means "division into two." A dichotomous key divides the task of identifying something into a series of questions that are based on physical features. Each set of questions offers opposing answers to choose from. As you make choices and eliminate others, you eventually find out the name of the "something." Use this key to identify the types of plants pictured below.

1. Are stems or other parts of the plant woody (hard, like a tree)?
Yes.....go to 2
No.....go to 3
2. Is the plant 10 feet tall or taller?
Yes.....it is a TREE
No.....it is a SHRUB
3. Does the plant have stems or leaves that are thickened and juicy with stored water?
Yes.....it is a SUCCULENT
No.....go to 4
4. Is the plant growing above the ground but supported by other plants and twined around them?
Yes.....it is a VINE
No.....go to 5
5. Is the base of the leaf wrapped around the stem?
Yes.....it is a GRASS
No.....it is a HERB

GLOSSARY:

TREE: A woody plant with one to few relatively massive trunks and an elevated canopy.

SHRUB: A low woody plant with one to many relatively slender trunks.

HERB: A plant with little or no aboveground perennial woody tissue, often dying back to the ground level at the end of the growing season.

VINE: A plant with long slender weak stems that are unable to support their own weight and that are supported by other plants or structures or that trail along the ground.

GRASS: A narrow-leafed green plant from the family Poaceae, usually low growing and occurring in clumps or mats connected by underground stems (stolons/rhizomes).

SUCCULENT: Thickened and juicy with water, e.g. cactus, a plant with fleshy water-storing tissues, often found in dry or saline conditions.

