ACTIVITY: WATER HYACINTH ADAPTATIONS

Objectives
Students will work in groups to …
● Practice making observations and inferences,
● Identify the structural characteristics and adaptations of water hyacinths and
● Explain why the adaptations are helpful for survival.

Materials (per group)
● Small clump of hyacinth plants which include roots, stems, leaves and flower
● Scalpel, plastic knife or scissors and hand lens
● Plastic tray or small plastic tub or small aquarium

Preparation
● Obtain enough water hyacinths for each group to have a small clump of plants. They are found in ditches, marsh channels, bayous, and ponds throughout the Gulf Coast region from spring to winter.
● Before class, fill each aquarium with water and add one clump of hyacinth or place a clump on a tray.

Engage/Explore
● Divide students into groups. Students will observe their hyacinth plants (flower, leaves, stem, roots etc.) and make a list of the external characteristics of the plant.
Possible observations: the plant has an attractive flower. The leaves are broad, waxy, curved or cup shape, can be on a long stem. The stem has a bulge that is soft and spongy. Some have a long hard stalk (stolon). The roots are dense and feathery.
● Ask students to hypothesize why the spongy bulbous part of the plant is an advantage to the plant? Then instruct one student in each group to break a single stem loose from the clump and, using a scalpel, plastic knife or scissors, cut crosswise through the stem. Instruct students to make additional observations and then take another bulbous stem and cut it longitudinally. Compare the two cross sections.
Some observations the bulbous stem is spongy and is filled with many air filled cells.

Explain
● Based on their observations, students should suggest how each of the hyacinth's characteristics has helped it to successfully adapt to an aquatic environment.
● Using suggestions from each group, make a list on the board of the water hyacinth's adaptive characteristics. Compare and contrast the hyacinth to other aquatic plants such as water lilies and duckweed.
Possible suggested adaptations: the curved, broad leaves could act like a sail allowing plants to easily travel over water and spread quickly, the soft and spongy is filled with air sacs which keep the plant buoyant. The roots are dense and feathery network which allow them to gather nutrients easily from the water. Roots are good habitat for fish, insect larvae and other invertebrates.
● If you have the Tellus video, check student's observation with those provided by the narrator.

Extend
● Brainstorm or research other possible adaptations the plant may have.
Possible ideas: plant reproduces in three different ways: seeds, fragmentation (vegetative) and stolons.
● Water hyacinths grow very rapidly, they can double in size in two weeks. What disadvantages does this pose for humans? To natural systems?
Possible responses: Dense mats interfere with boat navigation, clog drainage systems and impede fishing, swimming and other recreational activities. They restrict sunlight that native submerged plants need to thrive; eventually plants without light will die and decay. The decaying process depletes dissolved oxygen in the water column. Desirable fish such as bass and bream will seek new habitat decreasing health and diversity of the community. Eventually the oxygen level gets so low that very little life can survive.

Please dispose of your specimens properly. To ensure they do not spread is freeze them and then to dry them thoroughly before throwing them away or put them in your compost pile.

Adapted by Dianne Lindstedt from Project Tellus "What are the Adaptations of Water Hyacinths? "

Needs GLEs
Needs Water Hyacinth Fact Sheet

Other very similar versions are
 File:Modified DML TELLUS Activity 3.doc
File:Modified DML TELLUS Activity 3.doc Wetshop 07
Adapted from Sea Grant's Project Tellus by Dianne Lindstedt
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