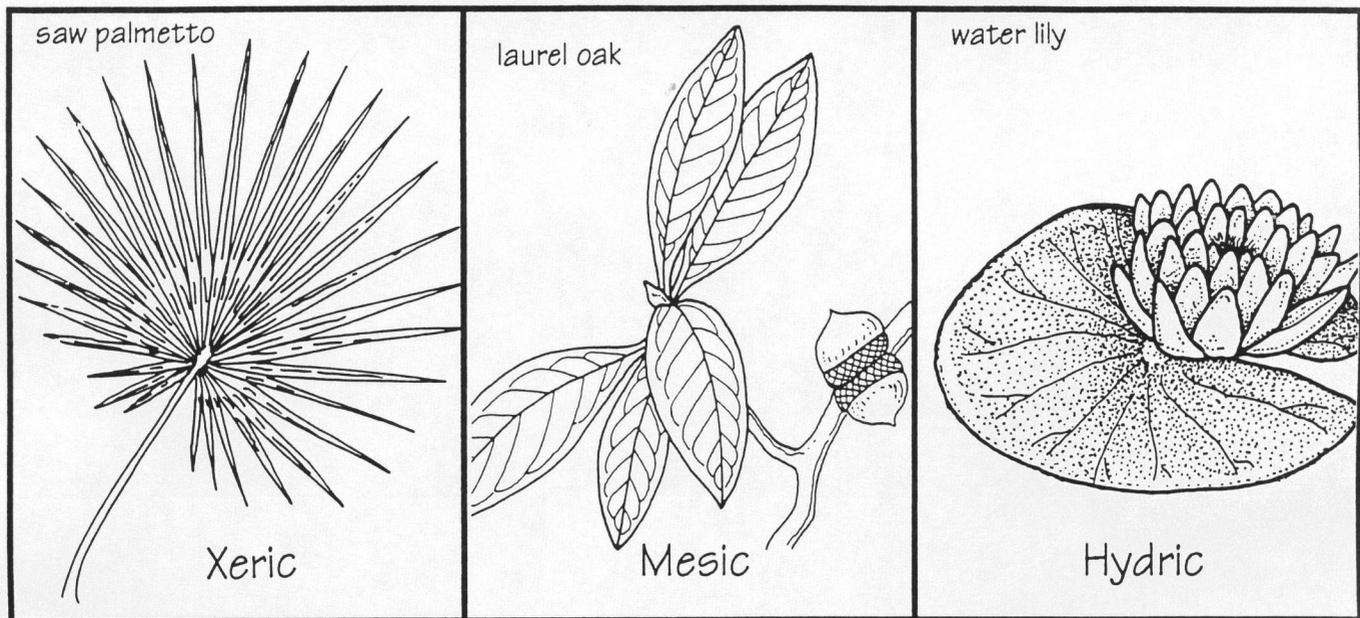


Lesson 4

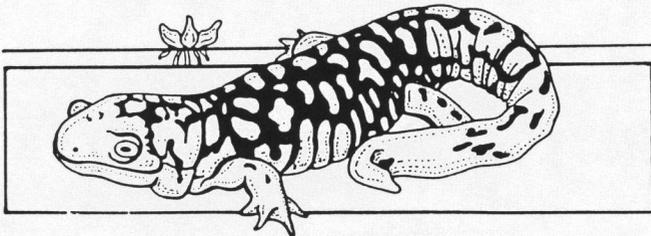
LET'S GO NATIVE



Key Question(s)

What is a "native" plant?

How do native plants survive in Florida's tough environmental conditions?



TARGET AUDIENCE:

GRADES 3-5, AGES 8-10, Suitable for visual and kinesthetic learners. Appropriate for all academic ability levels.

SCIENCE PROCESS SKILLS USED:

Observation, Communication (Mapping), Classification, Inference

TIME REQUIRED TO COMPLETE LESSON:

In-class: 50-60 minutes, In-field: 15-20 minutes

BEST TIME OF YEAR FOR LESSON:

All year if leaves are present on plants

Behavioral Objectives

As part of this activity, students will:

- (C) 1. define the terms "native," "xeric," "mesic," "hydric," and "drought-tolerant".
- (C) 2. describe the characteristics of plants adapted to survive in xeric, mesic, and hydric environments.
- (C) 3. classify leaf samples according to their native environment (xeric or mesic/hydric).
- (C) 4. survey the schoolyard and locate plants well adapted and poorly adapted to survive in xeric environments.
- (A) 5. explain why moisture-loving plants should not be planted in xeric areas.
- (A) 6. define the term "xeriscape" and explain its benefits.

Materials

ESSENTIAL: (per group of 3-4 students)

- "Let's Go Native" school site data sheet (prepared in advance by teacher)
- "Let's Go Native" worksheet

- Clipboard or other hard writing surface
- Small paper or plastic bag for leaf collecting
- Ball point pen

GETTING READY

Scan the school grounds and locate several hot, dry, sunny vegetated areas. Try to select some natural, undisturbed sites containing native vegetation and other cultivated sites such as lawns or entryway planted areas containing ornamental, non-native plants. You may want to obtain a copy of your Water Management District Plant Guide for native plant information, or consult your county extension service office.

Draw a *simple* diagram of the school site, including major landmarks and buildings, on the blank data sheet provided. Roughly indicate the boundaries for each xeric study site (see Figure 1 for completed sample). Each group of 3-4 students will need one copy of the prepared data sheet.

PROCEDURE

BEFORE GOING OUTSIDE(20-25 MINUTES):

1. Introduce the term "native" plant and define it as a plant that is naturally adapted to survive Florida's wet and dry season extremes without supplemental water. Next, introduce the terms "xeric," "mesic," and "hydric." Ask students what they think these terms mean. Explain that these words are often used by scientists to classify different types of natural environments. Xeric comes from a Greek word which means dry, mesic comes from a Greek word meaning moderately moist, and hydric comes from a Greek word which means water or wet. Explain that some plants native to Florida are adapted to survive in very moist hydric environments like swamps and marshes while other native Florida plants are adapted to survive and thrive in hot, dry, xeric areas like prairies or dry scrub. Most native plants living in hot, dry areas with well drained soil can survive extended periods of time (weeks or months) without rainfall or other irrigation. These plants are called "drought-tolerant." Explain that most drought-tolerant plants

naturally growing in sunny, open hot areas of Florida do not require that much water because they do not transpire very much.

2. Briefly review the major differences between hydric, mesic, and xeric environments. In general, hydric environments are found in low-lying areas such as river banks and are subject to periodic flooding or standing water. They usually contain very moist soil rich in organic matter. Many hydric environments, such as hydric hammocks (forests) are relatively cool and shady. Mesic environments are usually found on slightly higher ground and contain fertile sandy to loamy soils. The soil in these areas drains fairly well and does not stay wet for extended periods. Most mesic environments are warm and receive moderate amounts of sunlight. Xeric environments are usually found on high, dry ground and contain very sandy, well drained soil. They are rarely subjected to flooding and the soil is generally not fertile. Most xeric environments are hot, sparsely vegetated, and exposed to intense sunlight.

3. Ask students how they think plants naturally adapted to survive in wet environments are different from plants adapted to survive in dry environments. Make sure students realize that plants native to wet environments have developed many different ways to get rid of excess water. These plants often have broad, flat leaves which provide a large surface area for transpiration. In addition, many plants adapted to survive in wet environments have V-shaped leaves which droop down toward the ground to allow rain water to easily drip off. Leaves of most plants adapted to wet environments are often tender and moist. Plants native to dry environments have developed many different ways to conserve water. These plants usually have narrower, blade like leaves which minimize the surface area for transpiration. In addition, many xeric-adapted plants have thick or waxy leaves which help retain moisture. Leaves of plants adapted to dry environments are often dry and curled up during dry periods and open during rainy periods. Explain that during this activity, students will be working in groups to explore the schoolyard and locate plants that "belong" and "don't belong" in different areas.

WHILE OUTSIDE (15-20 MINUTES)

1. Divide students into groups of three to four and give each group a "Let's Go Native" data sheet, a clipboard, a small paper or plastic collecting bag, and a ball point pen. Explain that during the activity, groups will be focusing on plants found in the areas indicated on the data sheet map. Instruct each group to find 10 different schoolyard plants for study. Instruct students to assign each plant a number and indicate the location of the plant on the data sheet by writing the plant's number in the appropriate spot. Students should also select one sample leaf from each plant and use a ball point pen to write each plant's assigned number on the leaves. Have students place their numbered leaves in their collecting bag.

AFTER GOING OUTSIDE (30-35 MINUTES):

1. After returning to the classroom, distribute copies of the "Let's Go Native" worksheet to each group. Have groups closely examine their 10 leaf samples and complete the worksheet. Ask students to classify the leaves in their collections according to the traits observed. Leaves should be sorted into two groups: native to a xeric environment and NOT native to a xeric environment.

2. Ask students to share their observations and summarize the differences between leaves of xeric-adapted plants and leaves of non xeric-adapted plants. Conduct a whole-class discussion addressing the following questions:

- How are plants naturally growing in xeric areas adapted to reduce the amount of water lost to transpiration? (These plants usually have fewer leaves or less total leaf surface area than plants in shadier, cooler areas. Many plants native to hot, sunny, open areas (like grasses, saw palmettos, and prickly pear cacti) have smaller, narrower leaves or tough, waxy leaves to reduce transpiration rates.)

- How many plants found in xeric areas of the schoolyard are well adapted to survive hot, sunny, dry conditions? (Answers will vary.)

- How many plants found in xeric areas of the schoolyard are NOT well adapted to survive hot, sunny, dry conditions? (Answers will vary.)

3. Ask students to explain how planting non-drought tolerant plants in hot, sunny areas can affect water consumption. Students should realize that when non-drought tolerant plants are planted in xeric areas, they usually require supplemental water to compensate for the vast amount of water lost through transpiration. Some of these plants, especially moisture-loving ornamental flowers, can require daily watering which can lead to excessive, unnecessary water consumption.

4. Explain that outdoor irrigation of lawns and other ornamental plants can account for up to 50 percent of the water used by an average home in Florida. Ask students what could be done to reduce the amount of water needed for irrigation of home yards and schoolyards. Introduce the term "xeriscape" and define it as a way to conserve large amounts of water through creative landscaping. The primary focus of xeriscaping is the selection of landscape plants naturally adapted to selected environments. Drought-tolerant plants are planted in xeric areas of a yard while moisture-loving plants are planted in more moist oasis areas of a yard. Tell students that when proper xeriscaping techniques are used to landscape homes, schools, and businesses, water consumption for irrigation can be reduced by 30 to 80 percent.

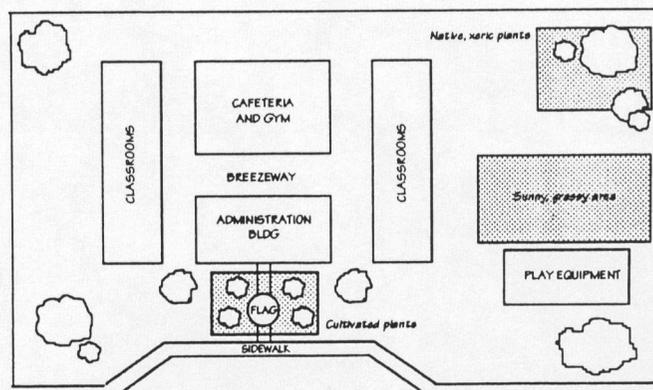


Figure 1
sample of school site diagram

LET'S GO NATIVE

Name _____

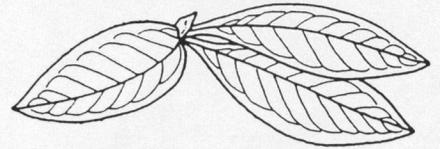
Name _____

Name _____

Name _____

Part I Directions:

Use your senses of sight and touch to complete this chart.



LEAF NUMBER	LEAF TEXTURE (thin, tender, thick, waxy, fuzzy, etc.)	LEAF SHAPE (broad, flat, narrow, thin, blade-like, etc.)	NATIVE ENVIRONMENT (dry or moist)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Part II Directions:

Use the information in the chart above to classify your leaf collections into two groups: adapted to a xeric (dry) environment and NOT adapted to a xeric (dry) environment.

Then answer these questions:

1. What traits do plants adapted to dry environments have? _____

2. What traits do plants adapted to wetter environments have? _____

3. Do you think moisture-loving plants should be planted in xeric areas of your schoolyard? Why or why not? _____

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