Forests are More than Trees

In a Nutshell

Students will discover, through a role playing activity, why trees need water, sunlight and nutrients to survive. A hike through the forest will encourage students to look for examples of ways wildlife use the forest. While exploring, students will assemble a tree field guide to refer back to throughout the school year.

Grade K-1
Seasons Spring, Fall, & Winter
Location Visitor Center

Literature Connections

The Lorax by Dr. Seuss
Sky Tree: Seeing Science Through Art by Thomas Locker (AD490L)
Under One Rock by Anthony D. Fredericks
Why Do Leaves Change Color? by Betsy Maestro (580L)
Red Leaf, Yellow Leaf by Lois Ehlert (AD680L)
Tell Me Tree by Gail Gibbons
Autumn Leaves by Ken Robbins (IG630L)
Fletcher and the Falling Leaves by Julia Rawlinson (AD650L)

Pre-Visit Suggestion

Using the Project Learning Tree, *Every Tree for Itself,* will help students understand what trees need to live and grow, and how competition affects tree survival.

On-site Activities

Reading the book A Log's Life, will help students discover trees are only one member of the forest community. Students will then explore a refuge forest to look for ways trees contribute to a forest community, and will assemble a tree field guide to record their observations along the way.

Classroom Connection

Any of the following Project Learning Tree activities:

Trees as Habitats, students discover how other plants and animals rely on trees to survive.

A Forest of Many Uses, students learn how forests are managed to meet a variety of human and environmental needs.

Adopt a Tree, students observe the seasonal changes of an individual tree. This activity encourages a greater understanding and appreciation of the student's local environment.

Teacher Resources

A Beginner's Guide to Minnesota Trees ed. by Mary Hoff
Peterson's First Guide to Trees by George A. Petrides
Tree Finder by May Theilgaard Watts
Tremendously Marvelous Trees by Minnesota Conservation Volunteer, Minnesota Department of Natural Resources

Forests are more than Trees
Pre Activities

Every Tree For Itself (K-1)

Students discover what trees need to survive and how competition for these needs affects a forest community.

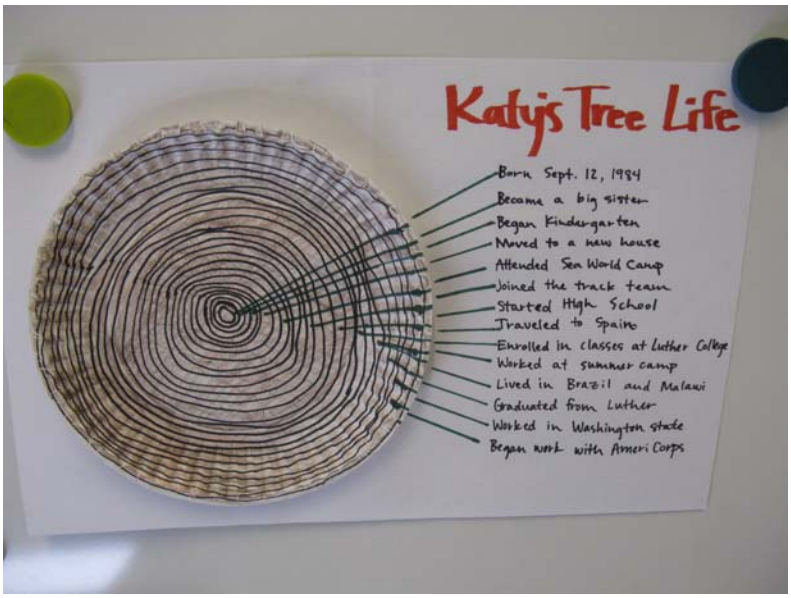
Materials

Tree Cookie Kit that includes:

- Paper Plates- one per student
- Example Tree ring paper plate
- Crayons or Markers
- Large Tree Cookie
- Small Tree Cookies – one per student, if available
- *Reading Tree Rings* background information and instruction tips
- Blue, Green & Yellow squares of construction paper
- Bird call
- Assortment of forest wildlife puppets (woodpecker, squirrel, raccoon, deer)
- Nutrients (Food), Water, and Sunlight Pictures

Introduction

The following activity was adapted from the Project Learning Tree activity *Every Tree for Itself.*



Begin by asking students to describe a forest habitat. Discuss how many trees together make up a forest. What animals depend on tree for survival? Use the puppets to illustrate how animals depend upon trees, living and dead.

1. Using the refuge tree cookie kit provided, pass out cross-sections from several tree braches and ask students to examine the growth rings, or, use the large tree cookie to show students the growth rings. Explain to students the number of rings indicate the age of the tree branch at the time the tree was cut. Note: The dark and light ring together is considered one year's growth. The light ring is wood produced during the summer growing season. The dark ring is wood produced during the fall growing season.

2. Create a timeline of your life using a paper plate and marker as shown in the sample provided in the kit and illustrated below. Start with the year you were born and then list of a few significant life events. Ask students for suggestions. What would they put on their "life cookie?" Add dates and events to a corresponding "life ring" on your paper plate.

   Kindergarten Students: go next to #4,

3. Pass out one paper plate and marker to each student. Explain to students how to make their own "life cookie" on their paper plate. Help them brainstorm possible significant events before letting them begin. Ask students what things they think trees need to survive.

4. Now ask students to consider what trees need to survive. Add the labels Nutrients (Food), Sunlight, and Water to the board as students identify each requirement. Pass out one paper plate to each student.

5. Ask the students to take their paper plate and spread out in the classroom about 3 feet apart. Instruct them to stand on their paper plate and pretend to be a tree. Explain to students that they will be playing a game called "Every Tree for Itself." The object of this game is for the "trees" to gather as many colored squares as they can. Explain to students each color represents a tree requirement. Blue = water, yellow = sunlight, and green = nutrients (nitrogen, phosphorous).

6. Distribute the squares equally on the floor around the students so they are about 1-2 feet apart.

7. At the start of the first round, students should reach with their branches (arms) to gather their requirements. Explain to students their feet are the roots and must remain planted on their paper plate at all times. Students are not allowed to slide their paper plate along the floor to gather the colored squares. In this game, ask students not to "share" their squares. In nature, some trees are not going to survive and that is just part of this game.

8. Allow "trees" to gather the squares for one-30 second round. Ask students to then sort their squares into color groups. Trees that survived must have one of each color. Record the survival number on the board.

9. Discuss the results from this round. How many trees survived (picked up at least one of each colored square)? Trees that did not survive should move to the "dead" tree zone designated in the classroom. They will be included in the game again.

10. Now, ask students to stand on their paper plates in groups of three to five. Gather the colored squares and spread them around the room again. Play another round. Ask students to sort the squares collected. Ask how many "trees" survived. Record the number on the board.

11. Compare the results of this round with those of the first. Why did some of the trees not survive this time? (Competition between trees is a big factor in their survival)
    a. What could happen to a real tree if one of the requirements was lacking? (the tree might grow more slowly and / or eventually die). Point out to students how different types of tree species have different requirements to survive. Some trees love water (cottonwood & willow) while others prefer to live in drier areas (oak).
    b. Can trees have too much water, sunlight, or nutrients? (Yes, every species has optimum levels, anything above or below will stress a living tree)

c. Are the "dead" trees still important to the forest community? Refer back to the introductory discussion that included wildlife. What animals depend on dead trees for food and shelter (squirrels, woodpeckers, wood ducks…)

12. Foresters and biologists use the knowledge of competition when caring for a stand of trees. Trees planted at an appropriate distance apart will reduce competition. The best distance varies by the species of the tree. Sometimes, young stands of trees are thinned to reduce competition and improve the chance for strong and healthy trees to grow. Even trees require space to survive.

13. If time remains, and depending on student age and comprehension, try several more rounds, comparing the results from each round. Here are some variations:
    a. Have all the students stand very close together.
    b. Reduce the number of color squares to simulate real habitat variations
        - fewer blue squares= drought
        - fewer yellow squares = young trees/overcrowding,
        - fewer green squares = poor soil quality
    c. Add a new color square to simulate other habitat challenges. However, don't tell the students what the new color represents until the round is complete!
        - Red squares = fire
        - Black or brown squares = insect infestation

Forests are More than Trees
On-site Activities

Materials

- Story, A Log's Life
- Collection of forest signs: moss, oak galls, leaves, nuts, bark, berries, nests & chewed twigs
- Blank tree field guides- 1 per student
- Bag of Crayons- 1 per student
- Hand lenses- 1 per student
- Clipboards- 4 per backpack
- Backpacks- 1 per adult

Introduction

Inside Visitor Center (20 minutes)

Explain to your class during this fieldtrip they will explore the Refuge forest and make a tree field guide to help them identify trees in the future.

Begin the activities by asking students what animals they have seen in or on trees? What were the animals doing in the trees (eating, making a nest, resting)? Read aloud to students the story A Log's Life. Ask students to name the animals that visited the tree. How did the animals use the tree? How did the tree change over the seasons?

Lead the discussion into the refuge collection of plant and animal signs. Each sign represents a piece of the forest community. The holes in the bark are signs that woodpeckers used the tree for food. The bird nest is a sign of how a bird gathers a variety of plant material (including leaves, twigs, vines and grasses) to build a shelter for its nestlings. Ask students to interpret the other signs in the refuge collection. What do these signs tell us about the forest?

While most people think of trees when they envision a forest, a forest is so much more. A forest is a natural community. Trees play an important role in the survival of many other living plants and animals. What is a community? Ask students for examples of communities. Explain to

students for their field trip today, they will observe trees and the community of plants and animals that make up a forest.

Tree Field Guide

During the hike, students will identify trees and add drawings and bark rubbings to blank field guides. Give each student, a blank tree field guide and pencil. Begin the tree guide activities with each student writing their name on the cover. Page through the guide and explain the type of information students should collect along the trail. Demonstrate how to make a bark and leaf rubbing. Show them where they can draw a picture of the tree's seed. The back page is a place for students to record other forest items they may see in the forest community.

Hike

Hillside Trail (50 minutes)

Prior to going outside for the hike, take a bathroom break. Divide students into teams, assigning at least one adult to each group of students. Pass out backpacks (which include crayons, clipboards, and hand lenses) to each adult. Students may use the equipment in the adult's backpack and the adults to assist them in making their field guides.

The following options are available for the Tree Journal Hike. Select the option that best fits your group.

Option 1: Mystery Tree Trail

Hang a set of Mystery Tree cards (up to ten) along a section of trail, the length and terrain to be determined by length of the fieldtrip and physical abilities of the students. Starting anywhere along the trail, lead your students to one of the numbered trees on the trail not already selected by a team. It is not necessary to visit each tree or to visit them in any specific order. While each tree is identified by

Not a Dendrologist?

…(a biologist that studies trees)

That's GOOD! You don't need to know the names of the trees you find. In fact, it is often more fun and emphasizes observation skills to let young students come up with their own tree name. Encourage students to use descriptive features that won't change over time. For example, Warty Bark would be a good, descriptive name for Hackberry and Triangle Leaf for Cottonwood .

common name on the back of the card, it is not necessary to call the tree by name.

Option 2: Student Tree Hunt

Start anywhere along the trail. Stop at any tree you or your students find interesting. It is not necessary to know the name of the trees you and your students investigate.

During either trail Option 1 or Option 2, ask students to describe what they see living on the trunk and branches. Pass out the hand lenses if students find something they'd like to observe more closely. Give students plenty of time to make observations and record the information in their field guides. The following questions will help guide their observation.

- Can you spot a bird or squirrel nest, chewed leaves/twigs, or other animal signs?
- Do you see any animals climbing on, around or in the tree? How about flying to and from the tree?
- Do you see any plants growing on the tree?

Encourage students to look on the ground around the base of the tree for fallen leaves, twigs, bark, seeds, fruit, or nuts that might also show signs of animal or plant life. Ask students if they have found any of the examples you showed them earlier? Remind students to record the name of the tree in their guide and to make a bark and / or leaf rubbing. To minimize damage to the tree, please only allow adults to pick a few leaves that students can use to make their rubbings.

A NOTE ABOUT PLANTS

Stinging nettle, thistle, and poison ivy may be present close to the trail. Pictures and specimen collections are available at the refuge to introduce these plants to your students. Please point these plants out to your students if you encounter them along the trail.

Management Connection: Habitat Protection

Review with students why trees are an important part of the forest community. Ask students for examples of how trees provide shelter, food, and add nutrients to the soil.

Refuge biologists manage the forest community to provide habitat for forest animals (large and small). Dead trees are as important as living trees. Dead trees provide homes and food for other plants (moss) and animals (woodpeckers). As trees decompose, the solid part of the tree will break down and create new soil. The decomposing tree will release soil nutrients for other trees, bushes and flowers which will help these plants to grow bigger and stronger.

Wrap-UP

Collect the field guides to bring back to school. Collect the backpacks and make sure all the equipment is accounted for.

The guides may not be completely finished during the field trip. Allow students extra time in class to work on their guides. During this time, encourage students to think about where they may find interesting trees on school grounds or within their community.

Forests are More than Trees
Rainy Day Hike Alternatives

Materials

- Power Point Presentation and Script: Forests are More than Trees
- Dry erase board or flip chart
- Markers
- Assortment of laminated pictures of forest plants and animals

Power Point Presentation

Start with drawing a tree on the dry erase board. On the dry erase board, tape pictures of plants and animals (also provided) near the area they may live, and ask students to name the picture and write the name on the board. (For example, a squirrel would be placed near the tree, and a flower would be placed near the bottom of the board (the forest floor). Explain to students a forest is a community, and discuss using the suggestions below how plants and animals are interconnected in this community.

Follow the discussion with the power point presentation.

Discussion Suggestions

1. Describe differences between a flower, tree, or shrub. Ask students to name some of these items that would live in a forest.

2. List some animals that fly, crawl, hop, or walk in a forest. Ask students to act out the animal movements.

3. Give examples of non-living things that help animals and plants survive in the forest? (Air, water, sun, rocks)

4. Ask students how animals use trees for homes?

5. Ask students what they would do if one day they went home and found it missing?

6. Ask students what may happen to a forest community if all trees suddenly disappeared.

My Tree Field Guide

Other things I found in the forest

Rocks/Sticks:

Animals:

Tracks/Homes:

This Journal belongs to: _____

Leaf:

Tree Name

Bark:

Seed/Nut:

Other:

_____

Tree Name

Leaf:

Bark:

Seed/Nut:

Other:

Leaf:

Tree Name

Bark:

Seed/Nut:

Other: