

TEACHER'S MANUAL

This Suitcase Program provides the materials and lesson plans for teachers of grades K-2 with content and activities increasing in difficulty by grade level. Activities in this Suitcase Exhibit may assist in meeting the Tennessee State Standards.

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TENNESSEE STATE STANDARDS FOR K-2

- K.PS1.1 Plan and conduct an investigation to describe and classify different kinds of materials including wood, plastic, metal, cloth, and paper by their observable properties (color, texture, hardness, and flexibility) and whether they are natural or human-made.
- K.LS1.1 Use information from observations to identify differences between plants and animals (locomotion, obtainment of food, and take in air/gasses).
- K.LS1.2 Recognize differences between living and non-living materials and sort them into groups by observable physical attributes.
- K.LS3.1 Make observations to describe that young plants and animals resemble their parents.
- K.ESS3.1 Use a model to represent the relationship between the basic needs (shelter, food, water) of different plants and animals (including humans) and the places they live.
- K.ETS1.2 Describe objects accurately by drawing and/or labeling pictures.
- 1.LS1.1 Recognize the structure of plants (roots, stems, leaves, flowers, fruits) and describe the function of the parts (taking in water and air, producing food, making new plants).
- 1.LS1.2 Illustrate and summarize the life cycle of plants.
- 1.LS1.3 Analyze and interpret data from observations to describe how changes in the environment cause plants to respond in different ways.

- 1.LS2.1 Conduct an experiment to show how plants depend on air, water, minerals from soil, and light to grow and thrive.
- 1.LS2.2 Obtain and communicate information to classify plants by where they grow (water, land) and the plant's physical characteristics.
- 1.LS2.3 Recognize how plants depend on their surroundings and other living things to meet their needs in the places they live.
- 1.ETS1.1 Solve scientific problems by asking testable questions, making short-term and long-term observations, and gathering information.
- 2.LS3.1 Use evidence to explain that living things have physical traits inherited from parents and that variations of these traits exist in groups of similar organisms.
- 2.ETS2.1 Use appropriate tools to make observations, record data, and refine design ideas.

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

ACTIVITY I: Tree Factory (From Project Learning Tree)

DURATION OF ACTIVITY: approximately 50 minutes

LESSON OBJECTIVES

By acting out the parts of a tree, students will learn about the general structure of a tree and how the different parts of a tree help the tree to function.

GUIDING QUESTIONS

What are the parts of a tree? What is the function of each part?

TENNESSEE STATE STANDARDS

- K.ETS1.1 Ask and answer questions about the scientific world and gather information using the senses.
- K.ETS1.2 Describe objects accurately by drawing and/or labeling pictures.
- K.ETS2.1 Use appropriate tools (magnifying glass, rain gauge, basic balance scale) to make observations and answer testable scientific questions.
- 1.LS1.1 Recognize the structure of plants (roots, stems, leaves, flowers, fruits) and describe the function of the parts (taking in water and air, producing food, making new plants).
- 1.LS2.1 Conduct an experiment to show how plants depend on air, water, minerals from soil, and light to grow and thrive.
- 1.LS2.2 Obtain and communicate information to classify plants by where they grow (water, land) and the plant's physical characteristics.
- 1.LS2.3 Recognize how plants depend on their surroundings and other living things to meet their needs in the places they live.
- 1.ETS2.1 Use appropriate tools (magnifying glass, basic balance scale) to make observations and answer testable scientific questions.

MATERIALS INCLUDED

Master copy of "Living Labels" handout (make a copy for each student)
Magnifiers
"Parts of A Tree" poster from Nature Watch
"Understanding Trees" 4-poster set
"Parts of a Tree" small Crown poster
"How a Tree Eats, Drinks and Breathes" large IP poster
Book, **Project Learning Tree Pre K-8 Environmental Education Activity Guide**
Book, **The Life Cycle of a Tree**
Booklet, *IP's The Life of the Forest*
*Video, DK Eyewitness, Tree (on order)

MATERIALS PROVIDED BY TEACHER

Art supplies

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

ACTIVITY II: Looking at Leaves (from Project Learning Tree)

DURATION OF ACTIVITY: 50 MINUTES

LESSON OBJECTIVES

Students will collect and examine leaves, using a set of questions to help them make observations. They will learn how leaf shapes, sizes and other characteristics vary from tree to tree and how to identify trees by their leaves.

GUIDING QUESTIONS

What are ways that leaves are different and ways they are similar?
How can examining its leaves help you to identify a tree?

TENNESSEE STATE STANDARDS

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| K.ETS1.1 | Ask and answer questions about the scientific world and gather information using the senses. |
| K.ETS1.2 | Describe objects accurately by drawing and/or labeling pictures. |
| K.ETS2.1 | Use appropriate tools (magnifying glass, rain gauge, basic balance scale) to make observations and answer testable scientific questions. |
| 1.LS1.1 | Recognize the structure of plants (roots, stems, leaves, flowers, fruits) and describe the function of the parts (taking in water and air, producing food, making new plants). |
| 1.LS2.2 | Obtain and communicate information to classify plants by where they grow (water, land) and the plant's physical characteristics. |
| 1.ETS2.1 | Use appropriate tools (magnifying glass, basic balance scale) to make observations and answer testable scientific questions. |

MATERIALS INCLUDED

Master copy of Project Learning Tree handout "A Look at Leaves"
Magnifiers
Leaf Riker mounts (17)
Leaf Venation Riker mount
Rubbing crayons
Leaf rubbing plates, for Enrichment activities
Leaf press for pressed leaves Enrichment activity
Nature Watch "Parts of a Tree" poster
Nature Watch "Types of Trees" poster
Large IP "Do You Recognize These Leaves and

MATERIALS PROVIDED BY TEACHER

An open area where students can find and collect tree leaves
Pencils
Leaf rubbing supplies for Enrichment activity:
Thin, plain paper – manuscript paper works best
Fat crayons
Waterproof markers

MoSH

Needles?" poster

Book, Project Learning Tree Pre K-8 Environmental
Education Activity Guide

Book, DK, eye know tree

Book, DK Eyewitness Books, Tree

Book, Lawrence & Fitzsimons, An Instant Guide to Trees

Book, St. Martin's Press, A Golden Guide, Trees

Booklet, Peterson, Flash Guide to Trees

Booklet, IP, The Life of the Forest

Booklet, Watts, Tree Finder

Booklet, TN Dept. of Ag., Common Upland

Hardwoods of Tennessee

Booklet, UT Extension, Identifying Common Tennessee Trees

Booklet, US Dept. of Ag., Important Forest Trees
of the Eastern U.S.

*Video, DK Eyewitness, Tree (on order)

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

ACTIVITY III: Tree Lifecycle (from Project Learning Tree)

DURATION OF ACTIVITY: approximately 50 minutes

LESSON OBJECTIVES

Students will act out the lifecycle of a tree, compare a tree lifecycle to a human lifecycle, and learn the role that each stage of a tree's life plays in the forest (or other) ecosystem.

GUIDING QUESTIONS

What are the stages of a tree's lifecycle?

What events can happen to affect a tree's lifecycle?

TENNESSEE STATE STANDARDS

- K.LS1.1 Use information from observations to identify differences between plants and animals (locomotion, obtainment of food, and take in air/gasses).
- K.ESS3.1 Use a model to represent the relationship between the basic needs (shelter, food, water) of different plants and animals (including humans) and the places they live.
- K.ETS1.1 Ask and answer questions about the scientific world and gather information using the senses.
- K.ETS1.2 Describe objects accurately by drawing and/or labeling pictures.
- 1.LS1.1 Recognize the structure of plants (roots, stems, leaves, flowers, fruits) and describe the function of the parts (taking in water and air, producing food, making new plants).
- 1.LS1.2 Illustrate and summarize the life cycle of plants.
- 1.LS2.1 Conduct an experiment to show how plants depend on air, water, minerals from soil, and light to grow and thrive.
- 1.LS2.2 Obtain and communicate information to classify plants by where they grow (water, land) and the plant's physical characteristics
- 1.LS2.3 Recognize how plants depend on their surroundings and other living things to meet their needs in the places they live.
- 2.LS1.3 Use simple graphical representations to show that species have unique and diverse life cycles.
- 2.ESS1.1 Recognize that some of Earth's natural processes are cyclical, while others have a beginning and an end. Some events happen quickly, while others occur slowly over time.

MATERIALS INCLUDED

Large "tree cookie"
"Tree Lifecycle" diagram (from Project Learning Tree)
"Parts of a Tree" and "Tree Growth and Development"
posters from "Understanding Trees" (4 poster set)

MATERIALS PROVIDED BY TEACHER

Books for "Tree Source" center
Paper
Pencils
Crayons and/or markers

MoSH

“This Pine Lived...” and “The Bounce Back Forest”
large IP posters
Book, Project Learning Tree Pre K-8 Environmental
Education Activity Guide
Book, The Life Cycle of a Tree
Book, Lawrence & Fitzsimmons, An Instant Guide to Trees
Book, A Golden Guide to Trees
Book, UT Ext., The All Season Pocket Guide to Identifying
Common TN Trees
Book, USDA, Important Forest Trees of the Eastern U.S.
Book, Eyewitness, Tree
Booklet, IP, The Life of the Forest
Booklet Peterson FlashGuide, Trees
*Video, Eyewitness, Tree (on order)

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

ACTIVITY IV: Tree Cookies (from Project Learning Tree)

DURATION OF ACTIVITY: approximately 50 minutes

LESSON OBJECTIVES

Students will use a cross section of a tree trunk (a “tree cookie”) to figure out (by counting the rings) how old that tree was. They will learn to identify bark, heartwood and cambium and their functions; and to make a timeline of a tree’s history that coincides with their own age.

GUIDING QUESTION

What can you learn by counting and interpreting a tree’s rings?

TENNESSEE STATE STANDARDS

- K.ETS1.1 Ask and answer questions about the scientific world and gather information using the senses.
- K.ETS1.2 Describe objects accurately by drawing and/or labeling pictures.
- K.ETS2.1 Use appropriate tools (magnifying glass, rain gauge, basic balance scale) to make observations and answer testable scientific questions.
- 1.LS1.1 Recognize the structure of plants (roots, stems, leaves, flowers, fruits) and describe the function of the parts (taking in water and air, producing food, making new plants).
- 1.LS2.2 Obtain and communicate information to classify plants by where they grow (water, land) and the plant’s physical characteristics.
- 1.ETS2.1 Use appropriate tools (magnifying glass, basic balance scale) to make observations and answer testable scientific questions.
- 2.LS2.2 Predict what happens to animals when the environment changes (temperature, cutting down trees, wildfires, pollution, salinity, drought, land preservation).

MATERIALS INCLUDED

Large tree cookie and log cross-section cut-away
Magnifiers
Copy for each student:
 Master copy of PLT “Tree Ring”
 Master copy of NatureWatch “Tree Ring Diagram”
“Parts of a Tree” poster from “Understanding Trees” (4 poster set)
Large “This Pine Lived Through...” and “How a Tree Eats...” IP posters
Book, **Project Learning Tree Pre K-8 Environmental Education Activity Guide**
Books, **The Life Cycle of a Tree** and **Eyewitness, Tree**
Booklet, IP, The Life of the Forest
*Video, Eyewitness, Tree (on order)

MATERIALS PROVIDED BY TEACHER

Ridged white paper plates (for variation activity for younger students)
Different colored stick-on labels to write on
Pencils, crayons, markers

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

ACTIVITY V: How Big is Your Tree? (from Project Learning Tree)

DURATION OF ACTIVITY: one or two 50-minute periods

LESSON OBJECTIVES

Students will measure and compare trees and tree parts; learn how and why people measure things, including trees; learn different units of measurement; and learn the need for consistency in measuring.

GUIDING QUESTIONS

How can trees be measured? Why is measuring trees important?

TENNESSEE STATE STANDARDS

- K.ETS1.1 Ask and answer questions about the scientific world and gather information using the senses.
- K.ETS1.2 Describe objects accurately by drawing and/or labeling pictures.
- 1.LS2.2 Obtain and communicate information to classify plants by where they grow (water, land) and the plant's physical characteristics.
- 1.ETS1.1 Solve scientific problems by asking testable questions, making short-term and long-term observations, and gathering information.

MATERIALS INCLUDED

Measuring tape
Master copy of "How Big Is That Tree?" handout
(make copies for each student)
"Tree Growth and Development" poster from
"Understanding Trees" (4 poster set)
Book, **Project Learning Tree Pre K-8 Environmental
Education Activity Guide**

MATERIALS PROVIDED BY TEACHER

String
Scissors (for teacher)

For the entire activity and materials and to reserve a Suitcase Exhibit, please call 901.636.2362.

SUITCASE EXHIBIT INVENTORY CHECKLIST

School: _____

Check Out: _____

Return Date: _____

MoSH Check In:	Teacher Check In:	Item	Books/Videos/Posters	Teacher Return:
		A	Teacher's Manual	
		B	Poster: "Why Are Trees Necessary"	
		C	Poster: "Parts of a Tree"	
		D	Poster: "Tree Growth and Development"	
		E	Poster: "Types of Trees"	
		F	Poster: "This Pine Lived Through a Fire, a Drought, and a Major Bug Attack"	
		G	Poster: "Ever Hear of Waste Not Want Not"	
		H	Poster: "A Well Managed Forest Keeps Giving"	
		I	Poster: "You Can Tell a Tree By Its Bark"	
		J	Poster: "Do You Recognize These Leaves and Needles?"	
		K	Poster: "Giving Our Endangered Species a Second Chance"	
		L	Poster: "Seeds Come in Every Shape and Size You Can Imagine!"	
		M	Poster: "Special Places, Special Care"	
		N	Poster: "The Bounce-Back Forest"	
		O	Poster: "How a Tree Eats, Drinks and Breathes"	
		P	Booklet: Peterson, Flash Guide to Trees	
		Q	Booklet: TN Dept. of Agriculture, Common Upland Hardwoods of Tennessee	
		R	Booklet: UT Extension, Identifying Common TN Trees	
		S	Booklet: US Dept. of Agriculture, Important Forest Trees of the Eastern U.S.	
		T	Book: An Instant Guide to Trees	
		U	Book: A Golden Guide, Trees	
		V	Book: DK Eye Know, Tree	
		W	Book: The Life Cycle of a Tree	
		X	Book: The Great Kapok Tree	
		Y	Book: DK Eyewitness Books, Tree	
		Z	Book: Milliken Plants	
		A.1	Book: Project Learning Tree	
		B.1- B.10	10 Books: The Life of the Forest	

SUITCASE EXHIBIT INVENTORY CHECKLIST

MoSH Check In:	Teacher Check In:	Item	Materials	Teacher Return:
		1	Leaf and Seed Display Mount-Leaf Venation	
		2	Leaf and Seed Display Mount-Black Tupelo	
		3	Leaf and Seed Display Mount-Black Cherry	
		4	Leaf and Seed Display Mount-Sugarberry	
		5	Leaf and Seed Display Mount-Yellow Poplar	
		6	Leaf and Seed Display Mount-Sweet Gum	
		7	Leaf and Seed Display Mount-Red Mulberry	
		8	Leaf and Seed Display Mount-Flowering Dogwood	
		9	Leaf and Seed Display Mount-Box Elder	
		10	Leaf and Seed Display Mount-American Beech	
		11	Leaf and Seed Display Mount-Eastern Redbud	
		12	Leaf and Seed Display Mount-Bald Cypress	
		13	Leaf and Seed Display Mount-Sassafrass	
		14	Leaf and Seed Display Mount-White Oak	
		15	Leaf and Seed Display Mount-Eastern Red Cedar	
		16	Leaf and Seed Display Mount-American Elm	
		17	Leaf and Seed Display Mount-Shortleaf Pine	
		18	Large Tree	
		19	Nature Press for Pressing Leaves and Flowers	
		20	Piece of Wood	
		21	Bag of Pine Cone Variety	
		22	Tree Finder Booklet with 39 Real Tree Leaves (see attached page for sample identification)	
		23	16 Leaf Rubbing Plates	
		24	Small Tree Cookie-Red Oak	
		25	Small Tree Cookie-Walnut	
		26	Small Tree Cookie-Pine	
		27	Small Tree Cookie-Basswood	
		28	Small Tree Cookie-Red Pine	
		29	Small Tree Cookie-Ash	
		30	Tape Measure	
		31	Set of Nature Watch "Tree-Mendous" Leaf Cards (65)	
		32	Ink Pad for stamping	
		33	Leaf Stamp Set containing 10 stamps: [Ginkgo (33.0), Red Mulberry (33.1), Willow (33.2), Fir (33.3), Red Elm (33.4), Aspen (33.5), Sugar Maple (33.6), White Oak (33.7), Longleaf Pine (33.8), Sycamore (33.9)]	

SUITCASE EXHIBIT INVENTORY CHECKLIST

Samples Identification

Item #	Materials	
22	Tree Finder Booklet with 39 Real Tree Leaves	
	Red Cedar Black Willow Green Ash Red Bud Scotch Pine Osage Orange Bur Oak Silver Maple Sycamore Honey Locust Cottonwood American Elm Black Walnut	
	Alternate #1, #1; #2, #2; #4, #4; #5, #5; #6, #6; #7, #7; #9, #9; #11, #11; #12, #12	
	Opposite #3, #3; #13, #13	
	Unknown #8, #8; #10, #10	
31	Set of Nature Watch "Tree-Mendous" Leaf Cards (65)	
	1 Directions Card 4 Fir 4 Aspen 4 Buckeye 4 Elm 4 Spruce 4 Ponderosa Pine 4 Ash 4 Live Oak 4 Maple 4 Sycamore 4 Birch 4 Cedar 4 Willow 4 Cottonwood 4 Deciduous Oak 4 Walnut	