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A Closer Look at Trees

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UNDERSTANDING BY DESIGN

Unit Cover Page

Unit Title: A Closer Look at Trees

Grade Level: Kindergarten

Subject/Topic Area(s): Science

Designed By: Mattina Van Coppenolle

Time Frame: 13 days

School District: Richardson Independent School District

School: Spring Creek Elementary

School Address and Phone: 7667 Roundrock, Dallas, TX 76248

469-493- 4500

Brief Summary of Unit:

In this unit, students will investigate living trees in order to answer the essential question of “What is a Tree?” By using some materials in the Trees FOSS Kit and classroom mini-field trips, students will experience how trees and leaves have identifiable structures such as particular shapes, colors, or textures. Through these outside investigations students will understand that there are different types of trees (e.g. evergreens, deciduous, old trees, young trees, oak, red oak, maple, pine, fruit trees). Likewise, trees are identifiable by physical characteristics such as the type of leaves and bark, product of the tree (acorns, apples, etc) or shape of the tree. In class, students will learn how a tree grows, the basic needs of trees, and the parts of trees (roots, trunk, bark, branches, and leaves). At the end of the unit, students will adopt a class tree in the school yard to observe through the seasons. Students will observe and document the seasonal changes of their class tree in a science journal.

Portions of this unit use materials from the FOSS (Full Option Science System) Kit: Trees

Citation: Regents of the University of California, Lawrence Hall of Science. (2003). *Trees*. (2003). *Foss: Full Option Science System*. New Hampshire: Delta Education.

Stage 1 – Desired Results		
<p>Established Goals:</p> <p><u>TEKS:</u> (K.2) Scientific processes. The student develops abilities necessary to do scientific inquiry in the field and the classroom.</p> <ul style="list-style-type: none"> (K.2A) ask questions about organisms, objects, and events; (K.2B) plan and conduct simple descriptive investigations; (K.2C) gather information using simple equipment and tools to extend the senses; (K.2D) construct reasonable explanations using information; and (K.2E) communicate findings about simple investigations. <p>(K.6) Science concepts. The student knows that systems have parts and are composed of organisms and objects.</p> <ul style="list-style-type: none"> (K.6A) sort organisms and objects into groups according to their parts and describe how the groups are formed (K.6B) record observations about parts of plants including leaves, roots, and stems (trunk) <p><u>National Science Education Standards:</u></p> <ul style="list-style-type: none"> Science as Inquiry: <ul style="list-style-type: none"> Develop students’ abilities to do and understand scientific inquiry by: <ol style="list-style-type: none"> asking and answering questions, planning and conducting simple investigations, and communicating investigations and explanations. Content: Life Science: <ul style="list-style-type: none"> Develop students’ beginning awareness of the characteristics of organisms. All organisms have basic needs. Trees need water, nutrients in the soil, light and air. Organisms have different structures that serve different functions in growth, survival, and reproduction 	Transfer	
	<p><i>Students will independently use their learning to accurately solve the “Mystery of the Unknown Tree.” The student will be given picture and word clues about the identity of a mystery tree. In order to solve the identity of the mystery tree, the student will need use the knowledge and learning experiences from the classroom to evaluate his or her clues.</i></p> <p><i>*See performance task attached at the end of the unit.</i></p>	
	Meaning	
	<p><u>Enduring Understandings:</u> <i>Students will understand that...</i></p> <ol style="list-style-type: none"> There are different types of trees (e.g. evergreens, deciduous, old trees, young trees, oak, red oak, maple, pine, fruit trees). Trees are identifiable by physical characteristics such as the type of leaves and bark, product of the tree (acorns, apples, etc) or shape of the tree. Deciduous trees physically change throughout the season; evergreen trees do not physically change. 	<p><u>Essential Questions:</u></p> <p>What is a tree?</p> <p>What can I learn about a tree?</p> <p>What can trees tell us about the season?</p>
Acquisition		
<p><u>Knowledge:</u> <i>Students will know...</i></p> <ol style="list-style-type: none"> The structures of a tree (roots, trunk, bark, branches, leaves). Trees and leaves have identifiable structures such as particular shapes, colors, or textures. Trees are growing, living organisms that have basic needs, including water, light, and nutrients from the soil. How a deciduous tree changes throughout the four seasons. 	<p><u>Skills:</u> <i>Students will be able to...</i></p> <ol style="list-style-type: none"> Identify and match pictures of tree bark and leaves to the actual living tree the pictures were taken from. Compare the similarities and differences of the trees and leaves observed on mini-field trips. Collect data about one tree and use its particular characteristics to identify the tree. For example: Is the tree old or young? Does it make a product? What characteristics make this tree different from other trees? Observe and document the seasonal changes of one particular tree. 	

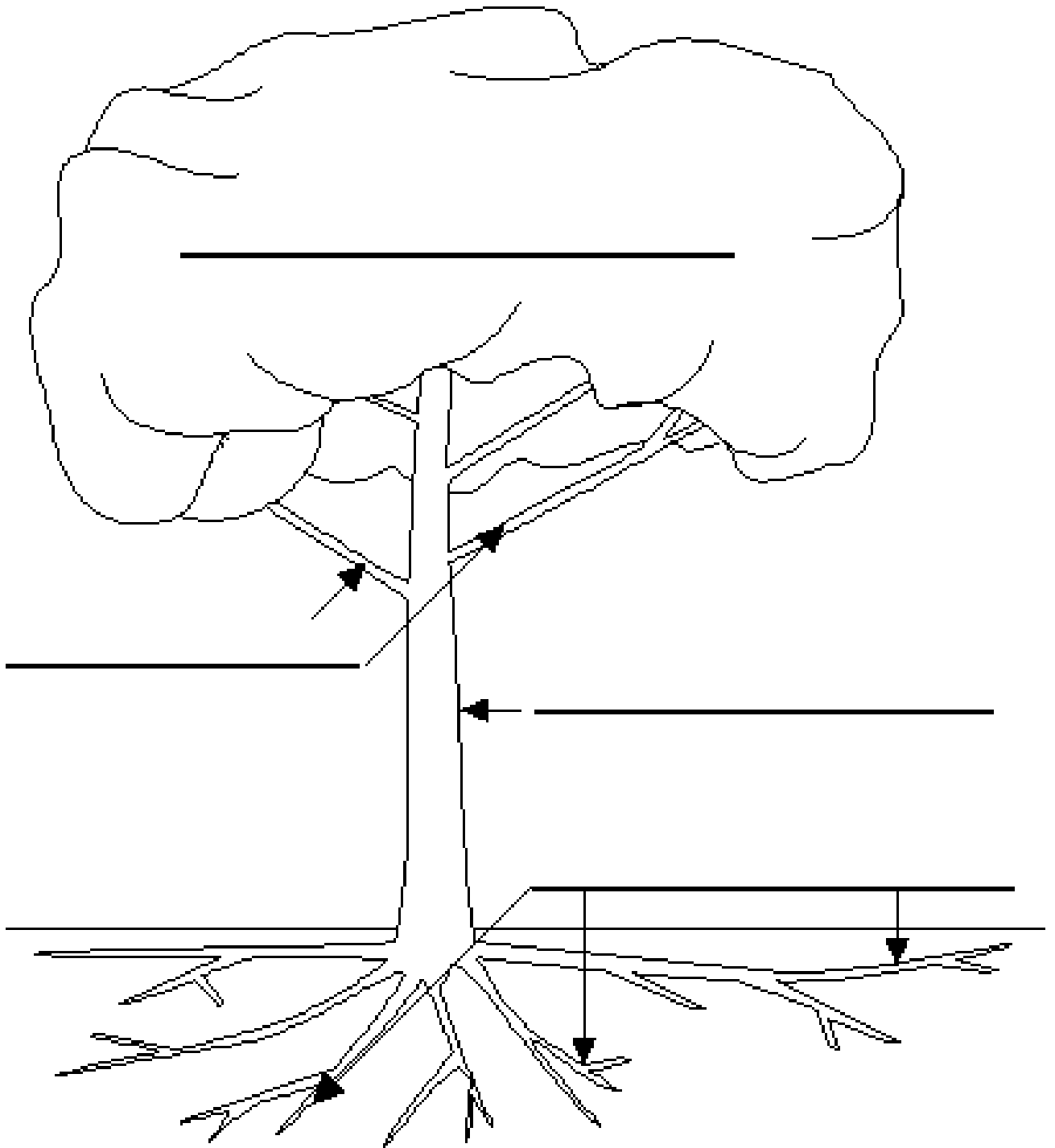
Stage 2 – Evidence		
CODE (M or T)		Evaluative Criteria (for rubric)
T	<p>Performance Task(s):</p> <p><i>Students will demonstrate meaning-making and transfer by:</i></p> <ul style="list-style-type: none"> • <i>Applying their knowledge of trees to solve the mystery of the unknown tree. Students will use clues and their understanding of tree characteristics to determine the identity of their mystery tree. Students must construct reasonable explanations to communicate how they solved the identity of the tree.</i> 	<p>Correctly identifies mystery tree using picture and word clues.</p> <p>The student clearly explains how he/she identified the mystery tree by using appropriate terminology about the physical characteristics of trees</p> <p>Student returns all necessary materials in original condition</p>
M	<p>Other Evidence (e.g., formative)</p> <p>Tree Drawing Journal: demonstrating knowledge of trees during the unit</p>	
M	<p>Class Tree Investigation Packet: observing and documenting a tree throughout the seasons</p>	
M	<p>Assessment rubric of tree stations</p>	
Stage 3 – Learning Plan		
	<p>Pre-Assessments:</p> <p><i>How will you check students' prior knowledge, skill levels, and potential misconceptions?</i></p> <ol style="list-style-type: none"> 1. Class discussion: How can you tell that this is a tree or not a tree? What can we learn about a tree? 2. Tree Or Not? Sort: Students will have various pictures of trees and plants. The student will sort the pictures into two groups: trees and not trees. Students will circle pictures of trees and cross out pictures that are not of trees. 3. Parts of a Tree Pre-Assessment: Students will match labels of tree parts to pictures of the four different tree parts (roots, trunk, branch, leaves) 	
CODE (A, M, T)	<p>Learning Activities:</p> <ul style="list-style-type: none"> • Day 1 <ul style="list-style-type: none"> - Pose questions to class: <i>Who has seen a tree lately? Where was it? What did it look like?</i> – turn and talk to your carpet partner; listen to student responses and record 	<p>Progress Monitoring (e.g., formative data)</p>
M	<ul style="list-style-type: none"> - Give students Tree or Not? Pre-Assessment - Show two pictures: one of a tree, and one of a bean plant. Begin classroom discussion: <i>How can you tell that this is a tree or not a tree? What kinds of things make a tree a tree? What characteristics do trees have that other plants do not?</i> Listen to student responses; jot down notes for pre-assessment data. Create tree anchor chart. 	<p>Tree or Not? Pre-Assessment</p>

M	<p>- Distribute Tree Drawing Journal. Model how this journal will be a tool to use during the unit. Ask students to draw a picture of their idea of a tree. Invite them to show all the parts of the tree that know.</p> <p>***Send home letter to parents introducing tree unit. Attached at the end of the unit.</p>	<p>Tree Drawing Journal: Picture of a Tree #1 (beginning of unit informal assessment)</p>
A	<ul style="list-style-type: none"> • Day 2 - Give Parts of a Tree Pre-Assessment, collect student data - Teach parts of the tree using tree diagram poster. There are four main parts to a tree (roots, trunk, branches, and leaves). Extension: The top of a tree that consists of branches and leaves is called the canopy. The outside of the trunk is called the bark. After modeling how to label a tree's parts, allow individual students to label the tree poster again. 	<p>Parts of Tree Pre-Assessment</p> <p>Whole Group: Parts of a Tree Labeling</p>
A, M	<p>- Mini field trip: Take students outside to identify and observe trees in the school yard. Give students pictures of different tree barks and leaves. See FOSS Kit activity at the end of the unit. Have them find the matching tree from which the pictures came from.</p> <p>Ask questions:</p> <p><i>How do you know that this is a tree?</i> <i>What can you tell me about this tree?</i> <i>Do you think this is an old tree or a young tree?</i> <i>How can you tell?</i> <i>How does the tree feel?</i> <i>What do the leaves look like?</i> <i>Are there the same kinds of trees or different kinds of trees outside?</i></p>	
M	<p>- Come back inside, ask students to draw a second picture of a tree, making sure they show all the parts of the tree that they have just learned. Student may dictate and point to the parts of the tree for the teacher to write, or the student may write his or her own labels.</p>	<p>Tree Drawing Journal: Picture of a Tree #2 (with labels)</p>
A	<ul style="list-style-type: none"> • Day 3 - Read: <u>How Does a Tree Grow?</u> - Teach and use photo cards to illustrate the growing and aging of a tree. Teach how a tree grows from a seed. Trees are living organisms that have basic needs: air, light, water, and nutrients. Pass out cross sections of the trunk of a tree so students can see how the trunk of a tree grows inside and outside. Discuss how all trees have trunks, even small, young trees. 	
A, M	<ul style="list-style-type: none"> • Day 4 - Read: <u>Trees</u> from Foss Science Stories Library. Stop periodically during the book to allow students to turn and talk about the different types of trees they see. Discuss how there are different kinds of trees. Trees that look the same might be the same kind of tree. - Show pictures of different types of trees: oak, maple, pine, apple, orange, and palm. Introduce vocabulary: "product of a tree." Ex: oak trees have acorns, pine trees have pine cones, fruit trees have different kinds of fruit. Revisit the class poster with the tree parts labeled. Add the label of "fruit, acorn, or pinecone." 	<p>Whole Group Tree Matching</p>

M	<p>- Whole group, match pictures of different trees with the name of the tree. Probe for student discussion about the attributes of the different trees.</p> <ul style="list-style-type: none"> Day 5 <ul style="list-style-type: none"> - Take students outside to collect parts of the tree that they have learned about in the previous days. Students can bring back to the classroom leaves, acorns, bark, twigs, small branches, etc. In the classroom, discuss the items the students have collected. Pose questions for class discussion. Ex: <i>How can we look at an item and tell what part of the tree it came from? How can we tell if two leaves came from the same tree or two different trees?</i> 	Tree Drawing Journal: Picture of a Tree #3. The student must label the specific type of tree and explain why it is that kind of tree; and include a close up picture of a leaf that comes from their tree (middle of unit informal assessment)
M	<p>- Ask students to draw a picture of a specific type of tree in their journal. This can be a tree they have seen in the school yard or in the books we have read. This time they must draw an additional close up picture of a leaf that comes from their tree. Model first.</p> <ul style="list-style-type: none"> Days 6 and 7 <ul style="list-style-type: none"> - Introduce Table Stations with tree activities. Students will rotate between 6 different stations that focus on the identification and comparing of different kinds of trees. Allow 5-10 minutes per center. <p><u>Station 1:</u> Use the same pictures and labels that were used whole group on Day 3 to allow students to independently practice identifying different trees and matching their correct names.</p> <p><u>Station 2:</u> Use Tree-Silhouette Cards (Foss Kit) to allow students to match different kinds of trees to each other. This gives students practice in distinguishing different shapes and attributes of trees. Students can sort pictures into two piles: trees and not trees.</p>	
M	<p><u>Station 3:</u> Using large laminated posters of trees from Day 2 (Foss kit), allow students to independently label the trees using vis-à-vis markers.</p> <p><u>Station 4:</u> Use Tree Part Cards (Foss Kit) so students can match the correct parts of the trees to pictures of various trees</p> <p><u>Station 5:</u> Tree puzzles (Foss Kit) - students will complete a puzzle of various types of trees. Students must look carefully at the shape of the trees and their parts to complete the puzzles.</p> <p><u>Station 6:</u> Allow student to explore items collected from trees on Day 4. Ask students to select two items that they think came from the same tree. Student will glue items onto paper and write why they think the two items came from the same type of tree. Ex: Two leaves look alike or two pieces of bark have the same texture and color.</p> <ul style="list-style-type: none"> <ul style="list-style-type: none"> ✓ Check for understanding: At the end of the two days of stations, gather students together to ask the essential question again: <i>What is a tree? What can I learn from a tree?</i> Day 8 <ul style="list-style-type: none"> - Adopting a Class Tree: Fall (late October/early November) 	Use assessment checklist to observe and document student interactions and use of new understandings during centers.

<p>M</p> <p>T</p> <p>T</p>	<p>- As a class, we will go outside to the school yard and choose a tree to adopt for the school year. Students will observe and draw their class tree in the fall season in their “Class Tree Investigation” book. Students will collect items from their class tree to bring back to the class. Measure the trunk of the tree and its height. Discuss physical attributes of tree. What does the bark look like? Leaves? Products of the tree? Is it big or small, old or young? How do we know?</p> <p>- Using the information we have gathered about our class tree and the knowledge we have learned about different types of trees, <i>what kind of tree is our class tree? Does it make a product? What can we learn from our class tree?</i> Turn and talk to carpet partner, then share out with the class.</p> <ul style="list-style-type: none"> • Days 9 and 10 <p>- Introduce performance assessment. Have students use their clues to identify their mystery tree. Conference with students to assess understanding and explanation of their findings.</p>	<p>Class tree booklet – tree in fall (end of unit informal assessment – final tree drawing before perf. task)</p> <p>Performance Task</p>
<p>A, M</p>	<p>*The continuation of this unit occurs in correlation with the students’ study of seasons. Students will continue to observe and document the seasonal changes of their class tree periodically through the year.</p> <ul style="list-style-type: none"> • Winter: Continue Study of Trees throughout the Seasons (January) <p>- Students will look at several pictures of trees in the winter. Do the trees look different? Why or why not? Introduce vocabulary: deciduous and evergreen. What are deciduous trees? What are evergreen trees? How are they the same and different? Introduce word: needles (e.g. pine needles)</p> <p>- Have students sort different pictures of deciduous and evergreen trees in the winter.</p> <p>- In their tree drawing journal, students can draw one picture of a deciduous tree and an evergreen tree in the winter.</p> <p>- In early January, take students to look at class tree again. Have them draw a picture of the tree in their “Class Tree Investigation” booklet for the season of winter. Is the class tree an evergreen or deciduous tree? How do we know?</p>	<p>Observational feedback</p> <p>Tree Drawing Journal #4: Picture of trees in winter</p> <p>Class tree booklet – tree in winter</p>
<p>M</p>	<ul style="list-style-type: none"> • Spring: Continue Study of Trees throughout the Seasons (March/April) <p>- Students will look at several pictures of trees in spring. Do the trees look different from the ones we saw in the fall and winter? Why or why not? Introduce vocabulary: flower, bud</p> <p>- In March or April, take students to look at class tree again. Have them draw a picture of the tree in their “Class Tree Investigation” booklet for the season of spring.</p>	<p>Class tree booklet – tree in spring</p>
<p>M</p>	<ul style="list-style-type: none"> • Summer: Continue Study of Trees throughout the Seasons (June) <p>- Revisit class tree in the summer (early June). Have them draw a picture of the tree in their “Class Tree Investigation” booklet for the season of summer.</p>	<p>Class tree booklet – tree in summer</p>

Labeling the Parts of a Tree Pre-Assessment

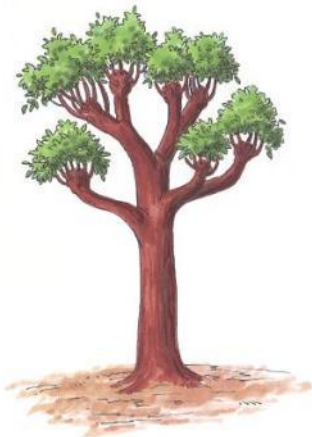


Word Bank:

Branches	Leaves	Roots	Trunk
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Is it a Tree? (Pre-Assessment)

Circle all the trees and cross out the pictures that are not trees.



Performance Task Assignment Sheet:

Today you are going to solve a mystery! Each one of you will receive a baggie with “clues” to a mystery tree. These clues will be pictures of parts of your tree. It is your job to look at these pictures and use what you know about trees to figure out which tree in the school yard is your mystery tree! Is your mystery tree by the playground? Is it the tree next to the fence? It is time to find out! Be sure not to lose your clues 😊



Bark of Tree



Ground Under Tree



Product of Tree



Tree Leaf

What is your mystery tree?



Performance Task Rubric:



Performance Task Rubric: Trees	Approaching Expectations	Meeting Expectations	Exceeding Expectations
<p><i>Student understands that there are different types of trees (e.g. evergreens, deciduous, old trees, young trees, oak, red oak, maple, pine, fruit trees).</i></p> <p><i>Student understands that trees are identifiable by physical characteristics such as the type of leaves and bark, product of the tree (acorns, pinecones, etc.) or shape of the tree.</i></p>	<p>The student incorrectly identifies his/her mystery tree. The student does not describe the attributes of the mystery tree.</p>	<p>The student correctly identifies his/her mystery tree. The student describes the attributes of the mystery tree using 2-3 identifiable characteristics.</p>	<p>The student correctly identifies his/her mystery tree. The student elaborately describes the attributes of the mystery tree using identifiable characteristics.</p>
<p><i>Explanation and reasoning for how the student used his/her clues to correctly identify the mystery tree.</i></p>	<p>Student lacks appropriate terminology to describe the clues given regarding his/her mystery tree. Explanation is not reasonable.</p>	<p>Student uses some appropriate terminology to describe the clues given regarding his/her mystery tree. Explanation is reasonable, but brief.</p>	<p>Student uses several appropriate terminology (leaf shape, bark, product of the tree) to describe the clues given regarding his/her mystery tree. Reasoning for how the student used the clues to identify the mystery tree is thorough and probable.</p>
<p><i>Student returns materials in appropriate condition.</i></p>	<p>The student does not return mystery tree clues and/or several of the clues are missing or damaged beyond repair.</p>	<p>The student returns materials with little to no damage. Materials are usable for the following year.</p>	<p>The student returns all materials in excellent condition.</p>

Table Stations Checklist:

Student Name	Correctly labels parts of the tree	Identifies similar characteristics of tree parts	Distinguishes between different types of trees/ is it a tree or not?	Describes tree attributes using appropriate vocabulary	Completes center #6: Selects two items that came from the same tree	Notes
1.						
2.						
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Letter to Parents:

Dear Parents,

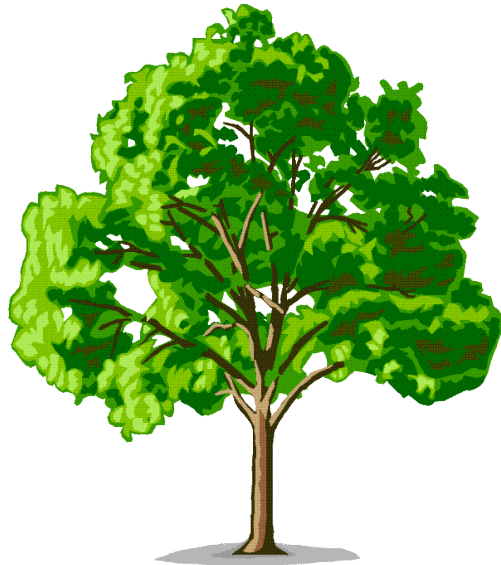
Our kindergarten class is beginning a science unit called *Trees*. We will be observing and comparing the trees in our schoolyard. We will also be observing our very own class tree in the school yard. Your child may come home with lots of information and questions about trees and their parts.

You can join in the tree study by taking your child for walks in your neighborhood to observe trees and to compare how they are alike and how they are different. For example, see if you can find two trees of the same kind. How were you able to tell they were the same kind? Which trees lose their leaves in the fall and which keep them all year? Look closely at the leaves. What shape are they? Do the trees have buds, flowers, fruit, or seeds? By making this close examination of trees, you might notice things about trees that you never thought about before.

Students are encouraged to bring to school parts of trees that they find (leaves, twigs, bark, etc). We will put them in our science discovery box!

Sincerely,

Kindergarten Teachers



Bean Plant vs. Tree Comparison Pictures: Day 1



Bark Hunt: Day 2

CENTER INSTRUCTION CARD

SPRING BARK HUNT

MATERIALS

Matching bark photos

SET UP THE CENTER

Place the stack of photos near the center for distribution during the investigation.

GUIDE THE INVESTIGATION

1. Introduce the Bark Hunt. Ask,

- *What is on the outside of a tree?*
- *Is all bark the same?*
- *How does bark feel?*
- *Have you ever smelled the bark of a tree?*

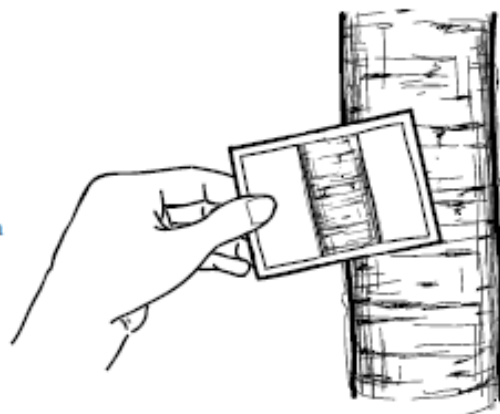
Tell students that they will go on a bark hunt. Show them the photos you have taken of bark from trees around the schoolyard.

- 2. Match the Photos.** Distribute a bark photo to each student. Make sure you hand out pairs of photos so each student will find a partner. Ask students to find the person who has a photo exactly like theirs, and to sit down with that person.
- 3. Take Students Outside.** Tell students that their next challenge is to find the tree in the schoolyard that matches their photo. Take the group outside. Walk together, stopping to carefully examine the bark of each tree. For students who find their matching tree early in the walk, pass out an additional photo for them to match.

VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

bark
bumpy
rough
smooth

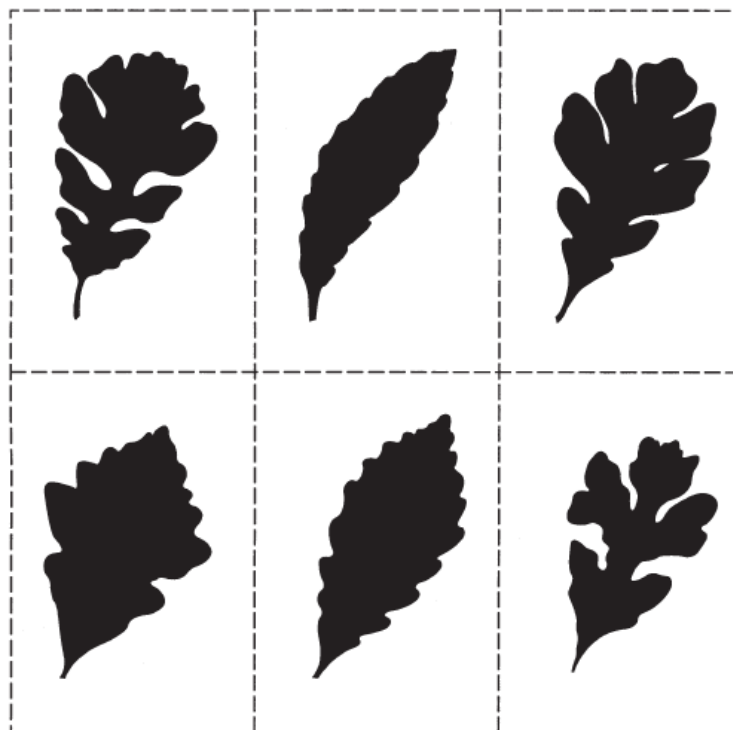
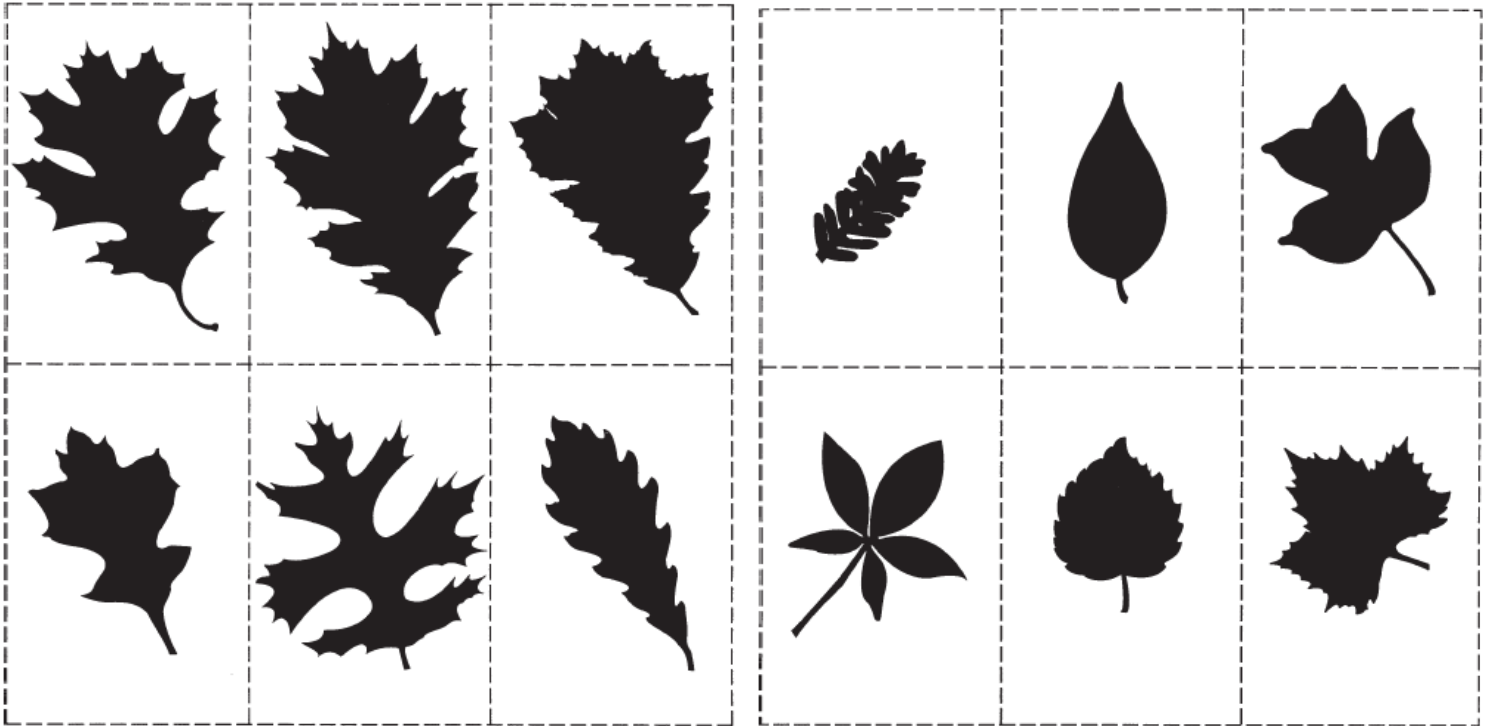


Leaves: Day 5

Allow student to use these templates to compare leaves that they find from outside. Student will note similarities and differences between the leaves. Enlarge and laminate onto cardstock.

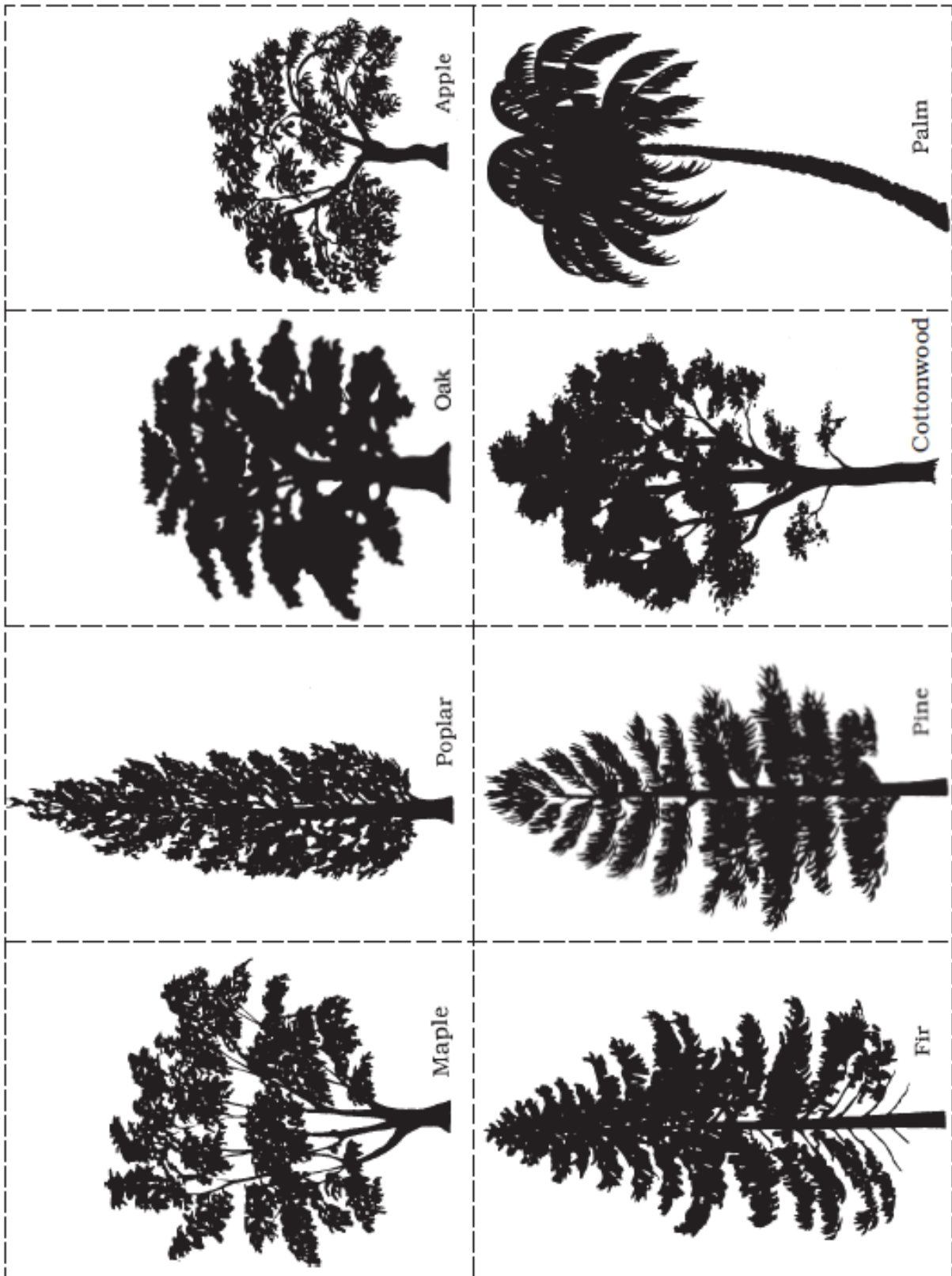
LEAF SILHOUETTES AND OUTLINES 1

Note: Reproduce this sheet on paper.



Materials for Stations: Days 6 and 7

TREE-SILHOUETTE CARDS



Tree Part Cards:

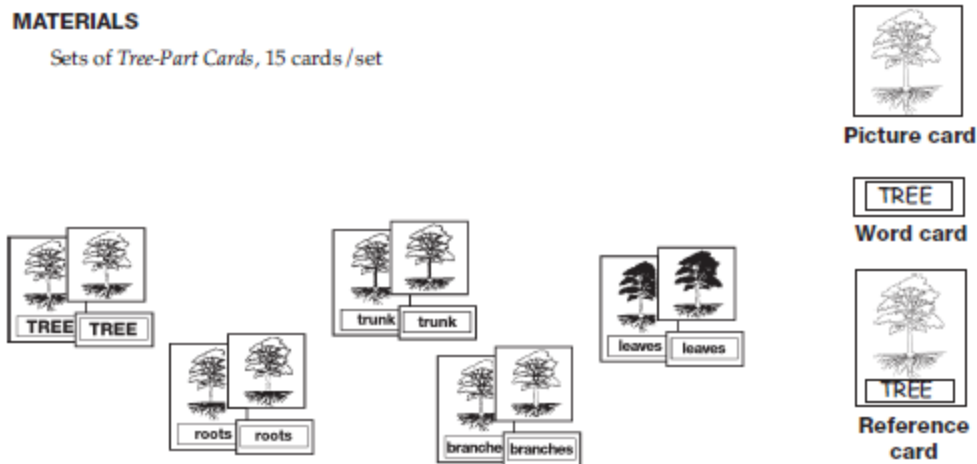
Enlarge pictures and laminate cards onto cardstock. Make one master set with the tree and label together. Make another set with the tree and label separated. Students will match parts to the pictures.

CENTER INSTRUCTION CARD

TREE-PART CARDS

MATERIALS

Sets of *Tree-Part Cards*, 15 cards/set



SET UP THE CENTER

Keep the sets of cards in zip bags. Have them ready to hand out to students.

GUIDE THE INVESTIGATION

1. **Distribute the Cards.** Give each pair of students one set of cards to work with.
2. **Use the Cards.** Let students take the cards out of the zip bags and begin to match them without giving them assistance. If students have trouble getting started, suggest that they lay out all the reference cards, and then lay the picture and word cards on top of the reference cards.
3. **Match without the Reference Cards.** If after several practice sessions students feel confident that they can match the word card to the picture card without the reference cards, let them do that. They can use the reference card to check their own work.

VOCABULARY

The best way for kindergartners to learn new vocabulary is for it to be used naturally in context within the investigation. Try to include these words in discussions with students.

branch
leaf
root
trunk



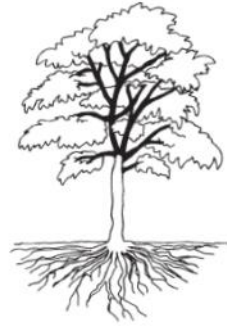
leaves



leaves



branches



branches



roots



roots



trunk



trunk

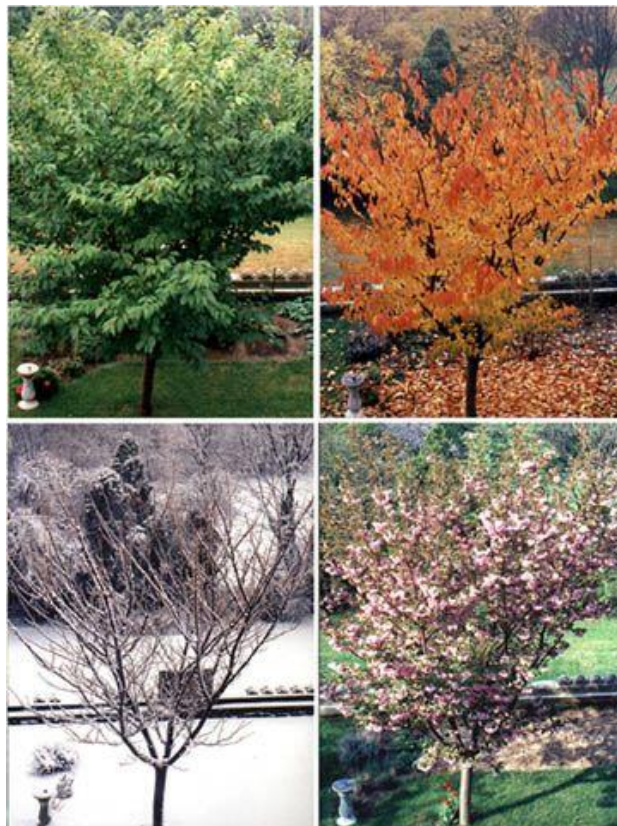
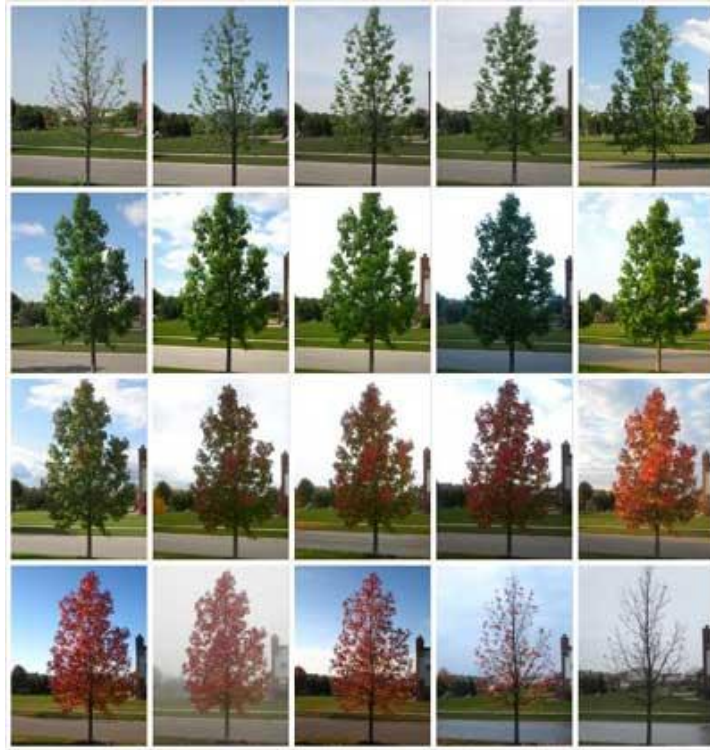


TREE



TREE

Trees Throughout the Four Seasons:



Evergreen and Deciduous Trees:



