

Lesson: Tree-Cycle

Topic/Essential Question: What is the life cycle of a tree?

Unit: "Why Are Trees Terrific?" Kindergarten Environmental Literacy

Content Standards:

- NGSS K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.
- SL.K.1 Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
- K.CC.B.4.A When counting objects, say the number names in standard order, pairing each object with one number name and each number name with one and only one object.
- K.CC.B.5 Count to answer "how many?" questions
- K.CC.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.
- K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
- K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.
- Foundation for EL Standards 2.0 Interaction of Earth's Systems, 3.0 Flow of Matter and Energy, and 4.0 Populations, Communities, and Ecosystems.



Length of Lesson: 30 minutes *(This lesson is split into two 15-minute activities that are taught simultaneously. The group splits in half for the lesson and swaps after their first activity.)*

Student Learning Outcome: The student will describe the changes that occur in the life cycle of a tree.

Knowledge of Learner:

- Prerequisite knowledge, skills, and processes: Students will complete the first three lessons of this unit at school before coming to the outdoor education center. The lessons will cover trees as living things, trees as plants, parts of tree, and what is a forest.
- Student needs, interests, previous learning: These will vary among students.
- Conceptual difficulties: Concept of life cycle, how tree rings show growth.
- Differentiated: The instructor may pace the lesson according to the responses and participation of the students.

Knowledge of Content:

- Content knowledge for instructor: Provided in the text of the lesson.
- Vocabulary: life cycle, seed, sprout, thin, thick, tree ring
- Resources:

Tree life cycle poster	Sample seeds
Seed needs poster	Seed sorting poster

Seed collection buckets
Wet erase markers
Tree measurement poster
Laminated tree measurement sheets

Clipboards
Large “Tree Cookie” for counting rings
*Tree cookie necklaces

- Curriculum connections: This environmental literacy unit includes content standards from science, social studies, language arts and math.
- Challenging, authentic, multidisciplinary: Students will observe, analyze and draw conclusions. Students will collect, record and report data. Students will be in an outdoor setting, interacting with real objects such as seeds and trees.

**If the school does not do the Tree Treasure Hunt lesson, then tree cookie necklaces will be handed out at the end of both activities to the entire group. (Camp Woodlands staff will inform you).*

Pre-Assessment: During the opening at the beginning of the field trip, Camp Woodlands staff will invite students to share what they have learned at school about trees including trees as living things, trees as plants, parts of tree, and what is a forest.

Activity A: Tree Seeds

Set Up Before Students Arrive:

1. Place posters on the table along with the container of “sample seeds.”
2. Have seed buckets close to where instructor will be standing.

Motivation/Warm-Up:

1. Welcome students to the activity and introduce yourself.
2. Inform the students that they are going to learn how a tree’s life begins.

Procedure:

1. Using the tree life cycle poster, explain that this is a life cycle of a tree. Point out the seed, the growing tree and the “grown-up” tree making more seeds.
2. Ask students, what do seeds need to grow? *Water, sun and soil* (Show the “Seed Needs” poster).
3. Show students different kinds of tree seeds. Ask if all these seeds look the same. Why or why not? Explain that different kinds of trees make different kinds of seeds.
4. Explain to the students that they are going to search for and collect tree seeds from the ground. Give each student a collection bucket. Remind them not to pick anything off of the trees. Allow students to search for and collect seeds.
5. Gather the students again and ask them to sort their seeds on the seed sorting poster.
6. Allow students to predict which seed type they found the most of and the fewest/least of.
7. Allow students to count each type of seed. The instructor may move each seed and count aloud with the students. Record the numbers on the poster. Ask students if their prediction was correct.
8. Review the data by pointing to each seed type on the poster and asking students to read the number of seeds found. Ask students, “Which seed did we find the most of? So this may

mean that we have a lot of what kind of tree?" (*Answers will depend on which seed the students found the most of.*)

9. The instructor will collect the seeds to be handed out to students during the "assessment" (*see below*).

Assessment: Hand seeds to each student and tell them to hold on to them. Role-play the life-cycle of a seed with the students pretending they are the "seeds". Ask them to start as seeds (crouch down). Ask the students what seeds need to grow and then the instructor will pretend to give the students (seeds) these things. Then ask them to sprout (slowly reach up with hands, and start to stand up) into "baby" trees. Now have them grow into an adult tree (reach hands up to the sky, fingers extended and standing on tiptoes). Lastly, have the students sprinkle their seeds from their hands on the ground and then turn back into a seed themselves (crouch down).

Optional if time permits:

10. Ask students to look at the seeds on the ground and imagine what would happen if each one grew into a tree right there. *The forest would be very crowded!*
11. Explain that all of the seeds that fall from a tree do not grow into trees. Many are eaten by insects, birds and other animals. The "grown-up" trees make enough seeds to "share."
12. Also, a seed will not sprout (*start growing*) if it doesn't get what it needs to grow. Different seeds have different needs, but most need water, air and the right temperature. Some seeds grow soon after they fall from the tree. Other seeds need to "sleep" through the winter and start growing the next spring.

Activity B: Tree Growth

Set Up Before Students Arrive:

1. Place large "Tree Growth" poster on picnic table.
2. Place clipboards with the smaller "Tree Growth" sheets in each one and set around the picnic table.
3. Place markers and large tree cookies nearby for later use. (*Tree Cookie necklaces will need to be at the lesson if the school is not doing the Tree Treasure Hunt lesson. Camp Woodlands staff will inform you.*)

Motivation/Warm-Up:

1. Welcome students to the activity and introduce yourself.
2. Inform the students that they are going to learn how a tree grows.
3. Have students point to a tree, then another, and then another. Ask these questions:
 - Are the trees they pointed to all the same size?
 - Why do you think the trees are different sizes?
 - Have you always been the same size?
 - Will you get bigger as you get older?

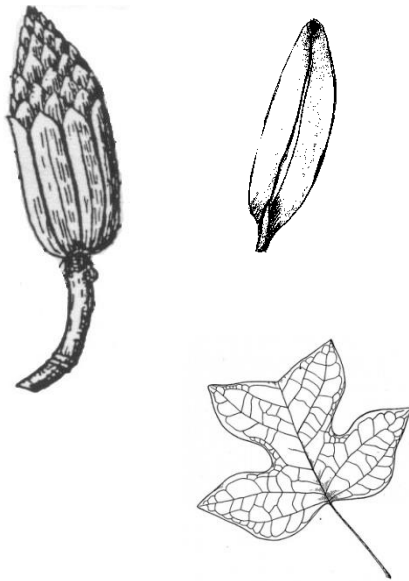
Procedure:

1. Inform students that they are going to look for trees of different sizes. Find some trees to stand by, while introducing the tree measurement poster, explain that they are going to look for:
 - A tree they can measure around the trunk with one hand (a “baby” tree)
 - A tree they can measure around the trunk with two hands (a “child” tree)
 - A tree they can measure around the trunk with both arms (a “mommy” or “daddy” tree)
 - A tree they can measure around the trunk by holding hands with a partner (a “grandfather” or “grandmother” tree)
2. Have students use their hands and arms to show you how they will measure the trees on the actual trees themselves.
3. Assign students to work in pairs (or small groups) with an adult. Give each pair/group of students a laminated data sheet, a clipboard and a crayon. Show students how to check off a picture when they find a tree of the right size.
4. Allow students to look for trees of different sizes. An adult should work with each group of students to help them find the trees.
5. Gather the students again. Have students report by raising their hands when you ask who found a tree of each size.
6. Have students observe the thinnest trees and the thickest trees. Ask them which are taller. Use hand motions to explain that as trees grow taller they also grow thicker. Have students repeat this and show it with hand motions.
7. Show students a tree “cookie,” a piece or slice of a tree. Explain that we don’t know exactly how old a tree is by its size. But if a tree falls, we can cut it and count the circles or “rings” in the trunk.
8. Point out the rings and explain that the tree grows thicker by adding a ring every year. Each ring represents a birthday for the tree. Have students count out loud with you as you point to the rings. Have students tell you how old the tree was.
9. Point out that if a ring is really thick, the tree grew a lot in one year. If a ring is thin, the tree did not grow very much that year. Ask students why the tree might grow more or less in a year. *More growth may mean more water or more sunlight. Less growth may mean less water or less sunlight.* Magnifying lenses can be handed out to students for further investigation.
10. (The Camp Woodlands Staff will inform you about this part of the activity. If the school group is doing the activity “Tree Treasure Hunt,” then tree cookies will be distributed during that activity. If not, they will be distributed during this activity.) Before students arrive, count out enough tree cookies for each group. Award each student with a Tree Cookie necklace as theirs to keep. Tell the students, “They are now Junior Arborists (*Someone who takes care of trees*).

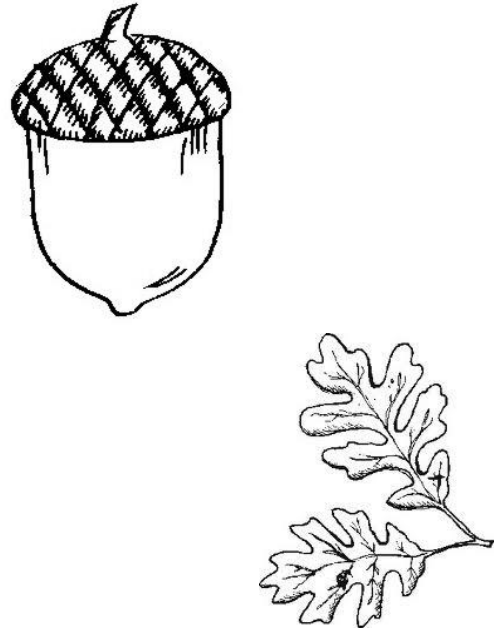
Assessment: Ask students to describe how a tree grows and to use their hands to show this. *As a tree grows taller it also grows thicker.*

Seed Sorting Poster

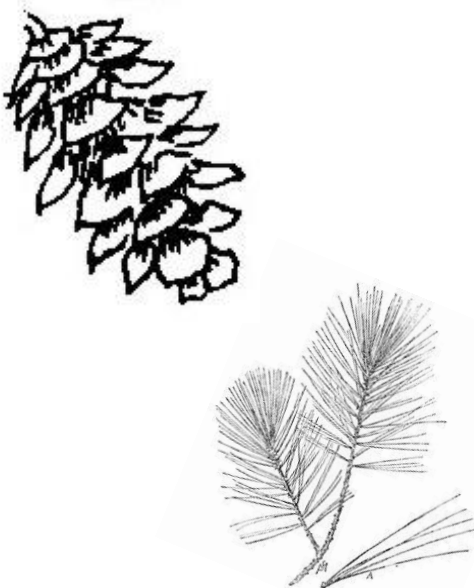
Tulip Poplar Seeds



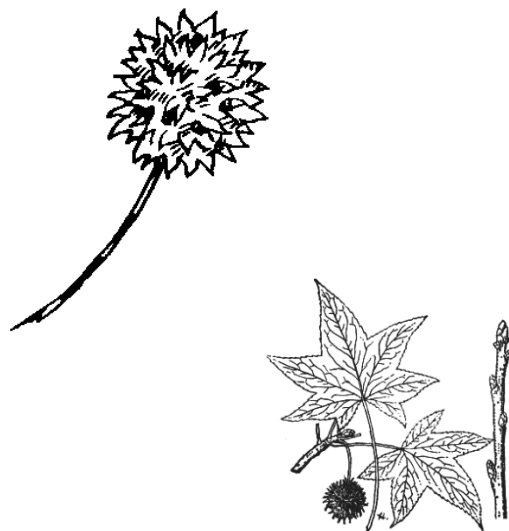
Acorn



Pine Cone



Sweet Gum Ball



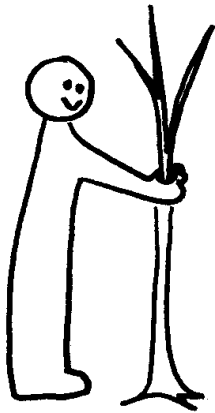
Hickory Nut



Other

Tree Measurement

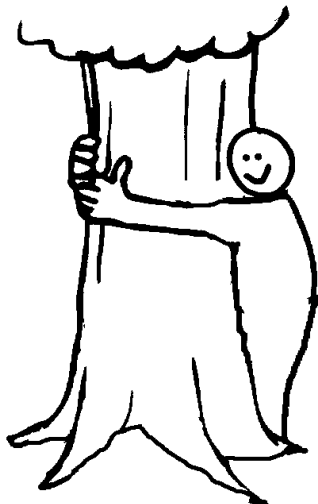
One hand
"Baby Tree"



Two hands
"Child Tree"



Two arms
"Parent Tree"



Two friends
"Grandparent Tree"

