



A Tree's Dream

Accompanying Lesson: Tree Growth & Products

GRADES

3-5

I. OVERVIEW

A. Title

In this lesson, students will learn about the life cycle of a tree, and the products that trees provide us with every day.

B. Learner Objectives

Activity 1: Diagram the life cycle of a tree to show their understanding of that life cycle

Activity 2: Watch A Tree's Dream video and list all the tree products listed or shown in the video

Activity 3: Describe the tree's role in the ecosystem and in our society throughout its life

Activity 4: Examine various tree products and determine which ones are made from trees

NEXT GENERATION SCIENCE STANDARDS

[4-ESS3-2 Earth and Human Activity](#). Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

[5-ESS3-1 Earth and Human Activity](#). Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

C. Materials

A Tree's Dream Video, small notebooks, different colored pieces of yarn (optional), pencils, drawing paper, crayons or markers, tree field guide, camera, variety of tree products

D. Time Considerations

Activity 1: Life cycle diagram and discussion – one 50-minute classroom session

Activity 2: A Tree's Dream Video – one 20-minute classroom session

Activity 3: Describing and observing a tree – one 50-minute classroom session

Activity 4: Tree products – one 50-minute classroom session

E. Getting Ready

Activity 1: Life cycle diagram and discussion – prepare paper and colored pencils for each student to draw as instructor describes life cycle

Activity 2: A Tree's Dream Video – prepare audio and visual technology to show A Trees Dream to students

Activity 3: Describing and observing a tree – gather notebooks for student journals, and find an area with several trees in various life stages on or near school grounds

Activity 4: Tree products – collect a variety of tree products (see Activity 4 for suggested items) and display in classroom

F. Key Vocabulary

Life cycle - The phases, changes, or stages through which an organism passes during its lifetime.

Ecosystem - The interacting system of a biological community and its non-living environment; also, the place where these interactions occur.

Seed - A small embryonic plant enclosed in a covering called the seed coat, usually with some stored food.

Germinate - To begin to grow and put out shoots after a period of dormancy.

Seedling - A young tree grown from a seed up to a small sapling.

Sapling - A young tree normally more than 4.5 feet high and less than 4 inches in diameter.

Diameter - A straight line passing from side to side through the center of a body or figure, especially a circle or sphere.

Mature tree - A tree close to its full height and crown size, with the dimensions being determined by species and site factors.

Renewable natural resource - A naturally occurring raw material or form of energy which has the capacity to replenish itself through ecological cycles and sound management practices.

Sustainable - Able to be maintained at a certain rate or level.

Forester - A person trained in and practicing forestry.

Volume - The amount of space, measured in cubic units, that an object or substance occupies.

II. BACKGROUND

Trees, like all living things, have a *life cycle* that includes birth, growth, injury and disease, aging, and death. As trees go from birth to death, their physical form changes, as well as their role in the forest *ecosystem*. You can learn about the tree's life cycle by observing the tree from birth as it grows and develops throughout its life.

Most trees begin as *seeds*. With favorable soil, climate, and nutrient conditions, a seed *germinates* and begins to grow. This tiny tree or plant is called a seedling. As the tree grows, it starts to get taller; its trunk begins to thicken, and it begins to develop branches. A *sapling* is a young tree more than about 4 feet high and up to 4 inches in *diameter* at breast height (measured at 4.5 feet off the ground). As part of the understory of a forest, young saplings must compete with other trees and plants for sunlight, nutrients, water, and space. In dense forests, many young trees must wait for years for older trees to fall and leave openings in the canopy into which they can grow. Alternatively, older trees may be harvested (cut down) to help the younger trees grow into mature trees. A *mature tree* is one that is fully developed, and is usually more than 4 inches in diameter at breast height (4.5 feet off the ground). The length of time it takes a tree to reach maturity depends on the species of tree. Mature trees continue to grow as long as they live. However, like all living things, trees are subject to disease and injury. Eventually, trees weakened by injury and disease will die, fall down, and be decomposed. When they die, trees return their nutrients and other elements back into the soil to be recycled through the forest ecosystem.

Mature trees have many different roles in the forest community depending on their age and size. Their leaves, bark, seeds, flowers, fruit, and roots provide food for many kinds of animals. Trees also provide roosts, shade and shelter to many living things. Mature trees usually produce many more seeds than can possibly survive, as most seeds will be destroyed by fungi and other decomposers or eaten by wildlife, leaving only a few seedlings to survive and become the next generation of mature members of the forest community. Trees are a *renewable natural resource* that can be harvested to provide us with over 5,000 everyday products. Trees of varying maturity, size and quality provide us with many different forest products. For example, bark, branches, and extra wood not

used to make solid lumber is used to make paper products and fuel for our mills. In the “A Tree’s Dream” video, it states that we plant 5 trees for every 1 tree that is harvested - indicating *sustainable* forestry practices. Sustainable forest management is essential not only to meet our current demand for this natural resource but ensure forests for future generations.

Take a walk through your neighborhood or around your school and look closely at the trees. You may notice an assortment of sizes, shapes, colors, textures, and life cycle stages. Some tree species such as pines tend to be tall and straight with relatively short branches. Other species like Southern magnolia tend to be shorter with long and broad branches. The growth rate of trees depends on the species and environmental conditions where it is growing. *Foresters* measure trees to plan harvesting operations, and to make other forest management decisions. To determine the approximate wood yield of a certain forested area, foresters do a “timber cruise” in which they calculate the *volume* of lumber in a given area, examine the health of the forest, and survey the species found there. This information is used to determine how the forest should be cared for and what the economic feasibility of a harvest should be. Volume of wood can be measured in board feet (a piece of lumber 12 in. square and 1 in. thick), cords (a stack of logs 4 ft. x 4 ft. x 8 ft.), cubic feet or cubic meters. One giant sequoia (250 feet tall or more and over 20 feet in diameter) could yield more than 500,000 board feet, enough to make 33 houses!

III. DOING THE ACTIVITY

A. Engage - captures interest, makes connections, and provides an opportunity for students to express what they know

Ask students, “What products come from trees?” Allow students to share different every-day items that they use, which are made from trees. Most answers will focus on paper products and items that are made from the wood of a tree.

Explain that products are derived from all parts of a tree – wood, bark, sap, leaves, fruits, and nuts. Tell the students, “There are over 5,000 products that are made from trees! So many of these items would surprise you like suntan lotion, chewing gum, crayons, and even some brands of parmesan cheese.”

Show a few short videos so the students can further explore tree products and how they are made (suggestions below). Wrap up by asking students, “What are some new tree products that you learned? Did any of them surprise you?”

[Forest Fast Break – Wood Products](#)

[Earth Facts – 7 Products You Didn’t Know Come From Trees](#)

[Mystery Doug – How do they turn wood into paper?](#)

B. Explore - activities to explore the concept or skill

ACTIVITY 1: LIFE CYCLE OF A TREE

Trees, like all living things, have a life cycle that includes birth, growth, injury and disease, aging, and death. As trees go from birth to death, their physical form changes, as well as their role in the forest ecosystem. Trees begin as seeds, which germinate and become seedlings. Seedlings grow taller and larger, becoming saplings, then eventually grow into mature trees. Most trees begin producing seeds once mature, and the life cycle begins again. Once trees reach their maximum growth potential, they are more susceptible to damage and disease. Many mature trees affected by damage or disease eventually die and become a “snag” (or standing dead tree), fall to the forest floor, and begin to decompose, releasing all its stored nutrients back into the soil and providing habitat to many types of wildlife and fungi.

In this activity, students will draw a tree’s life cycle as the instructor describes the process.

PROCEDURE

1. Discuss the idea of life cycles by asking students to describe the life cycle of a person. Write these stages on the

board. Ask students to identify the different jobs, roles, or things that a person might do in each stage of the life cycle. Next, ask them to describe the life cycle of a tree in similar terms (see above description for main life cycle stages and terminology).

2. Have students work individually (or in small groups) to draw a picture of the life cycle of a particular tree. Provide ample resources on a specific tree species for accuracy in life characteristics, climate, and environment. Students should include at least six stages in the life cycle picture (seed, seedling, sapling, mature tree, snag, and decomposing log), or events (like a forest fire or insect invasion). Remind students that one event that affects the tree (like fire damage) is likely to clear the way for another event in a later life cycle stage (like birds nesting in a hole). The life cycle should be represented by a circle on the page, with illustrations and a label for each stage or event.

3. Give students the opportunity to share their life cycles with the entire group and discuss the differences between different tree species' life cycles.

ACTIVITY 2: A TREE'S DREAM VIDEO

Explain to the students that they will watch a video about a tree from a forest who had a dream. Ask the students to try to figure out what was the dream of the tree, and to look for the life cycles of the tree that they learned in the previous activity.

A Tree's Dream Video: <https://www.youtube.com/watch?v=777wq0VIEFg&t=10s>

Questions to ask after the video:

1. What life cycle stage was the tree in at the beginning of the video? (adult tree)
2. What was the adult tree used for? (cut down to become lumber for a house)
3. What life cycle stage was the tree in at the end of the video? (sapling)

C. Explain - students develop explanations for the concept or skill they have experienced

ACTIVITY 3: TREE OBSERVATION AND DESCRIPTION

In this activity, students will take their knowledge of the tree life cycle and apply it to real-life observations. Students will discuss the life cycle stages, and what that stage's role is in the ecosystem.

PROCEDURE

1. Take the students on a walk through a neighborhood, local park or forest site that has plants and trees of various ages. Have them try to identify at least one tree in each of the following categories:

- a. Seed (what tree/species does that seed belong to?)
- b. Young sapling (stem or trunk < 1/2 inch)
- c. Juvenile (stem or trunk 1/2 inch to 2 inches)
- d. Young adult (stem or trunk > 2 inches, but tree still under canopy)
- e. Adult (trunk > 2 inches, tree in upper canopy)
- f. Injured or unhealthy trees (showing signs of injury, disease, or stress – is the tree likely to survive?)
- g. Elderly tree (What factors are weakening that tree?)

h. Dead tree (What factors combined likely caused the tree to die?)

2. With each category identified, have the student choose one example and write a story in their journals in the perspective of that tree. Use these prompts to guide their story-telling:

a. “I am a _____” (seed, sapling, juvenile, young adult, adult, injured or unhealthy, elderly, dead, or decaying tree)

b. “My next life cycle stage will be _____”

c. “I am important, because my role in this ecosystem is _____”

d. “Some unique things about me are _____” (use descriptors here for smell, color, shape, etc.)

e. “Eventually, I want to become _____” (students can choose a specific habitat, end life stage, or forest product to fill in this blank)

D. Elaborate & Evaluate - activities to apply learning to new situations and discuss/compare ideas with others & students review/reflect on their own learning and provide evidence for changes to their learning

ACTIVITY 4: TREE PRODUCTS

In this activity, students will expand on what they have learned about our dependence on trees in our everyday lives. They will examine various products and determine which ones are made from trees. They will also describe ways trees are used to make products and ways that these products can be conserved.

PROCEDURE

1. Collect as many of the following suggested items as you can:

- i. Tree product items - Newspaper, toothpicks, chocolate candy bar or one with almonds, scrap of lumber, tissue paper, sponge, article of rayon clothing or piece of rayon cloth, baseball, wooden cooking utensil, vanilla flavoring, magazine, cardboard box, chewing gum, can of paint, bottle cork, rubber gloves, apple or fruit from a tree, plastic comb, piece of cellophane, wooden furniture

2. Place these items throughout your classroom and label each item with a number. Have your students work in small groups of 3-4 for this activity.

3. Teams need to move around the room and examine all of the products. They should record each item and number on a data sheet and write down if they think the item is made from trees or not. They should create a table with two columns – non-tree products and tree products. Have them list each item under the appropriate column.

4. Once finished, have students do research on the diversity of tree products. Either have them explore a website, watch a few videos, and/or read an article aloud to the class (suggestions below). These items listed in the resources below might help you determine which tree products to display for this activity.

a. Videos: [Curiosity Show – What is Cellulose?;](#) [How It’s Made – How They Make Cellulose;](#) [Discover Wisconsin – Cellulose Products;](#) [Forest Fast Breaks: Wood Products](#)

b. Website: <https://kids.britannica.com/students/article/forest-products/274385>

c. Article: [The State of World’s Forests: Forests for Kids learning Guide - Module 3, Pages 25-29](#)

5. Allow the groups to discuss this information and then re-evaluate their lists of products. Ask them if there are any items they now want to add to the list of tree products?
6. Have the teams share their lists with the rest of the class and discuss the final results (all of the items were from trees).
7. Discuss how their new understanding of our everyday use of tree products might affect their behavior. Explain that trees are a renewable natural resource but we still need to use them wisely. Cover ways that they can conserve our forest products, such as recycling, reusing the products, and/or reducing its use.

IV. ENRICH

Option 1: An interesting way to incorporate what your students have learned in class, at their own houses, would be to assign the same activity for the students to do at home. Allowing the students to explore and share the uniqueness of the trees that grow near their homes or in their back yards. This would also be a great way for parents to learn about tree products, too! Check out Project Learning Tree's [Activities for Families](#).

Option 2: Start with a forest product of your choice (paper, pencil, diaper, lumber, chair, etc.), and trace the product back to the type of tree that was used to make that product. Each product is created from trees of different life stages. For example: paper is made from pulpwood, which comes from a young adult tree. Determine which life stages are important to made each product you chose. Have the class share their answers!

V. ADDITIONAL RESOURCES

1. Project Learning Tree – www.plt.org

Project Learning Tree (PLT) is an award-winning environmental education program designed for teachers and other educators, parents, and community leaders working with youth from preschool through grade 12.

- Project Learning Tree - Name that Tree: <https://www.plt.org/family-activity/teaching-with-itree/name-that-tree/>
- Project Learning Tree - Tree Life cycle Video: <https://vimeo.com/65575080>
- Project Learning Tree - Tree Life cycle Diagram: <https://www.plt.org/wp-content/uploads/2017/01/PLT-tree-lifecylce-diagram.jpg>
- Free Activities for Families: <https://www.plt.org/activities-for-families/>

2. GreenSchools Investigations - <https://shop.plt.org/Shop/ProductDetails/greenschools-investigations>

PLT's GreenSchools program inspires students to improve the environment at their school, at home, and in their community. Student-led Green Teams apply STEM (science, technology, engineering, math) to create greener and healthier schools—and save schools money!

3. Next Generation Science Standards - <https://www.nextgenscience.org/standards/standards>

Within the Next Generation Science Standards (NGSS), there are three distinct and equally important dimensions to learning science. These dimensions are combined to form each standard—or performance expectation—and each dimension works with the other two to help students build a cohesive understanding of science over time.