



Our Family's Tree Farm: ELA Lesson Tree Growth

Grade

3rd - 4th grade, 8-10 years old

Time

- One 45 minute period to introduce lesson and writing assignment
- Multiple periods for research, writing, and editing (dependent upon level and grade)

Purpose

Students will gain an understanding of family forests and their importance in the students' daily lives by creating a narrative of a tree's life on a tree farm.

Georgia Standards of Excellence

3rd Grade

- **ELAGSE3W3:** Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
- **ELAGSE3W4:** With guidance and support from adults, produce writing in which the development and organization are appropriate to the task and purpose.
- **ELAGSE3W5:** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.
- **ELAGSE3W6:** With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.
- **ELAGSE3W10:** Write routinely over extended time frames and shorter time frames for a range of discipline-specific tasks, purposes, and audiences.
- **Social Studies Information Processing Skills:** Assists in introducing or developing following skills:
 - #7. Interpreting timelines (developing)
 - #11. Drawing conclusions and making generalizations (introducing)

4th grade

- **ELAGSE4W3:** Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
- **ELAGSE4W4:** Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
- **ELAGSE4W5:** With guidance and support from peers and adults, develop and strengthen writings as needed by planning, revising, and editing.

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- **ELAGSE4W6:** With some guidance and support from adults, use technology, including Internet, to produce and publish writings as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single setting.
- **ELAGSE4W10:** Write routinely over extended time frames and shorter time frames for a range of discipline-specific tasks, purposes, and audiences.
- **Social Studies Information Processing Skills:** Assists in mastering following skills:
 - #7. Interpreting timelines
 - #11. Drawing conclusions and making generalizations

Materials

- *Our Family's Tree Farm* by Steve McWilliams
- PowerPoint lesson

Resources

- Georgia Forestry Foundation: gfagrow.org/foundation
- Georgia Tree Farm Program: treefarmssystem.org/georgia
- Georgia Forestry Commission: www.gatrees.org
- Society of American Foresters: www.eforester.org/

Vocabulary

Acre: unit of measuring land, about the size of a football field; 43,560 square feet

Controlled Burning: a planned fire in a forest to clean out smaller vegetation that competes with trees for nutrients and that adds material to a wildfire that might cause it to burn out of control

Erosion: the movement of topsoil, the most fertile layer of soil, by water, wind, and other forces

Forest: a large or small area of land that contains mostly trees

Forestry: the practice of planting, managing, and caring for forests

Germinate: when plants take root, sprout and begin to grow

Harvest: the process of gathering crops, removing them from the place where they have grown

Logging: the business of cutting down (harvesting) trees and delivering them to a mill

Renewable Resource: any resource such as wood or solar energy that can be replenished over time

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Thinning: the selective removal of some trees to improve the growth rate or health of the remaining trees

Tree Farm: privately owned forests that are managed for the owner's enjoyment and that help the environment and provide wood-related products

Wildfire: a large, destructive fire that spreads quickly over woodland or brush

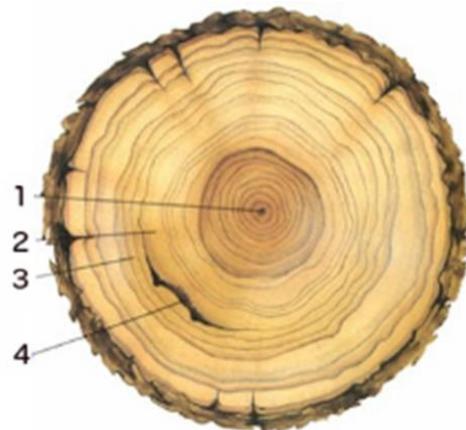
Background

For most tree species in a temperate climate (North America, Europe, China), growth occurs in two seasons, the winter season and the spring season. Usually, the winter season shows less growth due to less favorable growing conditions. These conditions might be colder temperatures, less sunlight, or less available water/nutrients. The spring season provides a better growing environment (warmer temperatures, more sunlight, and more water/nutrients available) and tree growth increases. The two different growing seasons are represented as tree rings. If a tree is cut or if a sample called a 'core' is taken, these rings can be visible. When determining how old a tree was when harvested, the rings can be counted. But remember, one year equals two rings for trees in a temperate forest. The easiest method to determine the age of a tree is by counting either the dark rings (winter season growth) or light rings (spring season growth).

The tree in Figure 1 was 19 years old when harvested. This tree cookie shows years which growing conditions were both favorable (#2) and unfavorable (#3). Favorable growth conditions means enough water, nutrients, and space were available. Unfavorable growth conditions may mean drought, insect infestation, disease, or high competition for resources (crowding). The dark mark at #4 shows that a fire occurred during year 13. A dark mark or spot cutting across a few rings usually represents a dead branch (not seen in Figure 1).

Scientists use tree rings not only to determine a tree's age, but also use them as windows into the past. When a tree's harvested year is known, the rings can be counted back to identify exact years for different events. For example, if the tree in Figure 1 was harvested in 2000, then that tree's first year was in 1981 (#1). The increase growth at #2 was in year 1994. A fire occurred during the summer or fall of 1994, before winter started (#4).

Figure 1: Tree Cookie Rings



From

<http://nupex.eu/index.php?lang=en&q=textcontent/nuclearapplications/datingartarch>

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Procedures

1. Read aloud *Our Family's Tree Farm* or provide a copy to each student and allow independent reading.
2. Lead a discussion with the students about Georgia's forest industry and its importance to our everyday lives by asking the following questions.
 - a. Did they discover anything surprising while they read?
 - b. What purposes do tree farms have?
 - c. Review the list of products on page 19. Ask if any products surprised them. Did they already know trees made some products on the list?
 - d. Define or review the term renewable resource. Ask why trees are considered a renewable resource
 - i. Humans manage trees by planting, caring, and harvesting them. Trees are renewable because humans plant trees to replace those which were harvested.
3. Discuss how tree farmers manage trees as a renewable resource so we may have products which we use every day.
 - a. Trees are managed on public and private forests located throughout the country.
 - b. In Georgia, the majority of the forests are privately owned, like a family business.
 - c. Most timber companies or family farms replant trees after harvesting, meaning Georgia grows more wood than what is being harvested.
 - d. Remember, trees take years to grow! Those seedlings that were planted yesterday may not be ready to become paper until 10-15 years later.
4. Lead a discussion about tree growth. This discussion will assist students in completing their writing assignment. Use the provided PowerPoint lesson to assist in the discussion.
 - a. When a tree is cut down, the rings that are seen show how much the tree has grown. In one year, the tree produces two rings, one light and one dark.
 - b. The light ring occurs during the spring season and is usually thicker than the dark ring. This is because the spring season is when the tree grows the most. The amount of sun, food and water plus the best temperatures allows this growth to occur.
 - c. The dark ring represents the winter season and is usually thinner because the tree becomes dormant. Growing conditions are not at their best (cooler temperatures, less sun, food or water) so the tree does not grow as much.

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- d. To determine how old a tree is when harvested, the rings can be counted. The easiest way to find the age of a tree is by counting the dark rings (winter season growth).
 - e. Have the students count the rings for the tree in the PowerPoint lesson.
5. Once the students understand how trees grow, lead a discussion on how a tree can be a window into the past by looking at the rings. Use the PowerPoint lesson to assist in the discussion.
 - a. The environment the tree grows in affects how much the tree grows. By looking at the rings, one can discover what the environment was like in the past.
 - b. For example, if we knew this tree was cut down in 2018, we can count backwards to see what the environment was like in 2000.
 - c. The thicker rings signify ideal growing conditions with enough water, nutrients, and space available. No drought or other harmful events occurred during that timeframe.
 - d. Thinner rings represent unhealthy or less favorable growing conditions. This could mean drought, insect infestation, disease, or high competition for resources (too many trees).
 - e. If there is a thicker black mark along a tree ring, then a fire could have been through that area. This is called a fire scar. Fire does not always kill trees, but can even help them grow faster! Some tree farmers use controlled fire to help reduce the competition from other plants so their trees can grow better.
 - f. Trees usually adapt to the damage and keep growing. By counting backwards from the harvest year, we can discover the year the fire, drought, or insect damage occurred, allowing us a window into the past.
6. Discuss with the students that they will now have the opportunity to create a narrative about a tree's life. Have them imagine growing up on Carrie Ann, Carlie Beth, and Callie Grace's family tree farm...as a tree!
 - a. Review the definition of narrative writing.
 - b. Choose a point of view to write the story
 - i. First person from the tree's point of view
 - ii. Third person from an outside point of view (narrator)
 - c. Depending upon the time available and students' level, decide upon the best focus of the writing.
 - i. From Seedling to Product
 1. Students write entire life of tree, from seedling to product (tree nursery, planted, grown, harvested, product).

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2. Provide time for students to research the production of various products.
 - ii. From Seedling to Harvest
 1. Students write entire life of tree, from seedling to harvest.
 - iii. A Year of Growth
 1. Students focus on one year, spring and winter growth seasons.
 - iv. A Season of Growth
 1. Students focus on one growth season, spring or winter, which was 'memorable' for the tree.
- d. Reminders:
 - i. Allow students enough time to write their narratives. This could take a few days or even weeks to create a final product!
 - ii. Students don't need to cover every year, but have them detail the good growing years (thicker rings) and difficult growing years (thinner rings).
 1. What conditions caused the tree to grow the best (thicker rings)? (enough food, space, water and best temperatures)
 2. What conditions caused the tree to grow the least (thinner rings)? (insect damage, drought, not enough space to grow, etc.)
 3. What did the tree farmer do to help? (controlled fire, removed some trees to allow more space to grow)
 - iii. Students can provide an illustration of the tree's history with tree rings.
7. Allow students the opportunity to read their writings to the class. Discuss how the different events the students wrote about affected their tree's growth.
 - a. If time allows, then also cover standard ELAGSE3SL4 OR ELAGSE4SL4

Extensions

- Ask a local tree farmer to visit your classroom. [Georgia Forestry Commission](#) and [Georgia Forestry Association](#) can assist in finding a local forester.
- Students can read their narratives to younger students.
- Create a book with the students' writings and share with your school.
- Students research what parts of the tree are used to make the different products and present their findings.

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- Students can explore dendrochronology, the study of using trees (rings) to date events/processes in the past.
 - [The University of Arizona's Laboratory of Tree-Ring Research](#)
 - [WebRangers: Dendrochronology](#) (National Park Service)

Other Reading Connections

- **The Tree Farmer** by Chuck Leavell and Nicholas Cravotta
A grandfather who owns a tree farm takes his grandson on a magical journey through the forest, where trees become musical instruments, books, a baby's crib, and more.
- **Christmas Tree Farm** by Ann Purmell
This book examines the production and marketing of Christmas trees. It begins with harvest on a family-owned tree farm but progresses to planting tree seedlings in the spring.
- **Forestry** by Jane Drake, Ann Love, and Pat Cupples
Examines commercial forestry-the process and benefits. Includes research and development, raising seedlings, planting trees, tree farming, harvesting, lumber mills and papermaking.
- **The Big Tree** by Bruce Hiscock
Follow a sugar maple tree during its emergence as a sapling in 1775 in the Revolutionary War to present maturity and learn about history along the way.

Did You Know? (Fun Facts)

- Georgia is number one in:
 - Commercially available timberland (land available for timber).
 - Exporter of pulp, paper, and paperboard products; 21% of U.S.'s exports of pulp and paper.
 - Exporter of wood fuel; valued at \$165 million.
- 144,000 jobs are created in Georgia, directly and indirectly from the forest industry.
- Georgia sportsmen spend more than \$1.8 billion annually, which contributes to 31,000 jobs.

Sources

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