

Background:

As trees age, they grow in height and width. Observing a cross section of a tree (tree cookie) you will see growth rings. You can tell the age of a tree by counting these rings. The width of the rings varies, depending on several factors, including amount of rainfall, available light, and length of growing season.

The **annual rings** of a tree are made each year when a new layer of wood is added to the trunk and branches of the tree. New wood grows from the **cambium layer** between the old wood and the bark. Since there is more moisture in the spring, the tree's energy can be directed toward producing large growth cells. As the season moves into summer, the growth slows and finally stops in the fall.

There are two parts to an annual ring - a light portion and a darker portion. The light section is called **springwood**. This part of the ring is usually widest because the tree does most of its growing then. The darker part, **summerwood**, is thinner. The tree's growth slows down, hence a thinner band.

The more optimal the growing season, the greater the distance between rings.

A tree does not have to be cut down to discover its age. There are several ways to determine the tree's age.

- The most popular way is to use a boring bar - a tool that takes a core sample from the tree. It looks like a long thin plug when it is removed from the tree. By counting the rings on the core, you can tell the age of the tree.
- Another way to tell the age of a tree is by walking around the area and looking for a tree that has fallen. If it is the same species and about the same width, you can count the rings. This also helps you to estimate the age of the tree.
 - o An ecological profile can also be done on the land you are visiting. If it was farmland 75 years ago, then you will know that none of the trees can be more than 75 years old. This is not very conclusive but you will know if you are in a young forest or an old forest.
- Some researchers use statistics to determine the age of trees. A chart is made for a specific site. The diameter and the height of the tree are taken. A boring is then done. Information is analyzed and charted on trees of various heights and diameters. Statistics from a specific site will give you the age of a certain tree.

The study of the rings of trees is called **dendrochronology**. Scientists have been able to use the information from the sizes and spacing of tree rings to identify climate changes. They have found wood that dates back to 7,000 BC, almost 9,000 years! These studies can also identify trees that are suffering from the early stages of pollution effects or can identify an area that is not getting enough irrigation. Past climate conditions can be discovered and future climate patterns can be predicted from the study of tree rings.

How Old Are You?

Objective:

Students will understand that we can learn about a tree's age, and how it grew by the rings on a cross section.

You can learn about a tree's growth and history by observing its rings. Use the **Treeture Ring-a-ling** as a guide to help animate and enhance your tree lesson. **Ring-a-ling** is a **Ring Counter**. Ring Counters keep track of the age of trees and the Treeture birthdays.

The Treetures were having a surprise birthday party for a 70-year-old oak. Sprig and Blossom argued that a nearby white pine tree was the same age as the oak or older because it was taller than the oak. Ring-a-Ling knew which tree was older. Can you guess what Ring-a-Ling's answer was? (The diameter of the oak's trunk was much wider than the pine's trunk - the oak had many more rings) The oak tree was older! (note: The species of the tree also determines how wide or tall a tree is when it reaches maturity - the rings are dense in an old tree with a narrow trunk)

Elicit a discussion on birthdays and growing.

- How old are you?
- How often do you have a birthday?
- How can you tell you are getting older? How can someone else tell you are getting older if they haven't seen you for a long time?
- What about the age of your pets? How can you tell your puppy or kitten is getting older?
- What about this plant here on the windowsill? How can we tell it is getting older? Or the seeds you plant in the garden? What about the trees in the park or yard? Do they have birthdays like people? How do we know they are growing? What happens?

Show a tree cookie, or pass out several if you have them. (Tree cookies can be gotten from a local arborist or tree care company). Ask, "How does it feel? What do you see?"

Activity 1 ([click here for tree work sheet](#))

Pass out copies of the tree stump picture.

1. How old was this tree when it was cut?
2. Observe the rings. How do they look? Do you see a pattern? What do they tell us about the tree?
3. Why do you think there is a ring with a dent in it?
4. How old were you when this tree was four years old?

Activity 2 ([click here for tree cross section work sheet](#))

Use the work sheet to have students match a variety of cross sections of tree cookies with their corresponding ages.

**The Treeture characters, as learning tools, can be adapted to any grade level. For example, students in grades K-1 could utilize coloring pages, finger puppets, and collages. Stories, poems, creation of new Treeture characters, newsletters, and plays could be fun and used as mentoring projects by 5th and 6th graders for younger students. Another entertaining and educational activity is to hold a Treeture Fair. This project has been successfully implemented in several schools. Each Treeture character can be enlarged and placed on an easel on a table with an appropriate experiment or example of its tree role.*

Extension:

Plan a surprise party for a tree at school or in a park. Estimate the age of the tree. The best time for a tree's birthday party is in the beginning of the growth season, spring. Bake tree cookies with the class or have students bring in different size round flat cookies. Use pastry tubes and add rings made of icing. Have the class make drawings or collect magazine pictures of the gifts you would give to a tree. Display your gifts under a large tree wall mural. What gifts can a tree give to us? (see the Treeture **Twigs** for a list of gifts) Add the gifts trees give us to the same display.

For a class of students grades 4-6, adopting a grove of trees and researching its history would be a good project to help learn about statistics. Tree charts can be made and age estimating can be done. Many universities have forestry departments that will share their information. Cornell University, the University of Arizona, the University of Arkansas.

Totally True Treeture Trivia:

There is a tree that is 4,767 years old. Its name is Methuselah and it is a bistlecone pine tree. Methuselah and other old bristlecone pines are in the White Mountain range in California. For more information about them and Dr. Edmund Schulman, the man who discovered the oldest trees, go to www.sonic.net/bristlecone/intro.html

