

Tree Rings Tell a Story

Grade 3

Supplies

- Log cross-sections (use pictures if you do not have access to real wood samples)
 - Coast live oak
 - Fremont cottonwood
 - Coast redwood
- Magnifying glasses
- Tree cross section activity sheet
- Tree cookies (thin 2-4 inch cross-sections of a woody branch) if available

Background information

Each year in California there are times when plants grow more quickly and times when they grow more slowly. In the spring, when there is moisture and sunlight readily available, trees grow fast and produce big new cells for transporting water and mineral nutrients. During the dry part of the year, plants grow more slowly and make much smaller new cells. When you look at the cross section of the tree trunk and see alternating dark and light colored rings, the darker colored bands are small, densely packed cells made during times of slow growth, and the lighter colored bands are larger, loosely packed cells made during times when growing conditions were favorable. This means that each year, in our climate, a tree trunk adds a light ring and a dark ring, which becomes part of the sapwood. The sapwood is the soft outer layers of recently formed wood between the heartwood and the bark which contains the functioning vascular tissue (phloem and xylem). Heartwood is the darker center part of the trunk which is 'dead' and more resistant to decay.

Environmental fluctuations and other events affect the patterns of tree rings. For example, during a series of drought years, rings will be thinner and grouped more closely together. Many California native trees are adapted to withstand fires, but they still cause scarring and irregularities in the growth rings.

Activity: Tree Ring Stories

Ask students to use a magnifying glass to examine the three log sections and describe (verbally or in writing) the differences they observe between the three species. Can they see the larger cells in the lighter rings and the smaller cells in the darker rings of wood? How does the outer layer of bark compare to the sapwood and heartwood? What would tree rings look like if rain and temperature were constant? (In the tropics, where rainfall is consistent, trees do not exhibit rings in cross section.)

Use the Tree Rings activity sheet. Determine the age of the tree depicted and identify the different areas of wood

- Bark
- Sapwood
- Heartwood
- Tree Ring

At the Santa Barbara Botanic Garden

Visit the redwood round in the Arroyo Section at the Garden. Can you count the rings on this tree? How old is it? Can you find a time of drought or a high water year? How does this bark differ from other trees around the Garden or the rounds you looked at in the activity above? What purpose might the thick redwood bark serve?

Other Curriculum

See **Leaf Litter** for information on the importance of leaf litter (including that provided by oak trees) to healthy ecosystems.

See **Oaks in the Garden** for more information on observations to make at the Garden.

See **What is a Plant – Background Information for teachers** to find out more about trees and tree parts.