



Scien-Tastic!

Bigger Questions, Better Answers, Bear Down

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UA SCIENCE

Tree-Rings Reveal Ancient History!

Dendrochronology is the science that analyzes the patterns of annual tree-rings, also known as growth rings. Scientists can date the time at which tree-rings were formed to the exact year. The change in pattern of rings (wide and narrow) is caused by temperature and precipitation. Here in the Southwest, the primary growth factor is precipitation. Wide rings were years with plenty of rain; narrow rings indicate years of less rainfall or even drought. Dendrochronologists use these patterns in tree-rings to reconstruct regional patterns of drought and climate change anywhere trees grow.

Tree-rings tell us much more than the age of a tree. The shape and width of the annual ring often differs from year to year. During a drought, a cooler than average winter or an unusual frost period, a tree may produce a narrow

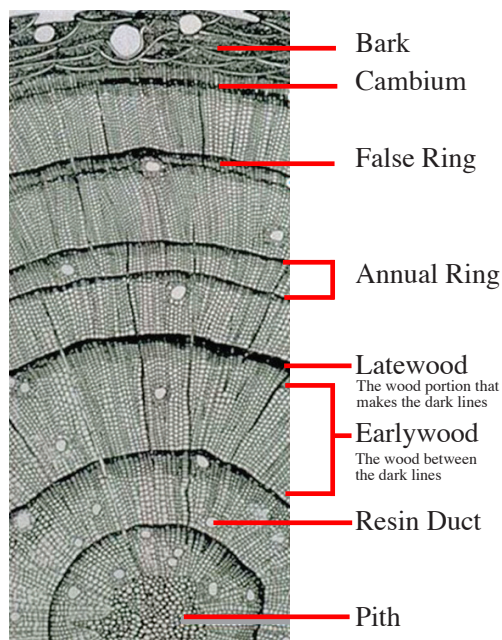
ring. Other factors may affect a tree's growth rings. Disease, insect infestation, root damage, fire, flood, and human intervention are all factors that affect a

tree's growth. Sometimes a disturbance will occur after the growth season, producing a misshapen ring the following year.

Dendrochronology can be applied to many fields of science like understanding a region's wildfire history. Dendroarchaeologists can date the wood from historic buildings and shipwrecks to understand cultures from the past. Dendroclimatologists use tree-rings to determine when volcanic eruptions occurred and the global temperature dropped!

Scientists can even date historic oak-panel paintings, violins and other wooden instruments using dendrochronology!

The Parts of a Tree



Activity:

Dendrochronologists build chronologies from tree-rings more than 10,000 years in the past. These chronologies contain annual information about climate, fire history, insect outbreaks, glacial movement and other disturbances.

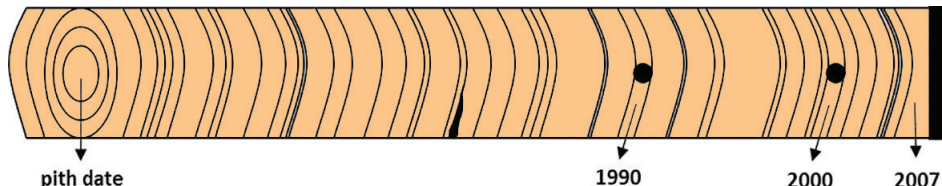
Scientists use a tool called an increment borer to drill a small hole in the tree and extract the rings without killing the tree. The resulting core can be measured and used in place of the whole cross section of a tree trunk.

On the core below, examine the 50 years of tree-ring information, and see what patterns you can find! Count the tree-rings backward from the bark (2007) to find the pith date (when the tree started growing). Mark every decade with a dot (hint: the years 2000 and 1990 have already been marked for you).

The tree rings are the white spaces between the lines. Think about what might cause variation in the tree-ring width.

Questions:

- What is the inner date (pith date) of the tree core?
- List the years of 5 of the narrowest rings.



Antique Violin's Age Discovered!

A Stradivarius is one of the violins, violas, cellos or other string instruments built by the Stradivari (Stradivarius) family during the 17th and 18th centuries. Only about 650 original Stradivari instruments survive today.



Museums that want to purchase a Stradivarius will work with dendrochronologists to verify the age of the wooden instruments before spending millions of dollars.

Resources

Schedule a Tree-Ring Presentation for Your Classroom!

We adapt our innovative approach to work with teachers and students of all ages and grade levels, depending on the need.



Tales Tree-Rings Tell

Students in this class will have a hands-on exploration of tree "cookies" or cross sections of trees to better understand how dendrochronology has influenced forest ecology, archaeology, and climate change.

For printable versions of illustrations, games and more, go to

www.beaessentialnews.com/scientastic.php

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