

Tree Cookies Activity: Clues to Time and Cycles?

Name _____

BACKGROUND

Proxy data are preserved physical characteristics of the environment that can stand in for direct measurements. Scientists rely on local and global historical data to determine whether changes in climate are part of Earth's normal pattern or caused by human activities. Analyzing patterns and cycles in tree rings, ice cores, pollen samples or the fossil record provide insight to the changes in climate we see today.

Dendrochronologists (tree scientists) study tree "cookies" to determine the age of a tree and collect data on historical growth conditions. Tree growth depends on environmental factors such as location, surrounding foliage, fire, insects and, most importantly, water and temperature. The annual variation of these factors may be reflected in trees' annual growth rings. Wider growth rings suggest periods of optimal growth; narrower rings suggest limited growth because of environmental factors. Because the amount of water in the environment varies from year to year, scientists use tree ring patterns to reconstruct regional patterns of drought and climate change.



Materials: tree cookie, ruler, calculator

Procedure:

1. Measure the radius of your tree cookie.

_____ cm

2. Determine the circumference of the tree cookie (circumference = $2\pi r$). Multiply the radius by 2π (2×3.14) to find the circumference.

_____ cm

3. The pith is the central column of spongy cellular tissue in the stems of woody plants. Each ring represents one year of growth. Begin at the pith and count the number of rings as you move to the outside of the tree cookie. Do not count the pith.

Number of rings: _____

4. Mark off each decade of growth and determine the percent of growth for each 10-year period. To do this, divide the width of the 10-year period of rings by the total radius and then multiply by 100.