Rings of Wonder

Science Activity | Grades 3-5
Standards: 4-ESS3-1 (Earth & Human Activity)
3-ESS2 (Earth's Essentials)

CALIFORNIA ARBOR WEEK
MARCH 7 - 14

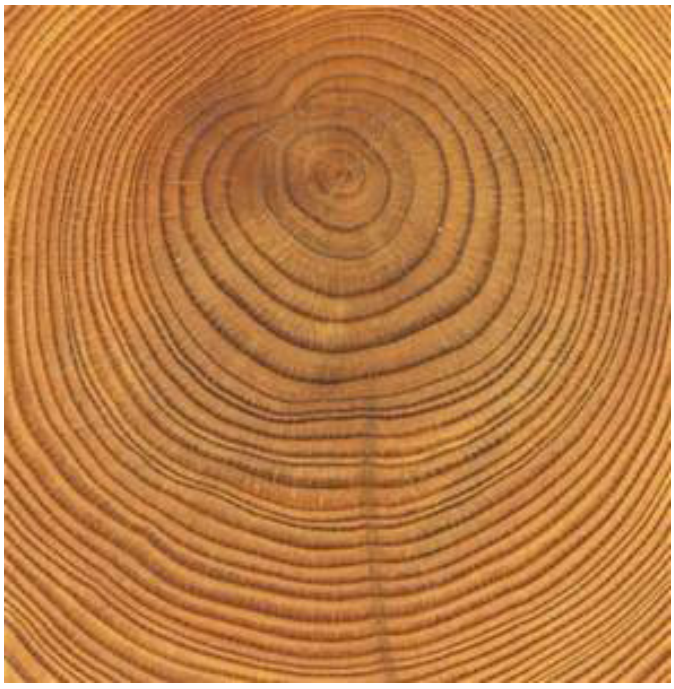
Overview:
By working with tree rings students will learn about how weather and temperature effect tree growth and what ***archaeologists*** (people who study human history) can glean from ***dendrochronology*** (tree timelines).

Materials:
Samples of tree rings (borrow from local Forest Service) or images of rings (online, books from library, books from list) or different sized pieces of wood from a lumber yard (look at ends to see rings), rulers, pencils, paper. If the teacher or a student has access to a tree that is being cut down and can have a slice taken from the trunk or a tree section from a local agency or college.

Tree growth depends on environmental factors including location, surrounding ***foliage*** (the leafy part of a plant), water, and temperature. How these factors change year to year are reflected in the ***tree's annual growth rings*** (circular growth patterns that form inside the tree trunk each year of the tree's life). Counting these growth rings gives a fairly accurate account of the tree's age. The wider the ring, the more growth; the narrower the ring, the less growth. Less growth may be due to drought or cold cycles. Because the amount of water in the environment varies from year to year, scientists use tree ring patterns to reconstruct the regional patterns of drought and climate change. Most trees add one growth ring a year. Usually one ring has two colors: light-colored in the summer and dark-colored in the winter.

Using a sample, count the rings on the tree. How old is this tree? Have the class look at the rings for the years since they were born, their siblings, pets, parents were born. Other questions you can ask:

- When was the school was built? When was the local shopping center built? When did man walked on the moon? Etc.
- Are there scars from fire or insects? When do you think the fire took place?
- If we were archaeologists, what else might we wonder about while looking at these rings?



Dry years and wet years can have a big impact on the people who live in the area. Ask students questions to help them think about the difference between dry and wet years:

- Which years have a dry pattern? A wet pattern?
- How might these wet years affect local people? Dry years?
- What types of jobs might be affected?

Tree Tidbit:

The average American family uses 400 gallons of water a day; in California 60% of that is used outside.

- What pattern might show a time when ancient peoples could have stored lots of food for bad years? ***(one or more very wide rings show years when there was plenty of rainfall)***
- What pattern would show a time when ancient people would have to depend on the food they had stored? ***(one or more very narrow rings show years when there was little rain)***
- What pattern might indicate a time when ancient people might have to consider leaving the area? ***(many narrow rings in a row indicate a lengthy drought)***
- What might a tree ring pattern look like here in California after several years of drought? ***(students can draw a tree ring section depicting ones local drought situation; California has been in an extreme drought for three years)*** Do you see a pattern like that in your sample?

Additional Activities:

1) Have the students choose a set of rings showing a period of 8 - 10 years and write a story about what life would have been like for someone who lived in that period. Or, let them draw their own tree ring pattern to write about.

2) Have a forester visit the class and show the use of an increment borer to see the rings without cutting down the tree, or an archeologist to tell how tree rings have been used to learn more about an archeological site near your school or in your community.

3) Brainstorm ways each student can use less water in their everyday life.

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