

Name: _____ Date: _____

Ancient Wise Ancestors:

Linking Ancient Wisdom to Modern Wisdom of the Tree Rings

In this activity, you will study rings in tree cores like a dendrochronologist (tree ring scientist). By analyzing the rings in cores, you can discover the age of trees and learn about environmental conditions over many years. Trees are sacred beings in Navajo and Hopi cultures that provide valuable teachings if we observe them carefully.

Do Now:

Take a look at the following photo from National Geographic Expeditions.



Photograph by Hugh Stevens Bell

1. Look at the photograph and think about what parts used to be living trees.

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Imagine you are in the Painted Desert of Arizona and you want to find the age of one of the Juniper trees.

2. Select one of the following:

Draw a cookie showing the age of 20 years.

Draw a core showing the age of 30 years.

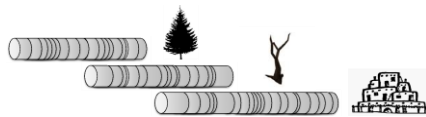
Now, we are going to get into groups.

You should have the following materials:

- Tree cores (digital images glued/taped on boba straws)
 - Navajo National Monument
- Hand lens
- Ruler

Trees tell us their stories through their rings.

Scientists who study tree rings are called **dendrochronologists**. By looking at the rings, they can translate (decode) what the trees are trying to tell us.



Let's look at these cores and see what they can tell us about their lives.

Navajo National Monument Tree Cores

3. How old is this core? (How old was this tree when it was brought down to build a house?)
4. Do you see any thin rings?
5. What can they be telling us about the environment at that time?

Modern core

6. How old is this core?
7. What year was this core obtained?
Hint: 2020 – (age of the core)
8. Do you see any thin rings?
9. What can they be telling us about the environment at that time?

Virtual Dendrochronology

Visit the Presto Project and load the North American Drought Atlas (NADA):

<https://paleopresto.org/visualizer.html?dataset=nada>

The NADA is a map and was created using about 1845 trees, consisting of Ponderosa Pines, Bristlecone Pines, Oaks, Junipers, and Douglas Fir. The NADA is used to estimate soil moisture and climate of the past.

10. In the area of Arizona and New Mexico in 2005, what do you notice about the soil moisture? Mark an “x” on the color bar below.



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11. Now, go back to 1934, what do you see? Mark an "x" below.



12. Now, let's go back to the year 1100, what do you see? Mark an "x" below.



13. What do you see in year 1251? Mark an "x" below.



The Dust Bowl happened 1929-1940 and it affected the climate of North America.

Structures at Navajo National Monument, Wupatki, and Chaco Canyon were built beginning about the year 850.

14. By the end of the 1200s, the ancestors of the Hopi, Diné, Apache, Pueblo, Yavapai, and Ute migrated to other places. Look at the NADA map, where do you think they moved to? Hint: Look for the bluish-green areas.

Understanding from Nature – Traditional Knowledge:

In Navajo and Hopi cultures, trees are viewed as sacred beings to be respected. Traditional ecological knowledge values learning from observing nature closely over many years.

15. You may draw and/or respond in words to the following question: How is knowing about the age of trees relate to where you come from?