

## Rings of Time: Innovating K-12 Education with Dendrochronology Project

Lesson Title: What Can Trees Tell Us?

Grade Level: First Grade  
Lesson Length: 50 minutes

<b>AZ Science Standard:</b>	1.L1U1.6  Observe, describe, and predict life cycles of animals and plants.
<b>Learning Objective:</b>	Students will be able to connect what trees need to grow with wide and narrow tree rings.  Students will be able to define what dendrochronology means.

Vocabulary	Materials
<ul style="list-style-type: none"> <li>• Dendrochronology</li> <li>• Early Wood</li> <li>• Late Wood</li> <li>• Pith</li> <li>• Tree Cookie</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Presentation</a></li> <li>• Activity Sheets                             <ul style="list-style-type: none"> <li>○ <a href="#">Parts of a Tree</a></li> <li>○ <a href="#">What do Trees Need to Grow</a></li> <li>○ <a href="#">Measuring Tree Rings</a></li> <li>○ <a href="#">Trace the Words!</a></li> <li>○ <a href="#">Structure of a Tree Rings</a></li> </ul> </li> <li>• Crayons (<i>class set</i>)</li> </ul>
<b>Guiding Questions:</b>  What does dendrochronology mean?  How many years does one tree ring represent?  What is the difference between early wood and late wood?	

### **Engagement/Introductory Activity**

The introductory activity leading into the lesson will occur as follows:

#### Topic Addressed - The Parts of a Tree

Have students stand up so they can use their body to demonstrate the different parts of a tree.

- Teacher will ask students to plant their feet firmly into the ground
  - What does this represent on a tree?
    - The roots!
- Teacher will ask the students to stand up straight with their hand by their sides
  - What part of the tree is our strong body?
    - The trunk!
- Teacher will ask students to put their arms out in the air
  - What do our arms represent on a tree?
    - The branches!
- Teacher will ask students to wiggle their fingers tips
  - What do our moving fingers represent on a tree? When wind moves through a tree they move with the wind...
    - The leaves!

Teachers can optionally include the worksheet for students to fill out instead of the body movement activity or in addition to.

Students may sit back down and get ready for the exploratory activity...

### **Exploratory Activity 1**

#### Topic Addressed - What Do Trees Need to Grow

Teacher passes out the “What Do Trees Need to Grow” worksheet and crayons.

Teachers should allow for 5 - 10 minutes for students to color their worksheets and explore the words on the images.

Once students have finished coloring, the teacher can move to explain.

### **Explain 1**

#### Topic Addressed - What Do Trees Need to Grow

Teacher will ask students:

- What is the first thing on your coloring sheet that trees need to grow?

- Rain!
- What did you color next that a tree needs to grow big and strong?
  - Sunlight which is energy from the sun
- And what is the last thing that trees need to grow?
  - Nutrients! Nutrients are food but for plants! Nutrients come from the dirt or soil in the ground.

## Exploratory Activity 2

### Topic Addressed - Measuring Tree Rings

Teachers will pass out the tree-ring coloring sheets and give each student two colors: one for the narrow rings and one for the wider rings. Have the students color the word WIDE on the sheet one color and have them color the word NARROW their other color.

- Example: Blue = NARROW and Green = WIDE

Now give them about 2-5 minutes to color their tree rings the respective colors they picked for WIDE and NARROW.

After the students are finished coloring, have them count the number of tree rings they colored and have them write it on their coloring sheet in the “Total Number of Rings: \_\_\_\_\_” line.

- Explain to the students that this is how old their tree is!

## Explain 2

### Topic Addressed - Tree Cookies and Tree Rings

Now the teacher can present the slides with different tree cookies on them.

Define what a tree cookie is:

- Tree Cookie: a slice of a tree trunk where we can see the inside of the tree and the rings that grow in the tree! They come from the trunk (or body) of a tree. Trees leave rings inside their trunk when they grow.

Have the students raise their hands, or call on them, to tell the teacher what they notice about different tree cookies.

- Guiding questions to ask as students make observations:
  - **Do you notice how narrow or wide some rings are?**
  - **Why do you think some are more wide or more narrow**
  - **Are the rings in a perfect circle?**
  - **Are there lots of rings or a little bit of rings?**

After making some observations, discuss important information:

- **What do the rings inside a tree tell us?**
  - *The rings tell us how old a tree is. Each ring equals one year the tree lived. So we can count these from the middle to the edge of the tree cookie to see how old it is. The process of counting these rings and using them to see how old a tree is, or date them, is known as dendrochronology.*
  - Define Dendrochronology: the science that deals with dating and studying the annual tree rings
- **We know that trees need the sun, rain, and nutrients to grow big and strong but what happens if a tree does not get these three things? Does it stop growing? Does it grow a lot? Does it grow a little?**
  - *Even if a tree does not get enough food, or sun, or water, it still grows but it only grows a little bit. This means its ring will be more narrow. When a tree gets a lot of sun, or food, or water, then its ring will be very wide! That is why we see some narrow rings on the tree cookies and some wide rings on the tree cookies. Some years that tree had enough of its needs to grow big and strong and some years it did not.*
- **Ask students:**
  - For trees living here in Tucson, Arizona what resource is the most important for trees to grow?
    - *Water is the limiting factor*
  - So what does that mean if we get more rain here?
    - *The rings in the trees here will be wider!*
- Use slides 12 to 23

Have students look back at their Measuring Tree Rings worksheet. Ask them how old their tree is? (This is the total number of rings they counted)

- Correlating slide = 24

### Extension Activity/Questions

#### Topic Addressed - Structure of a Tree Rings

Teachers will pass out the Structure of Tree Rings worksheet.

Students will attempt to label the parts of the tree cookie using the word key.

After a few minutes the teacher will go over the parts of the tree cookie and help students fill in the blanks correctly.

Vocabulary Discussed:

- Pith: the center of the tree cookie
- Early Wood: the lighter part of the tree ring : this grows during the first part of the trees growing season
- Late Wood: the darker part of the tree ring : this grows during the later part of the trees growing season



Use slides 25 to 31

Additional Facts:

- *The pith is the oldest part of the tree. (Yellow star on their worksheet)*
- *The outermost ring is the youngest part of the tree. (Green triangle on their worksheet)*
- *The bark is the only living part of the tree.*

### **Evaluation Activity**

To close out the lesson for the day, review the vocabulary they learned throughout the lesson. Teachers pass out the “Trace the Words!” worksheet and make sure each student has a writing utensil. Give the students the remainder of class to trace the vocabulary words.