Bay Area Scientists in Schools Presentation Plan

Lesson Name Can you ask a tree how old it is?
Presenter(s) Tim De Chant
Grade Level 1st
Standards Connection(s): Plants and animals meet their needs in different ways.

As a basis for understanding this concept:

- *Students know* different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places. ***Like humans have skin and hair, trees have the external feature of bark that help them thrive in different kinds of environments.***
- *Students know* both plants and animals need water, animals need food, and plants need light.
- *Students know* roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight ***Trees need water and light. Tree rings tell the "story" about a tree's intake of water from year to year.***

Abstract: Ever looked at a tree and wondered how old it was? How exactly do we determine this, and how can we do so without cutting the tree down? Enter tree coring. Coring a tree is a simple process that yields various and useful types of scientific data, making it a perfect component to many scientific studies. Despite its advanced uses, the conceptual backgrounds to tree coring and its partner discipline, dendrochronology, are easily understood. In this lesson, I will be introducing the students to the concept of tree coring and what we can learn from it. The lesson includes familiarizing the class with some basic vocabulary and providing them with a variety of hands-on experiences to engage their curiosity. Time and resources permitting, I will also be able to demonstrate the coring of a tree on the school grounds to give the class a first-hand view this process used by scientists around the world.

Vocabulary/Definitions:

tree ring: a band of light and dark wood in the trunk of a tree that represents one year of growth

core / coring *[LINK: apple core. Have you every eaten an apple all the way down to the core (noun)? What does a person "do" when he or she cores (verb) a bowl of apples?]*

age *[LINK: What is your age (n.)? Wine has to age (v.) a long time in barrels before people drink it. Based on its rings, I age (v.) this tree as 6 years old.]*

tree-aging *[The process of finding-out how old trees are by taking a sample of their core.]*

Materials:

I'll bring tree discs (cross sections) for the presentation; and concentric circle puzzles and blindfolds for the activity.

Classroom Set-up:

Teacher need to pair students before the presentation begins.
Access to an electrical outlet near "presentation area" of the room may be needed.

Classroom Visit

1. Personal Introduction: ____5____ **Minutes**

I am a graduate student at UC-Berkeley. I study trees and how the houses we build in amongst the trees affect how they grow. I'm interested in how trees grow just as the students are interested in their own growth. Tree rings are the key to understanding both how old a tree is and how well it grows. To introduce the topic, I plan on relating the growth of trees to their growth and the growth of other people. To draw comparisons, I plan on having photos of trees at certain ages (approximate) and of people at that same age.

At this time, we will also play a game of "Guess My Age." I will ask the children to share the reasons why they guessed a particular age. –Students may mention characteristics such as height, hair color, skin texture, clothing, and other factors that contributed to their predictions. (We will re-visit this game and the students' predictions when we talk about tree-aging.)

Topic Introduction: _____5_____ **Minutes**

The focus of this lesson will regard how we age trees via tree rings.

-Just as there are "clues" that sometimes help to "age" a human, there are clues that help to age trees. Here, students might share a few of their predictions as to the "clues" that scientist might use to age tree.

To assess their knowledge, I plan on bringing in cross section books that illustrate cross sections of every day things (cars, boats, etc.). To link this to trees, I will then introduce a tree cross-section. I will ask the children to whisper to their neighbor a prediction about what the object is that I have introduced. I will then ask for their guesses aloud. A final question, depending on how advanced I think the class is, will be to ask them what sorts of information we can gather from the tree cross section.

2. Learning Experience(s): _____30____ **Minute**

First, I will pass around the tree cross-sections and have the students inspect them (1 min).

To lead into tree aging, I will ask students if they have any ideas about how scientists use the cross-sections to learn the age of the tree. Then I will ask them to count rings in the tree cross sections they have. How old are their discs?

Second, I will ask students if there is anything else that they think the tree-rings might tell scientist. I will encourage students to examine how close or far apart the rings are from each other, and take ideas. Then, time-permitting, I may demonstrate how the distance between rings is representative of the tree's intake of water in a particular year.

Just as the circumference of a balloon expands when it is filled with water, the circumference of the tree ring expands with the intake of water, as well. (I might demonstrate this with actual balloons filled with varying quantities of water.)

Once this is complete, I will then introduce a puzzle that consists of concentric circles representing tree rings. I will have their partner blindfold them and ask them to assemble the puzzle starting from year one and moving out to the last year. Then they will switch.

3. Wrap-up: Sharing Experiences and Building Connections _____5_____ Minutes

I will summarize what we have discussed by asking the students questions about the various topics: How old am I? How old are some trees? What do we call the circles in a tree? How can we tell how old a tree is? What do the rings tell scientist about the tree's life? As a final note, I will ask the students how we can age a tree without cutting it down. This will lead back into my introduction about what I study and how.

4. Close: _____2_____ Minutes

I will thank the students and encourage them to think about the trees in their community. I will leave a couple of circle puzzles for the class to help them remember what they had learned.

TOTAL _50 – 60_____ Minutes

A FEW WORDS ABOUT AGING A TREE.

Aging a tree sounds simple, but can be a bit tricky. Since trees grow from their tops, we are missing age data when we core at anything above the base of the tree. Since coring the base is extremely difficult, we either attempt to find a small tree to cut down to determine its age or just estimate the missing data. To actually age the tree, we just count the rings from the center to the bark.

When coring, a 5 mm hole is all that is left in the tree. There is a very small possibility of introducing some rot into the center of the tree, but rot, in general, is actually somewhat typical and usually starts at the base from the soil. The damage caused by coring is analogous to shipping a small bit of bark off, similar to what a woodpecker does.

Follow-up – After Presentation

I will write my email address on the board and invite students to write me. Also, I will include some websites for them to visit such as: www.arborday.org/kids/carly/lifeofatree/

Dendrochronology: http://www.webrangers.us/activities/dendrochronology/

Reading Connections:

- Tell Me About Trees by Gail Gibbons
  http://www.amazon.com/Tell-Me-Tree-About-Trees/dp/0316309036
- Be A Friend to Trees by Patricia Lauber
  http://www.harpercollins.com/book/index.aspx?isbn=9780064451208