POLAR TREC
Learning Resources

## Details


**Completion Time:** Less than a week
**Permission:** Download and Share

# Rings of Life

**Overview**
Rings of life is a comparative lesson allowing students to investigate growth rings in walleye Pollock from the Bering Sea and Ponderosa Pine trees.

**Objectives**
Students will be able to compare and contrast growth rings on fish and trees, showing just one of the tools scientists use to monitor the health of different ecosystems. Students will also be able to make educated hypotheses on a species' success based on information found in the growth rings.

**Lesson Preparation**
This is not an introductory lesson; students must already have an understanding of oceanic ecosystems, and that of their own home community. Having a guest speaker from a local forestry source to discuss an increment bore, how it is used and how the information is used would be very beneficial.

**Procedure**
DAY ONE: Class discussion on the otolith of a walleye Pollock. Students can touch and explore the components of an otolith. Break the otolith in half and show the students under the high power of the microscope the rings within. It would be very beneficial to have one microscope set up and use an adaptor to show the entire class the view on a projected screen.

DAY TWO: Invite a representative from your local forestry service to come in and talk about the growth rings found in tree species. Schedule enough time for the students themselves to be able to bore a few different trees, and observe the core and count the rings.

DAY THREE: Class discussion, why do scientists look at growth rings in different species and how do these

## Materials

- Microscopes
- Access to Ponderosa Pine trees, or other indigenous tree species
- Increment bore (can be borrowed from local forestry office)
- Otoliths (Possible source are NOAA research vessels working in the Bering Sea)

growth rings tell a story about the life of that species, and the health of an ecosystem.

**Extension**

- Students can write letters to local scientists asking about the species they study and what they do with the information collected.
- Students can contact a research vessel (NOAA) and follow along with a fishing trawl to collect fish samples and ask questions about what happens to the data collected in these research experiences.
- Students can discuss with local ecologists the health of their own ecosystems, and what is being done to improve or maintain species diversity and health.
- Students can purchase local fish samples and complete a lab where they remove the otolith from the sample.

**Resources**

http://www.tchain.com/otoneurology/disorders/bppv/otoliths.html (otoliths)
http://www.marinebiodiversity.ca/otolith/english/remove.htm (Removing otoliths in fish)
http://web.utk.edu/~grissino/ (tree ring science)
http://www.arborday.org/kids/carly/lifeofatree/
(tree ring growth demonstration)
http://www.moc.noaa.gov/flthmpgs.htm (NOAA vessels and their contact information)

**Assessment**

Students will be assessed based on two criteria: their participation in the two labs, and an end of unit summative quiz.

**Credits**

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Learning Resources

**National Science Education Standards (NSES):**

**Content Standards, Grades K-4**

Content Standard A: Science As Inquiry
a. Abilities necessary to do scientific inquiry
b. Understandings about scientific inquiry

Content Standard C: Life Science
a. Characteristics of organisms

**Content Standards, Grades 5-8**

Content Standard C: Life Science
a. Structure and function in living systems
e. Diversity and adaptations of organisms

**Other Standards**
N/A

Rings of Life
End of unit summative assessment:

1. What is an otolith?

2. What information can scientists gain from studying otoliths?

3. How do trees produce growth rings?

4. What do the growth rings on trees tell scientists?

5. Why is the study of otoliths and tree rings important to science?