How Old Is Your Tree?

Introduction

There are two ways to find out how old a tree is. The first is to wait until the tree is cut down and count the rings. The second is to use an increment borer and count the rings on a trunk cross section. The study of tree rings to calculate a trees' age is called dendrochronology.

In each method the tree sustains damage. To obtain a trunk cross section sometimes called 'beaver cookies', 'tree cookies', or 'hockey pucks', the tree must be killed. To get an accurate age of the tree, the rings must be near the base (ground) of the tree. The borer takes a small (0.200 inch diameter) straw-like sample from the bark to the pith of the tree. Though this hole is small, it can still introduce decay in the trunk.

The increment borer is made of carbide steel, which makes it a relatively expensive tool. The borer has three parts; the handle, the steel shaft and the extractor. Proper maintenance and operation are essential if the tool is to last. Borers come in different sizes and should be at least 75% the diameter of the tree you are boring.

Tree trunk growth results primarily from the xylem layers and is counted to determine the age. The tree produces large xylem cells in the spring and small cells of xylem in the summer, making it easy to note the difference between years. The tree rings are larger in wet years than in dry years. In some hardwood trees, the rings are so small that a hand lens and pins may be needed to count the rings.

Materials

Increment borers or several tree core samples   Pins
Hand lenses   Clear Tape or glue
Notebooks   Graph Paper
Rulers

Procedure:

1. Before beginning this lab, the student should be able to identify:

   bark   pith   annual ring
   xylem   summer xylem   spring xylem

2. Each group of students will receive a tree core sample. Carefully remove the tree core from the straw and tape it to a piece of graph paper.

3. Students will measure (in millimeters) the length of the entire core sample and labeling the bark and pith ends. Students should also make sure to write down the tree species and location of tree (if known).

4. A small tick mark should be made on the graph paper denoting each new ring (hand lens may be required). Placing a pin at the location of each new ring may be helpful when measuring. Once completed students will count the number marks to determine the age of the tree. The age of the tree is to be recorded on the graph paper.

5. Measure and record the distance of the each new ring to the pith (in millimeters) in a table (AppleWorks, Excel, NeoOffice, DataStudio etc…)

Year	Ring to Pith (mm)	Yearly Growth (mm)
1999		
2000		
2001		
2002		
2003		
2004		
2005		
2006		
2007		
2008		

6. Look at your data and decide which graph type would be the best way to display your data and make the appropriate graph/s.

Discussion Questions:

1. Describe what your graph shows about your tree?

2. Is the variation in tree growth the same each year? What are some of the reasons you can give for the differences?

3. Which year/s did you see the largest growth?

4. What conditions do you think caused the difference in ring size and color?

5. Provide two additional inferences about your tree, based on what your graph and raw data show.

6. Describe the type of research you might conduct to determine if your inferences are logical.