PROBLEM SOLVING ACTIVITY:
READING BETWEEN THE LINES

OBJECTIVES: Students will:
- Analyze growth rings and core samples of trees;
- Learn how tree rings provide a record of past growing conditions and climate;
- Sample the techniques involved in reconstructing climatic history from tree rings.

MATERIALS;
- Pencil
- 3 paper strips representing cores taken from trees
- Student Worksheets
- Scissors
- Ruler
- Sticky tape
- Colored pencil
- Cut cross-section of tree or a tree stump outside

PROCEDURE:

1. Students work in groups using the student worksheet.

2. Students are given a set of three prepared strips of paper – they represent cores taken from three different trees (a living tree sampled in 2002, a fallen tree and a tree used to build a log cabin) from the same woodland.
   - Model how each rod or strip of paper represents a core of wood taken from a tree trunk with one end representing the center of the tree and the other representing the bark on the outside. The youngest wood is under the bark.

3. Using the simulated core samples, students can work out the age of each tree when the core was taken (in the latter two cases, when the tree died) and record them in a table like **Table 1**.

4. By looking at the ring patterns of the simulated cores, students can line up all three samples to find how much time all three samples span together.
   - They can color the overlapping sections so that they don't lose track.
   - The core samples were taken from trees whose ages 'overlap'.
   - Given that the trees are of the same species and all grew under similar conditions the tree-rings will therefore be the same distance apart in the same year.
   - With this information it is possible to match up the rings as shown in green in **Figure 1** and count the rings to give the two 'unknown' growth-years. The diagrams for each sample can be cut out and laid side by side to see this more clearly.

5. Pupils should then measure the width of each tree ring, for each core sample, and record them in a table such as **Table 2.**
   - Grey indicates sections where two strips overlap. There is no need to record the overlapping sections twice.

6. Students should then plot the ring-width data (on the Y-axis) against Time (on the X-axis).
   - They should plot 2002 on the left.
   - This will create a graph like the one above.
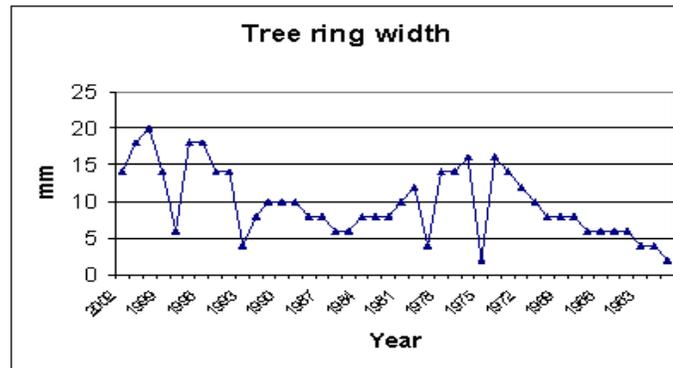
7. Students should then answer the **ANALYSIS** questions.