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INQUIRY LAB – ADVANCED

How Nature Records Changes in Climate

What can a tree tell us about climate? One way to determine how the climate of an area has changed year to year is to look at the size of the annual growth rings produced by the trees growing in that area. Wider annual growth rings signify the growing conditions were favorable that year while narrower annual growth rings indicate less favorable growing conditions. The field of dendrochronology studies historical patterns in plant growth and climate. This activity will introduce dendrochronology as you investigate recent climate data captured in tree rounds.

Focus on Science Practices

SEP 3 Planning and Carrying Out Investigations
SEP 6 Constructing Explanations and Designing Solutions
SEP 8 Obtaining, Evaluating, and Communicating Information

Materials Per Group

- Magnifier
- Marking pins
- Tree round sample, local, 1
- Ruler, metric, 1
- Tree round sample, 1

Procedure

1. Obtain a tree round sample.

1. Using the provided materials gather data on your sample's annual growth.

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Data Table — Tree Growth	

2. Graph your data.

3. Obtain local tree round samples and rainfall data for the area in which the trees grew, and analyze the two sets of data for patterns.

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Analyze and Interpret Data

1. **SEP Make Observations** Based on the size of the annual rings in your sample, how did the climate vary during the lifetime of the tree?

2. **SEP Construct an Explanation** How would the size of the annual growth rings be affected if the tree was growing in an area that had experienced a long sustained period of drought?

3. **SEP Evaluate and Communicate** Explain one advantage and one disadvantage to using annual growth rings to derive the historical climate information of an area.

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4. **SEP Evaluate and Communicate** What similarities did you observe between the local annual climate data and the size of the growth rings on the local sample?

5. **SEP Construct an Explanation** Several organizations are starting large global tree planting initiatives focused on adding billions of trees worldwide. Describe how the addition of several billion trees would affect current climate trends. Would the feedback be stabilizing or destabilizing?