



Community Science

Pollinators

Lesson 9: Tree Growth Patterns

Duration: 55-65 minutes

Location: Indoor/Outdoor

Overview

In this lesson students will:

Learn ways to interpret tree growth using tree cookies and outdoor tree observations (whorls, scars, colouration). In the extension exercise, they will identify general differences between trees and plants.

Learning objectives

By the end of the session, students will be able to:

- Identify ways to determine tree age and growth;
- Utilize tree cookies to hypothesize where and why tree growth occurred

Curriculum links

Grade: 6

Subject and Unit: Science, Trees and Forests

- Interpret the growth pattern of a young tree, distinguishing this year's growth from that of the previous year and from the year before that. Students meeting this expectation should recognize differences in colouration and texture of new growth and old growth, and locate scars that separate old and new growth



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Equipment required

- Computer with projector
- PowerPoint
- Magnifying glasses
- Tree cookies
- 30 Binoculars
- Nature journal(s) (optional)

Additional Information

Refer to the PowerPoint to learn the approach towards reading tree cookies and determining tree age and growth prior to going outside. Further information on counting terminal bud scale scars can be found [here](#).

Lesson plan

Time	Activity	Equipment Needed
15 minutes	<p>Tree Cookie Mystery</p> <p>Using the PowerPoint presentation, guide the students through the different parts of the tree cookie: outer bark, phloem, cambium, xylem, and heartwood. Explain how we determine tree age by looking at the tree cookies, as well as predict how its growth was influenced (refer to PowerPoint).</p> <p>Split the students into __ groups and provide one tree cookie to each group along with magnifying glasses. Instruct the groups to find each part of the tree cookies and determine the age of the tree, encourage each group to share their findings with the rest of the class.</p>	<ul style="list-style-type: none">• Computer and projector• PowerPoint• Magnifying glasses• Tree cookies



Community Science

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Lesson 9: Tree Growth Patterns

30-40
minutes

Nature Walk Tree Investigation

Before going outside, refer to the PowerPoint to teach the class how to determine tree age by looking at the tree branches.

Once you've reviewed the PowerPoint take your group outside, dressed for the weather. Your group will need to find a spot within the designated boundaries that is near a shorter coniferous tree. Ensure all students are able to see the whole tree tip to root!

Counting whorls: starting at the top of the tree, point out to the students where the first layer or whorl of branches is. From there, count out the branch whorls moving down the tree and determine the age of the tree as a group.

Observing colour: ask the class if they can see any changes in colour on the tree and have them share their observations. Students should notice that the colouring of the bark at the top portion of the tree (the newest growth) is lighter than the rest of the tree and its branches. Using colour is one way we can determine age with trees.

Counting branch scars or markings: trees will have terminal bud scale scars which is a marking where the new branch has grown out from the tree. A count of these scars can also be used to determine the approximate age of the trees.

After reviewing these techniques with the class, instruct the students to determine the age of 3 different trees in the area with a partner or group.

- Binoculars
- Nature journals (optional)



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10 minutes	Debrief Exercise (either outside or inside) Refer to the Debrief slide at the end of the PowerPoint.	• Nature journals (optional)
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4

Extension

1. During the Nature Walk Tree Investigation, expand on the teachings to identify the various characteristics that distinguish trees from other plants. Use the outdoors to your advantage and highlight these differences between trees and plants using the vegetation around you. Challenge the students to identify 3 differences and 3 similarities between plants and trees and ask them why they think these differences exist.

Examples of differences to share with your class:

- Trees have a hard woody trunk whereas plants have softer stems;
- Trees have bark whereas most plants do not
- Trees are larger than plants
- Trees have larger roots

Examples of similarities to share with your class:

- Both have roots and branches
- Both may have leaves and fruits/flowers/seeds

This extension would incorporate the following curriculum point:



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Pollinators

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- Identify general characteristics that distinguish trees from other plants, and characteristics that distinguish deciduous from coniferous trees.

Adapted from the *EnviroKids Investigative Forest Health, Teacher Utilization Guide for Grade 6 & 7 Teachers* (Inside Education)