COLLEGE OF SCIENCE
Laboratory of Tree-Ring Research

Tiny Sparks: Science and Storytelling in Early Learning

Lesson Title: Branching Out: Creativity & Curiosity with Trees

Grade Level: Preschool
Lesson Length: 50 minutes

AZ Science Standards:	K.L1U1.6 Obtain, evaluate, and communicate information about how organisms use different body parts for survival. K.L1U1.7 Observe, ask questions, and explain how specialized structures found on a variety of plants and animals (including humans) help them sense and respond to their environment.
Learning Objective:	● Students will be able to identify and name the main parts of a tree (roots, trunk, branches, and leaves). ● Students will be able to list the necessary components a tree needs for growth.

Vocabulary	Materials
● Dendrochronology ● Tree rings ● Annual Rings ● Leaves ● Roots ● Soil ● Sun ● Water ● Trunk ● Nutrients ● Tree cookie ● Timeline ● Photosynthesis	● The book "The Gentle Genius of Trees" by Phillip Bunting ● Photosynthesis worksheet (Kinder extension) ● Construction paper ● Markers, pastels, or paints ● A bottle of water, a box of cereal (to represent food), and a yellow ball, 2 balloons, and 2 Different colors latex ballons ● Precut different colored leaves from construction paper (green, yellow, and red). ● Leaf Memory Game

Costume Element:
Costumes play a vital role in storytelling by engaging children in immersive experiences, visually representing characters and concepts, and boosting cognitive skills through interactive play. They

encourage creativity and support multi-sensory learning, making scientific concepts more accessible and memorable for young learners.

- **Tree Costume**: Dress up as a tree with branches and leaves to introduce the concept of tree rings.
- **Forester**: Dress as a forester to emphasize the role of tree-ring analysis in understanding forest ecosystems.
- **Tree Fairy**: Dress like a tree fairy. Incorporate elements such as difference colored leaves (to link to photosynthesis).
- **Woodland Creature**: Dress as a squirrel or owl to connect tree rings with the animals that depend on trees for survival.

Guiding Questions:

- What part of the tree do tree cookies come from?
- What do the rings inside a tree tell us?
- How do trees help us and other living things?
- How do trees change with the seasons?

Engagement/Introductory Activity:

- Gather children in a circle
- Introduce the book The Gentle Genius of Trees" by Phillip Bunting
- Show the cover and ask children what they think the story might be about.
- Gather children in a circle and introduce the topic of trees.
- Ask children what they know about trees and their importance.

Body Movement Activity:
Have students stand up so they can use their body to demonstrate the different parts of a tree.

- Teacher will ask students to plant their feet firmly into the ground
  - What does this represent on a tree?
- The roots!
- Teacher will ask the students to stand up straight with their hand by their sides
  - What part of the tree is our strong body?
- The trunk!
- Teacher will ask students to put their arms out in the air
  - What do our arms represent on a tree?
- The branches!
- Teacher will ask students to wiggle their fingers tips
  - What do our moving fingers represent on a tree? When wind moves through a tree they move with the wind…
- The leaves!

Exploratory Activity:

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Storytelling (15 minutes)

- Read "The Gentle Genius of Trees" by Philip Bunting to the class.
- Pause occasionally to discuss interesting facts and ask questions.
- Highlight the book's messages about trees' intelligence and interconnectedness.

Science Activity 1: Parts of a Tree (15 minutes)
Gather the materials: a jar of water, a box of cereal (to represent food), and a yellow ball (to represent the sun) and an assortment of tree cookies.

- Start a discussion about what children need to grow: food, water and sunlight.
- Ask what trees need to grow: soil, sun, and water and carbon dioxide. These can be represented using the same examples but include a ballon to represent carbon dioxide.
- Even if a tree does not get enough food, or sun, or water, it still grows but it only grows a little bit. This means its ring will be narrower. When a tree gets a lot of sun, or food, or water, then its ring will be very wide. That is why we see some narrow rings on the tree cookies and some wide rings on the tree cookies. Some years that tree had enough of its needs to grow a wide ring and some years it did not.

Tree Cookie Observations

- Teacher passes out the tree samples for observations to students.
- Have the students raise their hands, or call on them, to tell the teacher what they notice about different tree cookies.

Guiding questions to ask as students make observations:

- Do you notice how narrow or wide some rings are?
- Why do you think some are more wide or more narrow
- Are the rings in a perfect circle?
- Are there lots of rings or a little bit of rings?

After making some observations, discuss important information:

- What do the rings inside a tree tell us?
- The rings tell us how old a tree is. Each ring equals one year the tree lived. Scientists can count these from the middle to the edge of the tree cookie to see how old it is. They use this information to create a timeline throughout history. (It may be helpful to have an example timeline with dates on it used to organize important events in order that they happen throughout time

Kindergarten Extension: Photosynthesis (10 minutes)

- Have a jar of water, a box of cereal (to represent food), and a yellow ball (to represent the sun).
- Start a discussion about what children need to grow: food, water and sunlight.
- Ask what trees need to grow: soil, sun, and water and carbon dioxide. These can be represented using the same examples but include a ballon to represent carbon dioxide.
- Explained that chloroplasts in the leaf cells only need 3 ingredients for their special recipe: water, carbon dioxide, and sunlight.
- Once a plant has these three things, something happens: they turn into two very important

things: sugar and oxygen. Sugar is the plant's food and source of energy. Oxygen is not important to the plant, so it releases it into the air. These can be represented with sugar and ballons filled with air.

- The teacher explains that to perform this process, plants require the help of a chemical called chlorophyll. This chemical is what gives leaves their green color. During fall and winter, there is less water and sunlight available for photosynthesis. Because of this, plants enter a resting state and stop producing glucose. When photosynthesis stops and chlorophyll decreases, the leaves begin to change colors. This is why trees have yellow and orange leaves during the colder months of the year. This discussion can be linked to the Leaf Memory Game, as there are different colored leaves.
- In photosynthesis, plants use sunlight to put together carbon dioxide and water to make their own food (sugar) and oxygen.
- Provide students the photosynthesis worksheets. Have them color in the five items and paste them on the worksheet.

Science Activity 2: Leaf and Tree Memory Game (10 minutes)

- Show children various leaf shapes and discuss their differences.
- Leaf Memory Game where learners match different leaves and trees.

Art Activity 1: Your Tree Story (10 minutes)

- Provide each child with construction paper, chalk pastels, paints or markers.
- Guide them to their own "tree story" based on the number of years (or rings) old they are. They can add additional relevant information, such as when a sibling was born.

Art Activity 2: Tissue Paper Trees – Option #2 (10 minutes)

- Give each child a tree outline and different colored leaves cut from construction paper (green, yellow, and red).
- Demonstrate how to glue leaves onto the tree to create foliage.
- Ask the students to describe what their tree is going through (all green leaves, red or yellow indicate fall/wintertime).

Explain:

- "What did you notice about the different leaves we looked at? How were they the same or different?"
- "What do you think trees need to grow big and strong? Why do you think they need these things?"
- "Is there anything about trees that still confuses you or that you'd like to learn more about?"

Extension Activity/Questions:

"Tree Detective Walk"

- Take the children on a short nature walk around the school grounds or a nearby park.

Encourage them to use their new knowledge to:

- Identify different parts of trees they see (roots, trunk, branches, leaves)
- Look for different leaf shapes and try to match them to what they learned
- Observe and discuss how trees in the area might help animals or people
- This activity helps children apply their learning to real-world contexts, enhancing their observational skills and reinforcing the concepts they've learned. It also encourages them to think about the broader role of trees in their immediate environment.

"Tree Life Cycle Collage"

- Provide children with magazines, scissors, glue, and a large piece of paper divided into four sections representing the four seasons. Ask them to:
- Cut out pictures that represent how a tree looks in each season
- Discuss what's happening to the tree in each season (e.g., growing new leaves, losing leaves, dormancy)
- Think about how animals and people might interact with the tree differently in each season
- This activity allows children to expand their understanding of trees beyond a single point in time, introducing the concept of cycles in nature. It also encourages them to think about the interconnectedness of trees with other living things throughout the year.

Evaluation Activity:

Enlist the teacher’s help to record the following data as needed.

Observation and Questioning: Throughout the lesson, observe students' participation and ask targeted questions to gauge their understanding. For example, during the tree parts labeling activity, note if students can correctly identify and name the main parts of a tree.

Hands-on Activities Assessment: Evaluate students' performance during picture-matching games where students connect images of tree leaves and trees.

Art Project Evaluation: Assess the students' tree artworks. Look for correct representation of the number of years corresponding to their age, which demonstrates their understanding of annual rings inside trees.

Verbal Explanation: At the end of the lesson, ask students to explain in their own words what they learned about trees, their parts, and their importance. This allows them to articulate their new understanding and helps identify any areas that need clarification.

Simple Matching Game: Create a simple picture-matching game where students connect images of tree parts to their correct labels. This can serve as a quick, engaging assessment of their ability to identify tree components.