

Lesson 2: Roots and Leaves

NGS Standard: SC.3.L.14.1: Describe structures in plants and their roles in food production, support, water and nutrient transport, and reproduction.

A. GRADE LEVEL: 3rd, 4th, 5th

B. SUBJECT: STEM/Science

C. DATE: [Insert Date]

D. DURATION: 50 minutes

E. LESSON FOCUS: Understanding the functions of roots in water absorption and anchoring, and leaves in transpiration.

F. MATERIALS: PowerPoint presentation, video on roots and leaves, assorted plant roots (e.g., carrots, radishes), clear plastic bags, tape, spray bottles, observation sheets, and access to STEMScholarsHub.net.

G. LESSON OBJECTIVES:

- Explain the role of roots in absorbing water and anchoring plants.
- Describe transpiration and its importance to plants.
- Observe condensation as evidence of transpiration.

H. PROCEDURES:

1. **INTRODUCTION:** (15 minutes)
 - Present a PowerPoint explaining the functions of roots and leaves. Highlight key terms such as absorption and transpiration.
 - Play a video demonstrating water absorption by roots and water vapor release by leaves.
 - Spray water on a leaf and cover it with a plastic bag. Ask students: *"What do you think will happen?"*
 - Share the lesson objectives and distribute observation sheets.
2. **EXPERIMENT:** (15 minutes)
 - Provide students with plant roots to examine. Guide them to discuss and record the functions of roots.
 - Demonstrate the plastic bag transpiration setup. Have students tape plastic bags over leaves on a plant or cut branch.
3. **OBSERVATION:** (10 minutes)
 - Students observe condensation forming in the plastic bags and record their findings.
 - Discuss the significance of water movement in plant survival.
4. **GENERALIZATION:** (5 minutes)
 - Lead a class discussion: *"How do roots and leaves help plants survive? Why are these functions important?"*
 - Connect their observations to the lesson objectives.
5. **ASSESSMENT:** (5 minutes)
 - Direct students to STEMScholarsHub.net to complete the **interactive quiz on Roots and Leaves**.

- Assess their learning through quiz performance and participation.

Additional Note:

This lesson is also suitable for self-paced learning or parental guidance using STEMScholarsHub.net.

For Parents or Self-Paced Learners:

1. Visit STEMScholarsHub.net to locate the interactive quiz on "Roots and Leaves."
2. Use the materials and steps in the "Procedures" section to explore roots and leaves through observation and experiments.
3. Encourage learners to make predictions and discuss their findings after completing the activities.
4. Use the quiz results as a tool to reinforce understanding and address misconceptions.

Note 1 (Safety):

Ensure students handle plant roots and spray bottles with care. Use clean and allergy-friendly materials. Monitor students closely to avoid overhandling of materials or spills.

Note 2 (Accommodations):

For ELL students, provide visuals and simplified explanations. Use bilingual glossaries where possible. For ESE students, provide step-by-step instructions and allow them to work with partners. Offer extra time to complete tasks if needed.