

## The Fallen Log (adapted from PLT)

## Teacher's Guide

**Subject:** Integrated Science (Life; Earth-Space; Physical)

**Topics:** Decomposition, soil formation, nutrient cycling (carbon cycle), microhabitats

**Summary:** Students will examine a fallen log and learn about decomposition, nutrient cycling, microhabitats, and soil/humus formation

After completing the field lab, students will be able to:

- Objective(s):**
1. Identify different micro-habitats in fallen logs
  2. Identify how the activities of organisms affect soil formation
  3. Describe the process of decomposition in creating rich soil
  4. Explain how carbon moves from the atmosphere to trees and back

**Ecosystem(s):** Hardwood Forest; Upland Mixed Forest; Floodplain Swamp

### Equipment:

- Clear containers with lids
- Clear plastic bags
- Hand Lens or field microscope
- GPS
- Field guide on fungi
- Field guide on insects
- Data sheet & clipboard
- Tweezers/forceps
- Thermometer
- Hand Trowel/Shovel
- Soil Thermometer

### Background:

- Vocabulary: photosynthesis, respiration, decomposition, fungus, bark, humus, microorganisms, plants, carbon cycle, decomposers, fossil fuels
- Reference Material: Adapted from PLT's (The Fallen Log)  
Nature's Recyclers Lesson 5 (Worms and Decomposition)  
Carbon -oxygen cycle; role of bacteria in decomposition; role of decomposition in creating rich soil.
- Equipment Training: Field Microscope, GPS

### Procedure (Engage; Explore; Explain)

1. Bring students to a location with previously identified dead logs (preferably one recently dead and one heavily decomposed).
2. Hook: You and your best friend are walking in the woods on a beautiful fall day. You see two fallen trees lying near each other. You friend kicks one of the trees--it immediately falls apart, almost like dust!! You decide to kick the other tree but (OUCH!!) you hurt your foot and the tree does not even move! We are going to examine two different trees and see what could have caused these drastic differences and how this relates to our unit on the earth's surface (soil)
3. Ask the Question: "What would the area (forest, woods) look like if logs (or any plants or animals) did not decompose?"
4. Describe the role of decomposers in the cycling of nutrients
5. Divide the students into two groups. Each group should examine a log and complete the questions on the data sheet. Have the students collect interesting and small items in the clear containers for viewing under the field microscopes.
6. After the students have completed the data sheets and examined items (including at least one fungus) under the field microscope, have them switch and examine the other log.
7. After the students have examined both logs, regroup and go through the assessment questions.
8. Introduce the cycling of Carbon by describing how it moves from the atmosphere to wood in the tree (through photosynthesis) then can follow three paths after the tree dies: 1) decompose and return to atmosphere through respiration of decomposers, 2) burns returning carbon to the atmosphere as smoke, and 3) is buried under sediments and over time and with the right geologic conditions is converted to hydrocarbons like coal, oil, and gas.

### Sunshine State Standards:

**Science:** SC.D.1.3.2,4; SC.G.1.3.3,4,5; SC.G.2.3.4; **Language Arts:** LA.A.1.3.3; LA.B.2.3.1; LA.C.1.3.1

**Mathematics:** MA.D.1.3.2 **Social Studies:** SS.A.6.3.2; SS.B.2.3.9

**The Fallen Log****Student Data Sheet****General Information**

Full Name:		Date:	
School (teacher):		Time:	
Latitude:		Longitude:	
Air Temperature:	[Optional]	Soil Temperature:	

**Hypothesis:** If two trees are found on the ground after they have died, then I (circle one: will / will not) be able to tell which tree has been dead for a longer period of time because \_\_\_\_\_

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**Field Observations/Measurements/Data**

Item	Observations Log # _____	Observations Log # _____	Observations Log # _____
Is the log wet or dry? • On top: • On bottom:			
Is there bark on the log? What is its condition?			
What kinds of plants are growing on the log?			
What kinds of fungi are growing on the log?			
What kinds of animals did you find? On the bark? Under the bark? Under the log? In the log?			
What do the animals appear to be doing?			
What evidence of animal activity do you see on or around the log?			
Is the wood hard or soft (soft can be easily broken by hand)			

# The Fallen Log (adapted from PLT)

# Assessment

1. Why were plants, fungi, and animals found on or in the log?

Plants	
Animals	
Fungi	

2. Which tree has been dead the longest time? The least time? What makes you think so?

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3. On which log do you see more animal activity? Why?

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4. What do decomposers and fire have in common?

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5. Imagine that your mom and dad are looking to grow a vegetable garden this year. Describe land/soil features that would help them grow the best vegetables.

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6. How would forests be different if trees were cut and removed before they died and fell?

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### Complete the Carbon – Oxygen Cycle concept diagram below

