



Log Life

Materials:

- ☆ Rotten log, to be carried into classroom
- ☆ camel hair or any type of small paintbrush
- ☆ white paper
- ☆ cardboard or plastic box to hold samples
- ☆ "Bug" boxes with magnifying lids for close-up view of catch OR magnifying lenses
- ☆ small plastic containers for initial viewing of catch
- ☆ screen trays
- ☆ cut gallon jug
- ☆ picture keys or field guides such as Zim's *Golden Guide to Insects* and *Golden Guide to Spiders*, Golden Press; see recommended web sites at the end of the lesson for on-line identification keys

Background

Insect identification does not have to be limited to what is active during the warm months. Insects and arachnids are plentiful if one knows where to look. A rotten log may contain a community of thirty or more arthropod species living within it, a perfect niche of decomposition or predation. Some of these species may even be left-over pests of the tree when it was alive and may have caused its destruction (bark beetles, termites). Samples of specimens found in a rotten log:

Insect orders: Coleoptera (beetles), Isoptera (termites), Hymenoptera (ants, wasps, bees), Collembola (springtails)

Arachnid orders: Acari (mites), Pseudoscorpiones (pseudoscorpions)

Rationale

This lesson reveals the diversity of arthropods that live in a habitat that can be studied year-round.



Objectives

1. Students will understand that a decomposing log provides a habitat for a variety of organisms, including insects.
2. Students will be able to identify arthropods found in a log sample.
3. Students will be able to describe the role of these arthropods in energy cycles such as decomposition.
4. Students will be able to describe the metamorphosis and behaviors of insect species found in logs.
5. Students will be able to describe the impact of pest species on trees in Arkansas.



Procedure

NOTE: Some students may be hesitant to place their hands in a box with the log remains or to handle arthropods. Wearing gloves may be a way to circumvent this fear.

1. Find a rotten log in the woods and break it apart with an ax (adults only; goggles recommended for eye protection). At the end of this activity, demonstrate good stewardship by returning the log remains and insects to the collection site.
2. Place the remains of the log in a sturdy box and bring back to the classroom or lab.
3. Spread out sheets or rolls of white paper on tables or desks and tape down edges.
4. Give each student pair a gallon-sized portion of the log sample.
5. Give each student pair a tray, two paintbrushes, plastic container, and magnifying lens (or bug box with magnifying lens).
6. Instruct students to use tray and paintbrushes to sort through the log remains, catch any animals they see, and place them in the small plastic container. From this container, they can use the magnifying glass to identify each animal using picture keys and field guides.

7. Each set of students should compare their results and the class can make a list of animals identified.
8. Assign one insect to each pair of students. Have the students research their insect and report the following information: role of the insect in the rotten log community (predator, decomposer, etc.), life cycle of the arthropod, order and characteristics of that order, characteristics that help identify the insect.



Recommended Web Sites:

<http://www.albany.edu/natweb/berlese.html>

includes instructions for making Berlese funnel

<http://bugscope.beckman.uiuc.edu/teacher/microarthcollectionandexam.html>

includes several lessons plans on microarthropod collection and examination

Extensions

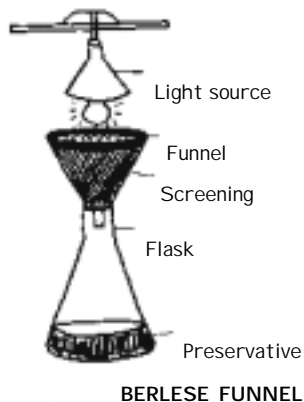
1. Compare the log samples with organisms found by sampling with a sweep net, malaise trap, or Berlese funnel.
2. Do a study of insect pest management and/or the economic impact of insect pests on the timber industry in Arkansas. Contact your local County Extension Agent for more information on new emerging pests in Arkansas or in your natural division.
3. Older students may expand the taxonomy, classification concepts found in this exercise. They should study both the larval and adult stages of the organisms found.

<http://www.cals.ncsu.edu/course/ent591k/berlese0.html>

includes on on-line identification guide and suggestions for comparing results of arthropod sampling

<http://web.missouri.edu/~bioscish/index.shtml>

includes an excellent pictographic key to leaf litter arthropods from the Missouri Ozark Forest Ecosystem Project



Correlation to National Science Standards

Science as Inquiry
Life Science
Unifying Concepts and Processes

Correlation to Arkansas Frameworks

Science: K-4: LS1.2, LS2.4, LS2.10
5-8: LS1.1, LS2.3, LS2.5, LS2.11

