

Lesson 6: Pit-Traps for Arthropod Population Sampling

Grades: K-12

Key Concepts:

- Different organisms inhabit different types of habitats.
- The same organisms inhabit different habitats.
- Arthropods are a diverse group of organisms that include predators, herbivores, decomposers, and parasites.
- Arthropods can be classified into their Classes and Orders based on their physical characteristics.

Skills:

- Identification
- Classification
- Making Descriptions
- Measurement
- Calculations

Materials:

- Trowel, 1 per group
- Metric measuring tape, 1 per group, or plastic flagging taped marked at 2.5 meter intervals up to 50 meters long
- Tweezers
- Magnifying glasses
- 16-ounce cups, 2 for each trap
- Permanent marker
- Data sheets
- Plastic shoe box tubs
- Small cooler with ice, optional
- *Site and Habitat Description (grades 4-12)* (handout)
- *Arthropod Data Sheet (grades 4-12)* (handout)
- *Alternate (K-3) Site Description and Data Sheet* (handout)

Outdoor Alert:

- *Flowering or green plants must be available to complete this activity.*
- *Bee and insect allergy alert!*

Adapted from the Arizona State University “Ecology Explorers” website.

Objective

Students will sample the arthropod population in different habitats on their schoolyard grounds using 16 ounce cups dug into the ground. The population sampling can occur on a regular basis to sample throughout the season or it can be done once. Students can conduct independent inquiry projects based on the methodology and data collected in this study.

Background

Studying arthropods in their habitat is an important activity in any biology related course. Arthropods are components of all food webs and most samples will include decomposers, herbivores, predators, and parasites. Collecting these examples in the student’s schoolyard provides powerful connections between the student, the curriculum, and nature.

Note: This activity can be done with any age. The younger the students, the less sophisticated the habitat assessment will be and the more the teacher will have to lead the activity. A data sheet for very young students is included at the end.

Procedure

Part 1: Setting up Trap Sites

Students will first establish where they want to set their trap. A trap site can be a single pit-trap or a group of traps. Groups of traps in similar habitats should be at least 2.5 meters apart. Trap sites should be varied over the schoolgrounds as to the sides of the building, vegetation and ground coverage, and topography (micro-habitats). Trap sites should be marked on a school map and demarcated by stones or other natural objects to ensure finding them. Locate general sites for the traps on a map of the school grounds before going outside.

Part 2: Setting Pit Traps

1. With a trowel, dig a hole at the desired site, the same diameter and depth as the cups you will be setting in.
2. Place 2 cups, one inside the other, in the holes. Make sure the rim of the cup is just below the surface of the soil.
3. Leave the traps alone for up to 72 hours.

Part 3: Habitat Descriptions of the Trap Sites

Describe the habitats where the pit-trap sites are. Record the vegetation and structures that are in contact with or directly above the pit-traps. See the *Site and Habitat Description* sheet (grades 4-12) or the *Alternate Site Description and Data Sheet* (for grades K-3).

Part 4: Collection Organisms from Trap Sites

1. Use a separate plastic shoe box for each trap and label each container to indicate the location of collection. To empty the trap, take the inside cup out of the second cup, leaving the second cup in the ground to preserve the hole for future use, and turn the cup over in the plastic shoe box.
2. Identify the insects using a key immediately or kill all specimens by freezing or using a kill jar to identify later. See *Insect Key* and *Common Insect Orders* (Appendix 2 and 4) as well as field guides for more information on identification.
3. In the *Arthropod Data Sheet* (grades 4-12) record the taxonomic order of the insects found and how many individuals found in each order. For grades K-3 use the *Alternate Site Description and Data Sheet*.
4. Analyze the data. Here are some sample questions you can discuss with the students:
 - *Were the same insect species found in all habitat sites?*
 - *Were the same numbers of insects found at all habitat sites?*
 - *What factors could have contributed to the differences in number and type of insects found?*

Site and Habitat Description

Provide a site and habitat description for each pit trap.

SITE DESCRIPTION

Names: _____ **Class:** _____

School: _____ **Date:** _____

Site Name: Create a name to identify the trap and its location for which you are collecting data. _____

HABITAT DESCRIPTION

Data Table 1

Vegetation	Descriptions
Describe any trees that cover or partially cover the trap	
Describe any perennial plants or shrubs that cover or partially cover the trap	
Describe the ground cover	

Draw a quick picture of the habitat for your pit-trap. Include all vegetation and structures within 0.5m radius and anything that hangs over the trap. Use an "X" or other mark to mark where your trap is located.

Arthropod Data Sheet

Names: _____ Class: _____

Site Name: _____

Collection Date: _____ Date trap was set: _____

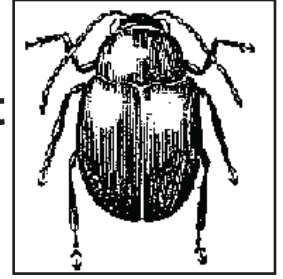
Comments/Observations:

Arthropod Data:

Order of Insect Collected	Tally



**Alternate (K-3)
Site Description and Data Sheet**



Name: _____

Drawing of habitat #1 pit trap	Drawings of and number of organisms found in pit trap:

Drawing of habitat #2 pit trap	Drawings of and number of organisms found in pit trap: