

Overview and Purpose

The purpose of this unit is to study ecological community relationships within a given environment and to see how the living and non-living parts interact. Students will be assigned an area of the school grounds in which they will observe, record, collect, identify and classify, photograph and research the insect population.

Educational Standards:

1. Biological Science Content Standards: Evolution and Biodiversity (5–12) and Ecology (6.1–6.4)
2. Scientific Inquiry Skills Standards: S1S1, S1S2, S1S3
3. Mathematics Frameworks: Measurement, Data, Analysis, Statistics, Probability
4. Technology/Engineering Standards: Engineering Design (1.1)

Objectives:

1. Describe the living and nonliving parts of an ecosystem
2. Define the term ecology
3. Observe and follow the flow of materials through an ecosystem
4. Describe the food chain and identify the organisms it contains
5. Identify the difference between an herbivore, a carnivore, and an omnivore
6. Describe a food web
7. Construct models of a food chain and a food web
8. Describe and give examples of a community
9. Describe an organism's habitat and niche within a community
10. Describe the factors that affect a population of organisms
11. Explain how one population can affect another population of organisms
12. Observe and record camouflage of organisms
13. Record daily observations of biotic and abiotic factors effecting populations
14. Recognize that species are classified into a hierarchical taxonomical system

2007

Winning Lesson Plan
from Marlborough,
Massachusetts

*Ecology Community
Relationships and
Classification Study*

by Ellen Graham
Marlborough High School
Subject: Biology – 1
Grade Level: 9
Duration: Minimum three
weeks

Overview and Purpose (Cont'd)

Objectives (Cont'd):

15. Classify organisms within a given habitat into proper taxonomy
16. Make a collection of organisms within a given habitat
17. Research individual organisms habitat, range, food, and life cycle
18. Digital camera photographs of organisms within a given habitat
19. Group presentations of ecological area study using multi-media presentation
20. Field Guide production (on going collection of research and findings)

Materials Needed:

- Insect Collecting Box
- Insect Collecting Net
- Forceps
- Magnifying Glass
- Pinning Board
- Colored Markers
- National Audubon's Society's: Field Guide to Insects and Spiders; Chanticleer Press, Inc. 2001
- Digital Camera
- Insect Killing Jars (Large and Small)
- Ethyl Alcohol
- Wireless Laptop Computer
- Field Journals

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Procedure

Teamwork

1. A group of 4 students will be assigned a habitat to investigate on the school grounds. The habitats of investigation will be: Tall Grassy Field, School Pond Area, Forest Floor, Deciduous Forest, Open Field of Grass (maintained). Students will work in their group daily for three weeks rotating daily 4 role:
 - Observation Journal Scribe (Daily Computer Entry Required)
 - Collector of Insect Specimen
 - Pinning of Insect and Field Guide Identification
 - Digital Photographer/Research of Insect
2. Responsibilities for each Group is listed below:
 - **Observation Journal Scribe** – role in their group is to carry out and protect the Laptop computer and return it safely to the teacher at the end of the class period. Into this computer they are responsible for recording all data collected and information of their assigned environment. This information should include a date, time of day, weather conditions, insect activity observation, detailed descriptive information of each specimens collected, counts of insects observed, abiotic and biotic observations, camouflage information of species, and any observations of interaction within their area.
 - **Collector of Specimens** – role is to carry the net out and into the school. They are to look and collect insects in every possible area in their environment. They are to assist in the etherizing of them, and deliver them to the Pinner so that they may be pinned and mounted in a timely manner for identification and display.
 - **Pinner of Insect and Field Guide Identification** – role is to work directly beside the Insect Collector and immediately assist in the etherizing and pinning of any and all specimens collected in the assigned environment. They also are responsible for the field guide identification of each insect collected on the day of their assigned role.
 - **Digital Photography/Researcher** – is to take a photograph of each insect collected. Each picture is to be printed, numbered and labeled by the photographer with a date, time of day, and location of collection. The Researcher is to work with the Pinner in the identification of the insect. The Researcher is to identify the range, habitat, niche, and life cycle of each insect collected during his assigned time so that it may be entered into the field guide for the school.

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Procedure (Cont'd)

Teamwork (Cont'd)

3. Required Assessments from Each Team of Four Members

- Daily Journal Log (Computer)
- Insect Collection-Presented in collection box by phylum, genus and species with a key that identifies habitat of collection
- Food Chain Display Model that represents your environment. Extra Credit will be given if you make a Food Web of your environment.
- Multi-Media Presentation of your environment to the class. Digital Photographs and research of information should be included in your presentation.

4. Individual Responsibilities

- Community Relationship Homework Packet, which contains vocabulary terms, and worksheets to better understand this assignment.
- Ecology Unit Test Assessment – A written test will be given on the homework packet and daily field collection experiences at the end of the project.

Extension Beyond The Classroom

Field Guide

As an accumulative project each year, students will submit their collections, photographs and research information of the community relations witnessed first hand on school grounds, to be placed into a field journal. Pictures, narratives and relationships will be entered with hopes of offering a personal look at the school grounds.

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