

Lesson: Mt. Abram Mini-Ecosystem Transect Study

Essential Questions:

How are the mini-ecosystems here at Mt Abram similar and different?

How are ecosystems dynamic?

What is biodiversity?

Objective: The purpose of this lab is to conduct a 1 meter by 1 meter transect study of a selected mini-ecosystem on the trail system here at Mt. Abram. Students will be collecting data about the abiotic factors in their transect such as soil pH, temperature, altitude, and light intensity. They will then examine the biotic factors that exist in their transect, catalogue them by taking pictures and identify them using multiple resources in the classroom. They will also be taking GPS coordinates of their transect so that it can be reexamined in the spring and by students next year so that students can track changes in our ecosystem over time.

Cautions: Students should pay close attention when walking on the trails, as they are sometimes narrow. Students should also be able to identify and stay out of the way of harmful plants such as poison ivy!

Note to Students: Our purpose is to observe the ecosystem and collect data – Please try to stay on marked trails and tread softly. Our purpose is to enjoy our environment, protect, and conserve it not to destroy it! For safety purposes make sure you are always within eyesight of Mrs. Snow!

Materials:

Pasco GLX

GPS Probe

Temperature/Light Intensity and Sound Probe

Digital Camera for Cataloguing Biotic Factors

4 Wooden Popsicles Sticks for marking corners of transect

Small plastic bag for collecting a soil sample of your transect

Clipboard-and a writing utensil

Lab paper for collecting data

Time allotment: two 72-minute class periods to gather data, another to analyze in the lab, and another week or so of 72-minute class periods to create the mini-ecosystem website.

Grade Level: Grade 10 (biology students)

Learning Outcomes

Students will be able to identify the flora and fauna of a 1x1 meter transect (mini ecosystem).

Students will be able to compare and contrast the MTA ecosystem with an ecosystem from another area.

Students will observe primary and secondary succession areas in the MTA ecosystem, and classify development of ecosystems as primary or secondary

Suggested Procedure:

1. Assign roles in your group (someone needs to be in charge of the camera, the GLX, the clipboard with data, the soil sample, the transect sticks)
2. Find an area within the selected study area to carefully lay your transect down, if you would like to include trees you can carefully pull one section of your transect apart get it around the tree and put it back together. When you have your transect carefully laid down you need to use the GLX GPS probe to gather GPS coordinates and altitude data for all four corners of your transect. Please mark each corner with a Popsicle stick that has your group's initials. When you are finished, pass your transect on to the next group.
3. Make sure to fill out necessary written observations in your data table about the weather and the appearance of your area of study as a whole and your transect.
4. Using a stick, carefully collect a soil sample in a baggie from within your transect. Later in the classroom we will be mixing the soil with distilled water and recording soil pH data for your transect.
5. Using the Temperature/Light Intensity and Sound probe record all three for your transect in your data table.
6. Now that you have collected several examples of abiotic factors, it is time to record and document the types and abundance of the biotic factors in your transect. Each living organism you find in your transect needs to be photographed and relative abundance recorded. Keep in mind you may be documenting plants, insects, fungi, moss, and even lichen on a tree. If there is a tree in your transect, you need to measure the diameter and record this in your observations. Don't worry about identifying each living organism right now. We will be doing that later. Make sure you have a good photograph and good written observations. You also need to work together to make sure the photos match each description with relative abundance data. Relative abundance can be classified as follows:
 - a. Abundant – the species is easily found in high numbers in your transect

- b. Frequent – the species is easily found but the number is not the highest in the transect
- c. Occasional – the species is not always detectable in the transect, but can usually be found in small numbers through persistent searches
- d. Rare – the species is seldom found in the transect

