

Indianfields Club Exchange **Nature Center of Tuscola County**

Plant and Animal Populations

Lesson Plan

Level: 9th – 10th Grades

Developed by Bob Tallman with funding support, in part, from the USDA Forest Service Community Forestry Grant

Program Description: Students will visit two or more habitats at Indianfields Township Park or the Caro Exchange Club Woods. Students will observe plants and animals using a quadrat, examine soil, measure the height of the community, discuss the organisms in the habitat and the ways in which they interact. The emphasis is on the characteristics of each food web, energy flow through the food web, and factors regulating population size. Each class will be given a set of pictures naming the organisms observed in each habitat.

MEAP Benchmarks:

SCII.III.5.HS.1: Describe common ecological relationships between and among species and their environments.

SCI.III.5. HS 2. Explain how energy flows through familiar ecosystems.

SCI.III.5.HS 3. Describe general factors regulating population size in ecosystems.

Pre-visit Suggestions:

1. Be sure that every student is dressed for the weather conditions. Layers work best. Tell them to wear shoes that can get muddy.
2. Each student should have paper and pencil on which to record the organisms observed. A clipboard works best.
3. Bring a camera to record each habitat.
4. Suggested vocabulary: producer, consumer, decomposer, predator, prey, parasite, competition, mutually beneficial, habitat, ecosystem, herbivore, saprovore, carnivore, omnivore, migration

Visit:

1. Students observe plants and animals in 2 or more habitats. In each food web community, they will count the organisms using a quadrat.

2. In each habitat, they will dig a hole to examine soil looking at layers and any animals present. They will sieve the soil and take a sample back to grow any seeds which might be present.
3. They will measure and compare the height of the communities.
4. Students will record the organisms observed and discuss how the food webs differ

Post-visit Suggestions:

1. Use the pictures of organisms observed at the site to create a food web showing relationships with string or yarn. This could be done on the floor or on a bulletin board, as a class project or in groups.
2. Create cards with the names of the organisms seen. Use the cards to create a food web by joining them with string or yarn. This could be used as an assessment.
3. Have students write a description of one of the food webs defining all the vocabulary terms in context.

Field Procedures:

How big is the tree?

(The height of the tree indicates the height of the community.)

Use a meterstick or a Biltmore stick.

1. The observer paces out from the tree in a straight line 22 paces (approximately 66').
2. Facing the tree, the observer holding the lower quarter of the meter stick. With one eye, line the bottom of the stick with the base of the trunk of the tree.
3. Looking up the stick, the observer lines the top of the tree with a number on the stick without moving the head, only moving the eyes.
4. Use the number on the Biltmore stick as the height of the tree. If using a meter stick, 3 cm up the meter stick represents 1 meter in the height of the tree.
5. Record the height.

Field Procedures:

Screening a Soil Sample for Organisms

Materials: shovel or hand trowel

Zip lock baggie

Centrifuge

Sieve

1. Dig a sample of soil from a 10 cm area and place it in a quart zip lock bag.
2. Soil is shaken through the screen.
3. Roots and animals are observed and counted.
4. Soil is then placed back in plastic bag with the root.
5. Take the soil sample back to the classroom. Place it in a container and water it. Observe and record any seeds that sprout.

After returning to the classroom, use a centrifuge, if available, to examine the composition of the sample.

1. Place 2 cm of soil in a centrifuge tube.
2. Add 3 cm of water for a total of 5 cm of material in the tube of different materials.
3. Place the thumb over the opening and shake.
4. Place the tube in the centrifuge and spin.
5. The side profile of the soil will show the layers of different materials in the soil.

Field Procedures:

Sampling Using a Quadrat

This method is used to collect data on a sample of a food web. Quadrat offers a means of sampling a given area by counting specific items within the boundary of the quadrat.

Materials: 1 meter square quadrat

String

Notebook and pencil

1. Place the quadrat over a representative area of the habitat.
- 2 . Identify and make a list of each plant and animal found in the quadrat. (It is not necessary to know the name of each. A description will do. A leaf (and flower, if present) of each plant can be collected to take back to the field trip leader or to the classroom for further identification.)
4. Count the number of each kind of plant and animal on the list and record the total number. The quadrat can be restrung for smaller areas (1 or 5 dm) where the count numbers are large.

Comparing the quantities as well as the kinds of organisms between food webs, helps to distinguish the difference between the food webs.