

Lesson 13 BIODIVERSITY STUDY: Disturbed v. Undisturbed

Overview

Students will examine the number of plants and animals found in different habitats.

Objectives:

Students will be able to:

1. Identify abiotic characteristics of undisturbed areas and disturbed areas.
2. Compare and contrast disturbed and undisturbed areas.
3. Measure biodiversity qualitatively.
4. Describe the ecological benefits of biodiversity.

Procedure

1. Ask students what kinds of foods they like to eat. Focus on the variety and what it would be like if they only had one type of food. What if that one food source was suddenly gone?
2. Discuss that healthy ecosystems depend on variety in order to stay "balanced" and healthy.
3. Take students to where disturbed and undisturbed areas are near each other: pavement, lawn/park, naturally vegetated area. Ask students to describe each area. Focus on diversity or lack of diversity.
4. Demonstrate how to do a quadrat investigation in a grassy area. Show how many different species there are if you look closely. Discuss how a greater diversity of animals can have their habitat/food needs met when there is a greater diversity of plants available.
5. Divide students into groups of 2-3.
6. Give each group a quadrat and a collection container.
7. Assign half the students to a paved area, lawn, or park, and the other half to a native vegetation area. Lay down the quadrats, and collect small samples of every different plant within the quadrat.
8. When students have exhausted the variety of plants, or time runs short, have all students return. Tape student samples of different plants in appropriate columns on data sheet: "Disturbed" and "Undisturbed."
9. Discuss:
 - Which area serves the food needs of more wildlife?
 - Which area offers a greater variety of habitats for nesting, cover, water, food?
 - What reduces diversity? *disease, insect infestation, exotic species*
 - How does plant diversity contribute to a more ecologically healthy environment?

Duration:

50-minute class period

Materials

8-12 yarn quadrats (1m length tied into a circle; 1 per group)
8-12 plastic containers to collect samples
Tape
Poster divided into two columns titled "Disturbed" and "Undisturbed"

Subject

Science
Math
Social Studies

Assessment

Data forms are completed. Student can explain the value of diversity to stable and sustainable ecosystems.

Michigan Content Standards Addressed

Science

Strand III.5 Life Sciences ~ *Ecosystems* All students will analyze how humans and the environment interact.

Standard III.5.6 MS Describe ways in which humans alter the environment.

Standard III.5.1 HS Describe common ecological relationships between and among species and their environments.

Standard III.5.4 HS Describe responses of an ecosystem to events that cause it to change.

Standard III.5.6 HS Explain the effects of agriculture and urban development on selected ecosystems.

MathStrand III. *Data Analysis and Statistics*

Standard III.1 Collection, Organization and Presentation of Data

- ◆ Students collect and explore data, organize data into a useful form, and develop skill in representing and reading data displayed in different formats.

Standard III.2 Description and Interpretation

- ◆ Students examine data and describe characteristics of a distribution, relate data to the situation from which they arose, and use data to answer questions convincingly and persuasively.

Standard III.3 Inference and Prediction

- ◆ Students draw defensible inferences and make predictions.

Social Studies

Strand II. Geographic Perspective

Standard II.2 Human/Environment Interaction

- ◆ All students will describe, compare, and explain the locations and characteristics of ecosystems, resources, human adaptation, environmental impact, and the interrelationships among them.

Biodiversity Study Data Form

Student Page

Team Members: _____

Location: _____ Date: _____

Record what you observe.

Site 1: Pavement (Disturbed Area)	Site 2: Lawn (Disturbed Area)	Site 3: Native Vegetation (Undisturbed Area)
<p>Number of different species:</p> <p>Trees _____</p> <p>Shrubs _____</p> <p>Grasses/others _____</p>	<p>Number of different species:</p> <p>Trees _____</p> <p>Shrubs _____</p> <p>Grasses/others _____</p>	<p>Number of different species:</p> <p>Trees _____</p> <p>Shrubs _____</p> <p>Grasses/others _____</p>
<p>Number of different species:</p> <p>Spiders _____</p> <p>Insects _____</p> <p>Other Invertebrates _____</p>	<p>Number of different species:</p> <p>Spiders _____</p> <p>Insects _____</p> <p>Other Invertebrates _____</p>	<p>Number of different species:</p> <p>Spiders _____</p> <p>Insects _____</p> <p>Other Invertebrates _____</p>
<p>Mammals: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Mammals: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Mammals: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Amphibians: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Amphibians: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Amphibians: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Birds: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Birds: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Birds: _____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Total # Vertebrates: _____</p>	<p>Total # Vertebrates: _____</p>	<p>Total # Vertebrates: _____</p>