



Don't Bother Me!

Materials:

- ☆ hand lenses (optional)
- ☆ inventory sheets
- ☆ graph paper (optional)
- ☆ field guides or identification keys for plants and animals

Rationale

Students will realize from direct observation that in stable communities diversity of plants and animals can often be reduced by extensive disturbance.

Objectives

1. Students will be able to measure species diversity.
2. Students will be able to compare species diversity in a disturbed site with that in a relatively undisturbed site.
3. Students can state good reasons for preserving biodiversity.
4. Students will be able to identify factors that characterize the relationship between disturbance and natural diversity.

Activity One: Disturbed vs. Undisturbed

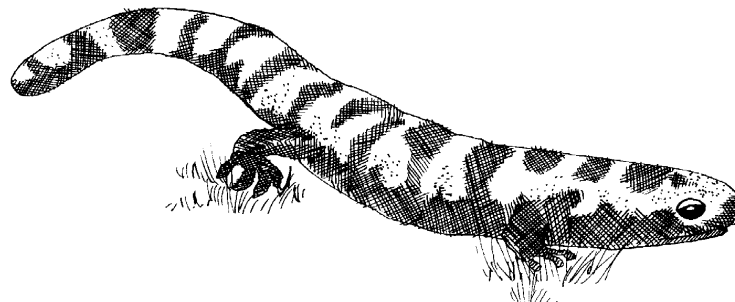
BACKGROUND INFORMATION: Most natural areas in the world today have been disturbed by human activity to some extent, even the most remote, least habitable ones. Think of DDT in the body fat of penguins at the South Pole. Not a lot of human activity occurs in this location, but still the effects of such activity have travel there through the food chain. A variety of types of disruptive activity produce a wide range of changes. Examples include plowing a grassy field, filling and paving over a former wetland, and clearcutting a mixed pine-hardwood forest and replacing it with pure stands of marketable timber. Students should be able to see a difference in diversity in disturbed sites versus relatively undisturbed sites.

PROCEDURE

1. Divide the class into three groups. Have each group select two field study sites. Sites available will vary with location, but the following examples offer an array of choices.

Pine plantation
State park
Streamside area
Stock pond
Old field or pasture
Deciduous forest
Vacant lot
Clear-cut area
Landscaped area
Cemetery
Highway right-of-way
Working farm

2. Have the class rank the study site list in two ways: 1) from most natural to most disturbed 2) from the one they believe will have the greatest species diversity to the one they believe will have the smallest number of species.
3. Have each group do a species inventory on their two study sites. Students may sketch plants or animals (or animal signs) they do not recognize or cannot find in field guides or keys. Hand lenses can be used to study very small organisms. This may be done during class time or as an outside assignment since the groups will be observing areas in different locations. See student field inventory sheet. **NOTE:** you cannot inventory the whole area completely. Some species will be missed.



4. As a class summarize the data brought in by the different groups. This may be done on an overhead, chalkboard or flip-chart.

<i>Site Name & Description</i>	<i>Species & Number of Plants</i>	<i>Species & Number of Animals</i>	<i>Total Species Number</i>
<i>1</i>			
<i>2</i>			
<i>3</i>			
<i>4</i>			
<i>5</i>			
<i>6</i>			

2. The site with the greatest number of species is considered to exhibit the greatest species diversity (this is assuming that each group did an equally complete survey). Use this concept to answer the following questions:

- Which class site had the greatest diversity? The least?
- Does the class data support the class hypothesis about which site would be most/least diverse? Try to explain any differences in your data and your hypothesis.

3. As a class, complete the following data table, then construct a graph to compare an area's degree of disturbance with its species diversity.

<i>Site Name/Description</i>	<i>Number of Species Present</i>
<i>Most Diverse</i>	<i>1</i>
	<i>2</i>
	<i>3</i>
	<i>4</i>
	<i>5</i>
<i>Least Diverse</i>	<i>6</i>

2. Discuss the following questions as a group:

- If each site had covered a larger area or contained more than one type of natural community, would you have found more or less species diversity? Explain your answer.
- What factors may have caused you to miss finding some species of plants or animals in your site?
- What procedures or time lines could you follow to collect data that is as complete as possible?

Activity Two: What Can I Do to Help?

PROCEDURE:

1. Have each group construct a food web for each of their two study sites using the data they collected. They should include all possible trophic (feeding) levels. Have them answer the following questions:

A. Which study site supports the largest and most complex food web, the disturbed or the undisturbed? Explain why you think this is so.

B. Remove one organism from each of your food webs. Describe how the loss of this organism might affect the ecosystem. Which site was affected more drastically by the loss, the disturbed or the undisturbed? How do you explain this difference?

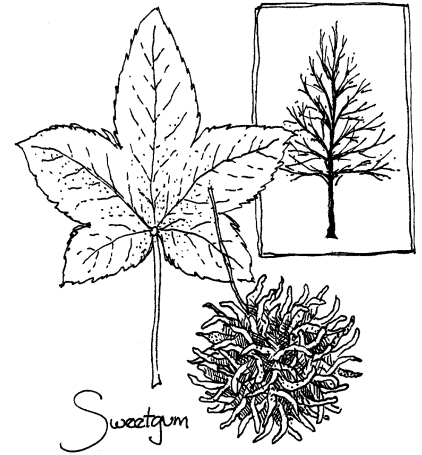
2. Have each group develop a

list of ten reasons to care about biological diversity. Have the whole class develop consensus on a top ten reasons list.

3. Decide on strategies the class can implement now and in the future that will preserve biodiversity for generations to come. For example:
 - Attend public hearings on environmental issues; become environmentally aware.
 - Write letters to political figures, industries and state organizations about local and/or state environmental issues.
 - Visit state parks and state natural areas. See what diversity your region has to offer. Find out how biological diversity is protected in your region and volunteer to help those organizations that are working to protect it.
 - Join an environmental organization such as the Sierra Club, the Ozark Society, the Audubon Society or the Native Plant Society.
 - Work with students in lower grades to help them become more environmentally aware.
 - Set up a landscaping plan for your school campus using native plants. Have areas that will attract wildlife such as birds and butterflies.

Extensions

1. Observe succession over time in a disturbed plot. Clear a one-meter square plot on the school ground. Ask a gardener or parent to till it. Have students photograph the plot before clearing, then monthly (or more often) throughout the school year. Also on a monthly basis, have students identify and count the number of species present at any given time. How does the number of species change through the school year? Compare the number of species found on the plot before it is cleared with the number and types found at the end of the school year. Follow the same procedure for a similar nearby plot that you do not disturb. In which area do the species change more rapidly? Why do you think this is so?



Correlation to National Science Standards

Unifying Concepts and Processes
Science in Personal and Social
Perspectives
Life Science

Correlation to Arkansas Frameworks

Science: K-4: LS.1.1, LS.1L3,
LS.7.2, LS.2.10, LS.3.1, LS.3.3
5-8: LS.1.1, LS.1.2, LS.2.11, LS.2.12,
LS.3.2, LS.3.4
9-12: LS.1.3, LS.1.5, LS.1.6, LS.3.3,
LS.3.7

Field Inventory Sheet

STUDY AREA ONE: NAME _____ DATE _____

CONDITIONS _____

SPECIES NAME/SKETCH	NUMBER OF INDIVIDUALS FOUND
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1.

2.

3.

ETC.

TOTAL NUMBER OF SPECIES _____	TOTAL NUMBER OF INDIVIDUALS _____
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STUDY AREA TWO: NAME _____ DATE _____

CONDITIONS _____

SPECIES NAME/SKETCH	NUMBER OF INDIVIDUALS FOUND
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1.

2.

3.

ETC.

TOTAL NUMBER OF SPECIES _____	TOTAL NUMBER OF INDIVIDUALS _____
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Discuss the following questions:

1. Which study area appeared to be more diverse? Explain your choice.
2. List reasons why one area contained more diversity than the other.
3. Are there other times of the day, month or year that either site might exhibit more diversity? Explain.
4. What are some ways that diversity might be increased for either site?
5. Why is it important that diversity exists for any site?

