

Reading the River, Summer 2003

Interpreting the Living Organisms in an Ecosystem

9th Grade
Life Science
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Kenton County
8/13/03

Interpreting the Living Organisms in an Ecosystem

Grade Level: 9th Grade

Objectives:

In this lesson, students will:

1. learn how to identify plants
2. learn how to identify aquatic insects
3. learn how to identify birds
4. learn how to identify fishes
5. learn how to identify animal tracks
6. learn how to identify reptiles and amphibians
7. learn how to collect data in the field
8. learn how to use all the information they collected to determine if they are in a ecosystem of good quality

Program of Studies:

Scientific Inquiry

Students will use equipment, tools, techniques, technology, and mathematics to improve scientific investigations and communications.

Students will design and conduct different kinds of scientific investigations.

Conceptual Understandings

Life Science (see core content)

Applications/Connections

Students will use science to investigate natural and human-induced hazards.

Students will analyze the role science plays in everyday life and compare different careers in science.

Core Content:

Life Science

- 3.2.2. Behavioral responses to internal changes and external stimuli can be innate or learned. Responses to external stimuli can result from interactions with the organism's own species and/or other species, as well as environmental changes.
- 3.2.3 The broad patterns of behavior exhibited by organisms have changed over time through natural selection to ensure reproductive success. Organisms often live in unpredictable environments, so their behavioral responses must be flexible enough to deal with uncertainty and change. Behaviors often have an adaptive logic.

Accompanying Handouts/Materials:

1. Tree Finder
2. Fern Finder
3. Flower Finder
4. Golden Guide to Pond Life
5. Golden Guide to Reptiles and Amphibians
6. Golden Guide to Birds of North America

7. Golden Guide to Wildflowers of North America
8. Guide to Aquatic Insects
9. Kick sane
10. Field Guide to Kentucky Lakes and Wetlands
11. Fish nets
12. Fishing poles and bait
13. Digital Camera
14. Binoculars
15. Enamel Pans
16. Clear jars with lids for samples
17. Plaster for track molds
18. Tweezers for aquatic insects
19. Field note book
20. Pocket Guide to Animal Tracks Found in Kentucky developed by The Kentucky Department of Fish and Wildlife.

Activity Procedure:

1. Students will have a basic knowledge about wetlands before beginning this lesson. Have a class discussion about what a wetland is and what do you find when you are in one. Explain to the students that there can be much information collected just by looking around at the things that exist in the ecosystem. Tell the students what are indicators of good and bad wetlands so they can look for certain characteristics. Students should know or have a list of plants, animals, and water conditions that are found in high and low quality wetlands.
2. When the students have a basic knowledge of what a wetland is, divide the class into sampling groups that consist of six students each. Within these groups, each student should have a number so that each member will have a specific job once they are out in the field. The numbers should go as follows:
 - #1 –This person in each group is in charge of collecting plants that are in the ecosystem. This collection should be done by placing leaves from each of the plants that are in the area into a garbage bag.
 - #2—This person is in charge of collecting aquatic insects using the kick sane. This collection will be done by showing the students how to use the sane by kicking rocks upstream of the sane and placing what is in the net into a white enamel pan. These specimens will then be placed into a jar with water to be identified later.
 - #3—This person will be in charge of collecting pictures of birds that are in the area (using a digital camera). This student will write down notes about the calls of the birds and other things they observe in addition to the pictures.
 - #4—This person will collect fish using nets and or fishing poles. If the fish are small, they will be brought into the classroom in a jar. If they are large, they will be photographed using a digital camera.
 - #5—This person will identify animal tracks that are found out in the field using the Pocket Guide to Animal Tracks Found in Kentucky developed

by The Kentucky Department of Fish and Wildlife. This student must also make a plaster mold of the track to be brought back into the classroom.

#6—This person will be in charge of collecting reptiles and amphibians.

These samples must be collected by the student and placed into a bucket to be examined by the students in the classroom.

3. When the sampling is finished the students must take all of their specimens back to the lab to identify. Students should work together to compose a list of plants, fish, birds, aquatic insects, tracks, and reptiles/amphibians that exist in their ecosystem.
4. After students have determined what exists in their ecosystem, they must research the habitats each living thing is most suited to live in and how well they tolerate pollution. Based on these things, the students must give an educated guess as to what type of ecosystem they have sampled in.
5. Have each group give a presentation about their conclusion and what they found.

Definition/Explanation of Concept/Skill:

Through out my college career, I have learned the importance of environmental science, and how to love nature and all of its parts. I wanted to expose my students to some of the experiences I have had in hopes of giving them the same appreciation for the environment. I feel that if we start educating our community's citizens at a young age, they will begin to have an appreciation for what is happening around them and will be more conscientious about the changes that affect their environment in the future.

Ecosystems can be given a quality rating by looking at what makes up the area. By looking at the things that live in the ecosystem, scientists can gather data about a system's quality, pollution, and habitat stability. What students do not understand, is that scientists are a bit like detectives. They have to look for clues and interpret them to find answers to their questions. I hope that after this lesson, my students will learn to look more closely at ecosystems, such as forests, and see more than just a clump of trees.

Method to Assess Stated Objective(s):

1. learn how to identify plants
2. learn how to identify aquatic insects
3. learn how to identify birds
4. learn how to identify fishes
5. learn how to identify animal tracks
6. learn how to identify reptiles and amphibians
 - * all of the above objectives will be assessed by the final presentation given by the students, by observations made in the lab while they are identifying, and by questions I will ask while they are identifying.
7. learn how to collect data in the field
 - * this objective will be assessed by my observations in the field. I will be demonstrating methods and observing the students during our field experience. I will also be quizzing the students on technique while we are out in the field.
8. learn how to use all the information they collected to determine if they are in a ecosystem of good quality
 - * this assessment will be during the final presentations

References:

This lesson was based on lessons that were taught during Reading the River 2003 by Dr. Yvonne Meichtry, Dr. Brian Reeder, Marc Hult, and Dr. Alan Risk.