



Approaching Walden 2005

The Relationship between Nature and Man's Place: A Curriculum Unit Designed for Urban High School Biology Students

Emily Steinberg
Lowell High School
50 Fr. Morrisette Blvd.
Lowell, MA 01853

August 2005

Overview

This unit is designed to help urban high school students define, and ultimately make connections to, the nature that surrounds them. Through this process, students will become more vigilant observers (as Thoreau was) of the environment around them by using journaling and the concept of scale. They will calculate their own impact on nature and, in doing so, they will be able to evaluate their own as well as man's place in (or outside) of nature. This unit will enable students to see beyond their immediate lives and into the larger picture of ecology and the interconnectedness of all living things. It is my hope that by making a connection to nature that students will be less apathetic to the plight of our environment and that they will be inspired to "live deliberately".

Students will be guided in their definition of nature by a set of fundamental unit questions. The students will reflect on these questions without any previous exposure to this topic. Subsequently, readings by Thoreau, Mike Davis, and William Cronon will be introduced. The questions will then be revisited again, and students will be asked if the readings influenced their answers now. Students will be asked to present their definition and any changes to it in a final project.

In addition to defining nature, students will learn the relevance of scale in dealing with ecology. They will understand the importance of observation and how scale and subjectivity can alter what is perceived.

Objectives

Students will be able to:

- Make observations using all of the five senses
- Make observations using the concept of scale
- Apply observations in order to answer fundamental unit questions
- Understand how scale affects our perceptions of nature
- Critically read several articles and extrapolate the authors' messages
- Apply information in selected articles to fundamental unit questions
- Calculate their own ecological footprint
- Understand the concept of the ecological footprint
- Reflect on their own ideas and the evolution of those ideas
- Define what nature means to them and how man fits into this definition

Grading

Journal entries will be assigned in two forms. Each will be worth **25%** of the grade of the unit.

1. Reflections on assigned readings: Students will write about their reactions to the assigned readings, how they felt the readings addressed the fundamental unit questions, and what they felt the author's message was.
2. Observations: Students will write their observations about their selected "place in nature" and how the concept of scale affects those observations. They will address the fundamental questions using what they have observed.

Ecological Footprint: Students will calculate their own ecological footprint and that of the individual members of their families. They will then present this information in a formal lab report (**15%**).

Final Project: Students will present their definition of nature and how they believe man does or does not fit into it. They may use any sort of means they wish in order to convey their ideas: an oral presentation, collage, sculpture, report, poster, video or audio presentation, skit, song, or any other media they find fitting. The project must convey their definition and what they believe to be man's role in nature. This project will be worth **35%** of the unit grade.

Process

This unit will be ongoing throughout the school year. It will begin in September with the studying of the scientific method and scale and will end in March as we conclude our unit on ecology. Rather than treat it as three individual lesson plans, I will treat it as three large sections with each section corresponding to a quarter of the school year.

1st Quarter:

- Define observation and its importance in science
- Practice observing with the five senses in the classroom
- Practice observing using different scales; discuss how the scale changed the inferences made about the object
- Explain science journaling and introduce the fundamental unit questions:
 1. What does urban mean?
 2. What is nature?
 3. Is there nature in urban areas?
 4. What is man's place in nature? Do we have a place?
 5. What is living deliberately?
 6. Do you live deliberately now? Is anything in your life deliberate?
 7. What are some things you could do to live deliberately?
- Preliminary reflection on fundamental unit questions
- Go outside and observe nature: Students will make observations and categorize them as either "natural things" or "man-made things".
- Share and discuss students' lists: What do they have in common? How do they differ? How is this significant?
- Go outside and observe nature: Students will make observations based on varying scales. Does this change your ideas about nature?
- Make preliminary definition of nature based on observations

2nd Quarter:

- Read selected articles: "Where I Lived and What I Lived For" and "Conclusion" by Henry D. Thoreau, "Ecology of Fear: Los Angeles and the Imagination of Disaster" (excerpts) by Mike Davis, and "Uncommon Ground: Rethinking the Human Place in Nature" (excerpts) edited by William Cronon.
- Discuss ideas introduced by the authors in the selected articles
- Reflect in journals on the authors' ideas as they pertain to the fundamental unit questions: Do the articles help to answer any of the questions? Do they change your previous answers to any of the questions?
- Re-work definition of nature if necessary

3rd Quarter:

- Discuss concept of ecological footprint
- Calculate individual ecological footprint using www.earthday.net/footprint
- Calculate ecological footprints for each member of family
- Calculate percentage of Earth's acreage family is using: Is this sustainable?
- Present ecological footprint data and conclusions in formal lab report
- **Extra Credit:** Calculate and graph how the average American's ecological footprint has increased since the founding of this country
- Discuss how ecological footprint ties in to definition of nature and living deliberately
- Finalize definition of nature and man's place in it

- Reflect on how definition of nature and ideas about it have evolved over the year: Have your ideas changed? In what ways? What most strongly influenced those changes? Are you going to do anything different as a result of your ideas about nature?
- Create final project making sure to include definition of nature, man's place in nature, and answers to fundamental unit questions

This unit covers the following Massachusetts State Science Frameworks (2001):

6. Ecology

- Broad Concept: Ecology is the interaction between living organisms and their environment.
- 6.2 Use a food web to identify and distinguish producers, consumers, and decomposers, and explain the transfer of energy through trophic levels.
- 6.3 Identify the factors in an ecosystem that influence fluctuations in population size.
- 6.4 Analyze changes in an ecosystem resulting from natural causes, changes in climate, human activity, or introduction of non-native species.

Supplementary Materials

In addition to copies of the aforementioned articles, the following supplies are needed (all will be provided by the school unless otherwise noted):

- journals (students may use own journals if they prefer)
- microscopes and slides
- hand lenses
- collection bottles and bags
- forceps
- dissection needles
- scalpels
- rulers and meter sticks
- field guides
- scissors, glue, tape
- markers and coloring pencils
- calculators (students must provide)
- Internet access (students may use school or home computers)