



# Lesson Plan

**Teacher's note:** This is a generic lesson plan that can be used with any one of the articles in this journal, or with a combination of articles. It may also be used with any *Natural Inquirer* article.

This lesson introduces scientific abstracts to the students.

**Time required:** 1 class period

**Materials required:** One or more articles from the *Natural Inquirer*, Student Scientist Edition FACTivity sheet, pencils

**National Science Education Standards:**

**5 minutes:** Introduce scientific abstracts

A scientific abstract is a very short version of an entire scientific paper. Although the abstract is placed at the beginning of the paper, it is written last. The abstract contains enough information for the reader to identify: **1)** the problem and the research question; **2)** how the study was conducted; **3)** the major findings; and **4)** the significance of the results. An abstract is usually written in one paragraph, just long enough to provide the essential information. The reader of a scientific article begins by reading the abstract. If the article is of sufficient interest, the whole article can be read.

Next, provide students with a copy of the following abstracts, printed on page 70. Explain to students that the abstracts were written from student scientist papers from the Henry Ford Academy, a public high school in Dearborn, Michigan. Students should individually read the abstracts, noting the following pieces of information:

1. The problem and research question;
2. How the study was conducted;
3. What was discovered; and
4. The significance of the findings

For each of the abstracts, have students complete the abstract summary sheet on page 68.

After students have completed this exercise, hold a class discussion about whether this was easy or difficult to do. Use this as a beginning point to discuss the four main sections of a research paper (Introduction, Method, Findings, Discussion).

In this *Natural Inquirer*, you will find five complete articles about research in the Oxbow. Each of these articles was written by a high school team of student scientists. As a class or individually, select an article to read. You may divide your class into groups, with each group reading one of the articles. Either individually or in groups, have students write an abstract for the article they read. To begin to write the abstract, students may use the template on page 69.

After students have identified the four essential points, have them write the abstract in paragraph form, using the abstracts they read earlier as models.

Hold a class discussion about the value of scientific abstracts. Here are some questions to get you started: Did their written abstracts adequately summarize the study they read? How might abstracts be used by scientists? Should an abstract be used without reading the entire article? Why or why not? The abstract summary sheet and writing sheet can be used as assessments.

## Abstract Summary Sheet

Student name: \_\_\_\_\_

Name of abstract	Problem or research question	Method used	Findings	Significance of findings
<b>Outdoor Recreation</b>				
<b>Bats</b>				
<b>Water Quality</b>				

## Abstract Writing Sheet

Student name(s): \_\_\_\_\_

### Name of the paper:

What is the problem and what is the question being answered by the research? (3-4 sentences)	
What method or methods were used? (3-4 sentences)	
What was discovered? (3-4 sentences)	
What is the significance of the findings? (3-4 sentences)	

# Sample Student Abstracts

## The Oxbow and Outdoor Recreation

Our group addressed the recreational issues at the Henry Ford Oxbow. One major problem in urban areas is getting more people involved in outdoor recreation. Greenfield Village, where the Oxbow is located, would like to see more people involved in outdoor recreation activities and also at the same time have fun. Our group went outside and explored the Oxbow to determine what types of activities would be good to have. We observed the Oxbow and determined where different activities might be placed. We also took a survey to see what visitors would really like. Through our research we determined that there are barriers and restrictions everywhere. Regardless of the environment there are things you

should be aware of. The first barrier would have to be safety. Safety means protecting the visitors from poison ivy, animal attacks, and anything else. Another thing that could be a barrier is mosquitoes. Activities should be restricted to daytime, since anyone who is in the Oxbow would need to see what they are doing. Some ideas for activities are making walking sticks, fishing, hiking, and learning the history of the island. Through our survey we learned that visitors would like all the activities we had planned, which worked out well for our group. So now we hope that everyone who did not take our survey feels the same as we do.

## Bringing Bats to the Oxbow

The mosquito population in the Oxbow is staggering. Unfortunately they are a menace to tourists because of their huge numbers. The large number of mosquitoes makes the Oxbow one of the least popular attractions in Greenfield Village. Bats are a necessary part of a forest ecosystem. Bats feed on insects that reproduce quickly. Although they provide the best mosquito-eating service, they have gained a bad reputation. We decided that it would be good to attract one species, the Big Brown Bat, to the Oxbow using

bat houses. We went to the Oxbow and identified the best places to put wooden bat houses. As part of our project, we visited the Oxbow and marked potential trees for houses. We recommend placing wooden bat houses on living trees or hollowing out some dead ash trees. These wooden houses should attract bats. If bats are attracted to the Oxbow, the population of mosquitoes will be reduced, making the area more attractive to tourists.

## Water Quality and the Oxbow

The Rouge River Oxbow Restoration Project is located at the Henry Ford Museum and Greenfield Village. Until recently, the water quality of the Rouge River had degraded significantly as a result of pollutant loadings from various sources. In general, what we studied was the water quality of the Oxbow. We collected our data on the west bank of the Oxbow in early December 2007. To collect our data, we used

a water scooper that carried about one liter of water. We performed the following tests: pH test, turbidity test, and dissolved oxygen test. Through our research we found that there is a high oxygen level in the water of the Oxbow and that sediment levels are higher than more clear-flowing streams. We concluded that the level of oxygen in the water is good.