



Natural Inquirer Scientific Process Module



Unit 3: Lesson 2: Culminating Project - A Research Project and An Article For the *Natural Inquirer*

Background: Students will apply what they have learned throughout the year about the scientific process by engaging in the process from beginning to end. This includes:

1. Identifying a research question
2. Doing a literature search
3. Modifying the question if necessary
4. Doing additional literature searching if necessary
5. Writing an “Introduction” section that includes the problem and the research question

6. Designing data collection
7. Designing analysis
8. Collecting and recording data
9. Analyzing data
10. Writing a “Methods” section that includes steps 6-9

11. Creating charts, graphs, maps, illustrations, photographs, tables, etc., to summarize the data and analysis
12. Writing a “Findings” section that includes text, the aids created in #11, and captions

13. Thinking about and discussing their findings in light of all of the previous steps
14. Writing an “Implications” section based on their activities in #13

15. Writing sections for “Thinking About Science” and “Thinking About the Environment”
16. Identifying any glossary words that might need to be defined
17. Adding any needed citations

18. Putting all of the sections together into one article in the same format as the *Natural Inquirer*.

Once completed, you may send your *Natural Inquirer* article to www.naturalinquirer.usda.gov for posting on the Web site.

Objectives:

- Students will be able to identify the different parts of the scientific process and understand how they relate to “doing science”
- Student will be able to read, analyze, and explain scientific information
- Students will be able to write and edit science writings
- Students will be able to communicate clearly their study, the findings and the implications to a larger audience
- Students will engage in scientific inquiry

Time: 1 month

Materials:

- *Natural Inquirer* journals
- Paper
- Pencils
- Variety of research tools: books, Internet, magazines, newspapers

Procedure:

1. Begin the class by reminding students that they are going to create a *Natural Inquirer* article based on their own research.
2. Each student should choose a topic to research. These research topics can be from science topics that the class has covered or they can be from *Natural Inquirer* articles. Listed below are some potential research areas
 - General topics: weather, water quality studies, plants, environment
 - *Natural Inquirer* Activities that can be used for research projects:
 - Urban Forest Edition p. 14, 21, 35, 49, 57
 - Facts to the Future Edition p. 14-15, 38-39, 55
 - Wildland Fire Edition p. 13, 32-33, 40
 - Tropical Edition p. 12, 18, 23, 30, 48, 54
 - 2002 Olympic Edition p. 22-23, 33, 47-48
 - Rocky Mountain Edition p. 17, 25, 29
3. Once students have chosen a research topic, allow them a couple of days to gather research on the topic.
4. After collecting the research, the students should write an introduction section with a hypothesis or problem statement.
5. Next students should design their experiment or study and begin to record observations. During this time, they should write their Method section of the *Natural Inquirer* article. Additionally, their observations and records will be used in the Findings section. Note: If a digital camera is available it would be great for students to also take pictures of their studies and experiments so that they can include visual documentation in their articles.
6. Once students have completed their study, they should write up their findings and include at least one chart or graph.
7. After students have completed their findings section, they should work on the implication section.

8. At this time, students may also have an easier time writing the “Thinking about Science” and “Thinking about Environment” sections, so they should write the paragraphs for each of these sections.
9. Finally, students should compile all of their typed sections and pictures and create an article. Note: During this time, you may want to have students engage in peer editing as well as editing by the teacher.
10. Students should also create a list of words and definitions from their article for the article’s glossary.
11. Ask students to include any citations that are necessary for their work.
12. Have students submit final article to the *Natural Inquirer* web site.

Assessment:

There are opportunities for ongoing assessment during this project. You may want students to turn in sections of writing as they go so that you can provide feedback for the student. Additionally, you may want to create a rubric for the *Natural Inquirer* article with requirements such as grammar, spelling, citations, pictures, graphs/charts, number of sentences, correct sections, creativity, and quality of information.

Modifications:

You may want to have students complete this project in pairs or small groups so that they can divide the workload. Additionally, students with difficulty reading or writing may benefit from having a partner to help.

Extra Resources:

Successful Science Fair Projects

<http://faculty.washington.edu/chudler/fair.html>

The Scientific Process

<http://bioweb.wku.edu/courses/Biol450/Process.html>

Scientific Process Log

http://whyfiles.larc.nasa.gov/text/educators/tools/pbl/scientific_process.html

Citing Sources

<http://www.ncsu.edu/midlink/citing.html>