

Review the Scientific process



Objectives:

- i Students will be able to identify the different parts of the scientific process and understand how they relate to “doing science.”
- i Student will be able to read, analyze, and explain scientific information.

Time Needed:

1-2 class periods

Materials (for each student or group of students):

- i *Natural Inquirer* monographs or articles
- Blank paper or notebook
- i Bucket/container
- i Writing utensil

Throughout Units 1 and 2, the scientific process was presented along with other relevant topics, such as what it means to be a scientist. In this lesson, you will help your students to put this information together. This lesson sets the stage for Unit 3, Lesson 2 when students will conduct the scientific process themselves.

At this point, your students should be ready to begin a research journey based on the activities presented in Units 1 and 2. In your professional training, you may have learned that the scientific process is a specific set of steps. In the previous units presented here, the scientific process was presented more organically and less like a series of succinct steps. You may want to combine your existing knowledge of the scientific process with what you have learned here as you review the scientific process with your students.

Although many hands-on science activities omit the first part of the scientific process as described here and begin with data collection, it is best to include as many of the given scientific process activities as you can. This will help your students to think

critically about their scientific endeavor, and will challenge them to design their own data collection and analysis rather than to simply follow directions.

At this point, you should review the background sections of all previous units and lessons. This will help to refresh your memory before reviewing the scientific process with your students. If you have had your students create a science process portfolio, you may also have your students review their portfolios as a part of the review process.

Methods:

Prep

Familiarize yourself with one *Natural Inquirer* monograph or article.

Day One

Begin the class by telling students that they are going to create a *Natural Inquirer* article based on their own research. However, before they begin this activity, the class is going to read one more *Natural Inquirer* article and review the steps of the scientific process.

Provide the chosen monograph or article to the students. Have students read the monograph or article in its entirety, or alternatively, read the text as a class. Students should be reading the sections in order. The sections include:

- i Thinking about Science- explains application of a larger science concept such as the importance of team work in science
- i Thinking about Environment- explains application of environmental theme or idea
- i Introduction- provides background research and defines the problem
- i Methods- explains how scientists try to answer the problem

- Findings- tells what the scientists discovered
- Discussion/Implications- describes what all the findings mean

Pause after each section and hold a class discussion that distills, in a few simple sentences, the role of that part of the text. When a simple definition is agreed upon, write that information on the board for all to see.

For homework, ask students to reflect on what they learned about the scientific process. Have them write a simple one-page paper discussing some of the most important information regarding the scientific process.

Day Two

Have students share what they learned about the scientific process with a small group or with the whole class. The most important points should be shared on the board for all to see. Where did students overlap in their thoughts regarding the scientific process?

Following the discussion, direct students to take out a blank piece of paper. On the blank paper, students should write down 1-2 questions they still have regarding the scientific process. Students should not put their name on the paper. Once they are done writing, students should crumple the paper and place it in the basket or container.

Take out pieces of paper one-by-one, share the question, and help answer the question. Alternatively, have students come up, grab a random piece of paper and present the question to the class. Hold class discussions that help students answer other student questions.