# Lesson Plan

**Science Skills:** Communication, Inquiry

**National Science Education Standards:**
Abilities to do scientific inquiry, Understandings about science inquiry, Science as a human endeavor

**Note:** This is a generic lesson plan that can be used with any *Investi-gator* or *Natural Inquirer* article.

## Estimated Time

One and one-half class periods (plus an optional third period for the FACTivity)

## Materials

- *Investi-gator* 2nd edition (one per student)
- 1 unlined piece of paper per student
- 1 lined piece of paper per student
- Pencils

## Procedure
### Day 1: 10-15 minutes

Introduce the scientific process, as expressed in scientific writing, to your students. Explain that scientists communicate with each other in writing by completing a scientific paper. A scientific paper is similar to what they do when they write a research paper. A scientific paper may have a number of sections, but they usually include:

1. **Introduction section.** The introduction gives the background of the research problem. It explains what the problem is and why it is a problem. It usually ends with a statement of the question the scientist wanted to answer or the specific problem to be solved.

2. **Methods section.** The methods section explains what kind of data or information the scientist collected, how it was collected, and how it was analyzed.

3. **Findings section.** The findings section presents the results of the data analysis and usually includes an interpretation of the analysis. An interpretation of the analysis is different than the analysis itself. The analysis is a process of data or information reduction, and may include mathematical and statistical processes. Mathematical and statistical analyses are not mandatory, as many forms of analysis may include non-numerical processes. The interpretation is the meaning given to the analysis. Different scientists could even interpret the same data or information in different ways.

4. **Discussion (or implications) section.** In this section, the scientist usually discusses the findings and interpretation in light of the original problem presented in the Introduction section. In addition, this section often suggests new questions or problems to be answered or solved.

Explain to your students that there are many ways to solve scientific problems or answer scientific questions. The type of data or information collected and the way it is analyzed depends on the problem or question. Introduce the *Investi-gator* by telling them that they will be reading a scientific paper written at their grade level. Tell them that this paper is based on an actual scientific paper written by scientists working for the U.S. Forest Service, a United States government agency.

1. Briefly introduce the article you have chosen, emphasizing the topic and the particular research question being addressed in the article. Give students two pieces of paper each. Have the students label the unlined sheet of paper with K-W-L and draw three columns—Column 1 **K** (What do you **K**now?), Column 2 **W** (**W**hat do you think you will learn?), Column 3 **L** (What did you **L**earn?). Label the lined sheet of paper "Reflection Questions." Have student divide the sheet of paper in four sections. Label the sections "Introduction," "Method," "Findings," and "Discussion."

2. Place students into groups of 3 to 5. Have students fill in the "K" column with words, terms, or phrases from their background or prior knowledge regarding the topic of the article. If you are having them draw on a topic previously learned, then the K column may be topic-related. But if the topic is something brand new, and they don't know anything (or much) about it, you should use the K column to have them bring to mind a similar, analogous, or broader idea.

3. Hand each student an *Investi-gator*. Have students predict what they might learn about the topic. (Complete the "W" column.) Students may look through the article to glance at headings, pictures, and charts. This technique helps focus their attention on key ideas. Students may add ideas about what they want to learn about the topic in the middle column too.

4. For homework, ask students to read the article that you have chosen. Students should read the entire article, but they do not need to read the FACTivity or the Reflection Questions.

## Day 2: Entire class period

Within each group, have students read the article aloud. Have students alternate reading paragraphs. At the end of each section have students discuss and answer the reflection questions on the piece of paper labeled "Reflection Questions."

After reading, students should fill in their new knowledge gained from reading the content. The student's misconceptions about the topic from the Know column before reading the article may be addressed from the knowledge gained from actually reading the article. Hold a class discussion about misconceptions, predictions, and new knowledge. Use these questions to get you started:

1. What misconceptions did you have? Where did those misconceptions come from?

2. What clues did you use to predict what you might learn from the article? Were your predictions accurate? Why or why not?

3. What did you learn from the article that cleared up a misconception?

### If you have time or as an extension,

1. Have each group designate a presenter. The presenter will present a reflection section answer and rationale to the class. Have the student read the reflection question before giving the answer and rationale. Continue with all groups until all Reflection Questions have been presented.

2. If time allows, hold a class discussion about the article. What did the students learn? What did they like or dislike about the article? Challenge the students to discuss how the research they just read might affect them personally. How might it affect their community?
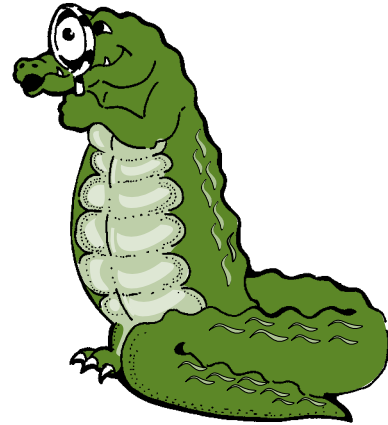
**Day 3:** Continue with the FACTivity if needed.

**Assessment**

Collect the students' K-W-L sheets and reflection question sheets. You can assess students comprehension from the responses found on the sheet.

## Assessment Rubric

| For each column (K, W, L) | No attempt to answer | 1 to 2 items identified | 3 to 4 items identified | 5 or more items identified |
|---|---|---|---|---|
| SCORE | 0 | 1 | 2 | 3 |

Assessment scoring:

Total Score 0 = 0 points

Total Score 1–2 = 1 point

Total Score 3–4 = 2 points

Total Score 5–6 = 3 points

Total Score 7–8 = 4 points

Total Score 9 = 5 points