

Profile a Lake Lesson Plan

Students explore a lake within their own watershed.

Lesson Summary: Lakes are all around us. We pass by them every day. But how well do we know them? In this exercise students will identify a lake close to their school, develop a plan for investigating one of its characteristics, and look at its ecosystem.

Grade Level: Middle School (Grades 6—8)

Time Allotted: 3 class periods of 50 minutes each, plus research performed as homework.

Performance Objectives

References are to the Next Generation Sunshine State Standards.

Science

- SC.7.L.17.3 Describe and investigate various limiting factors in the local ecosystem and their impact on native populations, including food, shelter, water, space, disease, parasitism, predation, and nesting sites.
- SC.7.N.1.5 Describe the methods used in the pursuit of a scientific explanation as seen in different fields of science such as biology, geology, and physics.
- SC.7.N.1.6 Explain that empirical evidence is the cumulative body of observations of a natural phenomenon on which scientific explanations are based.

Language Arts

- LA.6.3.1 The student will use prewriting strategies to generate ideas and formulate a plan.
- LA.6.3.2.1 The student will draft writing by developing main ideas from the pre-writing plan using primary and secondary sources appropriate to purpose and audience, elaborating on organized information using descriptive language, supporting details, and word choices appropriate to the selected tone and mood.
- LA.6.3.2.2 The student will draft writing by organizing information into a logical sequence and combining or deleting sentences to enhance clarity.
- LA.6.4.2.2 The student will record information (e.g., observations, notes, lists, charts, legends) related to a topic, including visual aids to organize and record information and include a list of sources used.
- LA.6.4.2.3 The student will write informational/expository essays (e.g., process, description, explanation, comparison/contrast, problem/solution) that include a thesis statement, supporting details, and introductory, body, and concluding paragraphs.
- LA.6.6.2 The student uses a systematic process for the collection, processing, and presentation of information.

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Prior Knowledge

Students should have familiarity with the use of maps.

Topic Overview

The Orange County Water Atlas has information about lakes, ponds, and streams throughout Orange County. This information provides scientific evidence that can be used to evaluate the environmental health of each lake. Students will explore the collected information for a lake they choose, and identify other possible sources of information.

Key Vocabulary

Bathymetric

Relating to the measurement of water depth.

Characteristic

A feature or quality of a person, place or thing.

Geology

The scientific study of the structure of the Earth, especially its rocks and minerals.

Hydrology

The scientific study of water on earth and in the atmosphere in all of its forms.

Impaired

Adversely affected for a specific use by contamination or pollution.

Nutrients

Elements or compounds that are essential as raw materials for organism growth and development, such as carbon, nitrogen, and phosphorus.

Pollutant

Substance that is harmful to the natural environment.

Watershed

A land area that drains into a stream, river, lake or estuary.

Materials

- Computer with internet access
- Digital camera
- Field guides for identifying Florida plants and animals
- Science notebook for recording observations

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References

Lake pages on the [Orange County Water Atlas](#)

[A Beginner's Guide to Water Management](#)—The ABCs: Descriptions of Commonly Used Terms

Source: [Florida LAKEWATCH](#), University of Florida Institute of Food and Agricultural Studies. 2000.

Alden, Peter. *National Audubon Society Field Guide to Florida*. New York: Random House. 2001.

[Center for Aquatic and Invasive Plants](#), University of Florida Institute of Food and Agricultural Studies.

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Procedure

Engage/Elicit

Tell the students that Orange County has over 700 lakes. Over half of them are small; they do not even have names. Ask them if they know what lake is closest to their school. Then ask them what they know about it. Write their answers on the board. If they need prompting, you might ask them:

- Is it big, or small?
- Is it shallow, or deep?
- Do people fish in it?
- Are there boats in it?
- Does it have alligators? Ducks? Other animals?
- Does it have “open water” or is it covered up with plants?
- What surrounds it? Houses? A park? A shopping center? Something else?
- Is the water in it clear? Cloudy? Green? Brown? Clean?
- Does water flow into or out of it? If so, from where? To where?
- Does the lake have a name?

Explore

1. Guide students to the [Orange County Water Atlas Advanced Mapping Tool](#). Tell them you want them to find out if the lake they described is, indeed, the closest one to their school. Have them use the tool to search for the street address of the school (provide it for them, if they do not know it). (Test this activity before you assign it, as some addresses may not be included in the geodatabase and you may need to give students an alternate address.)
2. Once they have found their school with the mapping tool, they should look for the lake they described to you. Is it closest? Does it have a name listed? If so, does the “official name” match the name they know for it? What watershed is it in?
3. If the lake does not have a name listed, it will not have data in the Water Atlas, so have them choose a different lake to investigate, the closest *named* lake.
4. Guide students to the home page of the Orange County Water Atlas. Ask them to use the Water Resource Search tool to locate the pages for the lake they will investigate.
5. Instruct students to explore the pages describing “their” lake. Explain that the information contained in these pages represents measurements collected by scientists (both citizen-scientists and volunteers). It is “empirical evidence” that helps scientists understand each lake. What information is there that confirms, conflicts with, expands on, or quantifies their prior impressions of the lake? For example, they may have said that the lake is “small” or “deep.” But how small, in acres? How deep, in feet?
6. Ask students what else they would like to know about this lake. Help each student to develop a question related to one of its physical or chemical characteristics, its relationship to the watershed or other water bodies, its natural history or ecosystem, its geologic, environmental or cultural history, or its value to the people in the community.

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7. Each student should develop a research plan for answering his or her question, including proposed sources of information. Review each student's plan, possibly suggesting additional resources.
8. Have students research their selected questions and organize the information they find. In the process of doing their research, did they discover any additional questions or interesting information?

Explain

Have each student write a report describing what they found out and how they discovered it. It should include:

- The student's original question
- The sources they used in their investigation.
- Whether they were able to answer the question and, if so, what they found
- If they were not able to answer the question, what other resources they might pursue, or investigation they might conduct.
- Any other interesting information they found, and how it is related to their original question.
- What additional questions, if any, their investigation raised that they were, or were not, able to immediately answer.

Extend

1. Choose a nearby lake that has public access and plan a class visit to investigate the ecosystem of the lake. What plants and animals do you find? Take pictures of the lake and any interesting plants and animals. Make a list of any animals you see in or around the lake.
2. When you return to the classroom, help students to look up any species they were unable to identify. Ask them: How does each species depend on the lake to "make its living" and reproduce? What relationships exist among the species? Have students summarize their information into a short report about their visit and share it, with their photographs, on the [Orange County Watershed Excursion](#). (See the Watershed Excursion Curriculum Lesson for instructions on how to do this.)

Exchange/Evaluate

1. Evaluate students' reports on their ability to form a testable question, identify and use information resources, and to organize and summarize their findings in a clear and logical way.
2. Optional: Have students share the answers to their individual lake questions with the class. (Or, have students share their reports on the [Orange County Watershed Excursion](#).)
3. Evaluate students' participation in the Extend activity, and their understanding of interrelationships among organisms in an ecosystem.
4. Have the students complete the supplemental FCAT activities for this lesson.

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