Fluid Histories *Lesson Plan*

Students explore the history of water resources and the possible implications of climate change.

Lesson Summary: Students will learn the geographic history of local bodies of water and use the reading of those histories as practice for the FCAT. Also, the students will read some general predictions of what may happen in Florida if the climate continues to change and will use that reading combined with the histories to predict what may occur to local bodies of water as climate change continues to advance.

Grade Level: 6th – 8th

Time Allotted: 1 class for reading practice (approximately 50 minutes), 1 or 2 classes for oral history extension, and 1 class for climate change exploration (approximately 50 minutes).

Performance Objectives

References are to the Next Generation Sunshine State Standards (2007).

Grade 6 – Language Arts

LA.6.1.5.1	The student will adjust reading rate based on purpose, text difficulty, form, and style.
LA.6.1.6	The student uses multiple strategies to develop grade appropriate vocabulary.
LA.6.1.7	The student uses a variety of strategies to comprehend grade level text.
LA.6.1.7.2	The student will analyze the authors purpose (e.g., to persuade, inform, entertain, or explain) and perspective in a variety of texts and understand how they affect meaning.
LA.6.1.7.3	The student will determine the main idea or essential message in grade-level text through inferring, paraphrasing, summarizing, and identifying relevant details.
LA.6.2.2	The student identifies, analyzes, and applies knowledge of the elements of a variety of nonfiction, informational, and expository texts to demonstrate an understanding of the information presented.

Grade 7 – Language Arts

LA.7.1.5.1	The student will adjust reading rate based on purpose, text difficulty, form, and style.
LA.7.1.6	Vocabulary Development: The student uses multiple strategies to develop grade appropriate vocabulary.
LA.7.1.7	Reading Comprehension: The student uses a variety of strategies to comprehend grade level text.

LA.7.1.7.2 The student will analyze the authors purpose (e.g., to persuade, inform, entertain, or explain) and perspective in a variety of texts and understand how they affect meaning.

LA.7.1.7.3 The student will determine the main idea or essential message in grade-level text through inferring, paraphrasing, summarizing, and identifying relevant details.

LA.7.2.2 Nonfiction: The student identifies, analyzes, and applies knowledge of the elements of a variety of nonfiction, informational, and expository texts to demonstrate an understanding of the information presented.

Grade 8 – Language Arts

LA.8.1.5.1 The student will adjust reading rate based on purpose, text difficulty, form, and style.

LA.8.1.6 Vocabulary Development: The student uses multiple strategies to develop grade appropriate vocabulary.

LA.8.1.7 Reading Comprehension: The student uses a variety of strategies to comprehend grade level text.

LA.8.1.7.2 The student will analyze the author's purpose and/or perspective in a variety of texts and understand how they affect meaning.

LA.8.1.7.3 The student will determine the main idea or essential message in grade-level text through inferring, paraphrasing, summarizing, and identifying relevant details.

LA.8.2.2 Nonfiction: The student identifies, analyzes, and applies knowledge of the elements of a variety of nonfiction, informational, and expository texts to demonstrate an understanding of the information presented.

Prior Knowledge

Some basic understanding of geographical history and climate change is recommended but not required.

Overview

Students will be reading excerpts from histories from Lake Apopka and St. Johns River before answering questions concerning what they have read. In order to open the Histories, go to the Orange County Water Atlas and search for Lake Apopka and St. Johns River. Preview the readings as well as the pictures under the Photo tab. Additionally, students will be asked to use these histories to predict and explain what might happen in the region if the climates and ecosystems are changed dramatically.

Key Vocabulary

Aboriginal
Referring to people that are native to a particular region. Another word for aboriginal is "indigenous."

Climate change
Long-term change in the average weather conditions for a specific place.

Ecosystem
A biological environment consisting of all the organisms that live in a particular area, as well as all the nonliving, physical components of the environment that sustain life, direcly or indirectly.

Effluent
A liquid, solid or gaseous emission, especially the discharge or outflow from an industrial plant or process.

Evapotranspiration
The process by which water is discharged from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces, and by transpiration from plants.

Hydrologic cycle
A conceptual model that describes the storage and movement of water between the ground, the earth's surface, and the atmosphere.

Levee
Also called a dike or embankment, an artificially-created, elongated ridge of soil or other fill material intended to block floodwaters.

Muck farm
An agricultural operation conducted in the soil of drained swampland, which is rich in humus and nutrients.

Nutrient pollution
Contamination of water by excessive amounts of natural elements like nitrogen and phosphorus that are components of fertilizer, human and animal waste, and organic debris.

Precipitation
Any form of water that condenses and falls from the sky: snow, sleet, hail or rain.

Resilient
As it relates to ecosystems, the capacity to tolerate disturbance without collapsing, and to recover quickly from such disturbance.

Riparian
Pertaining to the interface between land and a river or stream.

Saltwater intrusion
The movement of saline (salty) water into freshwater aquifers from encroaching coastal aquifers; it can be caused by sea level rise, or by over-pumping of groundwater for human uses.

Sedimentation
The process by which soil and other solid matter becomes suspended in water, often by erosion; this solid matter can cause water to become cloudy and reduce the amount of sunlight that penetrates it, preventing the growth of submerged aquatic plants.

Stewardship
The actions people take to ensure the continued health of the environment.

Timucua
A Native American people who lived in northeast and north central Florida, and in southeast Georgia.

Materials

- Computer with internet access
- Handout worksheets

References

The following resources may be found in the Digital Library of the Orange County Water Atlas:

Climate Change & Water: Perspectives from the US Forest Service
Source: U.S. Forest Service. 2008

Oral History Narratives, various water bodies. (Search Digital Library for "oral history".)

Other resources:

Reading 1: Lake Apopka Timeline
Source: Friends of Lake Apopka. 2008.

Reading 2: History of the St. Johns River
Source: *Water's Journey: The River Returns* website, Karst Productions and Fusionspark Media. 2005.

Procedure – Day 1 (Reading Histories)

Engage/Elicit

Begin by asking the students how long they have lived in Florida. Do they know how long their families lived in Florida? If they have moved from somewhere else, where did they come from and how long had they lived there? Give them time to discuss their family histories with those seated near them and allow them to share their stories for a few minutes.

After they have had time to share, ask them if they know how long a lake or river "lives". How much history has a lake seen? What sorts of events has a river been a part of during history? What sorts of changes have occurred to bodies of water over time? Do the students know any stories about nearby lakes or rivers? Give them a few more minutes to discuss these questions and perhaps share some histories they know.

Explore

Tell the students that they will start by learning some of the history of behind two important bodies of water: Lake Apopka and the St. John's River. Give them the two Handouts attached at the end of this lesson; they are to follow the directions on the handout and then answer the questions of the handout to practice reading and writing sample for the FCAT, using the history of these bodies of water to provide a more tangible connection to the students and the material they are reading.

Key for Lake Apopka

1. The earliest aboriginal culture surrounding Lake Apopka was _____.
    c. unnamed
2. Lake Apopka was once clear and pristine. However, it began to change in _____.
    c. 1941
3. The author's primary purpose for writing this article is to _____.
    b. describe the history and restoration of the lake.

Key for St. Johns River

1. In 1822 the settlement Cowford was _____.
    a. called "Jacksonville" for the first time
2. Droughts beginning in 1998 fueled wildfires and the St. John's River _____.
    c. could be a source of drinking and irrigation water
3. The author's primary purpose for writing this timeline is to _____.
    b. inform the reader of the history of the river.

Explain

Once the students have had time to finish the writing assignments on the handouts, collect the assignments. If enough time remains in class, discuss some of their answers to questions #4 on the handouts. Why did they answer the way they did? Are there any explanations they had not considered? (If there is not enough time left in the lesson, you may open the Day 2 activity with this discussion.)

Extend

Guide students to the Orange County Water Atlas Digital Library. Have them search for the term "oral history narrative" in "All Water Atlases." (There are over 100 oral history narratives in the library.) Allow students time to read/browse one or two histories of their choice. Tell students that anyone can create such histories, including themselves. If they were to create such a history, what would they like to know? Have them imagine that they will interview an elderly person who has lived most of his/her life on a lake (or river). What would they like to ask that person? Have each student create his/her own list.

Exchange/Evaluate

1. Collect the students' handouts and check them for accuracy.
2. Check the students' oral history questions for correct form and punctuation, and imaginative thinking.
3. You may wish to further extend the oral history exercise by having students conduct an interview with someone in the local community, either individually or as a group. Post the interview on the Orange County Watershed Excursion.

Procedure – Day 2 (Exploring Climate Change)

Engage/Elicit

If you did not have time to discuss the students' answers on the handouts yesterday, begin with that discussion described in the Day 1 'Explain' section.

Next, ask the students what they know about climate change? What is climate change? What does it do? Where have they heard it before? As they discuss climate change, make sure to lead the discussion towards the historical significance of climate change. You can mention Ice Ages and glaciation, changes to global levels of water (for a period of geological history, Florida was on the bottom of a shallow sea), etc as examples of historical climate and ecosystem changes that the students might be familiar with.

Explore

Have the students go to www.orange.wateratlas.org and locate this document in the Water Atlas Digital Library: Climate Change and Water: Perspectives from the US Forest Service and read through the short article (it is 4 pages long, but a lot of it is pictures).

Give the students time to read the document and then ask them to think about the histories of Lake Apopka and the St. Johns River they read the previous day (they can refer back to those histories on the Water Atlas if necessary). Put the students into groups of 4-6 and give them a large sheet of paper, poster board, butcher paper, etc (something they can make a poster out of). Tell them that are going to use what they have learned about the histories of these bodies of water and what they have just read about climate change in Florida to try and predict what might happen to Lake Apopka and the St. Johns River if Florida's climate changes. They are to create a time line on their poster extending from now to the next 100 years or so based on these predictions; half of the groups will create a time line for Lake Apopka and half for St. Johns River. They are free to be as creative as possible, but they should use what they have read in class to support their predictions.

Explain

After completing their posters, the students can display them in the classroom. Each group can give a brief explanation to the rest of the class as to why they included the "historical" events they chose in their time line. Ask the students to discuss and evaluate these explanations: do they make sense based on the readings? Are there other ways they could have interpreted or explained their "histories"?

Extend

Using the extension activities from Day 1, if the students have learned other histories of bodies of water in Orange County, then can try to predict time lines for these other bodies of water, too.

Exchange/Evaluate

Grade the students' posters based on their justification and uses of evidence from their readings to support their predicted time lines. No prediction is "incorrect" as long as they can justify and support their conclusions.

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