
Using Geographic Tools to Investigate Water Environments

Subject: Geography

Grade Level(s): 7

Time Required: 1 week

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Goal

Students will use geographic tools to analyze the physical geography of places and human effects on the environment.

Objectives

- Students will use Google Earth to view locations around the globe.
- Students will draw conclusions about the environments of places from Google Earth images.
- Students will learn about high-altitude ballooning (HAB) and how it can be used to study environments.
- Students will draw conclusions about the water quality and environments of places from HAB photographs.
- Students will compare and contrast different water environments from HAB photographs.
- Students will use HAB photographs to view oil spills and research the effects on the environment.

Materials

- Smartboard or projector/screen
- Google Earth & Google Presentation
- 1:1 laptops/tablets
- Text Set: texts #1-3, 5, 6
- Teacher's Guide, Analyzing Photographs & Prints (handout)
- Photograph Analysis Worksheet (handout)
- ven diagram (handout)
- HAB PowerPoint



Anticipatory Set

Before Class: Go onto Google Earth and pull up your school's location and show it over the Smartboard or projector. Open a new tab or window and pull up the Great Wall of China on Google Earth to refer to later.

During Class, Questions:

- How many of you have ever went on Google Earth and looked up where you live?
- How about the school, as seen here? (refer to screen)
- Have you ever looked at famous sites, such as the Eiffel Tower or Great Wall of China? (pull Great Wall of China Google Earth up on to screen)

Instructional Sequence/Procedure

1. DAY 1: Have students get on their laptops and open Google Earth. Have them practice finding locations via Google Earth by having them look up: 1. their home, 2. their hometown, 3. the White House, and 4. the Roman Colosseum.
2. Next, have students look at Brazil on Google Earth. What do they notice about the rainforest? Is Brazil entirely rainforest? Do they think it was originally? Have students find a place in (or around) Brazil that shows some kind of human impact on the environment, such as deforestation or a city. Have students share their findings with the class.
3. DAY 2: Begin by reviewing yesterday's activity, followed by a short lecture about how geographic tools (like Google Earth) can be used to learn about the environment.
4. As an example, have students complete Text #1 in the text set.
5. DAY 3: Introduce high-altitude ballooning (HAB) as another geographic tool that can be used to learn about physical geography and the environment. Explain how HAB works, how it collects data, and how it can be used to take photographs of the earth's surface (see PowerPoint).
6. Have students view Text #2 in text set. What do they see? What can they tell about the Little Wall Lake based off of the photograph?
7. Begin discussing information about the lake (see text set).
8. DAY 4: Quick review of information from yesterday. Ask students why they think Little Wall Lake has such high phosphorus levels (and algae levels as a result). Class brainstorm.
9. Have students view Text #3 in the text set. Reveal that Text #3 gives a clue of a possible cause of the high phosphorus levels. Point out that this HAB photograph is from the area surrounding Little Wall Lake. Have students complete the Photograph Analysis Worksheet (use Teacher's Guide, Analyzing Photographs & Prints as help if needed).
10. Point out the number of confined-animal feeding operations (CAFOs) in Text #3 (the white rectangles). How could these affect the lake?? Animal waste contains high amounts of phosphorus, and animal waste runoff could be seeping into the lake, raising both the phosphorus and algae levels (see text set).
11. Have students view text #5 in the text set and complete the ven diagram (attached) to compare and contrast Lake Erie with Little Wall Lake in terms of pollution (algae). Create a class ven diagram on the Smartboard/whiteboard. Discuss the algae situation in Lake Erie (see text set).
12. DAY 5: Have students view Text #6 in the text set and work on their assignment.

Five Themes of Geography Used

- Location, Place, Human-Environment Interaction

Formative Evaluation

- Class discussions, class brainstorms, Photograph Analysis Worksheet, ven diagram.

Assessment

- Students will research the effects of oil spills on the environment, and create an online poster using Google Presentation. Each student's poster must have 2 photographs, 8 facts regarding oil's affect on the environment, and organization and creativity.

Common Core/ ELA Standards

Research To Build and Present Knowledge

WHST.6-8.7: Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

WHST.6-8.8: Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

National Geography Standards

Standard 1: How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

Standard 3: How to analyze the spatial organization of people, places, and environments on Earth's surface.

Standard 4. The physical and human characteristics of places.

Standard 8. The characteristics and spatial distribution of ecosystems on Earth's surface.

Standard 14. How human actions modify the physical environment.