**Distance Learning Project**

This project will allow student to collaborate, live, with another classroom, school, state or country. This live connection will give the students a real life expedition in which they participate by questioning and answering questions created by students.

**Overview**

A major part of the Dust Bowl story concerns the Ogalalla Aquifer, an underground water source that covers 10,000 square miles from Texas to the Dakotas. Water from the Ogallala irrigates one fifth of all U.S. cropland. Yet, there are increasing signs that this vital resource may be losing in its ability to sustain agriculture at its present levels. Your team has been working with NASA satellite missions to quantify changes in the water resources in the Dust Bowl region. Your work will assist in developing policy concerning this most precious resource. (Chavez, 2009)

**Focus Question**

Dust Bowl, better known as “Black Sunday”, has made a change on earth. Is climate change starting another? (Chavez, 2009)

**Instructional Objectives**

* Students will describe what how the Dust Bowl affected the Ogalalla Aquifer.
* Students will explain the importance of using Earth Observation Satellites to obtain images and see the earth changes, if any
* Students will develop a policy concering the Ogalalla Aquifer

**Outline for the Distance Learning Conference Call**

1. Welcome
2. Introduction
3. What is the Dust Bowl
4. What is the Ogalalla Aquifer
5. Benefits of Using Images from Space
6. Precipitation
7. Pollution
8. Civilizations
9. Q & A
10. Goodbye

**Background Information**

On Black Sunday, April 14, 1935, a wall of blowing sand hit the eastern Oklahoma panhandle around 4 PM. As one witness described the event: "...a great black bank rolled in out of the northeast, and in a twinkling when it struck Liberal, plunged everything into inky blackness, worse than that on any midnight, when there is at least some starlight and outlines of objects can be seen. When the storm struck it was impossible to see one's hand before his face even two inches away. And it was several minutes before any trace of daylight whatsoever returned." Liberal News, April 15, 1935. Much of the Black Sunday dust was finally deposited in the Atlantic Ocean.

One outcome of the Dust Bowl was a mass exodus from the Plains. Hundreds of thousands of Dust Bowl refugees headed for California and other states. Often called "Okies," because many were from Oklahoma, they found economic conditions in their new states difficult due to the Great Depression. In the years since the Dust Bowl, the plains states would recover, but writers such as Timothy Egan in the Worst Hard Times would caution those who might have forgotten these difficult lessons. For example, Egan discusses current overuse of the Ogallala Aquifer. Others, such as NASA climate scientists, suggest that climate variability may have played a big role in what took place in the Plains states during the 30s. In addition, historian Daniel Worster cautions that climate change could turn the Plains into a disaster area and is of the opinion that government and economic policies only add to the danger. (Chavez, 2009)

Pre-/Post-Conference Assessment

1. What is the Dust Bowl? Why is it Unique?
2. What is the Ogallala Aquifer? Is it in danger?
3. How drastic will the weather change because of the Dust Bowl event?
4. Is the Ogallala Aquifer a renewable water source? How does it affect the US?
5. What was the time period for the drought? Did human presence play any role in the formation of the drought?
6. Did people die due to the Dust Bowl? Did people suffer long-term effects from the dust remaining in the air?
7. What effects did the Dust Bowl have on farmer’s health and civilization?
8. How were animals affected?
9. What are your thoughts?

(A, 2012)

**Pre-Conference Activity**

**Purpose**

This activity enables students to be creative and experience real life scenario that will possibly affect them in the present or future.

**Duration**

One class period (45mins)

**Materials**

* Computer lab environment with internet access (no more than 2 students per computer)
* Tanberg Distance Learning Equipment
* Teacher computer with a projector

**Procedure**

1. Review Dust Bowl event as well as images taken
2. Have students become knowledgeable of the history of the Dust Bowl
3. Divide the class into teams of 3 to 5 students
4. Explain to the students that like for them to become familiar with appropriate vocabulary like:
	1. Dust Bowl
	2. Ogalalla Aquifer
	3. Dust Bowl Refuge
	4. Homestead Act
	5. Railroad Act
	6. Immigrants
	7. Precipitation
	8. Black Sunday
	9. NASA’s involvement
5. Have students look through images and discuss each picture. This will prepare them for the videoconference event. Similar pictures will be shown and the students could be asking to talk about the images.
6. Now that the student have discussed the images have them interpret the consequences of the event
7. Possible questions:
	1. What do you think this is a picture of?
	2. Do you recognize any of the features?
	3. What questions come to your mind as you look at the pictures?
	4. Is there something in the picture that you want to know more about?
	5. After studying the picture, what can you tell me about it?
	6. What do you think a geographer or an early scientist looks for in a picture like this?
	7. Would this be a good place for a city? Why?
	8. Are there problems with the environment in this area?
	9. What types of geographic features are located here?

**Vocabulary**

**Agriculture:** The process of cultivating the soil, producing crops, and raising livestock.

**Climate:** The temperature, winds, and humidity patterns occurring year after year. For example, “Arizona has a desert climate. It’s almost always very dry and gets extremely hot on summer days.”

**Environment:** All the things and conditions that surround a person, animal, plant or object and affect its health, growth, development, or character in any way.

**Geography:** The science that deals with the location of living and nonliving things on Earth and the way they affect one another.

**International Space Station:** A spacecraft orbiting the Earth in which microgravity experiments are performed. Sixteen countries contribute to these scientific studies.

**Landform:** A natural feature of a land surface (e.g., mountains, glaciers, plains, rivers)

**Pollution:** The result or process of spoiling a place (the action of polluting) with substances those aren’t normally present.

* Natural examples: smoke and ash fall.
* Human-made examples: acid rain; factory and human waste disposed of in bodies of water.

**Satellite:** An object that orbits the Earth, moon, or other heavenly body. Our moon is a satellite of the Earth.

**Urban Development:** The process of planning, building, and developing (adding to) a city.

**Weather:** The state of the atmosphere for a short time (e.g., temperature, humidity, cloudiness, rain, hurricanes, tornados, snowfall). For example, “The weather report says it will be rainy and cold tomorrow.”

**Resources**

A view from the Top: Looking at Earth from Space: <http://www.nasa.gov/offices/education/programs/national/dln/events/A_View_from_the_Top.html>

History Channel story, saying that it was a man made event: <http://www.youtube.com/watch?v=psVsc74DLlE>

Sample of the Dust Bowl History Project: <http://www.youtube.com/watch?v=_Sl9tB9unx8>

**Reflection**

My major is computer science and I teach Technology Applications in middle school. Even then I see this project as an opportunity to teach across the curriculum integrating technology and science while still accomplishing my goal: students using their computer skills to work on other subject areas. Students will have the opportunity to Explore:

* Application Software
* Graphics & Multimedia
* Communications & Network
* Online Resources
* Keyboarding Skills

This PBL lesson can be used with any subject area and the students will have the opportunity to be creative and explore real life experiences.

# Works Cited

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Chavez, D. (2009, 01 01). *ESSEA Courses*. Retrieved 06 27, 2012, from Earth System Science Education Alliance: http://esseacourses.strategies.org/private/learner.module.php?course\_id=414&coursemodule\_id=979&cycle=C&cycle\_label=6

**Rubric**

“Critical Friend Critique”…please critique my PBL lesson plan according to the rubric below. E-mail your response to: noegranado@gmail.com . Provide a number from 1-4 : 4 being the highest grade possible 1 being the lowest grade possible. Please provide me with constructive feedback on each of the rubric.

**Goal Focus: Setting Expectations [ 1 2 3 4]**

The focus of the lesson should come from the key concepts about the topic, students' misconceptions and the content standards. Once you have identified these, write a straightforward, easy-to-read description to your students about what you expect them to accomplish. The word "transparent" is sometimes used to describe expectations to emphasize that they should be very clear, clear enough to "see through" to what is expected. Setting clear expectations helps you to design the scenario and students to stay focused.

**Rethinking: Scenario and instructional plan [ 1 2 3 4]**

The scenario needs to cause students to rethink what they think they know. To do that, it has to be interesting enough for them to care about thinking about it, understandable enough so students can think about what they already know, and be followed by a plan that guides them through the process of identifying questions, doing research, developing hypotheses, testing them out, and pulling together conclusions and recommendations. The scenario is critical to provoking student interest and getting them to share what they already know. The PBL steps are tried and true for taking them through the process of rethinking and evolving what they know until they are confident in what they know and how they know it.

**Resources: [ 1 2 3 4]**

For student use, resources should be annotated with the reasons to use it. Multiple sources and a variety of sources should be provided (such as summaries, primary and secondary sources, tables, charts).

**Assessment: Criteria and indicators of success [ 1 2 3 4]**

The best assessments are by-products of learning, embedded in the learning process, and stemming from it. A rubric makes the expectations clearer and provides a developmental road map for students. Since each level of the rubric is qualitative, a student who recognizes that their work is a level 1 can look to a level 2 to see the next best thing to improve it.

**Personal Reflection: What and how you have learned [ 1 2 3 4]**

This section of your lesson gives you a chance to talk about how PBL helped you to evolve your own understanding of the content. This will be particularly helpful to other teachers with whom you might share your lessons.