

Science, Science Fiction and American History

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Overview

I am a Social Studies teacher with an interest in designing a curriculum to supplement my course in American History. I am interested in motivating my students to become interested in exploring new ways of learning. I had no idea how I would do this until I heard a presentation by Dr. Mark Adams, Associate Professor of History and Sociology of Science at the University of Pennsylvania, offer a thought that the humans are now living in the age of science, and science fiction. Thinking about my youth, and having enjoyed reading a lot of Jules Verne and H.G. Wells science fiction books, I thought that my students would enjoy incorporating science, science fiction and history into their studies of American History.

By incorporating science, science fiction and social studies in the classroom to struggling readers, I hope that they can become excited and ready to explore new ways of learning. My classes consist of 33 inner-city students in a non-graded classroom. I would like to motivate my struggling readers by reading fiction that will aid in learning nonfiction classroom assignments. I believe that my students will gain concept knowledge and comprehensive strategies that they will need to read for social studies, with science and science fiction as its setting. I believe that using nonfiction and fiction text will enable my students to build knowledge of key concepts, reading skills and vocabulary. I hope by teaching this unit, I will be able to capture my students' imagination and fulfill an interest in science, science fiction and American History.

Rationale

This curriculum unit is designed to supplement an American History curriculum. Using ideas of science and invention, I would like to start my project during the Civil War era. Remembering that Historical and Skills Development (8.1.12A, B, C, D) standards are important to the history instruction and therefore I plan to science, science fiction novel

and invention into the American History program. The topic of instruction is The Crisis and the Reconstruction Period, 1848-1877 and the history of the first submarine during the Civil War. The introduction of the *Alligator*, a submarine during the Civil War, will be researched, discussed, and explored. It is hoped that this exploration will lead to discussion and better comprehension of the importance of the Industrial Revolution and its impacts on urban areas like Philadelphia and on warfare. Similarly we should be able to talk about how conflict and war can shape advances in technology. Also students may learn how ideas, fantasies, or stories in science fiction can inspire people to invent new things in real life.

I would like my students research the *Alligator* as well as the residence of one of the primary inventors, Brutus de Villeroi. (Hanley /USS Alligator) This would be a connection to my students of history in Philadelphia. As possible enrichment, I would also hope to arrange for students to visit the Seaport Museum in Philadelphia to see a replica of the submarine.

According to the local newspaper *The Philadelphia Inquirer* of May 18, 1861, on the front page a story indicated that there was a mechanical monster that had been discovered on a local harbor and seized by police. A small submarine made of iron that resembled an alligator because it had oars that looked like little legs with which Brutus de Villeroi was seen. Police thought that he was looking for jewelry.

Actually, the *Alligator* submarine was a secret weapon that Abraham Lincoln wanted to use against the Confederate military. The dangerous new ironclad was able to have someone sneak under the enemy ship, so that a diver could plant explosives under ships.

The questions that I would like to answer are:

- Why did Brutus deVilleroi chose to live in the Philadelphia area?
- Why did he live with an African American (former slave) and teach at an African American school?
- Unlock the secrecy of the *Alligator*: what significant part did it play in the Civil War?
- How was the submarine manned or operated?
- Did Mr. De Villeroi use the “black jack” (African American) sailors to man the underwater boat? Why or why not?
- Why did he meet Mr. Frederick Douglass, who was a naval person who spoke to African Americans in the south to come north to fight in the Civil War?
- Where did it get its name?
- Was this submarine ever commissioned in the U.S. navy?

For myself, when my students research and explore the *Alligator*, I will consider the following questions:

- How do I decide what is important for my students to learn?
- What are my students really getting out of this class?

- Am I really reaching all my students?

Background/History

The submarine *Alligator* was built in Philadelphia during the years of 1861-1862. Brutus de Villeroi was an interesting person who began submarine experiments well before the start of the American Civil War. There is evidence that indicates that the inventor demonstrated a small submarine vessel in the harbor of Nantes, France during the summer of 1832. His name appears in 1842 as a professor of mathematics and drawing at the College of Saint-Donation in Nantes where he claims to have taught the young Jules Verne.

Jules Verne was born and raised in the port of Nantes. His father was a successful lawyer and assumed that his son would follow in his footsteps. Jules Verne rebelled and declared his independence. It is told that he attempted to switch places with a ship's cabin boy, but he was removed before the boat left the harbor. His novel *Twenty Thousand Leagues Under the Sea* introduces Captain Nemo and his elaborate submarine, the *Nautilus*. Nemo's submarine represents the technology of science and the scholarship of science fiction. At the time, the technology of the *Nautilus* represented a fantastic future in the realm of what we call science fiction.

It is questionable whether or not Brutus de Villeroi taught Jules Verne, since the public records were destroyed. It is mentioned however, that he may well have known of or witnessed one or more demonstrations of the "fish boat", but no one is certain.

De Villeroi is mentioned in a Dover, Delaware newspaper in an October 1859, where he was experimenting along the Delaware.

The fish-ship that was conceived and constructed by De Villeroi was one that was unsinkable and has the ability to sail under water. De Villeroi's activities were marked by mysterious dives, and spectacular surfacing, suggesting activities in Jules Verne's *Twenty Thousand Leagues Under the Sea*. Is it possible that a professor and student shared drawings and sketches and dreams about the unthinkable and unsinkable underwater boat?

Stories later unfolded during the Civil War in letters written by De Villeroi relating to the *Alligator*. He and his wife moved into a house in Philadelphia. There seems to be evidence that he was considered to be an abolitionist during the war. There is reference to a subscription entitled "Subscription for the erection of a monument to the memory of brave and unfortunate John Brown: who perished on the scaffold for the emancipation of the colored race, on the sixteenth of December, 1859." His co-author is listed as Ralph Waldo Emerson.

The inventor lived in the home of Ms. Fanny Jackson Coppin, and as well as taught at The Institute for Colored Youth as a math teacher. The first African American college in Philadelphia was The Institute for Colored Youth, formerly located at 915 Bainbridge

Street. It was one of the first high schools to prepare black youth for skilled trades and teaching. The Institute for Colored Youth would later evolve into Cheyney University.

Conceived by de Villeroi, and constructed in Philadelphia in 1861, the Green Submarine *Alligator* was built to combat Confederate ironclad warships. The design was daring and innovative. It was the first operational submarine to have air-purifying system. As a forerunner of today's submarines, it even had the ability to deploy a diver while submerged. In April 1863, the *Alligator* was being towed south to take part in the attack on Charleston harbor. However, it was caught in a fierce storm and cut loose off Cape Hatteras, North Carolina. It has not been seen since. (If the *Alligator* is found, the U.S. Navy will retain custody of all it. Unauthorized removal of any property from a U.S. Navy wreck is illegal.)

The *Alligator* had been built in Philadelphia's Kensington area. This area was considered one of the largest manufacturing centers of the world for ship-building. The Neafie & Levy Ship and Engine Building Company was the plant located at Beach and Palmer Streets, on the Delaware River, and was known throughout the world for turning out vessels that represent the most improved ideas of maritime architecture marine work.

The construction of the ship was significant in that it is the first marine engine built in Philadelphia made of iron with side-wheels and propellers. It was designed as a new tool of war that was supposed to be economically affordable and submarine navigable.

The commander of the *Alligator* was Sam Eakin, who was born in Pennsylvania about 1810. The Eakin family was well known that shuttled back and forth from Philadelphia and Pittsburgh in the years of 1840-1860. He was reputed to have been a man of wealth who lived in Italy as well as Arizona. He fought in various wars in many parts of the world. However, it seems like he devoted his life to submarine operations, which, at the time, was an unusual task to do

Objectives

Research the location and recovery of the actual boat

Students should be able to:

- Learn the concept of continuity and change. In this unit my students will have the opportunity to learn about the history of Philadelphia and the interplay of technology.
- Construct a positive classroom environment that will increase the likelihood of enjoying the teaching and learning process.
- Use a variety of technology and information resources to gather and synthesize
- Interpret maps in order to locate and derive information
- Invite and discuss multiple answers and logical defense for encouragement for response.

Give students a choice in what and how they learn by actively involving them. This will promote learning and increase interest. Encourage students to persist until they attain mastery.

Strategies

My process of instructional process will consist in three goals.

1. I wish to help my students become able to understand this unit. The understanding is framed in essential questions that will guide my teaching and stimulate inquiry toward the desired understanding.
2. The second stage is to gather the evidence needed to document and validate that the desired learning has been achieved. By their performances at the end of the unit will indicate that students have achieved the desired outcome.
3. The third goal is to have students display enduring understanding in the classroom, as well as by extension outside the classroom.

Classroom Activities

Lesson 1: An Introduction.

It is imperative that students gather to discuss items and issues that may affect the operation of effectively carrying out this course

Discussion, using (KWL):

1. What is Science Fiction?
2. What can Science Fiction teach us about how people view real life?

Lesson 2: Reading Comprehension.

Jules Verne *Twenty Thousand Leagues under the Sea*

Glencoe *American Vision* textbook section "The Civil War" 1861-1865 (Write in complete sentences)

1. What were the Union's three military objectives in the War?
2. Why was the Union Naval blockade a powerful and necessary weapon to be used against the Confederacy?
3. In what ways would the *Alligator* be an important and useful weapon for the Union?
4. In what ways can we say that the Civil War was affected by the Industrial Revolution?
5. Describe and discuss some of the other advancements in naval war technology during this period.

Lesson 3: Primary Sources Using Photographs and Map

Procedure: I will direct my students to study old photographs of the city of Philadelphia, and an 1861 map of the city, and have them attempt to answer the following questions:

Look at the photos and the Map of Philadelphia in 1861:

1. Were there streets and locations that you recognize today? List five place names or locations that seem to be the same today.
2. Does the map and photos give you clues about how people made a living at that time? Explain.
3. What do you think are some of the reasons why Philadelphia had become such a large city?
4. What factors do you think attracted de Villeroi to Philadelphia rather than somewhere else?
5. How do you think that Philadelphia would play important roles in the Civil War?

General Questions:

1. What is your impression of the digital model of *Alligator* 1863?
2. What advantages and disadvantages came with the *Alligator*?
3. Why would a person risk the dangers of serving on the *Alligator*?
4. What do you think happened to the *Alligator*?

What other knowledge do you think primary and secondary sources could tell you about this time period?

Assessment

Each student will report his or her answers. I will check to make sure students are getting the important events, and also file their work in folders. Students then will have easy access to their folders. Those that have other concerns that we have not address in the class, I will use the “Parking Lot” method. Students will use stickers to place on chart paper “Parking Lot” of their concerns.

Lesson 4: Guided Discussion and Closure

While students are finishing up, I will have several students share their work with the class. Telling students that you can see writing can be a lot of fun and quite a few ideas are given.

Procedure: Students will then be guided into a discussion around the ideas of the questions previously stated.

Materials:

This lesson requires the following materials:

Jules Verne’s novel *Twenty Thousand Leagues under the Sea*

Textbook: Glencoe *The American Vision*

Access to encyclopedia, reference books and other informational materials related to the course.

There should be a reference hunt for the *Alligator* to determine explore the following questions concerning:

- the final design of the ship;
- who (i.e. what type of people) served aboard the vessel;
- what conditions and life was like on the *Alligator*.

Other questions that we would hope to answer are whether or not the design of the *Alligator* an inspiration of Captain Nemo's Nautilus in *Twenty-thousand Leagues Under the Sea*?

In conclusion, students should be able to think critically, and do analysis through a process incorporating Science, Science Fiction, with American History.

Analysis of Lesson:

Teachers: Ask yourself questions such as- did the students enjoy the lesson, what could be improved, what were the areas that caused problems, etc.

Bibliography for Teachers:

Books:

Verne, Jules (1865) *From Earth to Moon*

Verne, Jules (1870) *20,000 Leagues under the Sea*

Websites:

Philadelphia Seaport Museum: <http://www.phillyseaport.org>

Graveyard of the Atlantic: <http://www.graveyardoftheatlantic.com>

NPR.org Sept. 16, 2005

Official Records Regarding the 1862 Cruise Map of the 1862 Cruise of the Alligator <http://www.navyandmarine.org/alligator/1862map.htm>

The Crews of Alligator <http://www.navyandmarine.org/alligator/crew.htm>

Philadelphia, Pennsylvania in 1861 alligator@navyandmarine.org

Student Bibliography:

Books:

Glencoe: *The American Vision*, textbook

Verne, Jules (1865) *From Earth to Moon*

Verne, Jules (1870) *20,000 Leagues Under the Sea*

Film:

Disney, Walt (1954) film *20,000 Leagues Under The Sea*

Academic Standards for History

The unit will help students fulfill the School District of Philadelphia's Academic Standards in the following areas: Social Studies, Science and Technology, Reading, Writing, and Speaking and Listening.

These standards provide opportunities for students to develop competence through many activities.

8.1 Historical Analysis and Skills Development

- A. Evaluate chronological thinking
- B. Synthesize and evaluate historical sources
- C. Evaluate historical interpretation of events
- D. Evaluate historical interpretation of events

8.2 Pennsylvania History

- A. Analyze the political and cultural contributions of individuals and Groups to Pennsylvania history from 1787 to 1914
- A. Evaluate the political and cultural contributions of individuals and Groups to Pennsylvania history from 1890 to the present

- B. Identify and analyze primary documents, material artifacts, and Historical sites important in Pennsylvania history from 1890 to The present
- B. Identify and evaluate primary documents, material artifacts, and Historic sites important in Pennsylvania history from 1890 to The present
- C. Identify and analyze how continuity and change have influenced Pennsylvania history from 1787 to 1914
- C. Identify and evaluate how continuity and change have influenced Pennsylvania From the 1890s to the present
- D. Identify and analyze conflict and cooperation among social groups and organizations in Pennsylvania history from 1787 to 1914

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Specific Expectations:

1. Analyze and evaluate change and continuity in world events through and understanding of historical concepts, such as time, chronology, cause and effect, spatial relationships, and conflict.
2. Analyze changes within and among cultures during different historical periods and predict the effects of these changes.
3. Analyze and evaluate the relationship between history and geography in addressing issues of domestic and international significance.
4. Predict future events based on analysis of contemporary viewpoints concerning local, state, national and international issues.