

Close Reading Activity

Russell Freedman, *The Wright Brothers: How They Invented the Airplane*

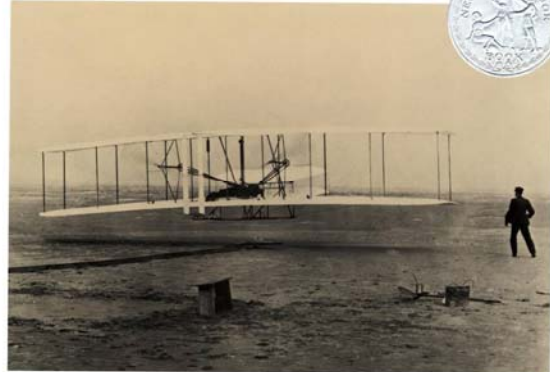
Getting Started

When the Wright brothers made their first trip to Kitty Hawk, they faced a lot of challenges. They had a hard time finding the place at first. Few people in the area could tell them where it was. The boat they did manage to charter nearly sank. Once they arrived, they spent a lot of time hauling equipment, rebuilding their glider, and fighting the swarms of mosquitoes. Despite all these troubles, the Wrights persisted and eventually developed a flying machine that created the modern world.

The story of the Wright brothers is largely a story of persistence and single-minded determination. The brothers set their minds to doing what most considered impossible, and, after years of hard work, they succeeded and rose to global superstardom. They were not alone in their efforts to master the skies. Others like Samuel Langley, Glenn Curtiss, Gustave Whitehead, and Otto Lilienthal also tried to take to the air. But it was the Wright brothers who ultimately succeeded.

THE WRIGHT BROTHERS

How They Invented the Airplane



Russell Freedman

With Original Photographs by Wilbur and Orville Wright

Instructions: Answer the following comprehension and analysis questions on the [Close Reading Activity Worksheet](#).

Chapter One: What Amos Root Saw

Vocabulary:

horseless carriage: an early term for an automobile

Comprehension Questions:

- What was Amos Root doing in Dayton when he saw Wilbur Wright piloting his flyer over a cow pasture?
- How long did the flight that Amos Root observed last?
- What role did Amos Root play in the development and popularization of human flight?
- Who did Root compare the Wright brothers to and why?

Analysis Questions:

- Amos Root traveled a long distance to catch a glimpse of the Wright Flyer. Why might he have invested so much of his time to see this device? What does this say about him and the technology the Wrights were creating?

Chapter Two: Wilbur and Orville

Vocabulary:

bachelor: an unmarried man

tuberculosis: a highly infectious bacterial disease that was a common cause of death until recently

Comprehension Questions:

- Where did the Wright Brothers go to college?
- How were Orville and Wilbur's personalities different? How were they similar?
- Where were Orville and Wilbur born?
- What types of things did the Wright brothers build as children?
- What made the safety bicycle different from other bicycles before that?
- How were the Wright brothers able to maintain both their bicycle shop and their printing business?

Analysis Questions:

- Why were the Wright brothers an unlikely pair to have succeeded in the way they did?
- Consider the following statement: The Wright brothers' interest in flying was mostly a product of their more general interest in new technologies. What evidence in chapter 2 supports this statement?

Chapter Three: The Art of Flying

Vocabulary:

pioneer: a person who is among the first to develop a new area of study or knowledge

Comprehension Questions:

- Why does the author recount the old Greek story of Icarus and his father Daedalus?
- Who was Eilmer, and why was he significant in the history of flight?
- Who was the first to envision the airplane in its present-day form?
- How did Lilienthal maintain balance on his gliders?
- What evidence does the author present to demonstrate that the U.S. government was impressed and encouraged with the Langley efforts?

Analysis Question:

- Review the following important historical figures in the history of aeronautics: Samuel Pierpont Langley, Otto Lilienthal, Octave Chanute, and Charles Manly. What were the accomplishments of these historical figures?

Chapter Four: Wind and Sand

Vocabulary:

wing-warping: a method of bending the back of a fixed wing to control an aircraft

rudder: a hinged piece attached to the rear of a boat or plane and used to turn

elevator: a hinged piece attached to an aircraft and used to control altitude

Comprehension Questions:

- What three basic features did the Wright brothers determine were necessary for any successful heavier-than-air flying machine?
- What is the purpose of making the top of an airplane's wing convex and the underside concave?
- In what way did the actions of birds serve as inspiration for the Wrights' ideas about controlling an aircraft?
- Why was it difficult for Wilbur to find Kitty Hawk at first?
- What were the camping conditions out on the sands of Kitty Hawk?
- How was the early glider different from Otto Lilienthal's gliders?
- How far were the Wrights able to glide in their 1900 glider?

Analysis Questions:

- How did early aviation theorists use their experiences with other vehicles to develop ideas about airplanes and how they might be controlled?
- What does Wilbur's letter to his father describing his plans to test a glider suggest about his future plans and hopes for flight?
- Was the 1901 glider an improvement over the 1900 glider?

Chapter Five: Back to the Drawing Board

Vocabulary:

catastrophe: a great disaster

painstaking: being careful or thorough

Comprehension Questions:

- Why did the Wrights build a 6-foot-long wind tunnel?
- How large and heavy was the aircraft the Wrights designed in 1902?
- Why did the Wrights decide to add a movable tail to the back of the glider?
- Who came to visit the Wrights on the dunes during their 1902 test runs?

Analysis Question:

- What does the meticulous testing of their designs after their 1901 efforts suggest about the Wrights?

Chapter Six: Horsepower and Propellers

Vocabulary:

aileron: a hinged device on the edge of a wing used to control an aircraft

propeller: a device fixed to a revolving shaft and used to power a boat or airplane

Comprehension Questions:

- Why did the Wright brothers ultimately decide to build the engine they needed themselves?
- Why did the Wrights decide to not place the engine in the center directly behind the pilot? What additional modifications did this change require?
- How did the Wrights adjust their wing-warping technique in the new powered flyer?
- What types of problems did Wrights experience when they returned to Kill Devil Hills in the fall of 1903?
- What news did Orville read while returning to North Carolina from Dayton to get a new propeller shaft?
- What did the Wrights call the starting track they designed?
- Why were the Wrights eager to fly on December 17 despite the less-than-ideal conditions?
- What made the short 12-second flight on December 17 a major milestone in aviation history?
- How far did the Wrights fly their 1903 flyer that year?

Analysis Question:

- Write a short paragraph answering the following prompt: What was the most important step the Wright brothers took that led to their success on December 17, 1903?

Chapter Seven: The First Practical Airplane

Vocabulary:

derrick: a large crane-like fixture used for lifting heavy weights

boisterous: greatly excited or happy

Comprehension Questions:

- What steps did the Wrights take upon returning to Dayton after their first successful flights?
- Where did the Wrights begin testing their new flyer?
- What was the purpose of the modified derrick with the 1,600 pound weight?
- What major milestone in aviation history was crossed on September 20, 1904?
- What was the most important innovation they made when they built their Wright Flyer III?

Analysis Questions:

- Read the following quote from Orville in 1905:

“I think it was mainly due to the fact that human flight was generally looked upon as an impossibility, and that scarcely anyone believed in it until he actually saw it with his own eyes.”

What does Orville mean by this? What is he responding to?

Chapter Eight: Fliers or Liars?

Vocabulary:

banked turn: a type of turn that involves the turning vehicle inclining into the inside of a turn

Comprehension Questions:

- Why did the Wright brothers decide to ground their flyer and keep it out of sight for over two years after their successful flights in 1905?
- How was the Wright Type A Flyer different from the other flyers they had built?
- What type of airplane did the U.S. Signal Corp request from the Wrights in 1908?
- Why were the French skeptical of claims made by the Wrights?
- What challenges did Wilbur face in preparing for his test flight in France?
- What had most impressed the French spectators about Wilbur's first demonstrated flight?

Analysis Question:

- Why was it important for the Wrights to bring their invention to France and test it there?

Chapter Nine: The Conquering Heroes

Vocabulary:

nosedive: a steep dive downward

Comprehension Questions:

- What caused the accident that caused the first airplane casualty in aviation history?
- Despite the accident that killed Lieutenant Selfridge and nearly killed Orville, why was the testing at Fort Myer a success?
- Where did the Wrights travel together once Orville was well enough after the crash?
- How long were the Wrights required to stay in the air in order to qualify for the army contract?
- Why did Orville select Lieutenant Foulois as his passenger for the second qualifying flight for the army contract?
- Which famous person had watched Orville fly near Berlin?

Analysis Question:

- What do the Wrights' efforts at securing contracts indicate about the early days of the airplane industry?

Chapter Ten: The Age of Flight

Vocabulary:

aerial exhibitions: events that showcased aircraft, and were commonly used in the early years of aviation history to demonstrate new aircraft

daredevil: a person willing to do reckless or dangerous things

Comprehension Questions:

- What were some of the limitations of airplanes in the first years of the Age of Flight?
- Why was Wilbur spending so much time in courtrooms?
- What was the Wright Baby Grand Racer designed for?
- How far did Calbraith Rodgers fly his Wright Flyer?
- What illness took the life of Wilbur in 1912?
- What were the consequences of Wilbur's death for Orville and the business?

Analysis Question:

- How was the airplane transformed in the decades after the Wrights' first success at Kitty Hawk?

Using Sources

Freedman has used a great number of both primary and secondary sources in his book. Primary sources are sources that provide a first-person account of an event. A journal entry by Orville Wright is an example of a primary source. Secondary sources use primary sources to explore the larger context. Freedman's book is a secondary source that uses many different primary and other secondary works to describe the life of the Wright brothers.

To better understand how primary and secondary sources work together, select a page from Freedman's book that has some quotes or references primary sources like letters from the Wrights, journal entries, or even newspaper articles. Be sure to select a page that discusses events that occurred no earlier than 1900, as these will have the most documentation. Then, research the extensive collection of primary sources in the [Wilbur and Orville Wright Papers at the Library of Congress](#). See if you can find the original primary sources themselves. Once you find one or two, draft a short paragraph summarizing the entire source.

Essay Questions

Select one of the following prompts. Write an essay in response to the prompt. Use what you learned from the reading to inform your essay. Be sure to reference the primary sources Freedman uses. Consider using the sources themselves if they are located in the [Wilbur and Orville Wright Papers at the Library of Congress](#). Also, consider consulting other secondary works on the Wright brothers listed in the bibliography at the end of the book.

- In what ways were the successes of the Wright brothers built on a foundation of other inventors, tinkerers, and engineers?
- To make the first powered flights, the Wright brothers had to master a number of techniques, including aerodynamics, internal combustion engine design, propeller design, and many other specializations. Write an essay describing how the Wrights mastered these different techniques and what this suggests about their efforts and even them personally.
- The two Wright brothers were very close, but also very different in many ways. Using the evidence in the book, write an essay evaluating their different personalities and how these differences helped them become successful.