

Wright Brothers: Twelve Seconds That Changed the World

Students will learn about the Wright brothers and the events leading up to, and after, the first powered, controlled, heavier-than-air flight.

Learning Objectives:

The students will:

- Learn about the lives of Ohioans Orville and Wilbur Wright and the importance of their innovations.
- Discover what happened before, during and after the world's first powered, controlled, heavier-than-air flight.
- Identify and study historic figures who have made significant contributions.
- Develop understanding of a scientific/technological Ohio-based breakthrough which has propelled change and how these changes have altered human experience forever.

Purpose:

Students will learn about the history of Orville & Wilbur Wright and their contributions to flight. Students will understand the timeframe to which research and development took place. Students will then work individually, in teams or as a class to create a timeline that encompasses the Wright brothers' journey to developing the first aircraft.

Background:

In the early 1900s, the Wright brothers, in Dayton, Ohio, started to develop gliders that were controlled by human interaction. This was the first time all three axes of motion had been controlled in the air by a human (roll, pitch and yaw). With their mechanic, the Wright brothers developed a small, 12-horsepower engine to power their aircraft, and they also designed the two large propellers that would be required. The propellers were counter-rotating and they actually 'pushed' the airplane through the air. On December 17, 1903, Orville flew the aircraft 120 feet in 12 seconds. Wilbur piloted their fourth and final flight that day and it lasted for 59 seconds. For more information on the Wright brothers, please review the **Resources** section.

Grade Level: 4

Ohio Learning Standards/Social Studies (2018)

History

1. Order of significant events in Ohio and the U.S. can be shown on a timeline
2. Primary & secondary sources be used for historic reasons
8. Many technological innovations originating in Ohio benefitted the U.S.

Government

17. Laws can protect rights, provide benefits and assign responsibilities

Economic

21. Entrepreneurs in Ohio and the U.S. take risk to compete with other producers

Materials Required:

- Paper
- Manila folders or cardstock
- Small paper clips, scotch tape
- Pencils
- Colored pencils or markers

Procedure:**A. Warm-up**

1. Review the information and resources in the introduction and resources section.
2. Prepare materials for the students to construct an Orville and Wilbur Wright innovation timeline: paper and colored pencils/markers.

B. Activity

1. Students will study, annotate and document The Wright Brothers' Timeline on pages (3 – 4).
2. Students will then create a timeline of the events in chronological order (optional: illustrations).
3. Use one or multiple pieces of paper to construct the timeline. Or use adding machine paper.

C. Wrap up

1. Students can discuss with others about their observations and timelines.
2. *Optional:* collect all timelines and hang them around the classroom.

Assessment/Evaluation:

The students should be evaluated on their overall class participation, listening skills and their ability to follow verbal instructions (especially when they are constructing their timelines).

Extension:

Students can prepare a paper glider to better understand the early developments of airplane engineering.

Many easy-to-build gliders are available online. Here is one example: <https://youtu.be/7vEU3rO0PuQ>

Resources:

<https://www.nationalmuseum.af.mil/Visit/Museum-Exhibits/Fact-Sheets/Display/Article/197462/meeting-the-challenge-the-wright-brothers/>

http://www.wright-brothers.org/History_Wing/Wright_Story/Wright_Timeline/Wright_Timeline_1910_1919.htm

<https://www.history.com/topics/inventions/wright-brothers>

<https://time.com/4143574/wright-brothers-patent-trolling/>

<https://www.nps.gov/wrbr/index.htm>

<https://airandspace.si.edu/exhibitions/wright-brothers/online/>



THE WRIGHT BROTHERS TIMELINE

1871 – Orville Wright is born in Dayton, OH. His brother, Wilbur, had been born about 4 years earlier in Indiana (the family moved to Dayton in 1869).

1896 – Orville and Wilbur Wright take an interest in the “flying problem” after hearing of unmanned “Aerodromes” and test glider experiments.

1899 – Wilbur Wright devises an aerodynamic control system for aircraft and builds a unique kite to test the concept in Dayton, Ohio.

1900 - The Wright brothers fly their first manned glider at Kitty Hawk, North Carolina to test their control system. It does not produce enough lift to make more than a handful of flights.

1901 – They test their second glider, also at Kitty Hawk, and it performs poorly. At this time, both of the brothers built a wind tunnel and conducted research on wing shapes in Dayton, Ohio.

1902 – They build a third glider based on their wind tunnel tests. They then refined their control system at Kitty Hawk, designing aerodynamic wings and adding pieces such as rudders to their design.

December 17, 1903 – The twelve seconds that changed the world: The Wright brothers succeeded in making the first controlled flight of a power-driven, heavier-than-air flying machine.

1904 – After the first flight, the Wright brothers went back to Dayton, Ohio to refine their powered airplane making test flights at Huffman Prairie.

1905 – The Wright brothers develop the first practical airplane and demonstrate it to the public. The U.S. military is slightly interested at the time.

1907 – The Wright brothers procure contracts for the sale of airplanes from French investors and the U.S. Army, provided they can successfully demonstrate their airplane to meet the required standards.

1909 – Demonstrations of the new airplane take place and the U.S. military buys its first military grade aircraft. The Wright brothers begin to develop, manufacture, and teach about airplanes.

1909 - The Wright 1909 Military Flyer was finally purchased by the U. S. Army Signal Corps at Ft. Myers, VA, and it had all the characteristics the government required: it carried two people, went 40 miles per hour, flew for one hour, was conveyable by horse and wagon and had a 125-mile range.

1910 – The first civilian flight training school in Montgomery, Alabama is established. Also, Wright Model B is fully developed for the military and public development.

1914 – The U.S. courts decide in favor of the Wrights in their suit against Curtiss Aeroplane & Motor Company, a rival innovation firm.

1914 and On – Increasing amount of airplane research and development led to more advanced models that further expanded the usage of the airplane.