



# Heartland Science

Ohio's Legacy of Discovery & Innovation

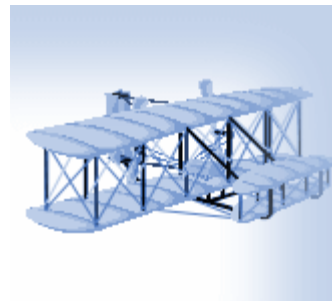


## Aviation & Aerospace

From the Wright Brothers to the Moon

### The Wright Brothers

Wilbur and Orville Wright began studying aeronautics in 1896 while building bicycles in Dayton, and built their first "flying machine" in 1903, after years of extensive study, research, and planning. Their dedication allowed them to solve one of the most complex technological problems of their day.



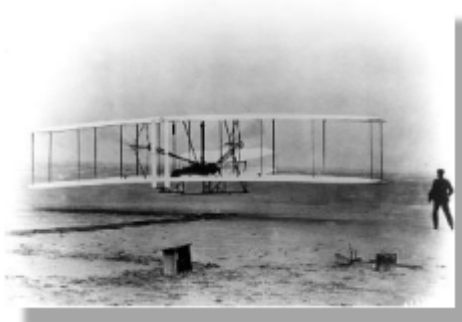
Wilbur was born in Indiana in 1867, and Orville was a native Ohioan, born in 1871 in Dayton. Their childhood home encouraged education and reading. Orville once explained that the two brothers "were lucky enough to grow up in a home environment where there was always much encouragement to children to pursue intellectual interests; to investigate whatever aroused their curiosity." While education was a priority, Orville and Wilbur were actually the only members of their family who did not receive a high school diploma or attend college.

Love of flight began at an early age for the Wright brothers. Their father traveled frequently on business and in 1878 was said to have brought home a rubber band powered toy helicopter for the boys. Apparently the boys enjoyed taking it apart, redesigning it, and rebuilding. This would have been the first powered aircraft that they built as a team.



In 1900, the team began carefully designing their first full scale aircraft, designed to carry a man. When the model was complete, they contacted the U.S. Weather Bureau for advice on a good location to build and test their aircraft. Based on feedback, they chose Kitty Hawk, on the Outer Banks of North Carolina. The wind tunnel was developed when their Kittyhawk tests showed them that available airfoil theory was incorrect, and they had to develop their own. It took several years for the brothers to rework their design for success.

On December 17, 1903, they reached their goal of controlled, powered flight. It was a chilly day with winds gusting at 22-27 miles per hour. They delayed their flight a bit due to the high winds and then decided to go for it, but with a goal of staying reasonably close to the ground. That first flight lasted only 12 seconds. They had flown a distance of 120 feet with a ground speed of 6.8 miles per hour and an airspeed of 30 miles per hour. Orville perhaps describes it best: "This flight lasted only 12 seconds, but it was nevertheless the first in the history of the world in which a machine carrying a man had raised itself by its own power into the air in



full flight, had sailed forward without reduction of speed, and had finally landed at a point as high as that from which it started." After a few repairs, three more flights were accomplished on that first day of air travel. The fourth flight damaged the plane significantly, and it was never flown again. But the efforts of the Wright brothers helped found the U.S. aviation industry.

### Did you know?

- Some believe the Wright Brother's greatest contribution to flight was the development of flight controls.
- Orville sold the U.S. Army its first airplane and trained the first well-known pilots to work in America.

### Find out more...

- [Wright Brothers Aeroplane Company and Museum of Pioneer Aviation](http://www.first-to-fly.com/)  
([www.first-to-fly.com/](http://www.first-to-fly.com/))
- [To Fly is Everything - a virtual museum of flight](http://invention.psychology.msstate.edu/air_main.shtml)  
([invention.psychology.msstate.edu/air\\_main.shtml](http://invention.psychology.msstate.edu/air_main.shtml))
- [Franklin Institute Flights of Inspiration](http://www.fi.edu/flights)  
([www.fi.edu/flights](http://www.fi.edu/flights))
- [NASA: The Wilbur and Orville Wright Story](http://www1.jsc.nasa.gov/er/seh/Wright1.html)  
([www1.jsc.nasa.gov/er/seh/Wright1.html](http://www1.jsc.nasa.gov/er/seh/Wright1.html))