

## **Student Resource: The Wright Brothers**

Orville Wright (August 19, 1871 – January 30, 1948, left) and Wilbur Wright (April 16, 1867 – May 30, 1912, right), were two brothers and aviation pioneers who are generally credited with inventing, building, and flying the world's first successful airplane. They made the first controlled, sustained flight of a powered, heavier-than-air aircraft on December 17, 1903, near Kitty Hawk, North Carolina, US. In 1904–05 the brothers further developed their flying machine into the first practical fixed-wing aircraft. Although not the first to build and fly experimental aircraft, the Wright Brothers were the first to invent and fine tune aircraft controls that made fixed-wing powered flight possible.

The brothers' real breakthrough was their invention of three-axis control – this enabled a pilot to steer the aircraft and maintain equilibrium, or balance. This method still remains the standard for all kinds of fixed-wing aircrafts. While others of the era were focusing on making more powerful engines, the Wright brothers thought that finding a way to control an aircraft was the more pressing challenge.

Using a small homebuilt wind tunnel, the brothers tested and retested their ideas and designs. They collected lots of data that helped them design and build more efficient wings and propellers that could be controlled. Their first U.S. patent, 821,393, did not claim invention of a flying machine, but rather, the invention of a “system of aerodynamic control that manipulated a flying machine's surfaces.”

They gained the experience and skills essential for their success by working with printing presses, bicycles, motors, and other machines. Their work with bicycles in particular influenced their belief that an unstable vehicle like a flying machine could actually be controlled and balanced with practice! From 1900 until their first powered flights in late 1903, they conducted extensive glider tests that also developed their skills as pilots.



More details on the Invention Process of the Wright Brothers can be found at <https://wright.nasa.gov/overview.htm>.

### **Take Flight!**

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