

AEROSPACE MICRO-LESSON

Easily digestible Aerospace Principles revealed for K-12 Students and Educators. These lessons will be sent on a bi-weekly basis and allow grade-level focused learning. - AIAA STEM K-12 Committee.

ANTOINE DE SAINT-EXUPÉRY

A man of many parts: Aristocrat, aviator, writer, explorer, poet, journalist, and national hero in France. In some circles he is best known for his book, *The Little Prince*; in other circles he is known for his lyrical writing about aviation. He also flew in France, North Africa, and South America; reported on the Spanish Civil War for several French newspapers; registered more than a dozen patents for inventions related to aviation; and flew for the French military during the Second World War. He disappeared while flying on a mission in that war.

GRADES K-2

One of Saint-Exupery's most beloved books is *Le Petit Prince*, known in English as *The Little Prince*. Here is a short video about the [Le Petit Prince Phenomenon](#). For over 70 years this story has been translated into more than 250 languages from around the world. Besides the graphic novels and pop-up book adaptations, it has also spawned a television series, feature films, and even a theme park. Here is the [trailer](#) for the movie version that was released in 2015. Perhaps your class would enjoy hearing you read the book aloud, or watching one of the films or TV episodes.

Extension idea: Your students might enjoy creating their own worlds for the Little Prince to explore. Who or what would live on their worlds?

GRADES 3-5

Each of the websites below has a biography of Antoine de Saint-Exupery. After reading over one or all of them, share some of the highlights with your students and display a few of the photos. He served as a pilot in the French military from 1921-1923 and flew for the French and Argentine airmail services. He returned to military flight following the German invasion of France in 1940. After the fall of France, he came to the United States to encourage the Americans to join the war. He died on a reconnaissance mission over the Mediterranean Sea near France for the Free French Air Force in 1944.

Encyclopaedia Britannica <https://www.britannica.com/biography/Antoine-de-Saint-Exupery>

GRADES 3-5 (CONTINUED)

Biography.com <http://www.biography.com/people/antoine-de-saint-exupery-030816>

The Aviation History Online Museum <http://www.aviation-history.com/airmen/exupery.htm>

Extension idea: You might have your students create a timeline of his life using some of these sources. [The official website of “The Little Prince”](#) has a list of the main events that can serve as a “one-stop” source.

GRADES 6-8

[The official website of “The Little Prince”](#) has a list of the main events of Saint-Exupéry’s life. As you can see, from 1921- 1923 he served in the French military. During the 1920s he was a mail pilot for l’Aeropostale. Later he served as a test pilot, a journalist covering the Spanish Civil War, and then returned to being a military pilot during World War II. Many of his real-life experiences served as inspiration or material for his writing. His short story, “The Aviator,” was published in April, 1926. He wrote a memoir in 1939 titled *Wind, Sand, and Stars*. One of the adventures he recounts in the book is an airplane crash he experienced in the Sahara desert in December 1935 while trying to win a 150,000-franc prize for breaking a speed record. He and his navigator were lost in the desert for three days before a Bedouin tribesman found them and saved their lives. (This also seems to be the inspiration for the aviator marooned in the desert who serves as the narrator for *Le Petit Prince*.)

Another tale from the final chapter of *Wind, Sand, and Stars* which the students might enjoy concerns a French outpost in southern Morocco during the Rif War. The outpost was located between two mountains filled with enemy tribesmen. A group of tribesmen came to the fort to negotiate; as they were having tea with the French soldiers, their allies from the other mountain attacked. When the French commander tried to send the first group off, their chief explained that they were guests of the French and would help them fight off their attacking allies. A few days later, the chief returned to the French fort, explaining that his men had expended some three hundred cartridges in the fort’s defense. He asked the French commander to replace these three hundred cartridges so that they could use them to attack the fort the next day. Saint-Exupéry, noting that the French commander was an officer and a gentleman, reported that he gave them their cartridges.

GRADES 6-8 (CONTINUED)

Extension idea: You might have students research the subject matter of Saint-Exupéry's other writings and try to match them up with his various accomplishments.

GRADES 9-12

Besides being a pilot and a writer, Saint-Exupéry also registered a dozen patents. One of these was for a “system of position finding by electromagnetic waves” ([US 2536728A](#)). Among the uses for this system that he listed was to “provide new and improved methods of and apparatus for navigating along a given route, for approaching a landing field, and for determining the location of a point in space relative to two or more fixed base points which are spaced apart at known locations.” This makes sense considering the number of flights he made looking for downed fliers while he was director of the Cap Juby Air Field in the Sahara, as well as during his time with Aeroposta Argentina.

The invention itself, however, while original, was not too practical. It proposed to use radio transmitters and receivers and the time required for the signals to travel between them to allow a person to determine his distance from each of several different stations whose locations he knew. In this it resembled radar slightly. His idea was that the person trying to locate himself, at “Station A,” would broadcast a signal to the other stations. The other stations would receive the signal and broadcast a signal of their own in response. Based on the round-trip times of the signals to and from the other stations, the person at Station A could figure out how far he was from those stations and then locate himself on a map.

The method of displaying the distances was also original. Saint-Exupéry envisioned a cathode ray tube, which is a container of glass from which the air has been removed. A beam of electrons is aimed at a phosphorescent screen on the other side of the tube. Electrically charged plates above and below the beam deflect it vertically and to the left and right of the beam deflect it horizontally. The idea was to vary the voltages on these charged plates with an alternating current to cause the electron beam to trace out a circle on the screen. The time required to trace out a single circle would depend on the frequency of the alternating current, which the user could select from four options. A signal received from one of the other stations would reduce the voltage on the deflecting plates, causing the electron beam to drop from the circumference of the circle towards its center, creating the notches shown in Figure 2 of the patent. The angles of the notches on the circle would tell the user the time of arrival of the radio signals, allowing him to figure the distances.

Sixty Years Ago in the Space Race:

October 29, 1956: [The journal "Aviation Week" published an announcement from "Moscow News" that the USSR would launch its first artificial satellite, an aluminum sphere weighing almost 100 pounds and 20-24 inches in diameter.](#) In spite of this advance notice, the launch of Sputnik I a year later still surprised the West.