



MUSEUM OF
NATURAL HISTORY
AND PLANETARIUM
Roger Williams Park

Flight Adventures Full-Dome

A Pre-Visit Information Guide for Teachers

NGSS: 3-PS2-1-2, 4-PS3-1, 3-5-ETS1-1

ABOUT THE CORMACK PLANETARIUM

- The ASH Warped Media fulldome projector system surrounds audiences with 360-degree digital visuals on the dome.
- In a planetarium, objects in the universe are projected, as they exist at any time in space.
- These celestial objects are projected onto a dome-shaped ceiling so it appears that one is looking up into the night sky.
- Our Star Projector is capable of displaying images of over 7,000 stars...many more than anyone can see without the aid of a telescope. Planets, comets, satellites and the Milky Way and Andromeda Galaxy can also be projected.

FLIGHT ADVENTURES

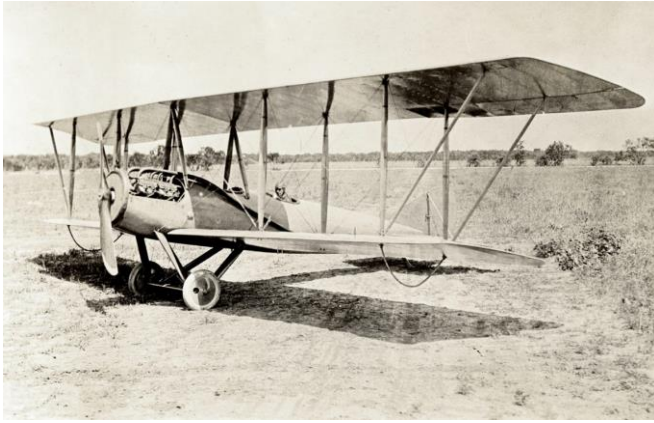
Discover the science of flight through the eyes of a young girl and her grandfather as they explore how birds, kites, planes, and models fly. Learn about the history and future of flight and how NASA is discovering new and safer ways to travel with the help of future engineers and aviators—like you! Join us in this collaboration with the Chanute Air Museum in Rantoul! This show was originally produced by the Children's Museum of Indianapolis

SUGGESTED CONCEPTS TO REVIEW INCLUDE:

Aviation	Force	Gravity
Aeronautics	Thrust	Model
Lift	Drag	Wright Brothers

HELPFUL INFORMATION: BRIEF HISTORY OF FLIGHT

Thousands of years ago, people in Asia invented kites, which were the very first flying objects made by humans. Inventors like Leonardo da Vinci drew pictures and studied how birds use their wings to soar. In 1783, the Montgolfier brothers built the first big balloon that floated in the air using hot air. In the 1890s, a man named Otto Lilienthal built gliders (aircraft with no engines) and flew them like large paper airplanes. Orville and Wilbur Wright owned a bicycle shop, but their true dream was to build a flying machine with an engine. They traveled to the windy beaches of Kitty Hawk, North Carolina, to test their designs. On December 17, 1903, they flew the *Wright Flyer*. The very first flight lasted only 12 seconds and went 120 feet (37 meters), but it changed the world forever! Just a few years later, planes could fly for hours and cross oceans. Soon, humans went even higher—flying into space in 1960 and landing on the moon in 1969!



ACTIVITIES

Teachers are encouraged to conduct pre-visit and post-visit classroom discussions and activities with their classes to make the most of their experience. If you take two sheets of paper and you wad up one of them, then drop them both, the wadded paper will hit the ground first. But why? What is the air doing to the flat (unwadded) paper? Try paper of different shapes. Use a handkerchief and, by attaching string to the corners, construct a parachute. Airplanes generate lift by way of "Bernoulli's Principle." You can demonstrate this simply by cutting a piece of paper roughly six inches long and an inch wide. Put the end of the paper just under your lip and blow across the top of the paper. What happens to the paper? Air pressure is pushing on the paper from all directions. When you blow across the top you lower the pressure on the top. Pressure from below pushes the paper up.