



Principles of Flight



Lesson Plan: Milestones of Flight

Grade Level: 4-8

Subject Area: Science and Math

Time Required: *Preparation:* 1 hour
Activity: 1-2 hours

**National Standards
Correlation:**

Science (grades K-4)

- Earth and Space Science Standard: Objects in the sky.
- Science as Inquiry Standard: Abilities necessary to do scientific inquiry.

Science (grades 5-8)

- Science as Inquiry Standard: Abilities necessary to do scientific inquiry.
- History and Nature of Science Standard: History of science.
- History and Nature of Science Standard: Nature of science.

Math (grades 3-5)

- Number and Operations Standard: Compute fluently and make reasonable estimates.
- Representation Standard: Use representations to model and interpret physical, social, and mathematical phenomena.

Math (grades 6-8)

- Number and Operations Standard: Compute fluently and make reasonable estimates.
- Representation Standard: Use representation to model and interpret physical, social, and mathematical phenomena.

Summary: In this lesson, students will learn about some significant milestones in the history of flight. Using adding machine paper tape, students will create a time line to represent the chronological order of the milestones of flight.

Objectives: Students will:

- Study various resource materials on the history of flight
- Learn about significant events which occurred in the history of flight
- Create a time line of significant events in the history of flight (complete with illustrations)
- Laminate the time lines
- Display the time lines in the hallway at school for other students to see and enjoy

Background: *Milestones of Flight:*
1200-1300: People first attempted to fly by attaching wings to their bodies.

1290: Roger Bacon proposed a gas-filled balloon.

1500: Leonardo da Vinci made drawings of a parachute, helicopter, propeller and a flying machine with wings.

1650: Italian Francesco de Lana published the first design for an airship.



1783: First hot-air balloon flight by Jean F. Pilatre de Rozier and Marquis d'Arlandes in a Montgolfier balloon. First flight in a hydrogen-filled balloon. J.A.C. Charles and M. Robert flew 25 miles (40 km) from Paris, France in two hours.

1785: First crossing of the English Channel by air. John Jeffries and Jean-Pierre Blanchard flew in a hydrogen balloon from England to France.

1809: Sir George Cayley built and flew the first full-sized unmanned glider.

1842: William S. Henson patented a design for a steam-driven airplane that foreshadowed the modern monoplane.

1848: John Stringfellow made and flew a model airplane that is said to be the first power-driven machine to fly. It flew 120 feet at Chard, England.

1866: F.H. Wenham contributed valuable study on the laws of flight. Five years later, Wenham designed the first wind-tunnel experiments.

1890: Clement Ader, a French engineer, achieved a distance of about 150 feet (46 m) in a power-driven monoplane.

1894: Sir Hiram S. Maxim built a plane operated by steam engines, which lifted equipment and a crew of three into the air.

1891-1896: German inventor Otto Lilienthal made the first successful glider flights that are said to have inspired the Wright brothers.

1903: First engine-powered, heavier-than-air flight by the Wright brothers at Kitty Hawk, North Carolina, on December 17.

1909: The first successful airplane crossing of the English Channel by Louis Bleriot of France. The trip took 37 minutes.

1912: Glen Curtiss flew the first successful flying boat or seaplane.

1918: The first regular air mail delivery in the world was started by U.S. Army pilots on May 15.

1919: First nonstop airplane flight across the Atlantic was undertaken by British fliers John Alcock and A.W. Brown on June 14. The 1,936-mile (3,115-km) trip took 16 hours, 12 minutes.

1924: The first round-the-world flight took place from April 5 to September 28. Two U.S. Army biplanes flew 26,345 miles (42,389 km) in 175 days.

1926: The first flight over the North Pole in an airplane was made on May 9 by Richard E. Byrd (navigator) and Floyd Bennett (pilot). The first airship flight over the North Pole took place from May 11 through May 14, with explorer Roald Amundsen, Umberto Nobile, and Lincoln Ellsworth on board.

1927: The first nonstop solo flight across the Atlantic in an airplane was flown by Charles A. Lindbergh on May 20-21. He flew 3,610 miles (5,806 km) in 33 hours, 30 minutes, from Roosevelt Field, New York, to Le Bourget Field, Paris.

1929: The first around-the-world flight by an airship was made by the Graf Zeppelin in 21 days, 8 hours, from August 8-29.



1932: The first woman to make a transatlantic solo flight was Amelia Earhart, who flew from Canada to Ireland on May 20-21 in 15 hours, 18 minutes.

1933: The first solo round-the-world airplane flight by Wiley Post took place from July 15-22, lasting 7 days, 18 hours, 49 minutes.

1939: The first jet-powered airplane was built by the Heinkel Company in Germany.

1940: The first successful flight of a single rotor helicopter took place on May 21, at Stratford, Connecticut, by Igor Sikorsky.

1947: The first flight faster than the speed of sound was made by U.S. Air Force Capt. Charles Yeager in a rocket-powered Bell X-1.

1955: Turboprop airliners were put into service by the major United States airlines.

1959: Jet airliners began regularly scheduled flights in the United States on January 25.

1961: The first man to fly in outer space was Yuri A. Gagarin of Russia on April 12. On May 5 Alan B. Shepard Jr. became the first American to make a space flight.

1962: On February 20, astronaut John H. Glenn Jr. completed three orbits around the earth in a space flight that lasted nearly five hours.

1969: On July 20, Apollo 11 landed on the Moon, and Neil Armstrong became the first person to walk on the moon's surface.

1971: The first space station Salyut I, was launched into orbit.

1976: The world's first supersonic passenger aircraft began operating.

1981: The first space shuttle, Columbia, was launched on April 12 and returned to earth 54 hours later.

1981: The first flight of the Stealth aircraft, the Lockheed F-117A.

1986: January 28 the space shuttle Challenger exploded.

1994: Astronauts use jet packs to free-fly in space.

Materials:

You will need:

- Adding machine tape
- Ruler
- Colored pencils/markers/crayons
- Laminating machine
- Double-sided tape

Procedure:

A. Warm-up

1. Show a video on the history of flight.
2. Have a class discussion about the historical importance of flight.



B. Activity

1. Measure and create a proportional scale to use for the time line (on adding machine paper tape).
2. Record significant events in the history of flight (on the adding machine paper tape).
3. Label and illustrate the time line.

C. Wrap-up

1. Laminate timelines.
2. Display in hallway of school.
3. Create mathematics problems based on the timeline dates.

**Assessment/
Evaluation:**

Students should be evaluated on class participation, their ability to follow directions and successful completion of project.

**Resources/
References:**

Platt, Richard. *Visual Timeline of Inventions*. London: Dorling Kindersley, 1994.

Scholastic Voyages of Discovery. *The Story of Flight*. New York: Scholastic Inc., 1995.

