



1

### Music Options For Teachers:

- Come Fly With Me (Frank Sinatra)
- Come Josephine in My Flying Machine (Ada Jones and Billy Murray)
- Bicycle Built For Two (Nat King Cole)
- The Aviation Rag (Al Marzian)
- Fly Me To The Moon (Frank Sinatra)
- Midnight Flyer (Frederick W. Hager)
- I'll Fly Away (Alison Krauss)
- Those Magnificent Men In Their Flying Machine (Ron Goodwin)
- Rocket Man (Elton John)
- Ground Control to Major Tom (David Bowie)



2



3

1900. The Wright Brothers begin testing gliders at Kitty Hawk, North Carolina.

4



In Greek mythology, Daedalus had an idea to escape from a Labyrinth with his son Icarus. He constructed wings from feathers and wax. Daedalus warned his son not to fly too low or his wings might touch the waves and get wet. He also told him not to fly too high or the sun might melt the wax. Young Icarus, overwhelmed by the thrill of flying, flew too close to the sun and the wax in his wings melted. He fell into the sea.

5



400 BC. Archytas of Tarentum, a Greek mathematician, scientist, and philosopher who lived in Italy, designed a small flying dove. It flew by means of a whirling arm which provided lift.

6

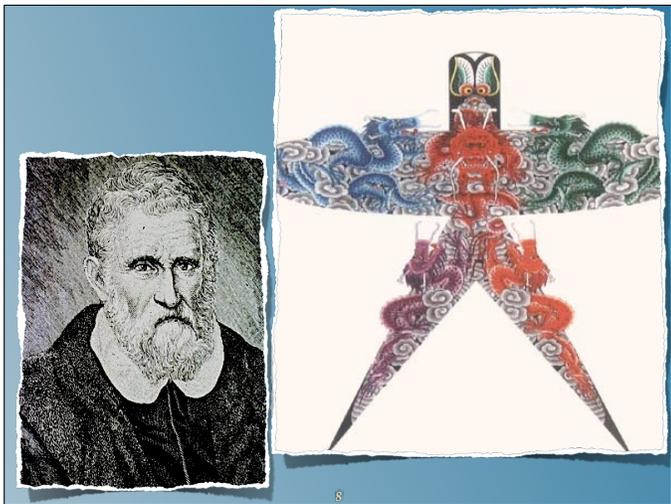


1010  
An English monk, Eilmer, jumped from Malmesbury Abbey equipped with flapping wings.



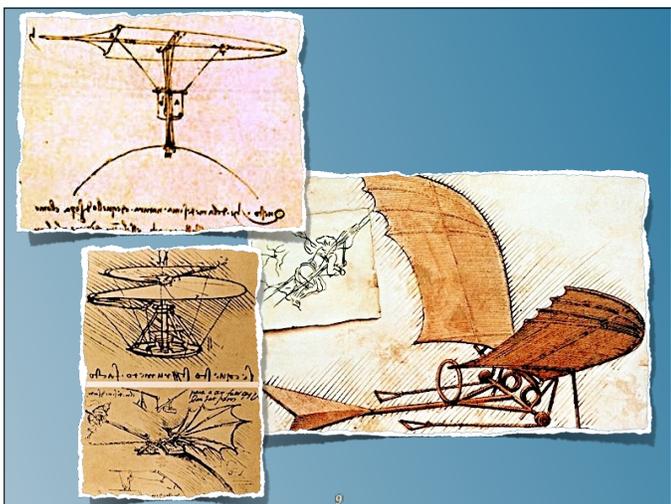
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1162. A man in Constantinople tried to fly from the top of a tower using sail-like wings made of pleated fabric.



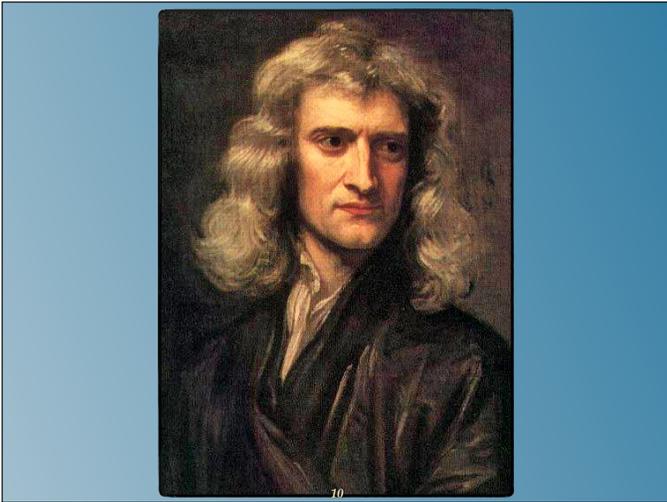
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1300 - Explorer Marco Polo reports human carrying kites in China.



9

1500. Artist Leonardo DaVinci of Italy sketches early designs for flying machines.



10

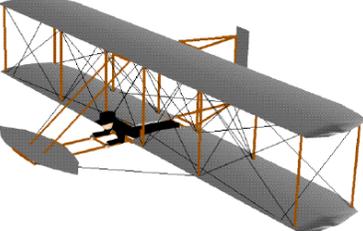
1687. A scientist named Isaac Newton came up with three Laws of Motion to describe how things move scientifically. This information was important to Orville and Wilbur Wright as they experimented with their flyer.



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### Newton's First Law

"Every object persists in its state of rest or uniform motion in a straight line unless it is compelled to change that state by forces impressed on it."



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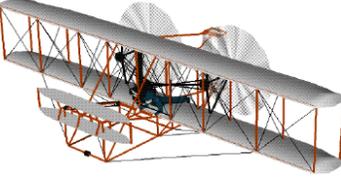
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1687 – Newton's First Law of Motion. Any object in motion will continue to move in the same direction and speed unless forces act on it.



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### Newton's Second Law Definitions



**Differential Form:** Force = change of momentum with change of time  $F = \frac{d(mv)}{dt}$

**With mass constant:** Force = mass X acceleration  $F = ma$

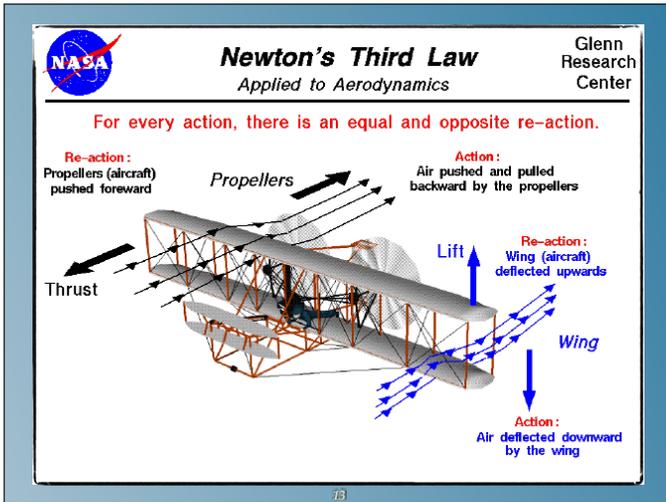
**or:** Force = mass X change in velocity with time  $F = \frac{m(V_1 - V_0)}{(t_1 - t_0)}$

Force, acceleration, momentum and velocity are all vector quantities. Each has both a magnitude and a direction.

12

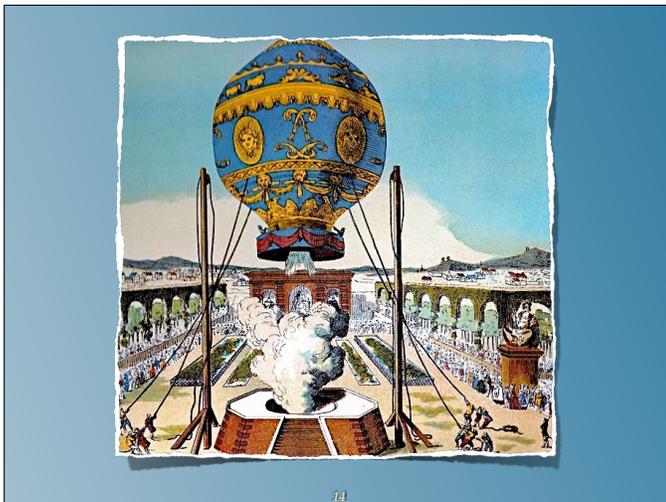
12

1687 – Newton's Second Law of Motion. The greater the mass of an object, the more force it will take to accelerate the object. There is even an equation that says Force = mass multiplied by acceleration or,  $F=ma$ .



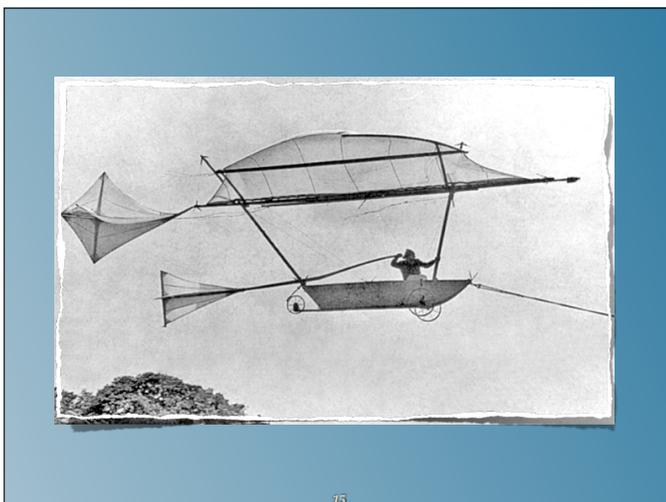
13

1687 – Newton’s Third Law of Motion. For every action, there is an equal and opposite reaction. This means that there are always two forces that are the same.



14

1783. First recorded human flight in a hot-air balloon invented by French brothers, Joseph and Etienne Montgolfier.



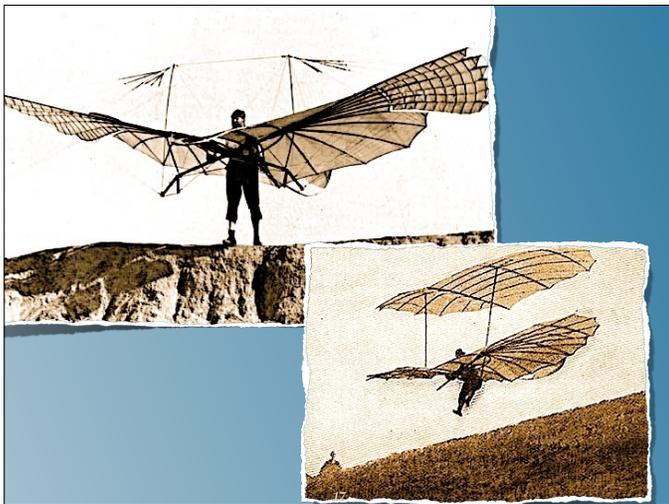
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1804 – Englishman Sir George Cayley invents and flies the first heavier-than-air-craft, a model glider.



16

1852 – Henri Giffard of France invents and flies the first dirigible powered by steam.



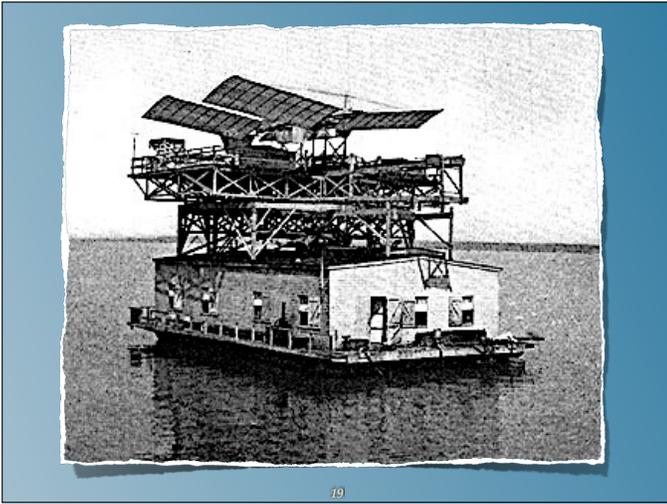
17

1891. Otto Lilienthal, a German engineer, famous for his experiments with gliders made over 2000 glider flights.



18

1891. German Otto Lilienthal becomes the first person to pilot glides and begins a series of glider test flights. In 1896, Lilienthal dies after a glider crash.



19

1896. American Samuel P. Langley launches a large unmanned powered flying machine driven by steam called an Aerodrome.

WRIGHT & WRIGHT,  
 ✧ JOB ✧ PRINTERS ✧  
 Cor. Third & Williams.

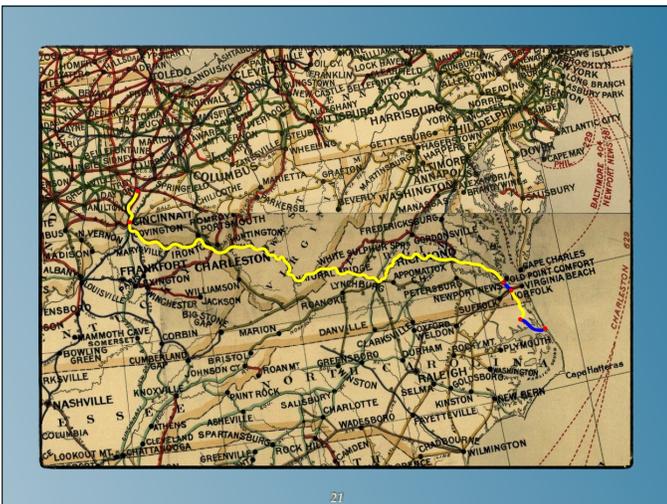
I know why the caged bird sings, ah me,  
 When his wing is bruised and his bosom  
 sore,- When he beats his bars and would be  
 free; It is not a carol of joy or glee, But a  
 prayer that he sends from his heart's deep  
 core, But a plea, that upward to Heaven he  
 flings- I know why the caged bird sings!

— Paul Laurence Dunbar —

AZ QUOTES

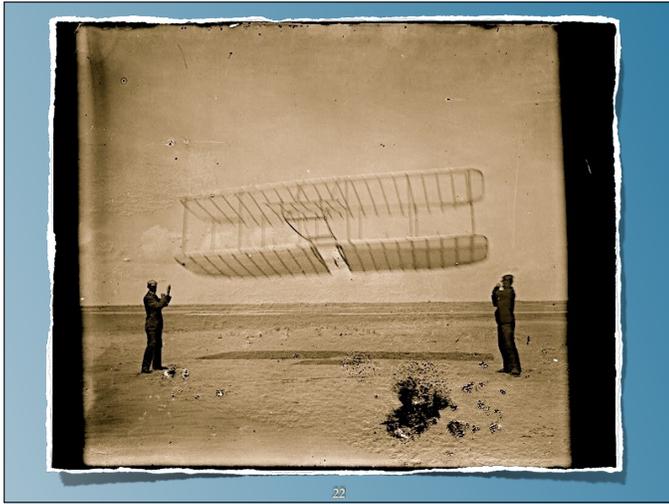
20

1890. Before flying, the Wright Brothers started their own printing shop. It was there that the Wrights printed a short-lived newspaper for the local African American community, the Dayton Tattler, edited by Paul Laurence Dunbar. Dunbar was a friend of the Wright Brothers.



21

1898. This Railroad map shows the Wright Brother's path from Dayton, Ohio to Kitty Hawk, NC. Yellow indicates travel by railroad, Blue indicates travel by ship.



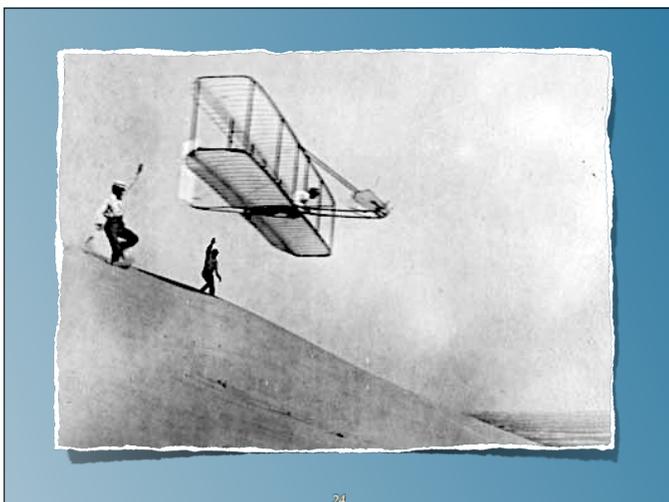
22

1900 - The Wright brothers begin testing gliders at Kitty Hawk, North Carolina.



23

1900 - The Wright brothers begin testing gliders at Kitty Hawk, North Carolina. The brothers picked Kitty Hawk because they believed its windy weather suited their experiments.



24

1902. Wright Brothers testing their glider.



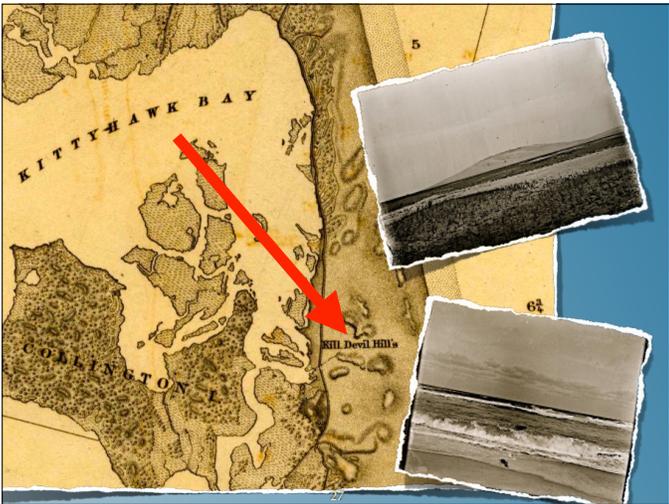
25

1903. The lifeguards who helped Orville and Wilbur roll their gliders and powered planes up the sand dunes at Kill Devil Hills, North Carolina. It was Orville's turn in the cradle on December 17, 1903. Later that day, Wilbur had his turn and flew over 852 feet over the course of 59 seconds.



26

1903. The Wright Brothers are airborne.



27

1900. Map of Kitty Hawk, North Carolina and the nearby Kill Devil Hills, where Orville and Wilbur Wright made the first powered flight in 1903.



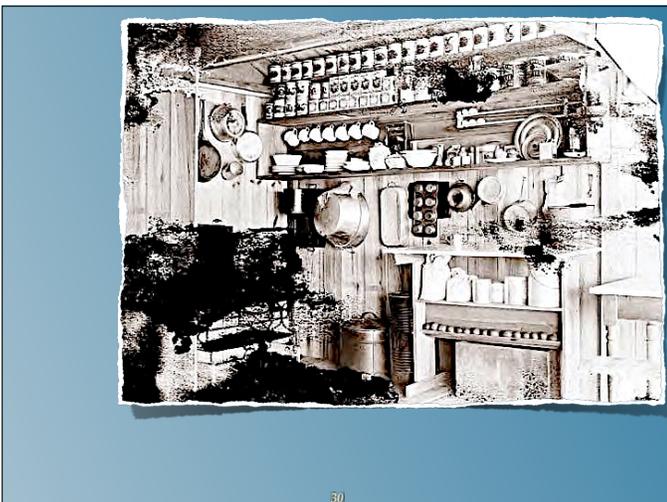
28

1903. The wind-swept sand dunes of Kill Devil Hills were over one-hundred feet high. Survival on the Outer Banks wasn't easy. They survived primarily on a diet of tomatoes, local eggs and hot biscuits made without milk. Orville once stated the only things that thrived in the Outer Banks were bed bugs, mosquitos and wood ticks.



29

1903. The shed built by the Wright Brothers for their stay in Kitty Hawk, NC.



30

1903. The kitchen in the Wright Brothers' shed at Kitty Hawk.

31



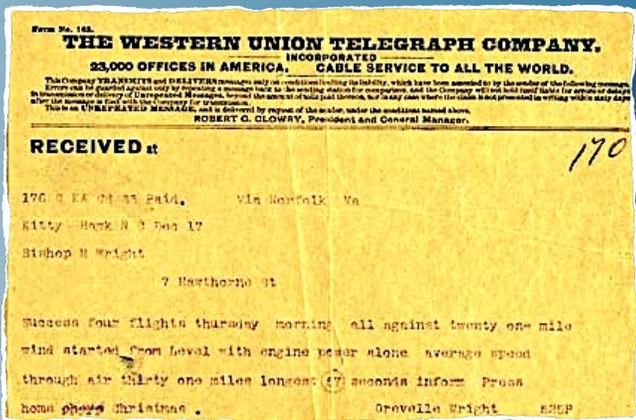
1903. Wilbur won a coin toss to be the first to fly their motorized plane, but he pulled too hard on the controls and the craft crashed after only 100 feet, when a wing came too close to the ground.

32

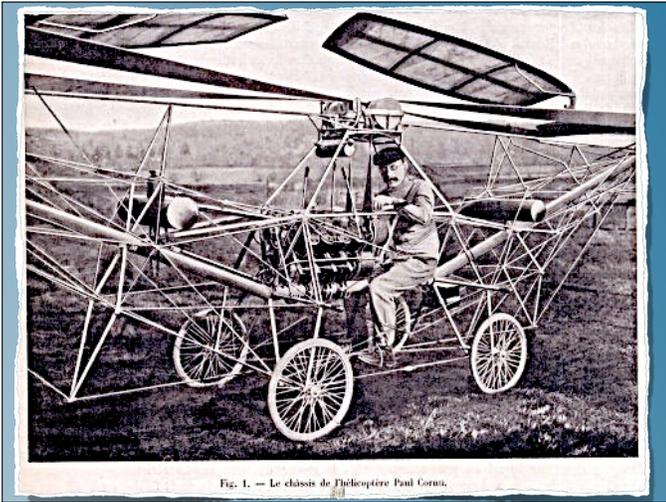


1903. The Wright Brothers First Flight at Kitty Hawk, North Carolina. "He is airborne!"

33

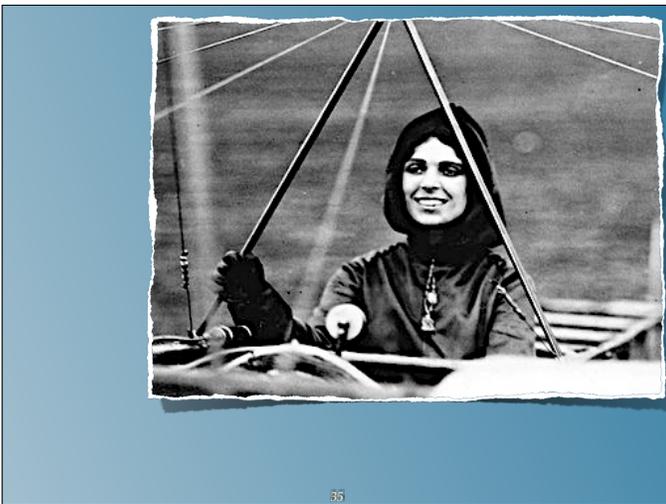


1903. This telegram from Orville Wright to his father, Bishop M. Wright, proclaims the success of the first flight, and promises the brothers will be home by Christmas. The telegraph officer spelled Orville's name incorrectly.



34

1907 – Paul Cornu of France makes the first flight in a helicopter, hovering over 5 feet for 20 seconds.



35

1911. Aviatrix Harriet Quimby becomes the first American woman to receive a pilot's license. In her trademark purple flight suit, she is the first woman to fly across the English Channel. In 1912 she is killed in a flying accident.



36

1915. The first fighter airplane appears for World War One in Germany.



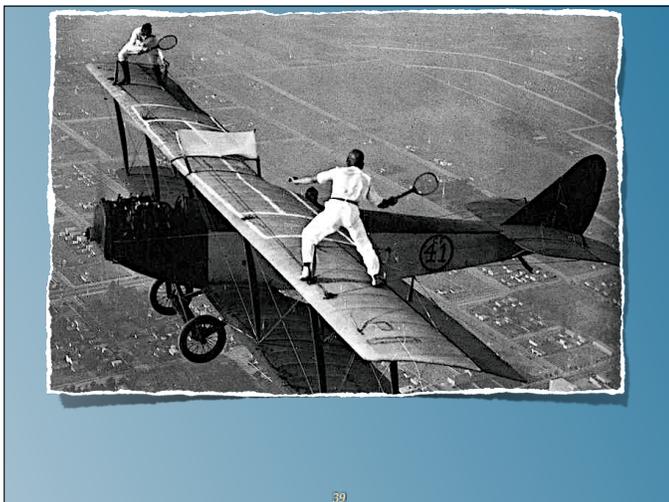
37

1917. William E. Boeing converted this 1909 boathouse for use as offices and production headquarters of the fledgling Boeing Airplane Company in Seattle, Washington.



38

1918. The United States officially establishes air mail service with flights between New York City, Philadelphia and Washington, D.C. The pilot on the first air mail route actually flew in the wrong direction, crash landing in Maryland instead of Philadelphia. Ironically, the first U.S. airmail pouch had to be delivered by train.



39

1920. Stunt performers begin barnstorming the skies on Curtiss JN-4 "Jenny" biplanes.

40

1921. Farmers discover the practical use of the airplane to dust crops from above with pesticides and fertilizer.



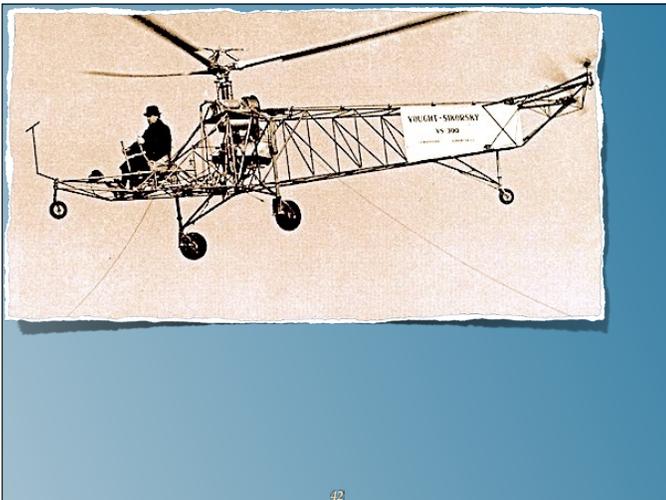
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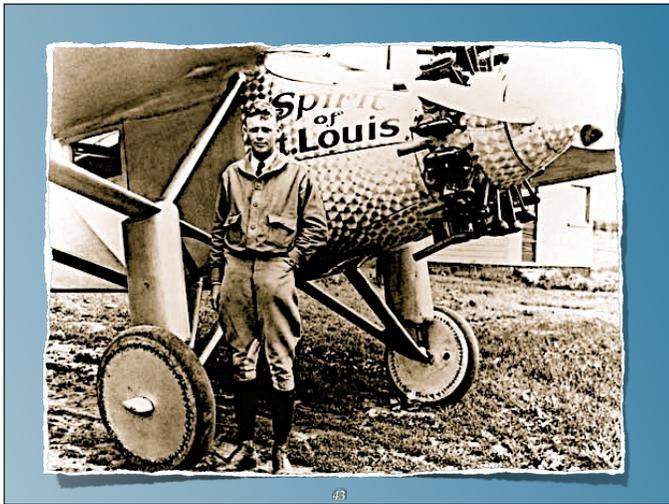
1921. Bessie Coleman is the first African American to receive her pilot's license. She is denied access to flight school in America, so she becomes fluent in French and learns to fly in France.



42

1925. Igor Sikorsky begins to manufacture helicopters for civilian and military use.





43

1927. Charles Lindbergh flies the Spirit of St. Louis solo from New York to Paris.



44

1932. Amelia Earhart is the first woman to fly solo across the Atlantic Ocean. In 1937 while attempting to fly around the world in a Lockheed Vega, Amelia, her navigator, Fred Noonan, and her plane disappeared near Howland Island. Her body was never found.



45

1935. The Douglas DC-3 passenger airline is introduced in the United States.



46

1937. The Hindenburg explodes in Lakehurst, New Jersey with 97 people on board . The airship tragedy decreased public confidence in this form of transportation.



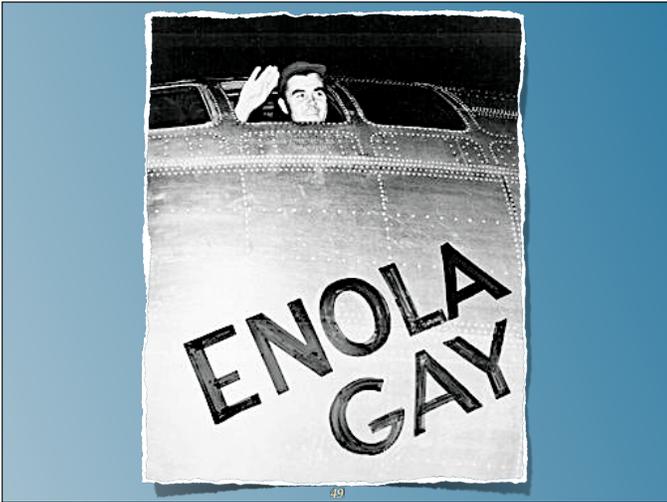
47

1943. The WASP's, or Women's Air Service Patrol, is formed to assist in the ferrying of airplanes during World War II.



48

1944. The Tuskegee Airmen, the first African-American military aviators, fly escorts for bombers in World War II.



49

1945. The Enola Gay, a Boeing B-29 Superfortress bomber, drops the atomic bomb on Hiroshima, Japan, ending World War II. “No, I don’t have any regrets about my part in the invention of the airplane, though no one could deplore more than I the destruction it has caused.” —Orville Wright



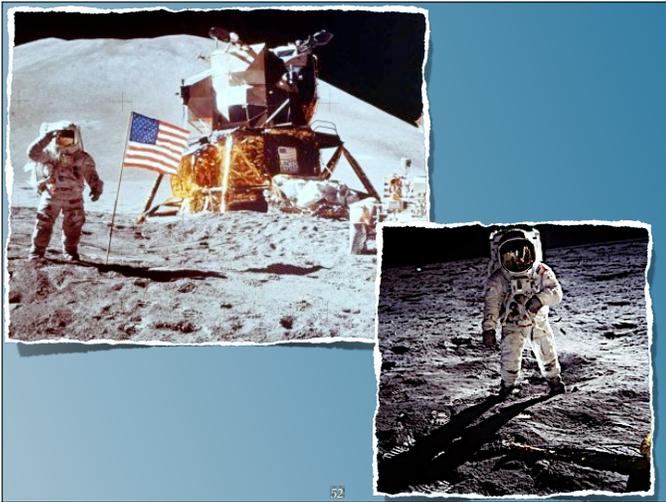
50

1947 - United States pilot, Chuck Yeager breaks the sound barrier in a rocket-powered aircraft.



51

1961. Alan Shepard is the first American in Space in the Mercury Freedom Seven.



52

1969. U.S. Astronaut Neil Armstrong is the first person to set foot on the moon. Buzz Aldrin follows.



53

1976 - The Concorde, a super-sonic passenger airliner, designed to transport passengers at speeds greater than the speed of sound, makes its first commercial flight.



54

1976. Lockheed SR-71 Blackbird, developed by the "Skunk Works" division, is a reconnaissance aircraft. It can outfly a missile.



55

1983 – Astronaut Sally Ride becomes the first American woman in space on the piloted spacecraft shuttle, Challenger.



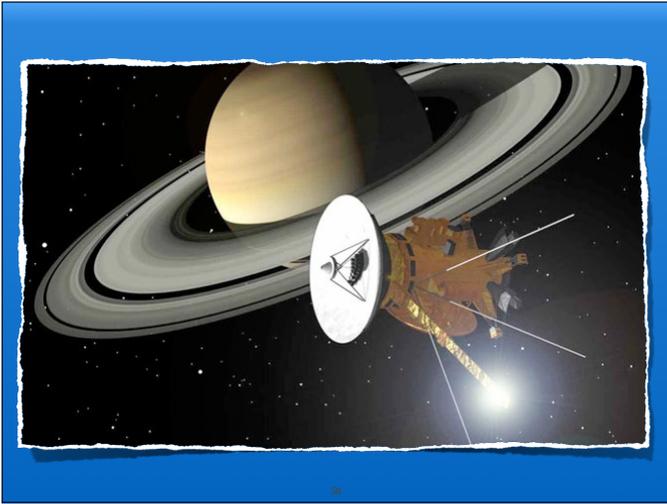
56

1986. After several successful flights, the Space Shuttle Challenger explodes seconds after its launch in 1986. The entire crew is lost including the first teacher in space, Christa McAuliffe.



57

1995. The Boeing 777 begins commercial service with United Airlines. The medium-size twin-jet can accommodate 440 passengers. It is Boeing's first entirely new plane in more than a decade.



58

1997. The United States launches the spacecraft Cassini. It reached Saturn on January 14th, 2005



59

September 11, 2001. Hijacked jets destroy the Twin Towers of the World Trade Center in NY and hit the Pentagon in a day of terror. 2997 people die in one of the worst terrorist attacks in the United States.



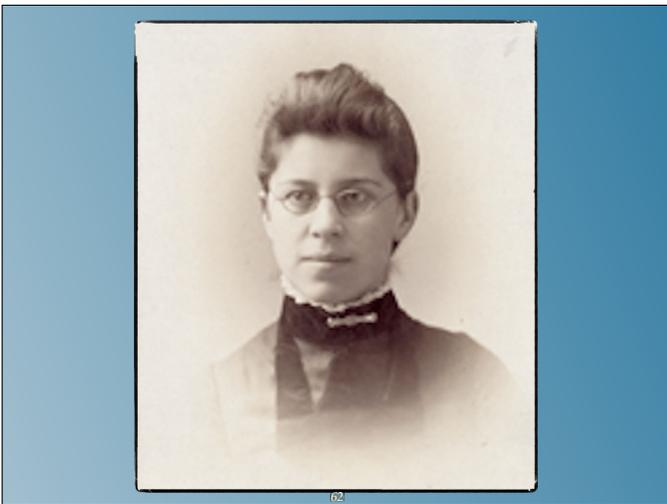
60

2003. The space shuttle Columbia breaks apart over Texas, sixteen minutes before it was supposed to land in Florida.



61

2003. A celebration in honor of the Wright Brothers' achievements and the 100th anniversary of powered flight. "In commemoration of the conquest of the air by the brothers Wilbur and Orville Wright. Conceived by genius, achieved by dauntless resolution and unconquerable faith."

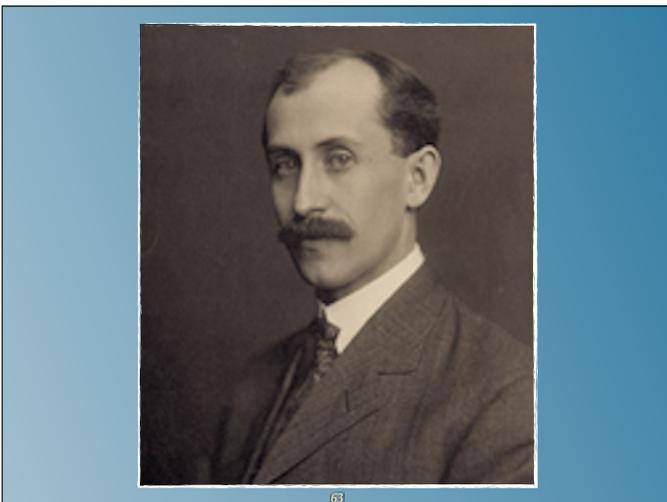


62

Katharine Wright excelled in high school and graduated from Oberlin College in 1898, the only Wright child to complete a full college course. She settled into a career as a teacher at a Dayton high school.

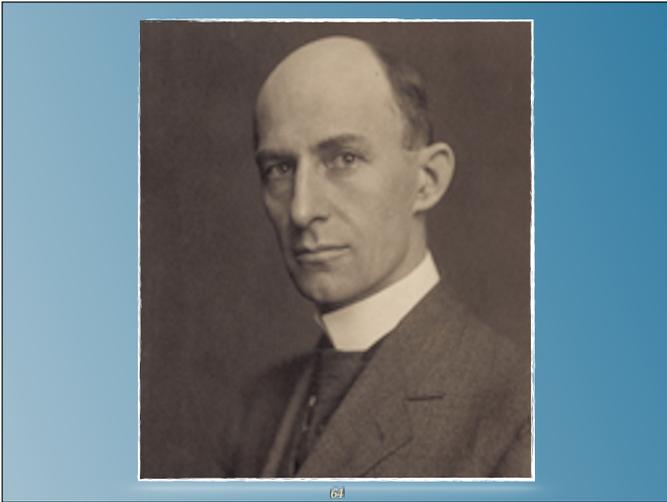
"No family ever had a happier childhood than ours. I was always in a hurry to get home after I had been away half a day."

—Katharine Wright



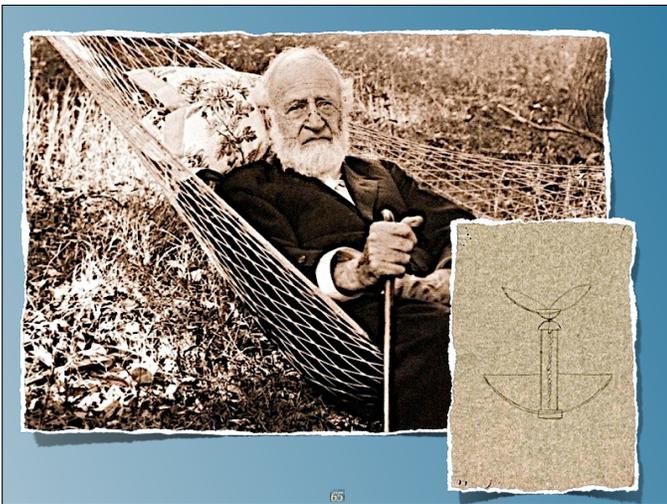
63

"I got more thrill out of flying before I had ever been in the air at all — while lying in bed thinking about how exciting it would be to fly." — Orville Wright



64

“It is possible to fly without motors, but not without knowledge and skill.”  
—Wilbur Wright.



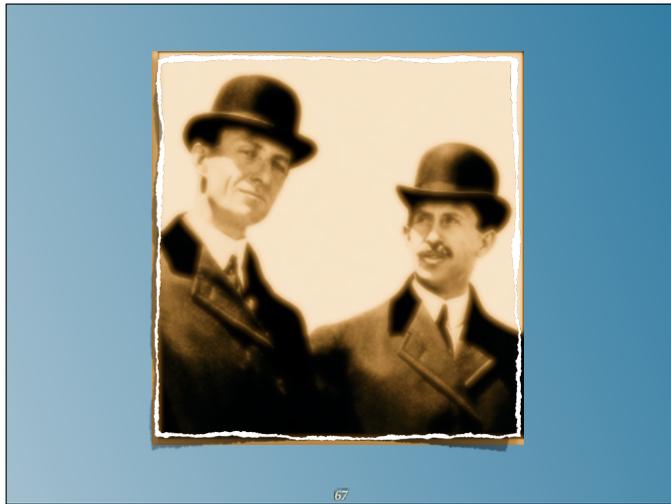
65

Bishop Milton Wright. The father of Orville, Wilbur and Kathryn Wright. He inspired the children’s curiosity by bringing home a wooden toy that could fly — powered by a rubber band.



66

The home of the Wright Brothers in Dayton, Ohio. Their mother, Susan Wright encouraged the children. “We were lucky enough to grow up in an environment where there was always much encouragement to children to pursue intellectual interests; to investigate whatever aroused curiosity. In a different kind of environment, our curiosity might have been nipped long before it could have borne fruit.” -- Orville Wright



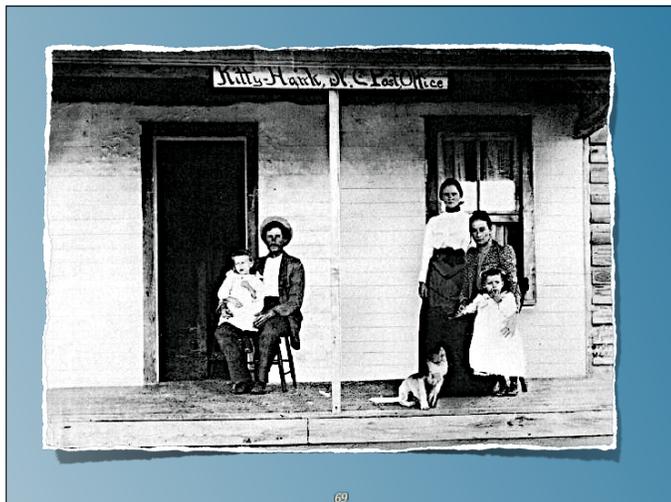
67

1903. Wilbur and Orville Wright at Kitty Hawk, NC.



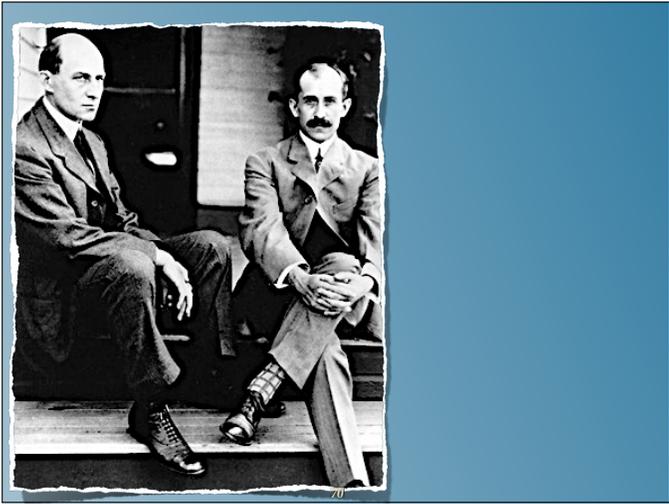
68

1893. The Wright Cycle Company in Dayton, Ohio. The Wrights used the profits from the Wright Cycle Company to finance their aviation experiments.



69

1903. The Tate Family and the Post Office in Kitty Hawk, North Carolina. Bill Tate was the local postman who helped the Wright Brothers learn their way around the area.



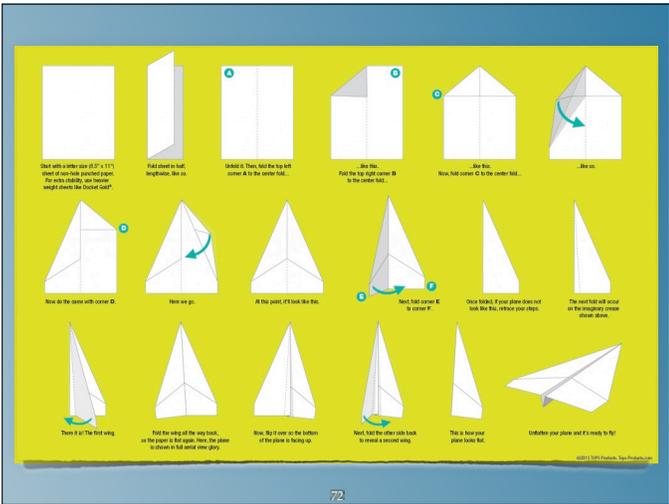
70

1909. The Wright Brothers after achieving success as pioneers.



71

“The desire to fly is an idea handed down to us by our ancestors who... looked enviously on the birds soaring freely through space... on the infinite highway of the air.” —Wilbur Wright

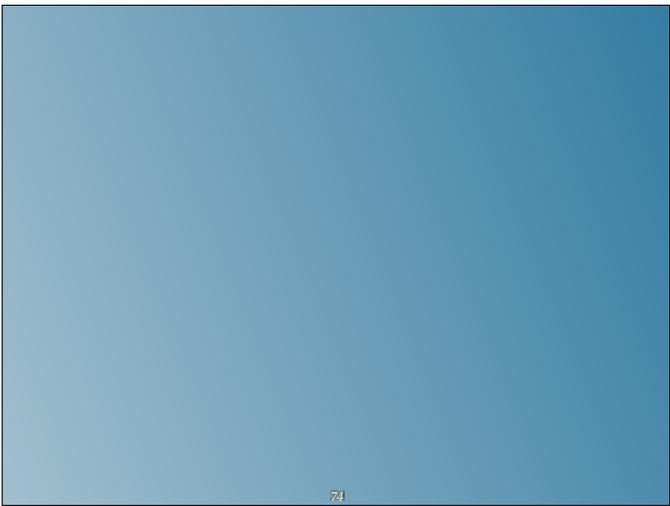


72

Have you ever made a paper airplane? Using a stop watch, keep track of how long each plane stays in the air before landing. Set up various targets and try to land your plane precisely.



73



74

