Airplanes

Grade 2: Use the keynote to supplement the social studies book *The Wright Brothers* by Robyn O’Sullivan
The first flyers

In 1903, an airplane called “Flyer 1” took off from a field in North Carolina. It flew for only 12 seconds and covered only 37 m (121 ft). But it was the first powered flight. “Flyer 1” was built by two brothers, Orville and Wilbur Wright. It was made of wood, wire and canvas.
In the late 1800s, Orville and Wilbur Wright studied Lilienthal’s theories. Then, they began inventing and testing heavier-than-air powered aircraft. The Wright brothers used a gasoline engine in their flying machine.

The first flight was on December 17, 1903. The airplane traveled 120 feet (37 m). This long-awaited first flight lasted 12 seconds. By the final flight of this historic day, the craft flew 852 feet (260 m) in just under one minute.

After this success, the science of flight advanced quickly. By the 1920s, airplanes could fly much farther. In 1927, Charles A. Lindbergh flew the Spirit of St. Louis nonstop from an airfield near New York City, New York, to one near Paris, France. It was the world’s first solo flight across the Atlantic Ocean.
**Everyday Inventions: Airplanes**

*by* Kristin Petrie

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<th>Year</th>
<th>Event</th>
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<tr>
<td>1783</td>
<td>Joseph-Michel and Jacques-Étienne Montgolfier's hot air balloon took flight with human passengers.</td>
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<td>1853</td>
<td>Sir George Cayley invented the first glider that could carry a person.</td>
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<td>1903</td>
<td>On December 17, Wilbur and Orville Wright flew the first heavier-than-air powered aircraft.</td>
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<td>1927</td>
<td>Charles A. Lindbergh flew the first solo, nonstop flight from New York to France.</td>
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<td>1932</td>
<td>Amelia Earhart became the first woman to fly solo across the Atlantic Ocean.</td>
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<td>1957</td>
<td>By this year, more people were crossing the Atlantic Ocean by airplane than by ship.</td>
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<td>1986</td>
<td>Dick Rutan and Jeana Yeager became the first people to fly around the world without stopping or refueling.</td>
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**Fun Facts**
Inventors had been trying to make flying machines from as early as 400 B.C. Greek legends claim the Greek scholar Archytas built a wooden pigeon that moved through the air with steam. Since then, flying machines have come a long way.

**Flying Around**

In 1903, Orville and Wilbur Wright designed the first successful airplane. Their first flight in North Carolina lasted twelve seconds.

**Over the Sea**

In 1927, U.S. aviator Charles Lindbergh piloted the first nonstop solo flight across the Atlantic Ocean. He flew from New York to Paris in 33.5 hours.
Brilliant Boeings
In 1969, Boeing built the first 747 jet (far left) in Washington State. At the time, the 747 was the largest passenger airplane in the world. People called it the “Jumbo Jet.” The first 747 could carry more than four hundred people and could fly 640 miles (1,030 km) per hour. Many airplanes today are modeled after the 747 jet.

Concorde
In 1976, France’s Concorde was the world’s first airplane to fly passengers faster than the speed of sound. The supersonic Concordes were used until 2003, when they were taken out of service.

Fun Facts

1903
The Wright brothers fly the first airplane.

1909
France’s Louis Blériot is the first to fly across the English Channel.

1927
Charles Lindbergh flies across the Atlantic Ocean.

1928
U.S. aviator Amelia Earhart is the first woman to fly across the Atlantic.

1939
German Hans von Ohain’s Heinkel He 178 is the first jet engine to fly.

1960
Hawker P1127, in England, makes the first vertical takeoffs and landings.

2005
The Airbus A380 becomes the largest airplane in the world. It can carry more than 550 passengers.
Ever since people first saw birds in the sky, humans have had a desire to fly. For almost 3,000 years, people experimented with different types of flying machines, and with the exception of kites, they all had the same result: crash! It’s no wonder that when Orville and Wilbur Wright rolled their Wright Flyer onto the beach at Kitty Hawk, North Carolina, on that cold December morning in 1903, they did it in secret. Like dozens of inventors before them, they expected the worst, but they were in for a great surprise. Their device stayed aloft, and the airplane was born. While the first flight of the Wright brothers is often considered the beginning of aviation, it really marks the end of many years of inventors’ struggles to take wing.

**IMPACT**
Within a few short years, airplanes had become a crucial part of society. First, they were used to deliver the mail, and later, for military purposes. Today’s airplanes move millions of people each year, making the world a much smaller place.
Airplane Facts

- The Concorde is a supersonic airplane. It travels at about 1,450 miles (2,330 kilometers) per hour. This speed is more than twice the speed of sound. The Concorde can cross the Atlantic Ocean in less than three hours.

- Most jet airplanes travel at 600 miles (966 kilometers) per hour.

- In 1927, Charles Lindbergh became the first person to fly alone across the Atlantic Ocean. His flight from New York City to Paris, France, took 33.5 hours.

- A Boeing 747 passenger airplane has about 4.5 million parts.

- Pilots fly most airplanes above the clouds. Flights are usually smooth because airplanes fly above the weather.
The Wright brothers gave us a tool, but it was up to individuals and nations to put it to use, and use it we have. The airplane revolutionized both peace and war. It brought families together: once, when a child or other close relatives left the old country for America, family and friends mourned for someone they would never see again. Today, the grandchild of that immigrant can return again and again across a vast ocean in just half a turn of the clock. But the airplane also helped tear families apart, by making international warfare an effortless reality.

“How Has the World Changed?”
http://www.time.com
Insects, birds, and bats fly by moving wings up and down. In the 1400s, Leonardo da Vinci sketched machines that would flap birdlike wings, but he did not try to build them. Later, people learned that machines with flapping wings are difficult to power and control.

In the early 1800s, George Cayley developed an easier way to fly. Cayley studied bird wings and recognized that their curved upper surfaces lift the bird as air flows over them. Cayley first built a small kite to test his idea. By 1808, he had invented the glider, essentially an airplane without an engine. In 1853, one of Cayley's gliders became the first heavier-than-air craft to lift a human for a sustained flight. In the 1890s, several efforts to use a steam engine to turn a propeller and lift a glider failed, partly because steam engines are heavy and partly because of the difficulty of controlling flight.

In 1903 the Wright brothers combined a lightweight gasoline engine with controls that enabled the craft to safely fly level and also turn at the pilot's order. Their flight on December 17, 1903, is considered the birthday of the airplane, although the first sustained flights took place five years later.
The Wrights created one of the greatest cultural forces since the development of writing, for their invention effectively became the World Wide Web of that era, bringing people, languages, ideas and values together.

It also ushered in an age of globalization, as the world's flight paths became the superhighways of an emerging international economy. Those superhighways of the sky not only revolutionized international business; they also opened up isolated economies, carried the cause of democracy around the world and broke down every kind of political barrier. And they set travelers on a path that would eventually lead beyond Earth's atmosphere.

“How Has the World Changed?”
http://www.time.com
Click on this site for a dramatic re-creation of the Wright Brothers' historic first flights. You can also explore the Kitty Hawk Shed. You can explore the 1903 Flyer in 3D.

http://kids.discovery.com/convergence/wright/wright.html

Click on the site below to see the letter the Wrights wrote to the Smithsonian Institute when they needed more research information. Check out the other great photos, too.

(The Wright Brothers were good researchers, just like you!)

http://www.centennialofflight.gov/essay/Wright_Bros/1900_Gliding/WR2.htm

"Wright Brothers First Flight"

http://www.kids.discovery.com
The airplane has had a greater impact on our lives than any other modern invention. The ability to fly has dramatically increased the speed at which we can travel and decreased the time it takes to receive mail, food, and other goods from far-off places. It has brought us into closer contact with people in other parts of the world, and it has drastically changed the way we wage war.

Yet, until the beginning of the 20th century, the idea of a practical flying machine was only a dream. Balloons and gliders had been flown before 1900, but they were unreliable and could not carry a person over a long distance and land at a chosen destination. It was not until Orville and Wilbur Wright invented and successfully flew the first powered, controllable aircraft that the dream of flight became a reality. On December 17, 1903, the Wrights' plane, the Flyer, took off at Kitty Hawk, North Carolina, and flew 120 feet (37 meters).

The airplane has changed greatly since 1903. The wingspan of a modern jumbo jet is longer than the entire distance flown on the Wright brothers' first flight. That flight lasted only 12 seconds; in 1986 a plane named Voyager was flown around the world in nine days without stopping or refueling. Airplanes have been flown at more than 4,500 miles (7,300 kilometers) per hour and to altitudes of almost 70 miles (110 kilometers) above the earth. But no matter how fast, high, or far airplanes fly, they are still subject to the same basic principles of flight as the Wright Flyer.
The term airplane, which is often shortened to plane, usually refers to any type of power-driven aircraft that has fixed wings and is heavier than air. An airplane propels itself through the air and supports itself with its wings. The wings are shaped in a particular way so that air travels over them and gives them lift. By contrast, balloons and airships are lifted by gases that are lighter than air, helicopters are lifted by spinning rotors, and gliders have wings but are not powered.
History

Many ancient civilizations told stories of gods, humans, and even horses that could fly. The Greek myth of Daedalus is about an inventor who builds wings made of feathers and wax. His son Icarus is killed when he flies too close to the sun, causing the wings to melt. The ancient Chinese invented the kite, and early Australians created the boomerang—a throwing stick that sails in the air. But human flight remained a dream.

In 1250 an English scientist named Roger Bacon proposed a vehicle that would use flapping wings to fly. Such an aircraft is now referred to as an ornithopter, meaning “bird-winged aircraft.” In 1490 the great Renaissance artist and scientist Leonardo da Vinci drew sketches of various types of flying machines, including Bacon’s ornithopter and a machine resembling a modern helicopter. Suitable power sources and materials did not exist in Leonardo’s time, however, and his machine never flew.

Before humans took to the air in airplanes, they flew in lighter-than-air craft. In 1783 two French brothers, Joseph-Michel and Jacques-Étienne Montgolfier, filled a paper balloon with hot air and saw it rise to a height of 6,000 feet (1,800 meters). Their first passengers were a rooster, a duck, and a sheep, but later that year they sent two people aloft.

The 19th century saw much experimentation in both lighter-than-air and heavier-than-air craft. Work with gliders, which are heavier than air, established principles of airplane design. Otto Lilienthal of Germany made more than 2,000 glider flights. Octave Chanute of the United States built several gliders and wrote extensively on flight. Another U.S. inventor, Samuel P. Langley, experimented with aircraft powered by steam and gasoline and achieved powered flight in 1896.