Flight 2014:

Celebrating **100 years** of commercial aviation

St. Petersburg - Tampa Airboat Line, 1914

Tampa Bay Times NIE newspaper in education tampabay.com/nie

St. Petersburg - Tampa Airboat Line 1914 - 2014 Centennial Celebration World's First Airline

ATAG Air Transport Action Group

Florida Aviation Historical Society

Tony Jannus Distinguished Aviation Society

St. Petersburg Museum of History Where Yesterdays Come Alive Everyday

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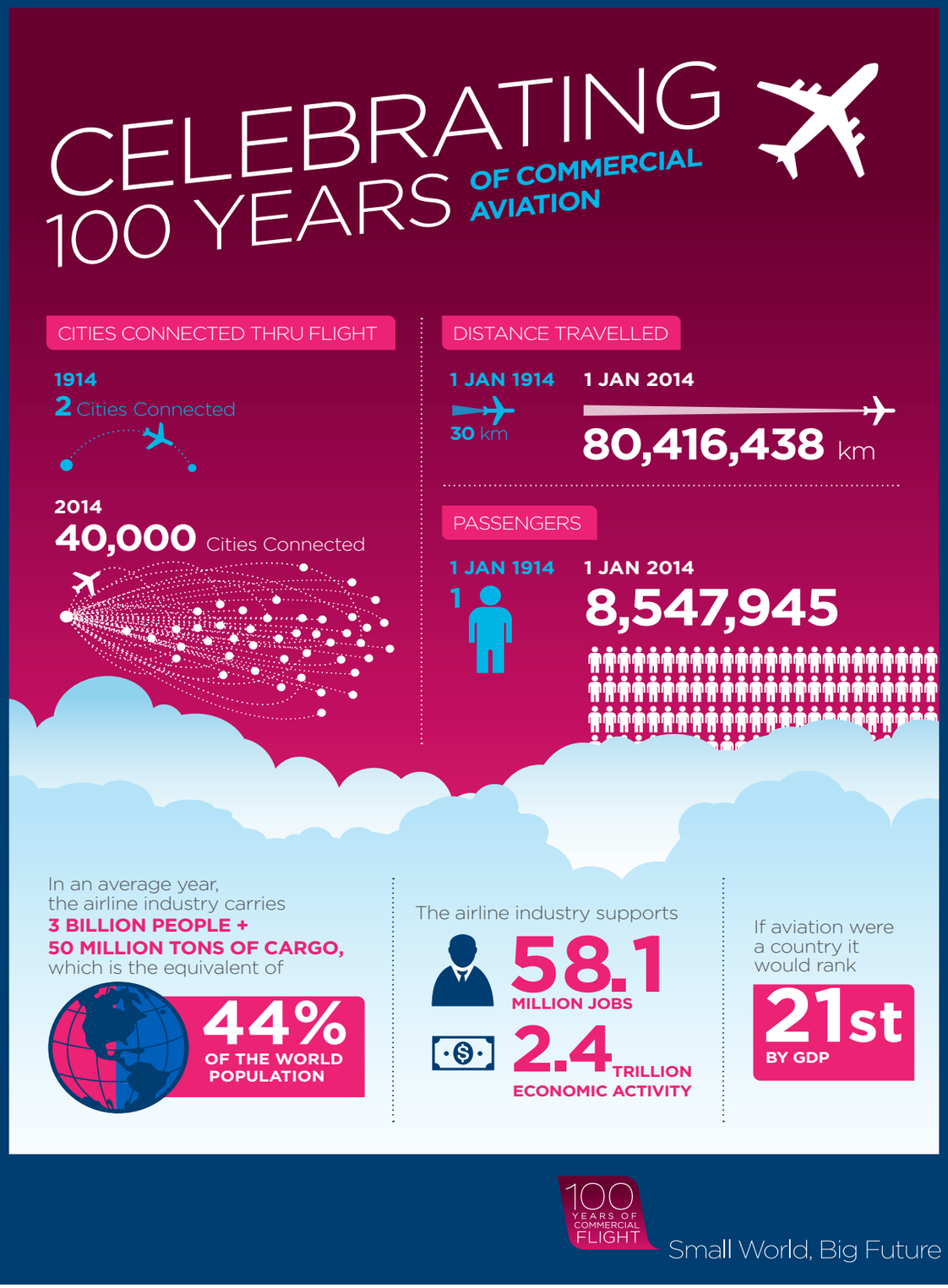
Florida Standards

The Florida Department of Education defines that the Florida Standards provide a robust set of goals for every grade. Emphasizing analytical thinking rather than rote memorization, the Florida Standards will prepare students for success in college, career and life.



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The world's first airline

On Jan. 1, 1914, a small biplane piloted by aviation pioneer Tony Jannus lifted from the water in downtown St. Petersburg, Fla., with one paying passenger. Twenty-three minutes later, the plane landed in Tampa, Fla., launching the world's first regularly scheduled commercial airline flight and flying into the annals of aviation history.

Just 10 years after the Wright brothers' first flight, the St. Petersburg-Tampa Airboat Line operated two scheduled round-trips daily across Tampa Bay, with two bi-wing seaplanes called Benoist airboats. Regular one-way fare was $5. With average airspeeds of 60 miles per hour, flight time between the bay cities was a fraction of the time required for the trip by car, rail or boat.

TONY JANUS WILL MAKE FIRST FLIGHT THURSDAY

AIR BOAT SHOULD HAVE ARRIVED HERE LAST NIGHT, BUT IS EXPECTED TO BE HERE TODAY

Times *files*

The centennial of the world's first regularly scheduled commercial airline flight offers a unique opportunity to recognize the history and promote the future of aviation science and technology. The developer of the St. Petersburg-Tampa Airboat Line, Percival Fansler, noted in his speech before the first takeoff, "What was impossible yesterday is an accomplishment today, while tomorrow heralds the unbelievable."

Learning with the *Times*

Learning new words

When you study new things, you often come up against some tough vocabulary words, such as aviation, transportation and tourism. Most vocabulary words are learned from context clues or good old-fashioned dictionary work. While you read this publication, be sure to highlight or circle words you don't know. Try to figure out the words' meanings by looking for clues in the sentences around them. Write down your best guess, and then look the words up in a dictionary. As a group activity, make a list of the words your classmates identified and see which ones stumped the class. Next, use these words for a news scavenger hunt. See if you can find these words in the *Tampa Bay Times.* The group that finds the most words wins the game.

Air Transport Action Group

The Air Transport Action Group (ATAG) is an organization that brings together companies from across the aviation industry. Representing airlines, airports, air traffic management companies and the makers of aircraft and engines, the ATAG team works on making sure that air transport can grow in terms of passengers and aircraft, but in a sustainable way with environmental concerns being addressed. ATAG and its members were able to develop the world's first climate-change targets for any global sector.

Aviation provides a great number of benefits to the world economy and society. It is a tool for business and a way for people to connect with their families and friends and experience the world. ATAG works with the industry and governments to make sure that the industry can grow and continue to provide benefits to the world while also meeting its environmental obligations.

For more information, visit aviationbenefits.org or atag.org.

Flight 2014 Planning Board Inc.

The Flight 2014 Planning Board Inc. is an organization composed of representatives from the Florida Aviation Historical Society, the Tony Jannus Distinguished Aviation Society, the St. Petersburg Museum of History, and the cities of St. Petersburg and Tampa.

The board's vision is "to share the story of the birth of the world's first scheduled airline with the world and to make all aware that pioneer aviator Tony Jannus' inaugural flight of the 1914 St. Petersburg-Tampa Airboat Line represents the birth of the global airline industry."

More information about the Flight 2014 Planning Board can be found at airlinecentennial.org.

See page 16 for a listing of the Flight 2014 Planning Board.

Florida Aviation Historical Society

The Florida Aviation Historical Society (FAHS) is a nonprofit corporation dedicated to preserving Florida's aviation heritage and to promoting Florida aviation, aerospace and airports. FAHS is Florida's largest aviation historical society, with approximately 900 members in 26 states. More information about FAHS can be found at FloridaAHS.org.

Tony Jannus and Percival Fansler in front of the Benoist airboat, 1914. St. Petersburg Museum of History

St. Petersburg-Tampa Airboat Line, the world's first airline

"I am pleased to join all those celebrating the 100th anniversary of commercial flight.

"America has always been a nation that empowers visionaries and entrepreneurs. And for generations, daring men and women have pushed our boundaries and kept America on the cutting edge of innovation.

"One century ago, a pilot and a passenger aboard a small plane carried this tradition forward by successfully completing a flight on the world's first airline. This short trip from St. Petersburg to Tampa ignited an industry that changed the way we travel and helped lead to today's interconnected world.

"As we celebrate this remarkable achievement in the history of aviation and the life of our nation, let it inspire us to continue the important work of testing the limits of our times. While we cannot predict where innovation will take us, this milestone serves as a reminder that when bold ideas unite with a spirit of discovery, the sky is no limit."

— President Barack Obama, January 1, 2014

Visit the *Tampa Bay Times'* First Flight centennial commemorative page at tampabay.com/topics/specials/centennial-jannus-first-commercial-flight.page.

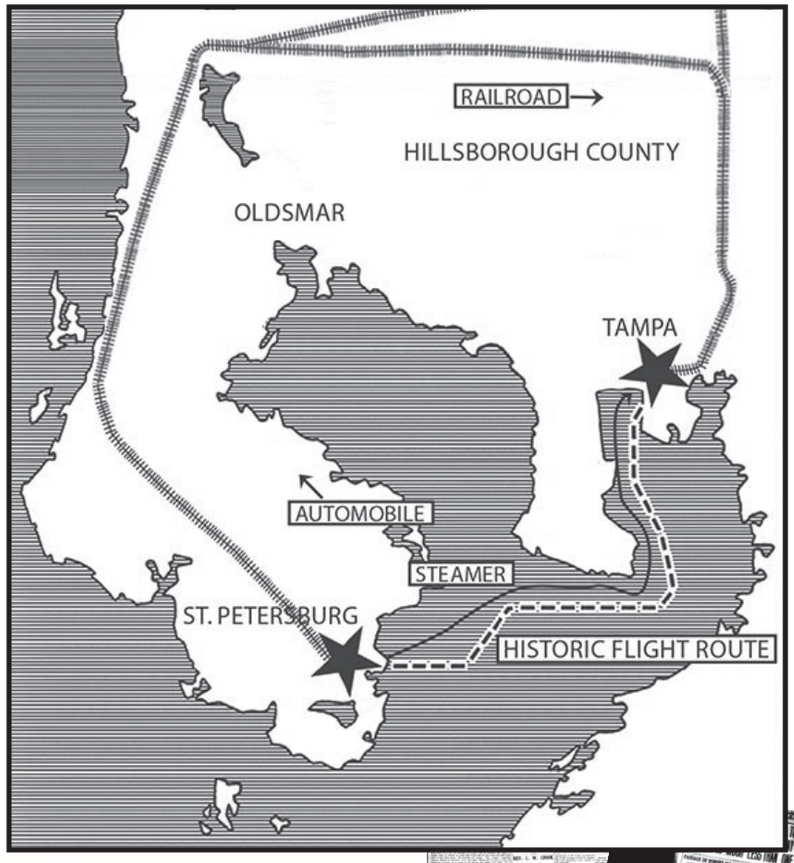
In the early 1900s, travel between St. Petersburg and Tampa was slow and difficult. With no bridges across Tampa Bay, both trains and automobiles had to travel north and around the bay – a five-to-12 hour trip by train and an all-day trip by car. Even the more direct route across the bay by steamboat took two hours.

Percival E. Fansler, a Jacksonville electrical engineer, had the idea of starting an airline between the two cities. He enlisted the support of airplane manufacturer Thomas Benoist, who agreed to supply the airboats and pilots and to operate the airline on a break-even basis, and the St. Petersburg city government, which built a hangar for the airboat on the municipal pier. Fansler also recruited investors from the city's business community to help subsidize the airline's cost.

St. Petersburg-Tampa Airboat Line and Benoist School of Aviation hangar, 1914.
St. Petersburg Museum of History

These early backers, some of the city's most notable citizens, included men whose names remain part of today's St. Petersburg, such as Noel Mitchell, C. Perry Snell and George Gandy.

The St. Petersburg-Tampa Airboat Line consisted of a fleet of two Benoist airboats, an early form of seaplane that could take off and land on water. This was a necessity, as St. Petersburg's first airport would not be built until 1926. Airboat No. 43 could carry one passenger in addition to the pilot. Airboat no. 45 could accommodate two passengers.



Cameron Cottrill, Times

At 10 a.m. on Jan. 1, 1914, history was made as pilot Tony Jannus and his first passenger, former St. Petersburg mayor Abram C. Pheil, who paid $400 in a charity auction for the privilege, lifted off from St. Petersburg and touched down on the Hillsborough River 23 minutes later. This short trip was the world's first scheduled airline flight and marked the dawn of commercial aviation.

For the next three months, the St. Petersburg-Tampa Airboat Line made at least two regularly scheduled round-trips between Tampa and St. Petersburg each day, carrying both passengers and cargo, including bundles of the *St. Petersburg Daily Times*. The cost to fly one passenger or 100 pounds of freight was $5 – more than $100 in today's currency. By the end of March 1914, the airboat line had carried 1,205 passengers and thousands of pounds of freight over Tampa Bay.

Above: Times *files*

Background photo: First flight of the St. Petersburg-Tampa Airboat Line, 1914.
St. Petersburg Museum of History

Financially, the St. Petersburg-Tampa Airboat Line came close to breaking even. Its last flight was on May 5, 1914. Scheduled commercial passenger service would not resume in the United States until 1919.

Sources: Will Michaels, *The Making of St. Petersburg*; Bob Bluffield, "St. Petersburg-Tampa Airboat Line: World's First Scheduled Airline" in *Airways: A Global Review of Commercial Flight*, June 2010

In 2010, the American Institute of Aeronautics and Astronautics designated St. Petersburg's Central Yacht Basin as a Historic Aerospace Site in recognition of its history as the site of the world's first commercial airline flight.

Benoist taxiing on the water, 1914. St. Petersburg Museum of History

Thomas Benoist (1874 - 1917)

Born in Irondale, Mo. in 1874, Thomas Benoist was an airplane pilot, flight instructor, designer, marketer and manufacturer. In 1908, Benoist founded America's first aircraft parts distributorship. He soon expanded into designing, manufacturing and selling aircraft. He designed his first production-model airplane in 1911 and opened a flying school the same year. After the closing of the St. Petersburg-Tampa Airboat Line, Benoist moved his company from St. Louis to Chicago, and then, in 1916, to Sandusky, Ohio. Tom Benoist was inducted into the Florida Aviation Hall of Fame in 2012.

Tony Jannus (1889 – 1916)

Tony Jannus at the controls of the Benoist No. 43, 1914. St. Petersburg Museum of History

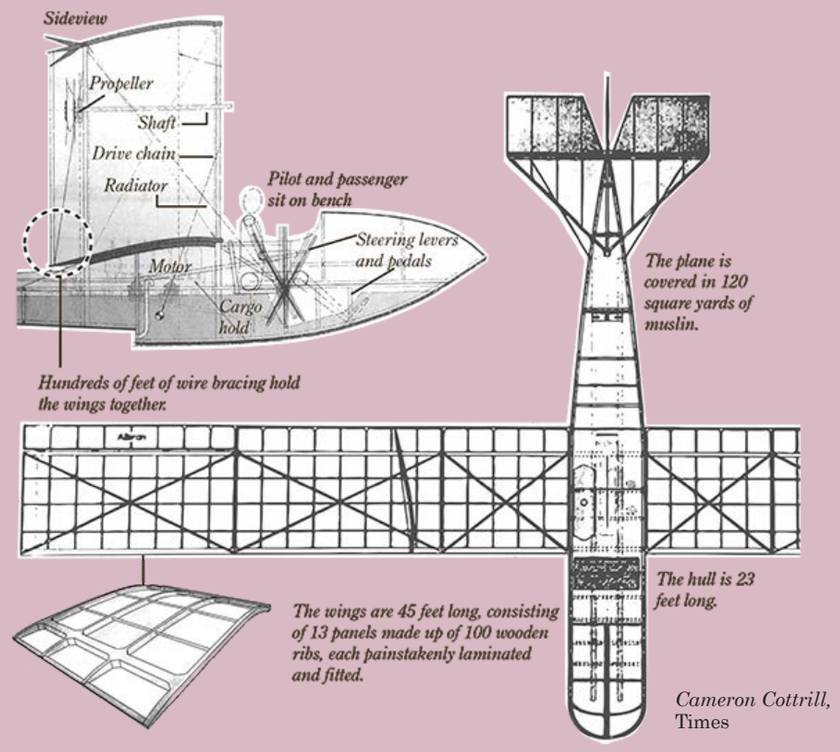
Anthony "Tony" Habersack Jannus was born in 1889 in Washington, D.C. Jannus taught himself to fly at the age of 21, and quickly became a skilled aviator. In 1911, he moved to St. Louis to serve as the chief pilot for the Benoist Aircraft Co.

On March 1, 1912, Jannus was the pilot for parachutist Albert Berry's world-first parachute jump from a moving airplane. Jannus' other aviation accomplishments include setting a record for over-water flight by flying a Benoist airboat 1,900 miles from Omaha, Neb., to New Orleans over the Missouri and Mississippi rivers. Jannus was only 24 years old when he made his historic flight across Tampa Bay.

In 1916, Jannus was killed in an accident while training Russian pilots for the Curtiss Aeroplane Co. during World War I.

In 2003, Jannus was inducted into the Florida Aviation Hall of Fame, and in 2006, his portrait was added to the First Flight Shrine at the Wright Brothers National Memorial. In 2010, he was designated a Great Floridian by the State of Florida.

Sources: First Flight Society; Will Michaels, *The Making of St. Petersburg*; Bob Bluffield, "St. Petersburg-Tampa Airboat Line: World's First Scheduled Airline" in *Airways: A Global Review of Commercial Flight,* June 2010



Cameron Cottrill, Times

Benoist airboat reproduction

In commemoration of the centennial of the first flight, aircraft designer Kermit Weeks built an exact, full-scale reproduction of the Benoist XIV airboat flown by Tony Jannus.

The entire aircraft was handcrafted by Weeks and his team. The six-cylinder, two-stroke engine was reverse-engineered from one of only six original Roberts engines left in the world and was built from scratch. Weeks planned to fly his reproduction aircraft across Tampa Bay on New Year's Day 2014, precisely 100 years after Tony Jannus' historic flight, but the aircraft wasn't ready.

Instead, Eddie Hoffman Jr. flew the flying boat *Mullet Skiff* across the bay to commemorate the occasion. The *Mullet Skiff* was built by Hoffman and his father Ed Hoffman Sr., who also built the Benoist airboat replica on display at the St. Petersburg Museum of History.

Sources: Fantasy of Flight, *Tampa Bay Times*

The Benoist airboat's engine weighs almost 300 pounds and is over 478 cubic inches, but it only produces 75 horsepower. A similarly sized modern engine can produce more than 500 horsepower.

See the details of Kermit Weeks' reconstruction of the Benoist Airboat at fantasyofflight.com/category/benoist-2014.

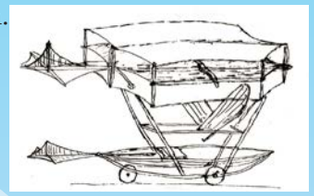
Learning with the *Times*
Breaking news

In the early 1900s, travel between St. Petersburg and Tampa was slow and difficult. But Percival E. Fansler, Thomas Benoist and Tony Jannus were about to change things in a big way. Put yourself in the role of a newspaper reporter who is going to break this story to the public. Research this time period and the information about these men. In a small group, create a mini newspaper for this big event. Use the *Tampa Bay Times* as your model. Be sure to include some advertisements that would appear in the newspaper during this time period. Also, be sure to include direct quotes from each inventor, and include some quotes from your classmates about their thoughts about flight travel and the new airline. Share your newspaper with your classmates.

The earliest attempts at aviation

The hot air balloon was the first aircraft to successfully carry human beings. Two French brothers named Joseph and Jacques Montgolfier invented the first hot air balloon. The first balloon had a fabric bag attached to a basket and used fire to heat air, which rose to fill the balloon. The first manned flight took place on Nov. 21, 1783. Less than two weeks after that first flight, Jacques Alexandre César Charles and M.N. Robert made the first flight in a hydrogen balloon.

Sir George Cayley was a pioneer of aircraft design. He designed and built working models of many different gliders. He also designed airships, ornithopters and was the first to envision the powered fixed-wing aircraft.



Cayley "boy-carrier" aircraft, 1849. National Air and Space Museum, Smithsonian Institution

German engineer Otto Lilienthal conducted extensive early research into aerodynamics and designed the first glider able to carry a person and fly long distances. In 1889, he published the book *Bird Flight as the Basis of Aviation*, which was used by the Wright brothers as the basis for their designs.

Astronomer Samuel P. Langley was the first to attempt to design a flying machine that was self-propelled, controlled in the air and able to carry a human. Langley used steam engines to power his "aerodromes." He built six full-scale prototypes, several of which flew briefly but none of which achieved controlled flight.

Langley "quarter-scale" aerodrome. Eric Long, National Air and Space Museum, Smithsonian Institution

Montgolfier's Balloon in the Presence of the King and Queen. *National Air and Space Museum, Smithsonian Institution*

Sources: American Institute of Aeronautics and Astronautics, Encyclopedia Britannica, Library of Congress, NASA, Smithsonian Institution, space.com

Airships

Unlike hot air balloons, airships, also known as dirigibles, are self-propelled and steerable.

Advertising poster for Hamburg-Amerika airship line. National Air and Space Museum, Smithsonian Institution

While there are several different kinds of airships, they all include a balloon filled with a lighter-than-air gas such as hydrogen or helium; a car or gondola that is carried below the balloon; engines for propulsion; and rudders for steering.

In 1900, a German named Count von Zeppelin invented a type of aluminum-framed rigid airship that came to be known as zeppelins. Zeppelins were used to bomb Paris and London during World War I. After the war, airships were used for passenger service. In 1936, trans-Atlantic passenger service began with the zeppelin *Hindenburg*. Unfortunately, the hydrogen-filled *Hindenburg* crashed while landing in New Jersey in 1937. This, and other disasters, combined with the advances taking place in heavier-than-air aircraft technology led to the decline of commercial airships.

Source: Encyclopedia Britannica

The Wright brothers

Inspired by the work of Otto Lilienthal, Orville and Wilbur Wright began by designing and building gliders. While Lilienthal sought to control his aircraft solely through body movements, the Wright brothers designed a method of controlling the glider's lift by twisting, or warping, the wings to present different angles to the wind. The pilot could cause the glider to climb, dive and bank to the right or left by "wing warping."

The brothers tested their first man-carrying glider at Kitty Hawk, N.C., in 1900. Although its lifting capabilities proved disappointing, the control system performed as designed. Over the next two years, they tested more than 200 types of miniature wings in a six-foot wind tunnel. They compared monoplane, biplane, triplane and staggered-wing models and measured the lift produced by different angles, aspect ratios, wing curvatures and thicknesses. In 1902, the Wrights returned to

Orville piloting the 1902 Wright glider. National Air and Space Museum, Smithsonian Institution

1000 B.C.E. - Kite is invented in China.

1485-1500 - Leonardo da Vinci designs flying machines and parachute.

1709 - Bartolomeu Laurenço de Gusmao designs and builds hot air balloon models.

1783 - Jean François Pilâtre de Rozier and Marquis d'Arlandes make the first voyage in a Montgolfier hot air balloon.

1783 - Jacques Alexandre César Charles and M.N. Robert fly in a hydrogen balloon.

1797 - André Jacques Garnerin makes the first human parachute descent from a hot air balloon.

1799 - Sir George Cayley designs gliders, helicopters, airships and fixed-wing aircraft.

1804 - Sir George Cayley builds and flies the world's first successful model glider.

1852 - Henri Giffard's steam-powered airship makes first flight.

1895 - Otto Lilienthal builds and flies monoplane and biplane gliders.

1896 - Samuel P. Langley builds and flies steam-powered Aerodrome models.

1900 - Count Ferdinand von Zeppelin makes the first flight in his "rigid" airship.

1903 - Orville and Wilbur Wright make the first powered, sustained and controlled flight in a heavier-than-air flying machine.

1908 - Madame Therese Peltier is the first woman to fly solo in an airplane.

1912 - Capt. Albert Berry makes the first parachute jump from a powered airplane.

Kitty Hawk with a larger glider that included a tail with two vertical vanes for stability. This aircraft could glide more than 600 feet.

On Dec. 17, 1903, the Wright brothers made the world's first powered, sustained and controlled flights in an airplane called the Flyer I. The Flyer I weighed about 600 pounds and had a 12-horsepower engine that generated about the same power as two modern lawn mowers. The first flight, by Orville Wright, covered more than 120 feet and lasted 12 seconds. The day's longest flight, by Wilbur Wright, covered 852 feet and lasted 59 seconds. The brothers spent the next two years improving their design, and on Oct. 5, 1905, Wilbur flew the Flyer III for 39 minutes.

Sopwith Snipe WWI fighter plane. National Air and Space Museum, Smithsonian Institution

Aviation in World Wars I and II

At the beginning of World War I, lighter-than-air aircraft – hot air balloons, zeppelins and other airships – were used extensively for observation, reconnaissance, artillery spotting, antisubmarine patrol and even for combat operations. The underpowered and unarmed heavier-than-air airplanes were used only for reconnaissance.

The value of controlling the airspace soon became clear and soon led to the emergence of fighter planes with more powerful engines and better designs. At the war's beginning, fighter pilots and observers carried pistols or rifles aboard to shoot at enemy planes, but by 1915, fighter planes armed with machine guns began to enter service for both the Germans and the Allies. New generations of combat aircraft continued to enter service throughout the war, including fighters, flying boats used for reconnaissance and the first ship-based aircraft.

While the typical combat aircraft of the first world war was an open-cockpit, fabric-covered biplane with fixed landing gear and top speeds of just over 100 miles per hour, World War II opened with all-metal, enclosed-cockpit monoplanes with retractable landing gear and top speeds of more than 350 miles per hour. Oxygen, voice radios, parachutes, gyroscopic flight instruments and electric cockpit lighting became standard equipment. World War II brought rapid technological innovation to fighters, bombers and reconnaissance and carrier aircraft. It also marked the coming-of-age of air transport and the dawn of the helicopter.

Sources: Encyclopedia Britannica

Doing the math

How much faster were the monoplanes flying during World War II than the biplanes flying in World War I?

The jet age

In 1929, a British engineer named Frank Whittle invented the gas turbine, or jet, engine. The first jet-powered aircraft flew in 1939. Although several jet-powered fighters and bombers were developed before the end of World War II, they entered the war too late to make a significant difference.

Whittle W.1X Turbojet Engine; National Air and Space Museum Archives, Smithsonian Institution

The first generation of jet-powered airplanes was based on existing airframes, which were not engineered for turbojet propulsion. The late 1940s marked the development of the second generation of jet aircraft, which had aerodynamic refinements such as swept-back wings and thinner control surfaces. Some of these jets could exceed the speed of sound.

USAF P-51 Mustang fighter plane. National Air and Space Museum, Smithsonian Institution

In the mid-1950s, a third generation of jet-powered aircraft capable of supersonic flight began to enter service. The 1950s also marked the beginning of passenger jet service with the Boeing 707 entering service in October 1958 with Pan American World Airways.

By the mid-1960s, fighter planes were capable of top speeds of more than Mach 2, or twice the speed of sound. The first V/STOL (vertical/short takeoff and landing) fighter jet became operational in 1967.

Sources: American Institute of Aeronautics and Astronautics, Encyclopedia Britannica

Learning with the *Times*

Learning to fly

When the Wright brothers first performed experiments, people thought they were crazy. People didn't think it was possible for humans to fly. Look how far we have come from that fateful day in December 1903 to today. Throughout the centuries, there have been many myths and legends about flying. Myths and legends are fictional stories that attempt to explain a phenomena of nature, such as flight. Research myths and legends about flight, and turn one of the stories you find into a newspaper-style article. Use the newspaper articles in the *Tampa Bay Times* as models. Be sure to include the five Ws: who, what, when, where and why. Combine all of the class articles into a mini newspaper or magazine. Think about and discuss with your classmates what the myths or legends tell you about early ideas concerning flight.

Capt. Albert Berry, Tony Jannus and Tom Benoist preparing for the world's first parachute jump from a plane, 1912. St. Petersburg Museum of History

1914 - The first regularly scheduled passenger air line begins between St. Petersburg and Tampa, Fla.

1926 - Robert H. Goddard makes the first free flight of a liquid-fueled rocket.

1927 - Charles A. Lindbergh completes the first solo, nonstop trans-Atlantic flight.

1929 - Fritz Opel flies the first rocket-powered plane.

1930 - Frank Whittle invents the jet engine.

1932 - Amelia Earhart is the first woman to fly a solo non stop trans-Atlantic flight.

1937 - The *Hindenburg* dirigible is destroyed by fire while landing in New Jersey.

1937 - Amelia Earhart is lost en route to Howland Island from Lae, New Guinea.

1939 - Igor Sikorsky makes the first helicopter flight in the VS-300.

1939 - Germany's Heinkel 178 is the first fully jet-propelled aircraft to fly.

1942 - First successful test flight of the V-2 rocket.

1942 - Fritz Wendel flies the world's first operational jet-powered fighter, the Messerschmitt 262.

1947 - Charles E. Yeager pilots the Bell X-1, the first aircraft to exceed the speed of sound in level flight.

1957 - The Soviet Union launches the first man-made Earth satellite, *Sputnik 1.*

Clockwise from top left: NASA Helios prototype flying wing, NASA Photo / Carla Thomas; USAF F-117A Nighthawk stealth fighter, Staff Sgt. Aaron Allmon II, USAF; The Falcon in flight, DARPA; SpaceShipTwo, Mark Greenberg, Virgin Galactic; Lockheed SR-71 Blackbird, NASA Photo / Tony Landis

Stealth technology

Since the development of radar in World War II, aircraft designers had been seeking ways to reduce the radar signature of aircraft. By the 1970s, new materials such as carbon-fiber composites and high-strength plastics had been developed that were light and strong enough for aviation use. These materials absorb radar energy rather than deflecting it, which makes them harder to detect. Avoiding radar detection also requires modifying the shape of an aircraft to avoid right angles, sharp curves and large surfaces.

B-2 stealth bomber. Staff Sgt. Bennie J. Davis III, USAF

In 1940, Northrop introduced the N-1M flying wing. This was the first aircraft that contained the pilot, engine and fuselage in a single airfoil structure. This radical design was the genesis of the design of the B-2 stealth bomber.

In 1983, the first stealth fighter became operational, and the first stealth bomber, the B-2, entered service in 1989.

Sources: Encyclopedia Britannica, Smithsonian Institution

Unmanned aerial vehicles

Unmanned aerial vehicles (UAVs) are aircraft that are guided remotely or autonomously. They are used for surveillance and reconnaissance and also can be used to designate targets and to drop munitions.

The first UAVs were remotely piloted vehicles (RPVs) used during World War II as training targets. In the 1950s, UAVs began to be used for photographic and electronic reconnaissance. In the 1980s, the development of new sensor technology, the implementation of the global positioning system and the miniaturization of avionics increased the capabilities of UAVs significantly. Today, UAVs are used by all four branches of the United States military for a variety of missions, and civilian versions are becoming increasingly common.

Source: Encyclopedia Britannica

U-2 spy plane. NASA Photo

Eyes in the sky

The U-2 high-altitude aircraft was developed during the Cold War to conduct reconnaissance from above the reach of Soviet anti-aircraft fire. It had a range of 3,000 miles and could carry up to 700 pounds of photoreconnaissance equipment to an unprecedented altitude of 70,000 feet. The U-2 entered service in 1956 and was initially projected to have an operational life of two years. However,

1959 - The Atlas rocket is the first liquid-fueled intercontinental ballistic missile with a range of more than 5,000 miles.

1959 - A. Scott Crossfield becomes the first to pilot the fastest and highest flying aircraft in history, the rocket-powered X-15.

1961 - Soviet cosmonaut Yuri Gagarin is the first man in space.

1961 - U.S. astronaut Alan Shepard is the first American in space.

1962 - U.S. astronaut John H. Glenn Jr. is the first American to orbit the earth.

1963 - Soviet cosmonaut Valentina Tereshkova is the first woman in space.

1965 - Soviet cosmonaut Alexei Leonov makes the first spacewalk.

1967 - U.S. astronauts Gus Grissom, Roger Chaffee and Ed White are killed in the *Apollo 1* capsule fire.

1968 - U.S. astronauts Frank Borman, James Lovell and William Anders are the first men to orbit the moon.

1969 - First docking of two manned spacecraft in orbit, *Soyuz 4* and *5,* takes place.

1969 - The first flight of the Concorde takes place.

1969 - U.S. astronauts Neil A. Armstrong and Edwin E. Aldrin Jr. are the first men to walk on the moon.

1971 - The first space station, Soviet *Salyut 1*, is launched into Earth's orbit.

1973 - The unmanned space station *Skylab* is launched.

1975 - Tom Stafford, Vance Brand, "Deke" Slayton, Alexei Leonov and Valeri Kubasov make the first joint U.S.-Soviet human spaceflight.

1981 - Ben L. Abruzzo makes the first balloon flight over the Pacific Ocean.

1981 - The U.S. launches the space shuttle, the world's first reusable spacecraft.

the U-2 would go on to see service in every post Cold War American conflict and is still in service today.

Sources: Lockheed Martin, NASA

X-43 scramjet. NASA photo / Jim Ross

Faster than a speeding bullet

The record for the fastest jet-powered aircraft was set in 2004 by NASA's experimental, unpiloted X-43A scramjet (supersonic-combustion ramjet) project. The X-43A reached Mach 9.6, approximately 7,000 miles per hour and nearly 10 times the speed of sound.

The fastest air-breathing, manned aircraft is the Lockheed SR-71 Blackbird, which has achieved more than Mach 3. The SR-71 was developed during the Cold War as a reconnaissance aircraft that could not be shot down. It flew higher and faster than any aircraft before or since. The SR-71, in service for more than two decades, was retired in 1990. Lockheed Martin is currently developing a hypersonic successor to the SR-71 called the SR-72. This unmanned aircraft would fly at speeds up to Mach 6 and could be operational by 2030.

The rocket-powered X-15 was developed as part of a program researching piloted hypersonic flight. The X-15 flew for nearly 10 years and set unofficial speed and altitude records of 4,520 miles per hour (Mach 6.7) and 354,200 feet. The X-15 was air-launched from a B-52 aircraft at about 45,000 feet. The rocket engine provided thrust for only the first 80 to 120 seconds of flight. The remainder of the flight was without power. Most X-15 flights only lasted eight to 12 minutes.

The fastest passenger airplane is the Concorde, which can reach speeds of more than Mach 2. This supersonic passenger plane made its first flight in 1969 and entered service in 1973. From 1976 to 2003, both British Airways and Air France flew the Concorde on transatlantic routes, cutting travel time in half compared to regular commercial aircraft. Both airlines ceased their Concorde operations in 2003, when it became clear that the aircraft would never be financially profitable.

The United States Defense Advanced Research Projects Agency (DARPA) is currently developing the Falcon Hypersonic Technology Vehicle 2 (HTV-2). The rocket-launched HTV-2 is an unmanned, maneuverable hypersonic air vehicle that glides through the atmosphere at up to Mach 20 – approximately 13,000 miles per hour. At this speed, the exterior of the HTV-2 reaches 3,500 degrees Fahrenheit – hotter than a blast furnace capable of melting steel.

Sources: DARPA, Encyclopedia Britannica, Lockheed Martin, NASA, SR-71 Online: An Online Aircraft Museum

Suborbital flight

SpaceShipTwo is a prototype of a commercial manned spaceship under development by Virgin Galactic. In design, it is an air-launched, carbon-fiber composite glider with a hybrid rocket motor and thrusters for maneuvering in space. SpaceShipTwo can carry six passengers and two pilots. SpaceShipTwo is carried to an altitude of about 50,000 feet by a transport aircraft called WhiteKnightTwo. Once released, the "space plane" uses its rocket motor to reach space. SpaceShipTwo completed its first rocket-powered flight in 2013.

Sources: Scaled Composites LLC, Virgin Galactic

Solar aircraft

The first flight of a solar-powered aircraft took place in 1974, when AstroFlight Inc.'s Sunrise II was launched from a catapult. Flat, thin and light, solar aircraft are covered with solar panels that power electric motors and charge batteries or fuel cells. In theory, solar aircraft could stay in the air for years without landing. However, the current record for an unmanned solar aircraft is two weeks, while the record for a manned aircraft is just slightly more than 26 hours.

NASA's Helios prototype aircraft was an unmanned solar-powered flying wing designed to operate at high altitudes for a long duration. In 2001, Helios reached 96,863 feet, a world-record altitude for a non-rocket-powered aircraft. Other unmanned solar planes include Aurora Flight Sciences' Odysseus and SunLight Eagle, QinetiQ's Zephyr, and NASA and AeroVironment's Pathfinder. Piloted solar aircraft include NASA and AeroVironment's Gossamer Penguin and Solar Challenger.

In 2015, a group called Solar Impulse is seeking to complete the first around-the-world solar-powered flight, and the United States Defense Advanced Research Projects Agency (DARPA) is currently working to develop a solar-powered aircraft called Vulture that will stay aloft for more than five years.

Sources: DARPA, How Stuff Works, NASA

Learning with the *Times*

Making connections beyond the text

What do you think the economic impact of flight technology has been in the Tampa Bay area and Florida? This is a difficult question because you would have to consider employment, recreational travel, business travel, and the import and export businesses, as well as the military's and NASA's presence in our state. With a partner or in a small group, research some of the points discussed on these pages as well as on the other pages in this publication. Take notes while you are doing research. Review the "Decision making/Cost-Benefit Analysis" video located at econedlink.org/interactives/index.php?iid=184&type=student. Create a graphic organizer — chart, web or outline — with the information you find. Based on what you have learned, write an argument essay for or against expansion of commercial and or government-sponsored air travel in Tampa Bay.

1982 - Ross Perot Jr. and Jay Coburn make the first around-the-world flight in a helicopter.

1986 - U.S. space shuttle *Challenger* breaks up shortly after launch, killing seven astronauts.

1986 - Soviet space station *Mir* is launched.

1986 - Jeana Yeager and Dick Rutan make the first nonstop flight around the world without refueling.

1995 - Space shuttle *Atlantis* and Soviet space station *Mir* are linked.

1998 - The first two modules of the International Space Station are launched and joined together in orbit.

1999 - Brian Jones and Bertrand Piccard complete the first non stop, around-the-world balloon flight.

2000 - The first crew arrives to take up residence in the International Space Station.

2003 - U.S. space shuttle *Columbia* breaks up upon reentry, killing seven astronauts.

2003 - Felix Baumgartner flies across the English Channel on a carbon-fiber wing.

2004 - *SpaceShipOne* wins the first X Prize for the first private manned spacecraft to exceed an altitude of 328,000 feet twice within a 14-day period.

2004 - NASA's X-43A hypersonic test vehicle reaches Mach 9.8 (7,000 mph).

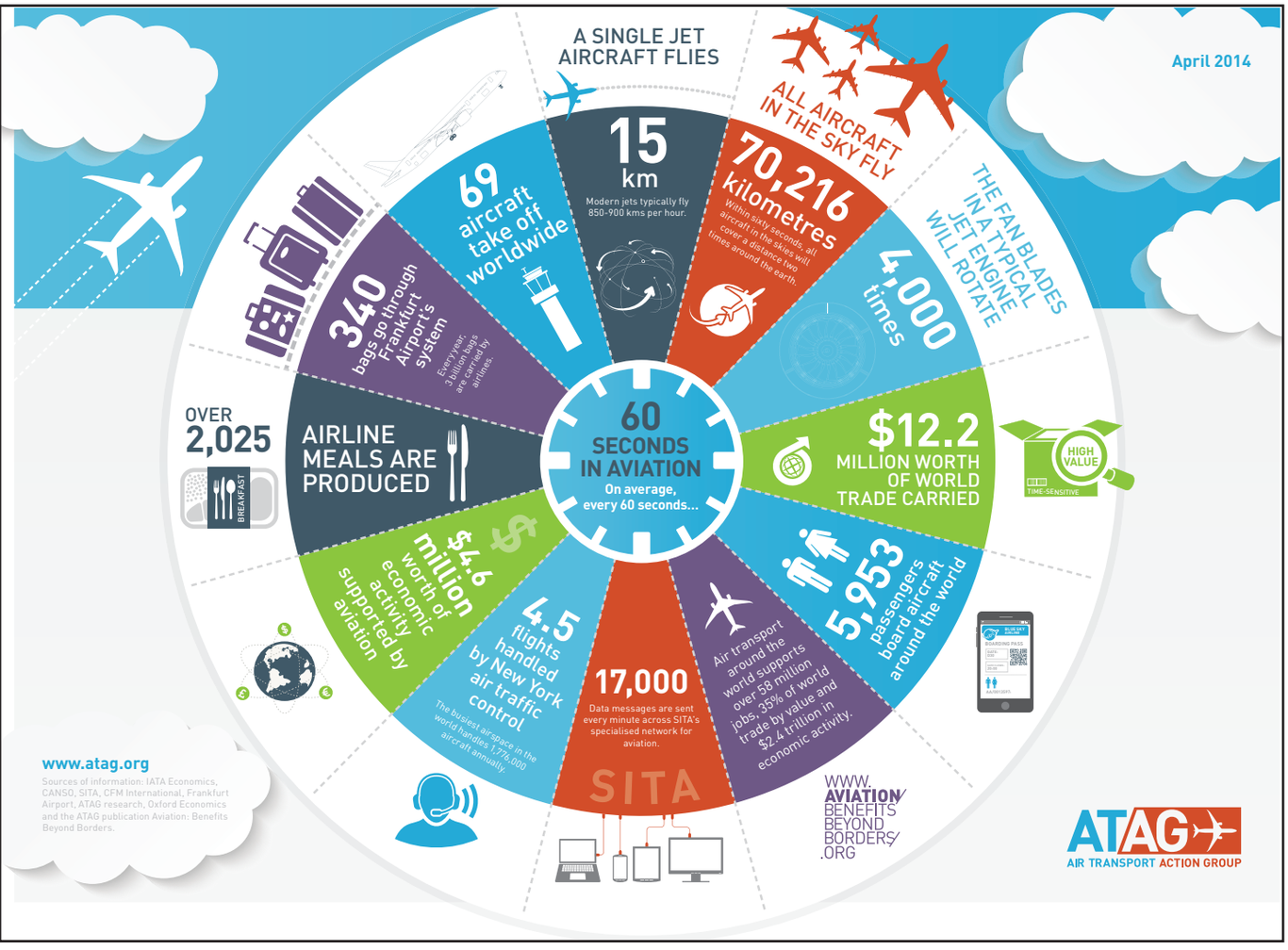
2010 - SpaceX's Falcon 9 rocket achieves Earth orbit.

2012 - SpaceX's *Dragon* and *Falcon* dock with the International Space Station.

2012 - Felix Baumgartner is the first man to break the sound barrier in a freefall jump from the edge of space.

Sources: American Institute of Aeronautics and Astronautics, Library of Congress, NASA

avi·a·tion: the business or practice of flying airplanes, helicopters, etc.
— Merriam-Webster



How has flight changed our lives?

The economic and social impact of aviation on our lives is immense. Air travel, as the only rapid worldwide transportation network, is essential for global business and tourism. By facilitating tourism and trade, aviation generates economic growth, provides jobs, improves living standards, alleviates poverty and increases revenues from taxes.

Globally, there are nearly 1,400 airlines, operating more than 25,000 aircraft and serving almost 4,000 airports. Every year, airlines transport over 3.1 billion passengers, and the annual global impact of aviation is estimated to be $2.4 trillion.

If aviation were a country, it would rank 21st in size economically. By 2032, it is estimated that the air transport industry will contribute more than 103.1 million jobs and $5.8 trillion to the world economy.

Creating jobs

Air transport is a major global employer, generating a total of 58.1 million jobs annually. This includes jobs in the aviation industry itself – in airline and airport operations, aircraft maintenance, air traffic management, head offices and activities such as check-in and baggage handling – as well as jobs created by aerospace manufacturers.

- Aviation directly provides 8.7 million jobs at airlines, airports and aircraft manufacturers.
- Aviation generates 9.8 million indirect jobs through the purchases of goods and services from companies in its supply chain.
- Aviation industry employees support 4.6 million jobs through spending.
- Aviation-enabled tourism generates 35 million jobs.

In North America alone, air transport supports almost 10 million jobs. Jobs in air transport cover a wide range of activities and skills, and many require a highly trained and qualified workforce, driving innovation and STEM skills development and providing well-paid opportunities.

Connecting our world

Aviation promotes global economic growth and development by facilitating world trade, increasing access to international markets and allowing the globalization of production. World trade is expected to nearly double over the next decade, and air transport will help make it possible.

Air transport is a vital component of many industries' global supply chain. Because it is more expensive than other transport options, it is used primarily for the rapid delivery of time-sensitive goods such as spare parts for machinery and equipment; sensitive electrical components; and perishable products such as vaccines, food and flowers.

The total value of goods transported by air represents 35 percent of all international trade. A leading economic forecaster estimates that the increase in global connectivity due to air transport over the last couple of decades is worth more than $200 billion to the global economy.

Connecting people

Tourism plays a significant role in the world economy, supporting more than 99 million jobs and contributing $1.8 trillion to the global economy. Tourism is particularly important to the economies of many developing countries. Aviation is critical to the global tourism industry, with more than 52 percent of international tourists now traveling by air. More than 35 million jobs in global tourism – jobs in industries such as hotels, restaurants, visitor attractions, local transport and car rental – are supported by foreign visitors arriving by air.

Supporting development

Air transport invests substantially in vital infrastructure, with the industry funding the vast majority of its own infrastructure costs. Infrastructure includes the basic equipment and structures needed for an organization to function properly: in this case, investment such as runways, airport terminals and air traffic control towers. In 2012, airports invested $19.3 billion in construction projects, creating jobs and providing new facilities to their communities.

Leading and innovating

Aviation is a technological industry with a focus on research and innovation. This not only leads to more efficient aircraft technology and operations, but also helps build research capacity at universities and high-tech skills across society. Every $100 million of research and development spending by the aerospace industry generates additional benefits of $70 million.

A vital lifeline

Air transport is a vital lifeline for communities that lack adequate road or rail networks. In many remote communities, reliable access to the rest of the world – and to essential services such as healthcare, education and government – is only possible by air. For example, there are more than 200 communities in Alaska, and more than 1,000 in Russia, that are inaccessible by road; while Indonesia consists of 17,508 separate islands. Air transport is relied upon for contact between communities and business links.

In Quebec, Canada, a remote northern region known as Nunavik is home to about 10,000 Inuit people who live in small family units and exist by hunting, fishing and gathering. Nunavik, an area of more than 300,000 square miles, has no roads. For almost 30 years, the community-owned airline Air Inuit has provided a fundamentally critical transport lifeline.

Emergency assistance

Air transport allows delivery of urgently needed assistance during humanitarian emergencies caused by natural disaster, famine or war. Aviation's speed allows emergency and aid workers and supplies to reach even remote or inaccessible locations quickly, when time is of the essence. Both military and commercial aircraft play roles in providing support to humanitarian relief efforts by conducting search-and-rescue efforts, evacuating refugees, delivering cargo and providing staging points for rescuers and supplies.

The massive earthquake that devastated the island nation of Haiti in 2010 illustrates how air transport can make a life-or-death impact. Haiti is the poorest country in the Western Hemisphere and has experienced political instability for most of its history. In January 2010, a magnitude 7.0 earthquake struck just west of the capital, Port-au-Prince. More than 300,000 people were killed, and 1.5 million were left homeless. Haiti and its capital city were devastated.

Airlines transported emergency and relief workers and donated emergency supplies such as tents, blankets, medicine and food at no cost. Without these aircraft and people volunteering to fly them, very little emergency airborne-relief aid would have reached Haiti because the cost of chartering a single all-cargo relief flight can be as high as $250,000. International aid would have had to rely on much slower methods of transport, and more people would certainly have died of injury, disease and hunger.

Sources: Air Transport Action Group, *The World Factbook*

Going beyond the text

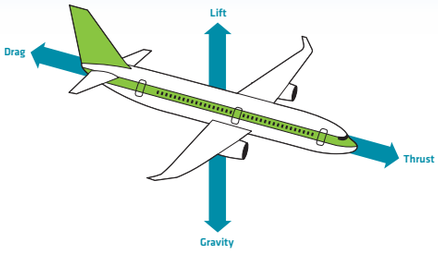
As you can see from the information you have read on these pages, air transportation plays a crucial role in the everyday lives of many people and businesses. Ask your teacher to separate your class into groups. Have your group choose one of the concepts discussed in this story to research. Research this information in your school media center or your local library. Find out as much information as you can. Write a report to share with your class. Be sure to document your sources. You can use print sources, such as newspapers, as well as electronic data bases and encyclopedias and atlases.

Learning with the *Times*

The importance of air transportation

Look for an article in the *Tampa Bay Times* that exemplifies the importance of air transportation in our society. Write an argument-style blog posting exploring why air transportation did or could have made a significant impact on the situation being described in this article. If air transportation was used, explain how it was used. If it was not used, explain why it should have been. Share your information and what you have learned with your class.

The science and technology of flight



The forces of flight

Four forces act on an aircraft in flight: thrust, drag, gravity and lift. The motion of the aircraft through the air depends on the relative strength and direction of these forces.

Thrust is the mechanical force which moves an aircraft through the air. The amount of thrust is determined by the propulsion system.

Drag is the aerodynamic force that opposes an aircraft's motion through the air. Drag is generated by every part of the external surface of an aircraft.

Weight is the force generated by the gravitational attraction of the earth on the aircraft and is always directed toward the center of the earth.

Lift is the mechanical aerodynamic force, produced by the motion of an aircraft through the air, which directly opposes the weight of an airplane and holds the aircraft in the air.

Sources: Air Transport Action Group, NASA

Going beyond the text

Research one of the concepts discussed on these pages. Present an oral report to your class explaining what you have learned.

Propulsion systems

NASA defines a propulsion system as "a machine that produces thrust to push an object forward." Propellers act like a spinning wing, creating lift by moving through the air. The engine used to power the propeller is most commonly an internal combustion engine similar to that used in automobiles, but they also can be powered by jet or electric engines.

Propellers have been used on aircraft since the Wright brothers' era and are still found on most general aviation airplanes. They are very efficient for low-speed flight, but they are not used on high-speed aircraft.

Gas turbine, or jet, engines burn fuel and air in a combustion chamber, creating hot exhaust that is passed through a turbine and out a nozzle to produce thrust. Jet engines can power aircraft for long distances and at high speeds. A turboprop engine is a gas turbine that powers a propeller.

Ramjets are a type of jet engine used for high-speed flight. However, unlike other jet engines, ramjets have no moving parts – only an inlet, a combustion chamber and a nozzle. Air is "rammed" into the combustor using the forward speed of the aircraft, burned with fuel, and ejected out of the nozzle to create thrust. Because of this, ramjets can produce thrust only when the aircraft is moving.

Rockets combine fuel and an onboard source of oxygen called an oxidizer. The oxygen and fuel ignite in a combustion chamber, exploding in hot exhaust that is passed through a nozzle to produce thrust. Because, unlike turbines, rockets carry their own oxygen and do not need air, they can fly in space. A rocket must accelerate to about five miles per second just to reach Earth orbit, about 25 times faster than the cruising speed of a passenger jet.

Sources: Air Transport Action Group, How Stuff Works, NASA, Smithsonian Institution

Roll, pitch and yaw

Unlike cars or boats, aircraft and spacecraft can move freely in three dimensions. A pilot must control the attitude, or orientation, of a vehicle in all three dimensions.

- **Roll** is movement of the wings of the aircraft up and down.
- **Yaw** is movement of the nose of the aircraft from side to side.
- **Pitch** is movement of the nose of the aircraft up or down.

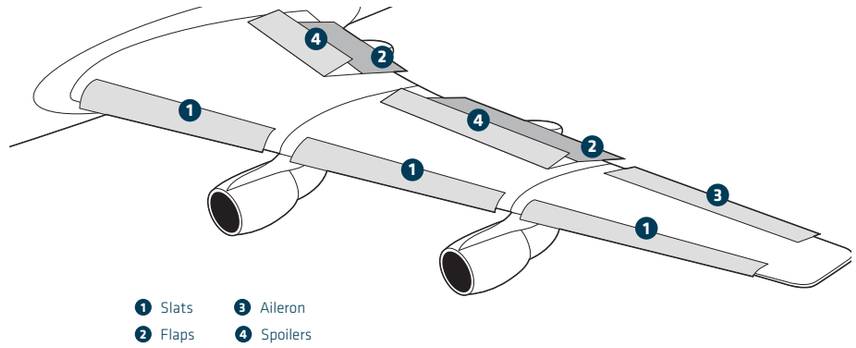
Sources: NASA, Smithsonian Institution

Controlling the air

Pilots control the attitude of their aircraft using control surfaces that produce aerodynamic forces and cause the aircraft to roll, pitch or yaw. Varying the type and amount of aerodynamic force allows the pilot to maneuver the aircraft.

- **Ailerons** are small hinged sections on the outboard portion of a wing. They can be used to generate a rolling motion.
- The **rudder** is a hinged section at the rear of the vertical stabilizer. It can be used to produce a yawing motion.
- The **elevators** are hinged sections at the rear of the horizontal stabilizers. They can be used to produce a pitching motion.
- **Slats** are moving parts on the leading edge of an aircraft's wings that can be extended forward to increase the wing area, which generates more lift at slow speeds.
- **Flaps** are moving parts on the trailing edge of an aircraft's wings that can be extended aft (toward the tail) to increase the wing area, which generates more lift at slow speeds.
- **Spoilers** are small, hinged plates on the top portion of an aircraft's wings that can be used to slow an aircraft or to make an aircraft descend. Spoilers also can be used to generate a rolling motion if only one is deployed.

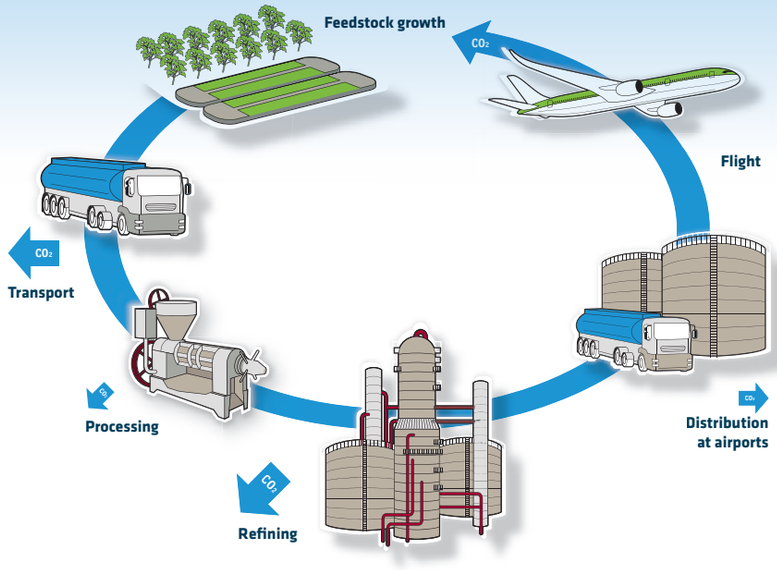
Sources: Air Transport Action Group, How Stuff Works, NASA, Smithsonian Institution

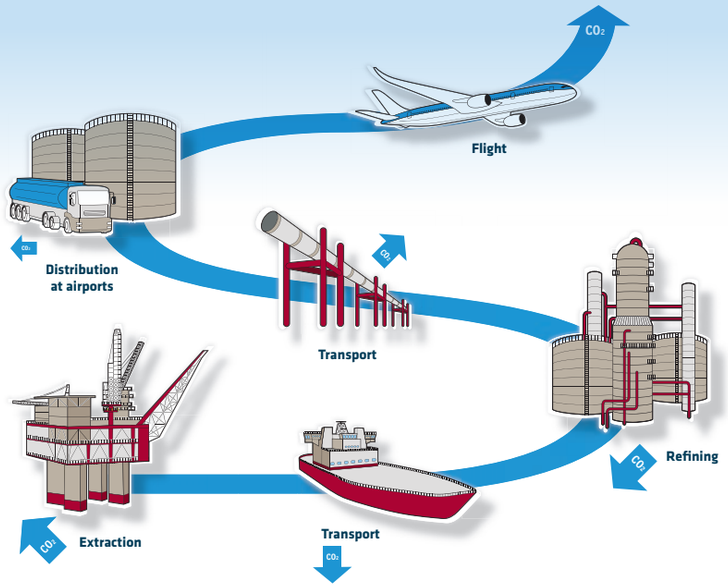


Controlling attitude in space

Because there is no air in space, the control surfaces that an airplane uses do not work there. To change orientation in space, a spacecraft uses torque, a twisting force that causes rotation. Typically, spacecraft use small thruster rockets to control their attitude. Some satellites use a system of spinning reaction wheels similar to gyroscopes.

Source: Smithsonian Institution





Sustainable aviation biofuels

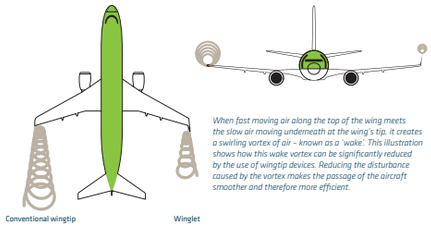
Unlike fossil fuels such as coal, oil or natural gas, biofuels are fuels that are produced from renewable biological resources such as plant or animal materials. Sustainably produced biofuels result in reduced greenhouse gas emissions compared to traditional fossil fuels. One of the most common biofuels is the petroleum substitute ethanol, which is produced by fermenting crops such as sugar cane or corn. Ethanol is a first-generation biofuel. First-generation biofuels are generally not suitable for use in aircraft and often come from non sustainable crops. Second-generation biofuels, which come from non food crop sources such as oil plants or municipal waste, can be processed into high-quality jet and diesel fuels. Developing sustainable biofuels for aviation will provide the industry with an alternative to petroleum-based fuels and enable it to reduce its greenhouse gas emissions.

Sustainable development

In 2008, the aviation industry committed to the world's first sector-specific climate-change targets. Goals include improving fleet fuel efficiency by 1.5 percent per year until 2020, capping net carbon emissions beginning in 2020 and reducing net carbon emissions to 50 percent below 2005 levels by 2050. Airlines are using multiple strategies to meet these ambitious targets: new technology, efficient operations, improved infrastructure and market-based measures.

Source: Air Transport Action Group

For more information about the aviation industry's commitment to sustainability, visit aviationbenefitsbeyondborders.org.



Efficiency in action: winglets

Adding tilted-up "winglets" to the tips of aircraft wings significantly reduces drag on the aircraft, resulting in fuel usage reductions of between 3 and 5 percent. Since their introduction, winglets have saved more than 4 billion gallons of jet fuel. They are being retrofitted to more than 5,000 aircraft.

All the graphics for Pages 12-13
Air Transport Action Group

Learning with the *Times*

Planning for the future

Reducing greenhouse gas emissions and other types of air pollution are important for the future of our environment. We need to think about reducing our carbon footprint today for it to affect the environment tomorrow. That is why it is important for the aviation industry to develop sustainable biofuels that will provide the industry with an alternative to petroleum-based fuels and enable it to reduce its greenhouse gas emissions. Working together with other students in your class, come up with a plan to get your school and family to reduce their carbon footprints. Next, look at the ads in the *Tampa Bay Times*. Think about the dynamics of the ads. Think about ways to draw people's attention to an ad and its message. Now, design an ad for the print and digital editions of the *Times* that encourages people of all ages to reduce their carbon footprints. Share your ideas with your classmates.

To learn more about how the aviation industry is working to reduce CO^2 emissions, visit enviro.aero.

Careers in aviation and aerospace

Are you interested in exploring career paths in aviation and aerospace? There are hundreds of options, including the ones outlined on these pages.

Aerospace engineer

Aerospace engineers design aircraft, spacecraft, satellites and missiles. They typically specialize in one of two types of engineering – aeronautical or astronautical – and can specialize in different types of aerospace products, such as aircraft, remotely piloted aircraft, spacecraft, or missiles and rockets. Aerospace engineers must have a four-year degree in aerospace engineering or another field of engineering or science related to aerospace systems, and may require security clearances.

Aerospace engineering and operations technician

Aerospace engineering and operations technicians operate, test and maintain equipment used in developing, testing and producing new aircraft and spacecraft. This may include programming and running computer simulations or working with additive manufacturing, or 3D, printing. Most aerospace engineering and operations technicians have a two-year degree in engineering technology, but some have a high school education plus a vocational certificate or diploma.

Air traffic controller

Air traffic controllers coordinate the safe and efficient movement of air traffic by managing the flow of aircraft into and out of airport airspace, guiding pilots during takeoff and landing, monitoring aircraft as they travel through the skies and directing the movement of vehicles on airport runways and taxiways. To become an air traffic controller, a person must be a U.S. citizen, pass medical and background checks, achieve a qualifying score on the Federal Aviation Administration (FAA) pre-employment test, and complete a training course at the FAA Academy. Most air traffic controllers have a four-year degree.

Aircraft mechanic

Aircraft and avionics equipment mechanics repair, maintain and perform inspections on aircraft. Many mechanics are generalists who work on many different types of aircraft. Others specialize in a particular type of aircraft – such as jets, piston-driven airplanes or helicopters – or in a particular section or system, such as the engine, hydraulics or electrical system. Although some aircraft mechanics enter the field with a high school education or equivalent and are trained on the job or receive training in the military, most learn their trade at an FAA-approved aviation maintenance technician school and are certified by the FAA.

Astronaut

The duties of professional NASA astronauts depend on their crew assignment as commander, pilot or mission specialist. The commander is responsible for the vehicle,

crew, mission success and safety of the flight. The pilot assists the commander in controlling and operating the vehicle. Mission specialists coordinate systems, crew activity planning, consumables usage and experiment/payload operations. Astronauts need a minimum of a four-year degree from an accredited institution in engineering, biological science, physical science or mathematics,

although an advanced degree is desirable. Astronauts also must pass a NASA space physical and be citizens of the United States. In addition, commanders and pilots must have at least 1,000 hours of pilot-in-command time in jet aircraft.

Flight attendant

Flight attendants ensure the safety and comfort of airline passengers by ensuring that everyone follows security regulations. Flight attendants, who must have at least a high school diploma, receive initial training from their employer and are certified by the FAA.

Pilot

Airline and commercial pilots fly and navigate airplanes, helicopters and other aircraft. Airline pilots fly for airlines that transport people and cargo on a fixed schedule, while commercial pilots fly aircraft for other reasons, including charter flights, rescue operations, firefighting, aerial photography and agricultural crop dusting. Most airline pilots begin their careers as commercial pilots. Commercial pilots typically need a high school diploma, while airline pilots typically need a four-year degree. All pilots who are paid to fly must have at least a commercial pilot's license from the FAA, and airline pilots also must have an Airline Transport Pilot (ATP) certification. Most pilots begin their flight training with independent instructors or through flight schools. You can search for a flight school near you at av-info.faa.gov/PilotSchool.asp.

Sources: Federal Aviation Administration, NASA, U.S. Bureau of Labor Statistics

Military careers in aviation and aerospace

The U.S. armed forces offer many occupational specialties related to aviation and aerospace for both officers and enlisted men and women. Many do not require any previous education or experience; training, which may also qualify for college credit, is provided by the military immediately following basic training. Of course, the Air Force offers many occupations directly involved with aviation and aerospace. However, the Army, Coast Guard, Marine Corps and Navy also have many jobs in these fields, including air traffic controller, air transportation specialist, aircrew member, flight engineer, aircraft launch and recovery specialist and crewchief.

Sources: U.S. Air Force, U.S. Army, U.S. Coast Guard, U.S. Marine Corps, U.S. Navy

Learning with the *Times*
Aviation careers

So are you interested in exploring career paths in aviation and aerospace? There are hundreds of options. Some career options are listed on these pages, but there are many more choices. What other types of jobs do you think there are in this field? Check out the websites listed on these pages. Write down all of the different types of jobs you can find. Choose five of these jobs and write a few sentences about how you feel these people make a difference in their community. Next, find an article in the *Tampa Bay Times* that depicts someone making a difference in the community. Write down the main points of the article. Share what you have learned with your class.

Tampa Bay-area aviation educational institutions

Hillsborough County

Hillsborough County Career and Technical Education in Aerospace Technologies
sdhc.k12.fl.us/cte/aerospacetechnology.asp

Pasco County

Aerospace Career Academy, Sunlake High School
slhs.pasco.k12.fl.us

Pinellas County

East Lake High School Academy of Engineering
eastlake-hs.pinellas.k12.fl.us

Clearwater Aeronautical Space Academy
clearwater-hs.pinellas.k12.fl.us

National Aviation Academy
naa.edu

Polk County

Central Florida Aerospace Academy
polkacademies.com/cfaa

Other

Embry-Riddle Aeronautical University
erau.edu

Florida Institute of Technology College of Aeronautics
coa.fit.edu

Aviation and aerospace career resources:

Air Line Pilots Association International
alpa.org

Air Transport Association of America Inc.
airlines.org

American Institute of Aeronautics and Astronautics Inc.
aiaa.org

Ask Polaris
askpolaris.org

Association of Flight Attendants
afanet.org

Federal Aviation Administration
faa.gov

Helicopter Association International
rotor.com

National Agricultural Aviation Association
agaviation.org

Professional Aviation Maintenance Association
aviationeducation.org

Regional Airline Association
raa.org

U.S. Army
goarmy.com

U.S. Coast Guard
gocoastguard.com

U.S. Marine Corps
marines.com

U.S. Navy
navy.com

U.S. Bureau of Labor Statistics Occupational Outlook Handbook
bls.gov/ooh

Tony Jannus Distinguished Aviation Society

Founded in 1964, the Tony Jannus Distinguished Aviation Society is a 501(c)(3) nonprofit organization that recognizes extraordinary accomplishments in the field of commercial aviation. Each year, the society honors a historic aviation achievement by recognizing a distinguished individual for outstanding contributions to scheduled air transportation with the Tony Jannus Award. The society also looks to the future by offering the annual Tony Jannus Student Essay Contest and the Tony Jannus Scholars Awards.

More information on the Tony Jannus Distinguished Aviation Society can be found at tonyjannus.org.

Tony Jannus student essay contest

The Tony Jannus Distinguished Aviation Society is proud to partner with the Florida Council on Economic Education to offer the annual Tony Jannus student essay contest.

The goal of the essay contest is to encourage the interest of high school students in scheduled commercial aviation and in Tony Jannus' history-making role. Students enrolled in grades 9 – 12 in a Florida school are eligible to enter. The Grand Prize winner is awarded a trip to Tampa for the award presentation in November, three round-trip airline tickets and a $600 spending allowance.

The deadline to enter the 2014 essay contest is Sept. 29, 2014. For more information about the Tony Jannus student essay contest, visit TonyJannus.org.

Tony Jannus Scholars Award

The Tony Jannus Distinguished Aviation Society provides financial support to students enrolled in college-level courses leading to a degree in fields related to potential careers in scheduled commercial aviation. Each year, the society honors six aspiring aviation leaders with awards totaling $15,000.

The deadline to apply for a 2014 Scholars Award is Sept. 29, 2014. For more information about the Tony Jannus Scholars Award, including how to apply, visit TonyJannus.org.

Centennial Exhibit Flight One Gallery, St. Petersburg Museum of History

The St. Petersburg Museum of History's signature exhibit traces the story of commercial aviation from its inception in St. Petersburg on Jan. 1, 1914. The World's First Airline Gallery proudly features a full-size, working replica of the Benoist airboat, which was flown from St. Petersburg to Tampa by pilot Ed Hoffman Sr. to recognize the 70th anniversary of the first flight in 1984.

The St. Petersburg Museum of History was founded in 1920 as the St. Petersburg Memorial Historical Society. The mission of the St. Petersburg Museum of History is to collect, preserve and communicate the history and heritage of Florida with emphasis on St. Petersburg and the Pinellas Peninsula. The museum maintains a collection of more than 32,000 artifacts and an archive of more than 8,000 historic photos and 5,000 documents. More information about the museum can be found at spmoh.com.

Florida Aviation Hall of Fame

Membership in the Florida Aviation Hall of Fame is awarded annually by a selection committee of aviation historians chosen by the Florida Aviation Historical Society. Honorees are inducted into the Hall of Fame at an installation ceremony at the Florida Air Museum at Lakeland Linder Airport in Lakeland, Fla.

Honorees

- Douglas Baker, test pilot (2003)
- George "Ted" Baker, founder of National Airlines (2004)
- Thomas W. Benoist, pioneer aircraft builder (2011)
- Leroy Brown, pioneer pilot, crop-duster, airline pilot and co-founder, U.S. Airline Industry Museum (2009)
- Jacqueline Cochran, pioneer aviatrix (2004)
- Glenn Curtiss, pioneer pilot, inventor and founder of three Florida cities (2006)
- Jimmy Doolittle, pioneer pilot and war hero (2007)
- Amelia Earhart, pioneer aviatrix (2010)
- Chalmers H. Goodlin, WWII fighter pilot and test pilot (2005)
- George Haldeman, test pilot and holder of numerous aviation records (2006)
- Ed Hoffman Sr., pioneer pilot (2008)
- Howard Hughes, pioneer pilot and movie producer (2007)
- Jack Hunt, Navy blimp pilot, Distinguished Flying Cross recipient and founding president of Embry-Riddle Aeronautical University (2011)
- Antony H. Jannus, pilot of the first airline (2003)
- Colin Kelly, WWII B-17 pilot and "first hero of WWII" (2011)
- Joseph W. Kittinger Jr., balloonist and test pilot (2003)
- William Krusen, pioneer pilot (2011)
- Col. & Mrs. Charles A. Lindbergh, pioneer pilots (2004)
- Lewis Maytag, CEO of National Airlines (2007)
- David McCampbell, Navy pilot and Medal of Honor recipient (2010)
- A.B. McMullen, builder of many of Florida's airports (2004)
- Zack Mosley, creator of nationally syndicated aviation comic strip "Smilin' Jack" (2008)
- Charles E. Richbourg, Navy test pilot (2006)
- Edward Vernon Rickenbacker, CEO of Eastern Air Lines (2003)
- John Paul Riddle, founder of Embry-Riddle Aeronautical University (2005)
- Lawrence Sperry, inventor of the autopilot, turn-and-bank indicator and artificial horizon (2011)
- Nicole Stott, astronaut (2011)
- Paul W. Tibbets Jr., pilot of the B-29 that carried the first atomic bomb (2005)
- Juan Terry Trippe, founder of Pan American World Airways (2003)
- Kermit Weeks, aerobatics pilot, experimental aircraft builder and founder of Fantasy of Flight air museum (2008)
- Robert M. White, WWII fighter pilot and test pilot

Flight 2014 Planning Board

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