



Women in Aviation

Study Guide

**For them, not even the
sky is the limit.**

In their pursuit of excellence, these women
exemplify the right stuff and teach us that
education and determination breaks
through all barriers.



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Women in Aviation

How do we tell the story of women in aviation? The vibrant television special, *Quest for Excellence: Women in Aviation*, focuses on the extraordinary story of how some unique women broke the sound barrier and shattered the glass ceiling. From Amelia Earhart to Ellen Ochoa and beyond, they have honed their technological prowess and ongoing belief in the possibilities of what women can accomplish in a field once dominated by men. They live by the belief, “You can’t be what you can’t dream.”

Quest for Excellence: Women in Aviation is a one-hour broadcast television special. It provides a chance for viewers to meet ground-breaking women in aviation, many recently honored at the Palm Springs Air Museum’s annual gala. Women fighter pilots, astronauts, heroes, and daredevils. The first Latina in space, the first female commander of a naval air test base, the first female commander of a space shuttle mission, the fastest female speed record holder in a Reno air race, the female Captain hero of Southwest Flight 380, and many more. Their accomplishments and contributions to aviation span decades. The Palm Springs Air Museum provides a platform to tell engaging stories with historical accuracy, featuring the planes pilots flew and the stories behind them. They have the muscle to tell stories that are Engaging, Impactful, and Inspiring.

Quest for Excellence: Women in Aviation offers educators and students an extraordinary opportunity to connect with these women while learning their fascinating individual stories.

Curriculum Connections

Quest for Excellence: Women in Aviation is useful for science, history, social studies, geography, and ethnic studies courses. It is recommended for 7th-grade students and above. The program connects with many state standards and curriculum guides in history and social studies.

Throughout this study guide, there are discussion questions for you to ponder, discuss with a friend or family member or review in a classroom setting. The questions can be used in small or large group settings, or some can be answered in essay format for further exploration.

Questions are noted with a zooming arrow reminiscent of flying aircraft. For example:

- What is the meaning of the word “aviation?” Aviation includes the activities surrounding flight and the aircraft industry.
- What does it mean to be an aviator?

- What are the different types of aircraft you know? Create a list. As you watch the video presentation, check off those that are mentioned and add any that you missed.

Sometimes there are comments to aid you in the discussion. For example, aircraft include fixed-wing and rotary-wing types, morphable wings, and wing-less lifting bodies, as well as lighter-than-air craft such as hot air balloons and airships.

PREVIEWING ACTIVITIES

Experience with Aviation

Discuss the following topics with a partner, friend, or family member.

- Have you ever flown? Where to? When? Why?
- Are there any women aviators in your family or the local community? What are their stories?
- What role does aviation play in our local community? What opportunities are available for any type of flight? What are the local airports? Is there a high school or college that trains pilots or maintenance workers for aircraft?
- What **important events and people** do you know about the history of aviation? Make a list and review it again during or after watching the program to determine what can be added to the list.
- What are all the **types of aircraft** with which you are familiar? Create a list. As you view the program, list all the types of aircraft that can be seen at the Palm Springs Air Museum.

DURING-VIEWING ACTIVITIES

Families and classes of students are encouraged to watch this program together and discuss its meaning and relevance in relation to their own local community and their family histories.

Questions to Answer

Create a list of questions you would like answered as you view the program. After the program, revisit the questions to see if they were answered. If not, what can you do to find the answers?

- Who were some of the first women in aviation?

As you view the video, seek out the stories of the early women in aviation. Your list might include Raymonde de la Roche, Blanche Stuart, Harriet Quimby, Bessie Coleman, Amelia Earhart, and Jackie Cochran.

Search and Find

As you view the video, identify the following women:

- one of the first female fighter pilots of an F-18 Super Hornet (1985 Tammie Jo Shults)
- the first Latina in space (1993, Ellen Ochoa)
- the first female commander of Naval Test Wing Atlantic (2022, Elizabeth M. Somerville)
- the first female commander of a space shuttle mission (1999, Eileen M. Collins)
- the internationally renowned pilot, skydiver, aerobatic performer, and the fastest female speed record holder in a Reno air race (Vicky Benzing)
- the female Captain hero of Southwest Flight 380 (2018 Tammie Jo Shults)
- a Chief Warrant Officer 5, USA test pilot, instructor and combat pilot (Lourie A. Deboer)
- advocate for WASP military honors at all national military cemeteries (Erin Miller)

Search and Find:

- Who were some of the **first women in space**? As you view the video, listen for the stories of the first women in space. You might seek out Rhea Seddon, Sally Ride, Ellen Ochoa, and Eileen Collins.
- **What careers are available for women in aviation or space?** Today women fly for commercial airlines, fly in the military and in space, fly in air races, helicopter mercy flights, command naval air bases and so much more.
- What is the Palm Springs Air Museum's **First Flight**? It is a program to spark an interest in a career in aviation or space travel. Included is a flight on a Cessna 182 for kids ages 12 to 17.
- What is the Palm Springs Air Museum's **Young Science Professional Scholarship Foundation** (yspsf)? It is a \$10,000 scholarship for young women.

List of Important Events and People from Aviation History

Before viewing the program, you made a list of important events and people you knew about from aviation history. Review this list and ask, "What can we now add to the list?"

AFTER VIEWING ACTIVITIES

Women Astronauts

By 2019, female astronauts represented roughly 12% of all space travelers. As of 2021, there were 72 women with completed spaceflights.

- How did these women astronauts get there? What are their educational backgrounds, workforce trajectory, talents, and lifetime accomplishments?
- Who was the first female astronaut? (In 1963 Soviet cosmonaut Valentina Tereshova became the first woman in space.)
- Who was the first American female astronaut? (Sally Ride was the first American woman to fly in space in 1978. She finished her Ph.D. in physics at Stanford University. After five years of training, she finally flew on Space Shuttle Challenger in 1983.)
- Who is Christa McAuliffe and how is she remembered?

Other women astronauts to study include Mae Jemison, Eileen Collins, Kalpana Chawla, Peggy Whitson, Christina Koch, Jessica Meir, and Kate Rubins.

For Further Study – Women in Aviation

<https://www.thoughtco.com/women-in-aviation-timeline-3528458>

Available links on the timeline include:

- Biography of Amelia Earhart, Pioneering Female Pilot
- Amelia Earhart Quotes
- Bessie Coleman
- Biography of Harriet Quimby
- Harriet Quimby Quotes
- They Never Became Astronauts: The Story of the Mercury Women in Space - Timeline
- Women Astronauts

Many of the above topics include additional links. For example, *The Women in Space Timeline* includes the following links:

- Women in Space
- Sally Ride
- Sally Ride Photo Gallery
- Ellen Ochoa: Inventor, Astronaut, Pioneer
- Valentina Tereshkova: The First Woman in Space
- Biography of Judith Resnik, Second American Woman in Space

The last entry in the *Women in Space Timeline* is in 2014. Research the recent Women in space since 2014 and update the timeline.

Essential Traits of a Good Leader

The program, *Quest for Excellence: Women in Aviation*, provides a roadmap for boys and girls alike who have a vision they want to pursue, whether in aviation or another field.

While demonstrating courage, integrity, perseverance, and confidence, the women portrayed in this program showed personal character. These are some of the essential traits needed for good leadership.

- What are the essential qualities of a good leader?

Additional qualities you may include:

- ✓ willing to take risks.
- ✓ a willingness to take action in a timely manner.
- ✓ willing to act alone and in some cases take an unpopular position.
- ✓ willing to be fully accountable for the action that is taken.
- ✓ must be able to communicate her vision to others.
- ✓ plan in advance for mistakes or failures in order to rebuild trust.
- ✓ never allow mistakes or failures to shake her self-confidence.
- ✓ learns from mistakes or failures.
- ✓ a vision that brings out the best in her followers

Challenges Faced

Most leaders have faced challenges. Discuss the women in the program and the challenges they faced in their careers. How did they respond to crises? What success did they have in getting support for their goals?

- Ask an adult what crisis or challenge he or she has faced. How did you handle it? What did you learn from the experience?

Work together in groups of four to research one of the women in the program or another aviator or famous person. Identify the challenges faced and how the person responded.

Name of Person	Major Job	Challenges Faced	Response to Challenge

Each group shares the results of their research and records information on the above chart.

Report Card Assessment

You are being given the task of “grading” the aviators or other famous persons researched in the previous activity.

You have examined the challenges faced and the responses to these challenges. You now have the responsibility of creating a report card.

You may evaluate all the people listed in the above chart or just the one researched by your group.

Your job is to identify the qualities and actions that make someone effective and rate the success of the person/s against those standards and qualities. You will record a grade A, B, C, D, or F in each of the boxes on the leadership report card below.

Charisma is a measure of the compelling, magnetic charm or appeal that can help the person gain popular support and inspire devotion in others. It is a personal magic of leadership that supports special popular loyalty or enthusiasm.	Ethics is a measure of integrity. A person who scores high in this category will have no major scandals, making it easier for them to carry out their duties. Ethics generally refers to the rules of code of conduct that people use to determine when an action is right or wrong.
Crisis Response is a measure of the person’s ability to act decisively and effectively in times of crisis.	Vision is the ability to think about or plan the future with imagination or wisdom. It often includes creativity, inventiveness, or innovation.
Courage is the choice and willingness to confront danger, fear, pain, uncertainty, or intimidation. A courageous person has the mental or moral strength to withstand difficulty.	*Perseverance is the continued effort to do or achieve something despite difficulties, failure, opposition or delay in achieving success. A person shows perseverance by continuing when other people might have stopped.

*Perseverance is also NASA’s car-sized robotic rover looking for signs of past life in a region of Mars called the Jezero crater. Nicknamed Percy, it is part of NASA’s Mars 2020 mission.

Who was Bessie Coleman? Why was a Commemorative Quarter released in her honor? In February 2023, the U.S. Mint presented its new Bessie Colman Commemorative Quarter to the FAA. It has been called a gift from the past and a valuable symbol of an important chapter in U.S. aviation history. Bessie, who defied all

odds with her tenacious drive and fearless personality, helped pave the way for future generations of aviators and women. Bessie Coleman was the first licensed African American and Native American female pilot, and the first African American to earn an international pilot's license.

- **When do you think aviation began?** Aviation began in the 18th century with the development of the hot-air balloon.

Have groups of students research the history of aviation from gliders to the Wright Brothers' first-powered airplanes to fixed wings to propellers to jets to spacecraft to plans for the future. Create a timeline of aviation and have each group report on a different aviation-related event.

Federal Aviation Administration (FAA)

FAA stands for the Federal Aviation Administration, a federal government agency. Runway safety is one of the FAA's highest priorities. This encompasses pilots, air traffic controllers, and airport vehicle drivers. The priorities of the FAA include safety (both on and off the ground), sustainability, equity, and job creation.

Environmental Impact

The operation of powered aircraft releases soot and other pollutants into the atmosphere. Greenhouse gases such as carbon dioxide are also produced. Aviation also creates noise pollution, mainly caused by taking off and landing and sonic booms from supersonic aircraft. What can be done to lessen the impact of aviation on the environment? What are some current projects under development?

- The FAA is working to build a net-zero sustainable aviation system by 2050. How do they plan to do this?
- What are morphable wings and how could they be used to build more agile, fuel-efficient wings for aircraft?

Air Traffic Control

Air traffic control involves communication with aircraft to ensure they are sufficiently far enough apart horizontally and vertically.

- What are the qualifications to be an air traffic controller?
- How is radar used to see aircraft positions?
- What does it mean to fly under instrument flight rules?
- What are some of the largest, busiest airports in the United States? In the world?

In February 2023, nearly \$1B in Bipartisan Infrastructure Law Airport Funding was awarded to meet the surging air travel demand. Some of the improvements will include larger security checkpoints, more reliable and faster baggage systems, better roadways, and multimodal connections. Several grants will address the needs of aging traffic control towers.

Jobs in Aviation

- What types of jobs and programs are available in the aviation industry?

In March 2023, schools nationwide received \$10 million in FAA grants to develop the next generation of aviation professionals. The Aircraft Pilots Aviation Workforce Development Grant is designed to prepare students to become pilots, aerospace engineers, or drone operators. Part of the funding will also be used for the Aviation Maintenance Technical Workers Workforce Development Program.

United States Space Force (USSF)

The U.S. Space Force is the space service branch of the U.S. Armed Forces, one of the eight U.S. uniformed services, and the world's only independent space force. It was founded on December 20, 2019. Their motto is *Semper Supra*, "Always above."

- What is the mission of the Space Force? Who can join the Space Force?
- What kinds of equipment do they have?
- In what types of engagements has the Air Force Space Command been involved?

Space X

- What is Space X and who was the founder? What is unique about Space X?
- How is Space X different from NASA?
- Space X must submit data to the FAA at least seven days before an attempted launch. Why is this required? (Launch collision analysis data is used to assess the probability of the launch vehicle colliding with one of the thousands of tracked objects orbiting the Earth.)

Objects Orbiting the Earth

There are three types of Earth orbits: high Earth orbit, medium Earth orbit, and low Earth orbit. Many weather satellites and some communication satellites tend to have a high Earth orbit. Navigation and specialty satellites tend to be in a medium Earth orbit. They are designed to monitor a particular region. Most scientific satellites, including NASA's Earth Observing System fleet, have a low Earth orbit.

- What types of objects are orbiting the Earth? Why is this information important?
- What impact do these objects have on our lives?
- What are the concerns about objects orbiting the Earth?
- What is space junk? Why is it important?

International Space Station

The International Space Station (ISS), the largest modular space station in low Earth orbit, provides a unique perspective of our planet as the crew conducts scientific research in astrobiology, astronomy, meteorology, physics, and other fields. Members of the ISS crew also test spacecraft systems and equipment required for possible future long-duration missions to the Moon and Mars.

- Who is part of the crew currently serving on the International Space Station?
- Would you want to serve on a crew at the ISS? Why or why not?

You can learn details about the ISS mission by following the commercial crew blog, [@commercial_crew](#) on Twitter, and [commercial crew](#) on Facebook.

Learn more about ISS activities by following the space station, [@space_station](#) and [@ISS_Research](#) on Twitter, as well as the ISS Facebook and ISS Instagram accounts.

- How often does it take the ISS to orbit the Earth/?
- How many times a day does it orbit the Earth?
- How long has the ISS been in orbit?
- What disposal options have been planned for the end of the ISS?

As of March 3, 2023, the ISS has been in orbit for 24 years, 3 months, 11 days, and it has been occupied for 22 years, 4 months, and 1 day. The ISS program evolved from the Space Station *Freedom*, a 1984 American proposal to construct a permanently crewed Earth-orbiting station. The ISS is the ninth space station to be inhabited by crews. It is the largest artificial object in the solar system.

Balloons in the Sky

- What do we know so far about the Chinese spy balloon and other objects the U.S. shot down in early 2023?
- What have the recovery efforts revealed about the objects?

Some early reports suggested that the unidentified ariel objects might have been weather balloons or other high-altitude balloons used for scientific research, but no organization, company, or individual has been linked to them so far.

UFOs or “Unidentified Flying Objects”

For many years, there have been serious concerns about advanced technology aircraft that we can't explain. The Navy has officially acknowledged 11 near misses with Unidentified Aerial Phenomena (UAP) that required evasive action and triggered mandatory safety reports between 2004 and 2021.

The UAPs accelerated up to a speed of Mach 1, the speed of sound. They could hold their position, appearing motionless. They had no visible means of lift like aircraft with wings, flaps, or engines.

- What is the history of citizens reporting UAP sightings?
- What is being done to investigate highly advanced objects, especially those in highly restricted airspace over military bases?

Thank you for viewing this Study Guide for the program *Quest for Excellence: Women in Aviation*. We invite you to visit us at the Palm Springs Air Museum.

The Palm Springs Air Museum is a living history museum dedicated to educating the public about the role Air Power played in preserving American liberties and way of life. Established in 1994, the Palm Springs Air Museum is located at 745 North Gene Autry Trail, Palm Springs, California 92262.

The Museum has a growing collection of vintage aircraft in a 70,000-square-foot facility. The aircraft collection contains planes in the permanent collection and on loan. The website lists all our planes in alphabetical order by their manufacturer. Catalogs with a full description and history of each aircraft on display are sold on-site in the museum gift shop. Warbird Ride Certificates are available for multiple aircraft. Come fly with us and live the dream!

If you cannot visit us in person, you can view on the website each aircraft in our collection. You can also visit our Gift Shop online and purchase a wide range of aircraft items, including clothing, toys, books for youngsters, and much more!



Find out more about the Palm Springs Air Museum at
<https://palmspringsairmuseum.org>