

TOOLKIT 8 PIONEERS OF THE SKY



OKLAHOMA
Aeronautics



OKLAHOMA
CareerTech

Overview: Students explore career opportunities in Aerospace & Aviation Pathways using career pathways videos.

Source: Oklahoma Department of Career and Technology Education

Grade Levels: 6-8, 9-12

Location: All resources are provided in this toolkit.

| 1 Student Activity | 2 Lesson Plan or Procedure | 3 Activity Evaluation or Rubric | 4 Suggested Activities | 5 Glossary | 6 Teacher Background or Concepts | 7 Student Background or Concepts | 8 Standards Alignment |
|--------------------------|-------------------------------------|------------------------------------------|------------------------------|---------------|-------------------------------------------|-------------------------------------------|-----------------------------|
| x | x | x | | | x | | |
| Notes: | | | | | | | |

KEY:

1. Student Activity: This is the focus of the toolkit. It is at least one complete activity or lab for students to complete that relates to a topic relevant to aviation/aerospace. It may include related worksheets.
2. Lesson Plan or Procedure: These are the steps or instructions for the teacher to use to deliver the activity.
3. Activity Evaluation or Rubric: These are answers to the activity or a rubric or other tool for evaluating students' results.
4. Suggested Activities: These are additional or extension strategies for the teacher that relate to the topic/activity.
5. Glossary: This is a list of the vocabulary terms and their definitions that relate to the activity and/or associated concepts.
6. Teacher Background or Concepts: This is any background information for the teacher that explains key concepts relating to the topic/activity, provides the aerospace context for the activity or otherwise helps prepare the teacher for the topic/activity.
7. Student Background or Concepts: This is any background information for the student about theory and concepts related to the topic/activity. It may be separate handout files or a text section within the larger topic/activity.
8. Standards Alignment: These are education or industry standards that align with the topic/activity.

SUPPLEMENTAL RESOURCES

General Resources

- *Pilot's Handbook of Aeronautical Knowledge*, Federal Aviation Administration, 2016. Free to download at https://www.faa.gov/regulations_policies/handbooks_manuals/aviation/.
- Airport Acronyms and Abbreviations, Federal Aviation Administration, <https://www.faa.gov/airports/resources/acronyms/>
- Find an Airport, Oklahoma Aeronautics Commission, <https://oac.ok.gov/airports>
- K-12 Student/Teacher Resources, NASA, <https://www.nasa.gov/aeroresearch/resources/k-12-resources>

Instructional Practice Resources

- *60 Formative Assessment Strategies*, Natalie Regier, 2012. Free to download at <https://www.okcareertech.org/educators/resource-center/teacher-trainer-tools>.
- *Student Learning That Works: How brain science informs a student learning model*, McREL International, 2018. Free to download at <https://www.mcrel.org/student-learning-that-works-wp/>.

Career Planning Resources

- OK Career Guide. Free to Oklahoma educators. For more information, see <https://www.okcareertech.org/educators/career-and-academic-connections/ok-career-guide>.
- Aviation Organizations, Oklahoma Aeronautics Commission, <https://oac.ok.gov/media-outreach/aviation-organizations>
- *Careers in Aerospace*, American Institute of Aeronautics and Astronautics. Free to download at <https://www.aiaa.org/get-involved/students-educators/Careers-in-Aerospace>.
- Flying for a Career, AOPA, <https://www.aopa.org/training-and-safety/learn-to-fly/flying-for-a-career>
- Oklahoma Aerospace: Building on a Rich Tradition, Oklahoma Department of Career and Technology Education, <https://www.okcareertech.org/business-and-industry/aerospace-and-aviation>
- *Direct Your Future* career exploration curriculum, Kuder, Inc., available to download at <https://www.okcareertech.org/educators/career-and-academic-connections/ok-career-guide/ok-career-guide-resources/direct-your-futurem-career-exploration-curriculum>

Activity-Specific Resources

- 100 Most Influential Women in the Aviation and Aerospace Industry, Women in Aviation International, <https://www.wai.org/pioneers/100womenscript>
- 99s Museum of Women Pilots, <https://www.museumofwomenpilots.org/>
- Aerospace Pioneers, FAA, <https://www.faa.gov/about/history/pioneers/>
- Endless Skyway: The Early Days of Aviation in Oklahoma, TravelOK.com, https://www.travelok.com/article_page/endless-skyway-the-early-days-of-aviation-in-oklahoma
- Oklahoma Museums Association, <https://www.okmuseums.org/oklahoma-museums/>
- Pioneers of Flight Gallery, Smithsonian National Air and Space Museum, <https://pioneersofflight.si.edu/>
- Women in Aviation and Space History, Smithsonian National Air and Space Museum, <https://airandspace.si.edu/explore-and-learn/topics/women-in-aviation/>

TEACHER INSTRUCTIONS

- Read the teacher background information, “Oklahoma’s Aviation & Aerospace Heritage.”
- Ask students if they know about any pioneers of the sky from their community. Why do they think of this person as a pioneer?
- Distribute the student handout, “Pioneers of the Sky.”
- Review the listed websites of the Oklahoma Historical Society and the *Oklahoma Today* magazine archive.
- Provide any additional resources for student research.
- Use the Student Presentation Rubric to evaluate students’ presentations.
- Build upon the activity by visiting a local aviation or other museum.

TEACHER BACKGROUND INFORMATION

OKLAHOMA'S AVIATION & AEROSPACE HERITAGE

Oklahoma has a rich heritage in the history of air travel and space exploration. The state is associated with some of the early pioneers of aviation in America. Clyde Cessna flew his first airplane above the Great Salt Plains in northwest Oklahoma in 1911. In 1917, commercial aircraft production began at Dewey, including manufacturing the Curtiss JN-4 Jenny. That same year, Frank Champion of Oklahoma City became world famous for his exhibition flying. After World War I (1914-1918), barnstorming became popular, with pilots landing in pastures and offering short rides to the public for a fee.

In 1928, Tom Braniff offered the first commercial passenger flight in Oklahoma, connecting Tulsa and Oklahoma City. Braniff and his brother, Paul, launched one of America's first major airlines.

The state became a stopover during the early days of commercial air travel in America in 1929. Charles Lindbergh, who had flown solo to Paris just two years earlier, chose the northwest Oklahoma town of Waynoka as a site for an airport along the New York-to-Los Angeles route of Transcontinental Air Transport.

Famous people of the time who stopped in Waynoka included Charles Lindbergh and his wife, author and diarist Anne Morrow Lindbergh; pioneering aviator Amelia Earhart; actor Lionel Barrymore; author Ernie Pyle; and Oklahoma's own Will Rogers.



Photo courtesy Waynoka Historical Society

Wiley Post, though not born in Oklahoma, grew up near Maysville in Garvin County. During the 1920s, Post followed an unlikely path toward aviation history. He served time in the state prison for robbery, but was paroled early; took his first solo flight; lost an eye to a freak oilfield accident; purchased an airplane (with insurance money from the eye injury); and received his pilot's license, which was signed by Orville Wright himself. Before the plane crash in Alaska that took his life and the life of Will Rogers in 1935, Post made world aviation history. In 1931, he and Harold Gatty completed the fastest around-the-world flight aboard the Lockheed Vega Winnie Mae (named for the daughter of Chickasha oil man and aviation enthusiast F.C. Hall, who bought the plane). In 1933, Post set another world record by completing the first solo flight around the world. He did it in just seven days, 18 hours and 49 minutes.

Women with Oklahoma ties have also made aviation history. Bessie Coleman, who went to school in Langston, went on to become the world's first international woman pilot and the first African-American licensed pilot. (The U.S. Postal Service honored Coleman with a stamp in 1995.) Mary Haizlip learned to fly in Oklahoma City, gained fame in the 1930s as a race pilot and became the second woman in America to receive a commercial pilot's license. Another Oklahoma City resident, Dorothy K. Pressler Morgan, became the first female transport pilot in the state and the first female airport manager in the country. During World War II, members of the Women Airforce Service Pilots delivered aircraft, freeing male pilots to fight overseas.

Shannon W. Lucid, from Bethany, flew aboard five space shuttle flights, logging some 223 days in space. Aboard the space shuttle Columbia in 1993, she logged 838 hours and 54 minutes in space, making her America's female space traveler with the most hours in space.

The 99s Museum of Women Pilots at Will Rogers World Airport in Oklahoma City spotlights not only the women who flew early day airplanes, but also the pilots of today and tomorrow. Its exhibit areas and library provide insights into the role female pilots played in the development of aviation. The museum chronicles the rich history of female aviators from Amelia Earhart to today's women of space. The museum also includes an extensive collection of artifacts belonging to Earhart.



Photo courtesy 99s Museum of Women Pilots, Oklahoma City

During World War II (1939-1945), Oklahoma played a vital role in training pilots for combat. Air bases, fields and schools were established at Tinker in Midwest City, at Altus in the southwest corner of the state, at Enid in northcentral Oklahoma and at Ardmore in the south.

Oklahoma remains a manufacturing, maintenance and training hub for both military and civilian aviation. The Air Force Air Logistics Center at Tinker Air Force Base outside Oklahoma City and the large American Airlines maintenance facility in Tulsa demonstrate this fact. The Federal Aviation Administration's Mike Monroney Aeronautical Center in Oklahoma City is the national center for flight-related training. Its FAA Academy is where air traffic controllers, flight attendants, pilots and others who work in aviation receive their training. The academy has also trained participants from more than 170 countries. In addition to the academy, the FAA Logistics Center provides repair and technical support for air traffic control equipment and aircraft for the U.S. and other countries.

The Transportation Safety Institute provides training on topics from hazardous materials to highway and aviation safety. The Civil Aviation Registry is home to the records of every privately owned U.S. plane and licensed pilot, including those of Amelia Earhart and Wiley Post.

Oklahomans are no strangers to space travel. In addition to Shannon Lucid, a number of Oklahomans have left their mark on the frontiers of space. Leroy Gordon Cooper was born in Shawnee; Owen K. Garriott was born in Enid; John Bennett Herrington was born in Wetumka; William Reid Pogue was born in Okemah; Stuart Allen Roosa attended school in Claremore and at Oklahoma State University; and Thomas P. Stafford was born in Weatherford.

Source: *Touring Oklahoma* (2008 edition), Oklahoma Department of Career and Technology Education

PIONEERS OF THE SKY

Name: _____

Instructions

1. Research a pioneer of the sky in Oklahoma. Use resources such as the ones below, plus any that your teacher provides:

The Encyclopedia of Oklahoma History and Culture
<https://www.okhistory.org/publications/encyclopediaonline>

Oklahoma Today Archives
<https://dc.library.okstate.edu/digital/collection/OKToday>

2. Answer at least the following questions about the pioneer you chose:

- What is her/his connection to aviation and aerospace in Oklahoma?
- What are 3-5 key points in her/his life story?
- Why did you choose this pioneer?

3. Give a presentation about the pioneer you chose.

STUDENT PRESENTATION RUBRIC

| | 9-10 pts. | 7-8 pts. | 1-6 pts. | Student Score | Teacher Comments |
|--------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------------|---------------------------|
| Preparedness | Student is completely prepared and has clearly rehearsed. | Student seems fairly prepared but could have used more rehearsal. | Student does not seem prepared to present. | | |
| Stays on Topic | Stays on topic all of the time. | Stays on topic most of the time. | It was hard to tell what the topic was. | | |
| Speaks Clearly | Speaks clearly and distinctly all the time and mispronounces no words. | Speaks clearly and distinctly most of the time. Mispronounces words occasionally. | Often mumbles or mispronounces words. Hard to understand. | | |
| Posture and Eye Contact | Stands up straight, looks relaxed and confident. Establishes eye contact during the presentation. | Stands up straight and establishes eye contact some of the time during the presentation. | Slouches and/or does not look at people during the presentation. | | |
| Content | Shows a full understanding of the topic. | Shows a good understanding of the topic. | Does not seem to understand the topic very well. | | |
| Total Points | | | | | 50 points possible |

