



ACTIVITY / PROJECT-BASED LEARNING

A JOURNEY TO THE MOON THROUGH TEXAS

Social Studies, Grades 4 and 7

OBJECTIVE

In the 1950s and 1960s in the United States, national support and funding for space programs and technological research expanded as the international political climate following World War II gave way to the Cold War. Often referred to as the “Space Race,” the competition between the United States and the Soviet Union for supremacy in spaceflight and aerospace technology led to the rapid development of space programs in both countries. Huge advancements were made in a relatively short period of time as both countries scrambled to develop superior technologies for both manned and unmanned exploration beyond the surface of the Earth. In the United States, the national effort led to a mission landing the first men on the moon just over a decade after the country’s first satellite was launched.

These rapid developments were the result of a concerted effort of scientists, engineers, and researchers across the country, but Texas proved a significant location for the space program. At the Manned Spacecraft Center in Clear Lake, Texas (now the Johnson Space Center), thousands of employees worked to test equipment, train astronauts, and develop communication systems that would allow workers at Mission Control to speak to spacecraft beyond the Earth’s atmosphere. Additionally, although the launches of space missions took place at Cape Kennedy in Florida, the Manned Spacecraft Center became the visible front of the space program in the US, broadcasting video updates of program and mission developments.

This lesson explores this unique period of growth in the U.S. space program focusing on the role of the Manned Spacecraft Center and the contributions of workers at the Texas site. Using films produced by NASA and staff at the Manned Spacecraft Center, as well as home movies and other promotional films, students will gain a greater understanding of the developments within the space program and the short timeline and rapid progress that was made.

PROCESS

Prior Knowledge

The following lesson assumes that students:

- Have a basic understanding of the historical context of the space program in the United States and the international climate following World War II that led to the Space Race.
- Know that historical sources can be biased and may represent a particular perspective. Students should be able to take an analytical view of the materials presented.



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- Should have the skills to conduct independent research and create a basic presentation on the subject matter.
- Have access to technology that allows them to view streaming video individually or in a group setting.

Hook

Explain to students that you will be discussing the development of the space program in the United States.

Draw a simple timeline on the board or overhead. At one end, write 1957 (the Soviet Union launches Sputnik) and at the other end write 1969 (when the first man walked on the moon).

Brainstorm with students what needed to happen in this time span and what needed to be developed to enable the space program in the United States to compete with the space program in the Soviet Union.

Students can either call out answers or write their ideas on paper that is collected. At this point you can make suggestions, such as telling them that they would need to fly, communicate, eat, etc.

When you have gathered the students' ideas, write them in an approximate order of development on the board.

Lesson

Tell your students that they will be watching a video that shows the work that was done at the Manned Spacecraft Center in Clear Lake, Texas (near Houston) in the years leading up to the mission that placed a man on the moon. This video should give them an idea of all of the work that had to go into rapidly developing a space program from the building of the center to the building and testing of space craft to the training of astronauts.

Hand out a worksheet (see Worksheets) with questions over the video. This worksheet will highlight some of the key areas mentioned in the video, as well as require critical thinking at the end where students must analyze what they have seen and draw conclusions based on the information.

Show students the video "The NASA Manned Spacecraft Center: A National Resource." Have students complete the worksheet as they watch the video.

<https://www.journeytothemoonthroughtexas.com/portfolio-item/the-nasa-manned-spacecraft-center-a-national-resource/>



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After students complete the worksheet, ask if there were any developments that surprised them. Did they think of any other research or developments that had to be made in the short time-span that they had not thought of before that they should add to the timeline?

Independent Practice

Depending on the size of your classroom and your available resources, break students into groups or let students work independently.

Assign students or groups to a particular mission. A list of missions is available below along with a link to that mission's page on the Texas Archive of the Moving Image's web exhibit, *A Journey to the Moon through Texas*, <https://www.journeytothemoonthroughtexas.com/>. Students will be responsible for researching their mission and presenting on the history of that mission, the technological developments that took place, the people involved, and any interesting facts about their subject. Students may use the worksheet in the worksheet tab to compile their information.

Compile all time periods in class to develop your classroom timeline of the space program in the United States, paying particular attention to the place of the Manned Spacecraft Program in Clear Lake, Texas in the overall US Space Program. Depending on your space availability, you can create this digitally through a Prezi or PowerPoint, or you can have each group be responsible for a section of a paper timeline on a classroom wall or chalkboard/whiteboard.

Exhibit Sections

Apollo 1

The launch of this mission was supposed to take place on February 21, 1967, but during a launch rehearsal of the mission, a fire broke out and the crew were killed. The videos associated with the mission cover recommendations from a review board on changes that needed to be made.

https://www.journeytothemoonthroughtexas.com/apollo_1/

Apollo 5

Another unmanned mission, this Apollo mission was made to test the lunar module in a space environment prior to its use by astronauts Neil Armstrong and Buzz Aldrin to reach the surface of the moon.

https://www.journeytothemoonthroughtexas.com/apollo_5/

Apollo 7

The first manned spacecraft Apollo mission since the failure of Apollo 1, this mission's objective was to test the Command and Service Module. It was also the first mission to be broadcast to the public from space.

https://www.journeytothemoonthroughtexas.com/apollo_7/



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Apollo 8

The second human spaceflight mission put men into orbit around the Earth for the first time and recorded the fastest speeds that humans had ever travelled. The principle objectives of the mission were to test navigation and midcourse corrections.

http://www.texasarchive.org/a_journey_to_the_moon/apollo_8/

Apollo 9

The first test flight of the entire Apollo spacecraft. On this mission, the crew named the components of the ship.

https://www.journeytothemoonthrough texas.com/apollo_8/

Apollo 10

The “dress rehearsal” for the moon landing, this mission included all aspects of the lunar surface landing except walking on the moon. The crew shot films in orbit, and, thus, the first color images of the moon were broadcast to the world.

https://www.journeytothemoonthrough texas.com/apollo_10/

Apollo 11

The mission that landed Neil Armstrong and Buzz Aldrin on the moon after a bumpy start.

https://www.journeytothemoonthrough texas.com/apollo_11/

Mercury Program

The first human spaceflight program and the first attempt by the United States to send a human to orbit the Earth. The Mercury program consisted of twenty unmanned test missions, six manned missions, seven astronauts, and two chimpanzees preparing for manned orbits.

https://www.journeytothemoonthrough texas.com/mercury_program/

Gemini Program

The immediate predecessor to Project Apollo, which sought to land a man on the moon, the Gemini Program developed much of the technology that would be used in missions to come. It was during the Gemini Program that mission control operations were moved to the Manned Spacecraft Center in Clear Lake, Texas.

https://www.journeytothemoonthrough texas.com/gemini_program/

Worksheets

A Journey to the Moon Video Worksheet

https://texasarchive.org/sites/default/files/Journey_to_the_Moon_Video_Worksheet.pdf

A Journey to the Moon Video Worksheet (TEACHER'S KEY)

https://texasarchive.org/sites/default/files/Journey_to_the_Moon_Video_Worksheet_TEACHER'S_KEY.pdf



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Independent Practice Worksheet

https://texasarchive.org/sites/default/files/Journey_to_the_Moon_Independent_Practice.pdf

Extended Learning Worksheet

https://texasarchive.org/sites/default/files/Journey_to_the_Moon_Extended_Learning.pdf

Extended Learning

Have students create a virtual exhibit on one of the space programs that were developed in the United States in the 1960s through the 1980s. Students will create their own PowerPoint presentation using images, narratives, and links to videos on the Texas Archive of the Moving Image web exhibit, web exhibit, *A Journey to the Moon through Texas*,

<https://www.journeytothemoonthroughtexas.com/>. Student research worksheets and links to other resources are available under the 'Resources' and 'Worksheets' tab.

RESOURCES

Smithsonian National Air and Space Museum

The website for the Smithsonian National Air and Space Museum provides a number of valuable research resources for students. Their Online Exhibition section features exhibits on the development of aerospace technology and on the Space Race. Students can utilize the multi-media section for images and secondary source research material on all of the Apollo missions.

<http://airandspace.si.edu/>

The National Cold War Exhibition – Space Race exhibit

This exhibit provides a general overview of the Space Race, showing developments in both the United States and the Soviet Union. The section entitled "Unmanned Exploration" features a timeline comparing the two countries' technological developments in unmanned satellites. There is also a brief overview of the mission programs for both NASA and the Soviet Space Program.

<http://www.nationalcoldwarexhibition.org/schools-colleges/national-curriculum/space-race/>

NASA History Program

The NASA History Program began in 1959 and has documented and preserved the agency's history to the present day. The History Program website makes the agency's digital collection available to the public. The site contains a topical index so that students can easily locate resources on their particular subject. The Johnson Space Center has its own website accessible through links on the page, <https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/>, that contain images, timelines, and articles.

<https://history.nasa.gov/>



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National Archives and Records Administration (NARA) – Space Exploration

The National Archives houses a number of digital collections related to space exploration. This landing site provides an excellent timeline, as well as links to biographies of astronauts, finding aids for materials in presidential libraries, and other resources.

<http://www.archives.gov/research/alic/reference/space-timeline.html>

Texas State Historical Association - Lyndon B. Johnson Space Center

This article in the Handbook of Texas provides a full history of the Johnson Space Center from the federal establishment of a national space program to present day.

<https://tshaonline.org/handbook/online/articles/sql01>

NASA – Johnson Space Center

This website features a look at the work being done at the Johnson Space Center today.

<https://www.nasa.gov/centers/johnson/home/index.html>

Mission Control, This is Apollo: The Story of the First Voyages to the Moon

by Andrew Chaikin (Author), Alan Bean (Illustrator)

Age Range: 8 - 12 years

Grade Level: 3 - 7

Lexile Measure: 1150L

Hardcover: 128 pages

Publisher: Viking Books for Young Readers (May 28, 2009)

Language: English

ISBN-10: 0670011568

ISBN-13: 978-0670011568

Apollo: The Epic Journey to the Moon, 1963-1972

by David West Reynolds (Author), Gene Cernan

Hardcover: 272 pages

Publisher: Zenith Press; First edition (May 26, 2013)

Language: English

ISBN-10: 0760344523

ISBN-13: 978-0760344521

Moonwalk: The First Trip to the Moon (Step-Into-Reading, Step 5) Paperback – May 6, 1989

by Judy Donnelly (Author)

Age Range: 7 - 9 years

Grade Level: 2 - 4

Lexile Measure: 550L

Series: Step into Reading



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Paperback: 48 pages

Publisher: Random House Books for Young Readers; Step-Into-Reading, Step 5 edition (May 6, 1989)

Language: English

ISBN-10: 0394824571

ISBN-13: 978-0394824574

Johnson Space Center: The First 50 Years

Edited by Laura Bruns and Mike Litchfield

Series: Images of Aviation

Paperback: 128 pages

Publisher: Arcadia Publishing; 1st Ed. edition (February 4, 2013)

Language: English

ISBN-10: 0738595101

ISBN-13: 978-0738595108

Suddenly, Tomorrow Came: The NASA History of the Johnson Space Center (Dover Books on Astronomy)

by Henry C. Dethloff

Series: Dover Books on Astronomy

Paperback: 432 pages

Publisher: Dover Publications (September 19, 2012)

Language: English

ISBN-10: 0486477568

ISBN-13: 978-0486477565

TEKS

Social Studies, Grade 4

5A – Identify the impact of various issues and events on life in Texas such as urbanization and World War II

5B – Explain the impact of the oil and gas industry upon industrialization and urbanization in Texas, including important places

5C – Identify the accomplishments of notable individuals

8C – Explain the geographic factors such as landforms and climate that influence patterns of settlement

9B – Identify reasons why people have adapted to and modified their environment in Texas, past and present, such as the use of natural resources to facilitate transportation



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12B – Explain how geographic factors such as climate, transportation, and natural resources have influenced the location of economic activities in Texas

12D – Describe the impact of mass production, specialization, and division of labor on the economic growth of Texas

12E – Explain how developments in transportation and communication have influenced economic activities in Texas

13A – Identify ways in which technological changes in areas such as transportation and communication have resulted in increased interdependence among Texas, the United States, and the world

20A – Identify famous inventors and scientists

20B – Describe how scientific discoveries and innovations such as in aerospace, energy, and technology have benefited individuals, businesses, and society in Texas;

20C – Predict how future scientific discoveries and technological innovations might affect life in Texas.

21B – Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions

21C – Organize and interpret information in outlines, reports, databases, and visuals, including graphs, charts, timelines, and maps

22B – Incorporate main and supporting ideas in verbal and written communication

22C – Express ideas orally based on research and experiences;

22D – Create written and visual material such as journal entries, reports, graphic organizers, outlines, and bibliographies; and

22E – Use standard grammar, spelling, sentence structure, and punctuation.

Social Studies, Grade 7

1B – Apply absolute and relative chronology through the sequencing of significant individuals, events, and time periods

7A – Explain the political, economic, and social impact of the oil industry on the industrialization of Texas

7B – Define and trace the impact of "boom-and-bust" cycles of leading Texas industries throughout the 20th and early 21st centuries such as computer technology (and aerospace)



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7F – Analyze the political, economic, and social impact of major events in the latter half of the 20th and early 21st centuries such as major conflicts, the emergence of a two-party system, political and economic controversies, immigration, and migration.

9C – Analyze the effects of physical and human factors such as climate, weather, landforms, irrigation, transportation, and communication on major events in Texas

10A – Identify ways in which Texans have adapted to and modified the environment and analyze the positive and negative consequences of the modifications

12C – Explain the changes in the types of jobs and occupations that have resulted from the urbanization of Texas.

13A – Analyze the impact of national and international markets and events on the production of goods and services in Texas such as agriculture, oil and gas, and computer technology;

13C – Analyze the impact of significant industries in Texas such as oil and gas, aerospace, medical, and computer technologies on local, national, and international markets.

20A – Compare types and uses of technology, past and present

20B – Identify Texas leaders in science and technology

20C – Analyze the effects of various scientific discoveries and technological innovations on the development of Texas such as advancements in the agricultural, energy, medical, computer, and aerospace industries

20D - Evaluate the effects of scientific discoveries and technological innovations on the use of resources such as fossil fuels, water, and land

20E – Analyze how scientific discoveries and technological innovations have resulted in an interdependence among Texas, the United States, and the world.

21A – Differentiate between, locate, and use valid primary and secondary sources such as computer software, databases, media and news services, biographies, interviews, and artifacts to acquire information about Texas

21B – Analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions

21C – Organize and interpret information from outlines, reports, databases, and visuals, including graphs, charts, timelines, and maps

21D – Identify points of view from the historical context surrounding an event and the frame of reference that influenced the participants



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22B – Use standard grammar, spelling, sentence structure, punctuation, and proper citation of sources

22C – Transfer information from one medium to another, including written to visual and statistical to written or visual, using computer software as appropriate

22D – Create written, oral, and visual presentations of social studies information.