

We Chose to Go to the Moon: The Apollo Program

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Junior Division

Group Documentary

Process Paper: 500 words

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Practically everyone is aware of the moon landing, yet most don't know the impossibility it was before it happened. Just flipping through special edition magazines for Apollo's 50th anniversary showed us how much we'd missed. For example, a copy of *Smithsonian* mentioned that, before Apollo 11, NASA worried that the dust on the moon could act like quicksand and astronauts would sink irreversibly into the ground. Most impressive to us was that scientists weren't sure what would happen on the moon - many decisions they made were guesses based on probability. With millions of parts, even with 99.9 percent reliability, thousands could fail. The unlikeliness of mission success, and also because it was Apollo's 50th anniversary, lead us to agree on this topic.

Our secondary source research consisted primarily of books and articles. The main part of researching, however, was in primary sources. For example, we learned about public library databases that offered a wide variety of sources. We also interviewed an astronaut and a futurist as primary sources, both who helped us understand the effects of Apollo 11 and analyze the history. We attended talks, and looked at many newspapers that were helpful to us because it helped exemplify public opinion and political barriers that were broken. After we decided on our project medium, a documentary, we realized we needed many more primary sources, particularly images and videos, to complete our project. By chance, we found a video library and image archive on the NASA website, which was extremely helpful, and a whole archive just for

presidential speeches, making research easier. Additionally, it made the process for creating credits much smoother.

We chose to create a documentary. Our topic has such a wide variety of primary sources in terms of videos and images, and we felt that our topic could best be expressed in that way. We could tell more of a story in a video format which we thought would make the history more interesting. Also, the visuals surrounding our project were so iconic that we thought it would be important to our project to include them. In that way, we could connect the things everyone knows about with the backstory and the breaking barriers aspect.

The topic fits the theme of breaking barriers, specifically of technology, politics and public opinion. Technology expanded many times over because of the Apollo missions. This was mainly because scientists had thousands of unsolved problems and needed to innovate new solutions. It is not as if those scientists had a list of problems that they could solve and then check off like a homework assignment. They had to come up with ideas out of thin air. Secondly, President Kennedy had to break political and social barriers in order to receive funding for the missions. His persuasive, enthusiastic, and now historic speeches, as well as his overwhelming popularity, helped. The most important thing to us was that it broke barriers then, so now, people can expand and break new barriers further in space.

Bibliography

Primary Sources

"50-Year-Old Memories of Apollo 11." In *Weekend All Things Considered*. N.p., 2019.

https://link.gale.com/apps/doc/A594148579/UHIC?u=dclib_main&sid=UHIC&xid=3df3cfd2.

On the 50th anniversary marking the success of the Apollo 11, the Smithsonian National Air and Space museum commemorated the Apollo 11 by projecting the 363-foot Saturn V rocket on the Washington Monument. Many people came to watch the spectacular Apollo 11 event taking place on the National Mall. Reporter Sarah McCammon walked around the National Mall interviewing people who were around five decades ago to watch the moon landing. McCammon interviewed a man that watched the moon landing from his bed in the United Kingdom. The fact that people watched the moon landing from across the world signifies the importance of the Apollo 11 mission. Additionally, due to the fact that many people vividly remember the moon landing fifty years later implies that the success of the Apollo 11 had a massive impact on everyone who was watching.

"Although Boeing Is Best Known as a Manufacturer of Airplanes, It Has Long Been Involved with The..." In *Gale Encyclopedia of U.S. Economic History*, edited by Thomas Riggs. 2nd ed. Vol. 1. Farmington Hills, MI: Gale, 2015.

https://link.gale.com/apps/doc/PC3611087046/UHIC?u=dclib_main&sid=UHIC&xid=383a7bb4.

This source is an image of a Lunar Roving Vehicle built by Boeing for NASA. This one was used on the Apollo 16 mission in 1972 and Apollo 11 did not even have a rover to use on their mission. This contributes to our project because it is a source that fits in our segmentation. It fits in the "after" category and helps us show a viewer the advancement of the missions after the first and that they continued to advance on into the future because of the first program.

Apollo Contour Rocket Nozzle in the Propulsion Systems Laboratory. Photograph. NASA. July 7, 1964. Accessed February 1, 2020. <https://images.nasa.gov/details-GRC-1964-C-70929>.

This image shows a rocket nozzle being tested by scientists in a laboratory that could simulate conditions found in very high altitudes to provide critical information about flight performance. The facility shown was used to test complex rocket engines such as the ones used in the Apollo mission. The photo shown contributes to the project because it shows some of the testing facilities used for the Apollo program, as well as other space flight tests. These tests were vital for the mission because they provided opportunities to create environments that aren't naturally found on the Earth so that scientists could discover how to best prepare for the atmospheres found in space.

Apollo 8 Mission image, Earth over the horizon of the moon. Photograph. NASA. December 24, 1968. Accessed February 6, 2020. <https://images.nasa.gov/details-as08-14-2383>.

This source shows a picture, taken by Apollo 8, of the Earth over the moon's horizon, as if it is "rising". It is about five degrees above the moon's horizon and the photo was taken around 10:40 AM. It is similar to the famous "Earthrise" picture also taken by Apollo 8, which showed the Earth rising over the moon's horizon just as we see the Sun or the Moon. This image was important to our project because it is an iconic photo, and also because it helps visualize the enormity of the missions. When people see this photo their minds go to the progress that occurred in order to get a picture from out there. It was also taken by Apollo 8, not Apollo 11 which further exhibits the contributions of other Apollo missions.

Apollo 11 astronaut footprint on Moon. Photography. *Encyclopædia Britannica ImageQuest*. Accessed Jan 17, 2020. https://quest.eb.com/search/132_1248707/1/132_1248707.

This picture is an image of Neil Armstrong's footprint on the moon during the Apollo 11 mission. It was a milestone in human history and this image encapsulates such a vital part in human history. This image is important to our research because it shows this important event in just one image. Everyone who sees it knows what it means.

"Apollo 11 Launch." MP4 video, 2:50. NASA. July 10, 2018. Accessed January 20, 2020. <https://moon.nasa.gov/resources/288/apollo-11-launch/>.

As this video shows, the launch for Apollo 11 was a spectacular event in which millions of people world-wide viewed with awe, as well as anxiousness as they watched it ascend into the atmosphere. The scientists at mission control especially were nervous as their years of hard work and dedication was presented for the world because of the chance of catastrophic failure. Because there were so many different parts, even with a 99.9 percent reliability, it was still extremely likely that thousands of parts would fail. This source is important for our documentary and for our research because it is a video that encapsulates the excited and monumental nature of the event. This moment is the summation of ten years of barrier-breaking and hard work.

"Apollo 11 Overview." MP4 video, 2:17. NASA. July 16, 1969. Accessed January 26, 2020. <https://images.nasa.gov/details-Apollo%2011%20Overview>.

This source is a video clip of footage from the Apollo 11 mission in July of 1969. The video contains the main highlights from the mission including the dramatic liftoff, the landing, Neil Armstrong's first steps, and words, the American flag-planting, and finally, the return to Earth. This source is helpful to our research because it shows the important moments of the mission that we need to show. It also is a primary source so we can use it in our documentary to show these particular events.

"Apollo 11 Splashed down in the Pacific Ocean Southwest of Hawaii after Completing Its Lunar Landing..." In *Primary Sources*, edited by Lawrence W. Baker, Sarah Hermsen, Rob Nagel, and Peggy Saari. Vol. 4 of *Space Exploration Reference Library*. Detroit, MI: UXL, 2005.

https://link.gale.com/apps/doc/PC3441487286/UHIC?u=dclib_main&sid=UHIC&xid=bdac77f8.

This is an image of the Apollo 11 splashdown in the Pacific Ocean after the crew returned from the moon. After this time, the crew had to go directly to quarantine just in case they had picked up any bugs from the moon. In fact, Neil Armstrong spent his birthday quarantined! This source contributes to our research because it shows the final stages of the Apollo mission, directly after they returned from the moon. It fits in our "during the event," segment.

Apollo 9 prime crew on deck of ship prior to water egress training. Photograph. NASA. November 1968. Accessed February 5, 2020. <https://images.nasa.gov/details-S68-54841>.

This source is a picture of the Apollo 9 crew as they stand on the deck of the ship in the Gulf of Mexico before undergoing training in the water. The ocean was often used for testing because it could be used to simulate conditions found in deep space. The astronauts shown here went to space as the third manned Apollo mission that went to space. This source is important to our research because it was an example of a picture of the Apollo 9 crew in training as they prepared for their mission. It is important to show in our documentary because it is not an aspect of the program that everyone knows about. Most people don't know the names of the astronauts in the picture because their mission didn't go to the moon.

Apollo 1 Fire. Photograph. airandspace.si.edu. Accessed January 17, 2020. <https://airandspace.si.edu/multimedia-gallery/5381hjpg?id=5381>.

This image is a photograph of the Apollo 1 capsule after a fire ignited in the almost pure oxygen environment. It killed all three astronauts during a pre-flight test, and although NASA had an evacuation plan, it wasn't fast enough to get everyone out safely. Because of the immense tragedy, NASA was careful to prevent the issue from repeating. The photo is important to our project because Apollo 1 was a very important mission for the future of the Apollo program. Scientists realized the problem after it was too late, but in the future, they never made the same mistake.

Apollo Portable Life Support System. Photograph. NASA. June 11, 1968. Accessed February 1, 2020. <https://images.nasa.gov/details-S68-34580>.

The image cited here is a photograph of the Apollo mission's life support system that was used to provide vital resources to astronauts such as oxygen and a properly pressured environment in their spacesuits. The device in the picture has its cover removed to view the inside and you can see the tanks and intricate wiring of the device. It is attached to the back of a spacesuit so that astronauts are able to breathe outside of the spacecraft and walk on the moon. This source is necessary for us to look and use because it shows one of the many parts that scientists at NASA had to engineer in just a short time. Not only did they have to prepare a many-layered space suit to protect the astronauts, but they also had to develop a way to provide life support in a fail-safe way.

"Armstrong Footprint on Moon." In *UXL Encyclopedia of Science*, edited by Amy Hackney Blackwell and Elizabeth Manar. 3rd ed. Farmington Hills, MI: UXL, 2015.
https://link.gale.com/apps/doc/PC4205139679/MSIC?u=dclib_main&sid=MSIC&xid=a6b013fc.

This is another image of a footprint on the moon's surface, imprinted by an astronaut's boot during the Apollo 11 mission. After disembarking from the Lunar Module, Neil Armstrong took his first steps on the moon, placing his feet into the dirt, which sunk slightly, creating an implant. In fact, some scientists worried that the dust would be so deep that an astronaut would fall in, like quicksand. This image is important to our project because it provides symbolism. That footprint is still on the moon today because of the lack of wind, or any sort of changes on the moon's surface.

Cinematic Motivational Trailer. By AShamaluevMusic. compact disc. Accessed February 25, 2020. <https://www.ashamaluevmusic.com/dramatic-music>.

This source is a score called, "Cinematic Motivational Trailer", composed by AShamaluevMusic. This score is played during the introduction to our documentary. During that period, we displayed images that illustrate early civilizations' interests in the moon. This source is important to our documentary because it helps draw the viewer in. We want the music to set a tone that captivates the audience leaving them wanting more.

Clean Room in the Zero Gravity Research Facility. Photograph. images.nasa.gov. July 1, 1968. Accessed February 3, 2020. <https://images.nasa.gov/details-GRC-1968-C-02344>.

This source is an image of a technician preparing a test sample in the Zero Gravity Research Facility clean room at NASA Lewis Research Center. The facility has been used for a variety of studies relating to the behavior of fluids and flames in microgravity. The Zero Gravity Facility was originally designed to support the research and development of analyzing components in a weightless or microgravity environment. This source is important because it illustrates the research that went into the finding a way to get a man to the moon. When Kennedy first proposed the idea to send a man to the moon many people were skeptical that a human could survive in a microgravity environment, the fact that we were able to successfully place a man on the moon exemplifies the importance of the research at the Zero Gravity Research Facility.

Dismukes, Kim. "U.S.S. Hornet Recovers the Apollo 11 Command Module." MPEG video, 0:30. NASA. Accessed January 20, 2020.
<https://spaceflight.nasa.gov/gallery/video/apollo/apollo11/html/recovery.html>.

This source is a clip of a video of a ship, the USS Hornet picking up the Apollo 11 command module to recover the astronauts inside after they crashed into the ocean. The ship had previously been going 40,000 feet per second before it slammed into the ocean, but it was slowed down enough from its plummet by parachutes to protect the astronauts within. We think this source should be in our documentary and is important to our project because it finalizes the journey and the events that took place in the story we are telling. It shows how the broken barriers narrative concluded.

Egypt, Cairo, Ancient Memphis, Saqqara necropolis, Unas' pyramid interior, burial chamber ceiling decorated with stars. Photography. *Encyclopædia Britannica ImageQuest*. Accessed Jan 16, 2020. https://quest.eb.com/search/126_3736390/1/126_3736390/cite.

This image is of an ancient pyramid with the ceiling decorated with stars. The image shows the great history behind people's desire to explore the cosmos and understand what lay with the stars. This contributes to our research because it is important to our project to show the great build-up to the barriers broken in the 1960s. It helps us further understand the amazing achievement it was to land a human on the moon.

Evening Star (Washington (DC), District of Columbia), June 12, 1963.

<https://infoweb-newsbank-com.dclibrary.idm.oclc.org/apps/news/document-view?p=WO RLDNEWS&docref=image/v2:13D5DA85AE05A305@EANX-NB-14DE86794C7774D4@2438193-14DC3BFF9B7627E3@0-14DC3BFF9B7627E3@>.

This source is a PDF of a newspaper article from the sixties which reports on the budget cuts and cancellations that NASA and President Kennedy had to deal with during the Space Age. Although now most people unanimously agree that the project was worth the money, people living during the time didn't foresee the benefits the program would reap and therefore didn't believe the project to necessitate so much funding from congress. This ended up ending the Mercury series and delaying Gemini as well as reducing funding for Apollo. This source is important to our research because it shows the importance of President Kennedy's role in breaking barriers. He realized that he had this role, and did his best to get congress to pay for the program. Although he wasn't versed in the science of it, Kennedy still had a strong desire to bring a man to the moon, and specifically an American man to prove American dominance in space.

Evening Star (Washington (DC), District of Columbia), September 22, 1963: 14. *NewsBank: Access World News – Historical and Current*.

<https://infoweb-newsbank-com.dclibrary.idm.oclc.org/apps/news/document-view?p=WO RLDNEWS&docref=image/v2%3A13D5DA85AE05A305%40EANX-NB-14DF3781176C1D17%402438295-14DD8B7BB0D91742%4013-14DD8B7BB0D91742%40>.

The source cited here is a clipping from a newspaper, the *Evening Star* from 1963, which provides information about the UN General Assembly that President Kennedy spoke at and his suggestion that the United States and the Soviet Union work together on a joint moon mission. It is pessimistic about this and states that moon cooperation is doubted in the headline, but also discusses how NASA is banning any Soviet cosmonauts from riding aboard an American ship. This source is important to our documentary because it shows the struggles that Kennedy went through when he attempted to break political barriers.

Evening Star (Washington (DC), District of Columbia), September 22, 1963: 22. *NewsBank: Access World News – Historical and Current*.

<https://infoweb-newsbank-com.dclibrary.idm.oclc.org/apps/news/document-view?p=WO>

RLDNEWS&docref=image/v2%3A13D5DA85AE05A305%40EANX-NB-14DF3781176C1D17%402438295-14DD8B840346DE1C%4021-14DD8B840346DE1C%40.

This source is a section from *The Sunday Star* Newspaper in 1963 after a UN Grand Assembly meeting in which President Kennedy suggests that the US could cooperate with the Soviet Union in space. He had tried asking this in 1961, but icy relations between the US and the Soviet Union prevented any headway. The second offer did not work too well either and Kennedy was killed shortly after, preventing any further arrangements. This source contributes to our research because it explains the struggles Kennedy had trying to get funding for the program. One of the reasons Kennedy reached out to the Soviet Union was because the project was in danger of cancellation.

F-1 Engines of Apollo/Saturn V First Stage Leave Trail of Flame after Liftoff. Photograph. NASA. April 4, 1968. Accessed February 6, 2020. <https://images.nasa.gov/details-S68-27365>.

The source cited above is an example of one of the beautiful visuals that came with the Space Age. During this time, people began to see more and more of the universe from different angles. Also, the rocket shown in the picture was part of Apollo 6, which was unmanned. We are using this source in our project because it contributes to our efforts to show parts of the program other than Apollo 11. In our documentary, we don't spend a lot of time on Apollo 11 because we wanted to show the build-up in order to present the breaking barriers aspect of the event.

Fesliyan, David. "City of Ruins." On *City of Ruins*. compact disc. Accessed February 11, 2020. <https://www.fesliyanstudios.com/royalty-free-music/download/city-of-ruins/43>.

This source is a score called, "City of Ruins", composed by David Fesliyan. Kennedy's death was not taken lightly by the American people. After all Kennedy had done for our country the American people were not going to let Kennedy die in vain. They were going to honor him in the only way they knew possible, they were going to send a man to the moon. This source is important because it helps set the tone of Kennedy's death and it illustrates how his death impacted the American people.

"Fly Me to the Moon." Recorded June 9, 1964. On *It Might as Well Be Swing*. Performed by Frank Sinatra. By Quincy Jones. 1664, MP3.

This source is a song called, "Fly Me to the Moon," which was recorded by Frank Sinatra in the midsixties. It was first recorded as a part of his "It Might as Well Be Swing," in 1964, and then later re-recorded in 1965 as a part of "A Man and His Music." This source is important to our research because this song was very closely associated with the Apollo Program and the 60s. Apollo 10 even took a copy of it on its mission to play in space.

Gemini Model in the 10- by 10-Foot Supersonic Wind Tunnel. Photograph. NASA. September 1, 1962. Accessed February 2, 2020. <https://images.nasa.gov/details-GRC-1962-C-61762>.

This source is a picture of a Gemini model being held by a researcher at NASA as he examines it in the supersonic wind tunnel testing facility. The model is to scale and is

a model of the Gemini capsule for testing. The Gemini program was established after Mercury and Apollo, but it served as a transitional program between the two and tested docking in space. The source is helpful to our research because it shows the interesting "before" part of the Apollo missions where researchers had to test things through previous programs, including Gemini and Mercury. It helps us show research that took place before the first take-off of the Apollo program rocket, Saturn V.

Glenn, Jerome. Interview by the author. Washington, DC. February 13, 2020.

We conducted this interview with Jerome Glenn, a futurist and a writer who is also the Executive Director and starter of the Millenium project. His job as a futurist means that he takes into account trends of the present in order to "predict" the future, or make accurate guesses. This helped us learn more about the future of space travel and Apollo's effects on it, as well as learn more about the 60s. Glenn was beneficial to our project because he wrote a book about space travel, (*Space Trek: The Endless Migration*) and also lived through our period of time.

"Gonzalez with President John F. Kennedy and Vice President Lyndon B. Johnson." In *UXL Hispanic American Reference Library*, edited by Sonia Benson. 2nd ed. Detroit, MI: UXL, 2003.

https://link.gale.com/apps/doc/EJ2210064508/MSIC?u=dclib_main&sid=MSIC&xid=00b05256.

In this image, John F. Kennedy, Lyndon B. Johnson, and another man. This source contributes to our research because we needed an image of John F. Kennedy with his vice president for our final documentary. This image is helpful because it contributes to our research and helps us represent the people involved in the government during the apollo missions. The president played a vital role during the 60s to get funding from congress and boost morale.

Howard Simons, Staff Reporter. "Red Space Feat Doesn't Decide Moon Race: Officials Reassuring." *The Washington Post, Times Herald (1959-1973)*, Aug 19, 1962.

<https://search-proquest-com.dclibrary.idm.oclc.org/docview/141617852?accountid=46320>.

This source, directly pulled from a 1962 edition of the Washington Post, describes one of Soviet Russia's space-race accomplishments from the perspective of Americans in 1962. At this time, the Soviet Union seemed way ahead of the US in the space race, and there was controversy about whether NASA should continue to receive funding. The journalist highlights how the last thing the government wants is a hot and cold public on the topic of the Apollo missions. This source is helpful to our research because it depicts a different perspective from what we have today. Contrary to common belief, the American public was not completely behind the efforts to go to the moon. Many believed it was too expensive, and unnecessary. This source provides information from that time and the government's assurances that everything would be worth it.

"John F. Kennedy's 'We Choose to Go to The Moon' Speech." *CBS News*, November 12, 1962. *Gale In Context: U.S. History* (accessed January 15, 2020).
https://link.gale.com/apps/doc/PC4295840367/UHIC?u=dclib_main&sid=UHIC&xid=15cb4740.

This source is a video version of the famous, "We Choose to Go to the Moon," speech given by President John F. Kennedy. This was one of the most motivating speeches given in the lead up to the Apollo Missions. This source contributes to our research because it provides a visual for our project. Also, it shows how President Kennedy broke political barriers in order to get funding from congress.

"John F. Kennedy." In *Primary Sources*, edited by Lawrence W. Baker, Sarah Hermsen, Rob Nagel, and Peggy Saari, 50-59. Vol. 4 of *Space Exploration Reference Library*. Detroit, MI: UXL, 2005.
https://link.gale.com/apps/doc/CX3441400083/UHIC?u=dclib_main&sid=UHIC&xid=e91a2a42.

This source illustrates Kennedy's intentions for putting a man on the moon. The source begins by providing background information on why it was crucial for the United States to be the first country to put a man on the moon. At that time the U.S. and the former Soviet Union were engaged in the Cold War, a period of hostile relations, both nations were competing for military superiority and dominance in space. The United States always seemed to be one step behind the soviets. It was time for the U.S. to do something incredible to prove their importance. Kennedy spoke to Congress and asked for a considerable amount of money for space exploration. He encouraged U.S. citizens to come together as one. He explained that one man was not going to the moon by himself, they would go as a nation and support each other along the way.

John Noble Wilford. "ASTRONAUTS SPEEDING TOWARD THE MOON; FIRST DAY OF APOLLO FLIGHT IS FLAWLESS; NIXON ASKS FOR NATIONAL HOLIDAY MONDAY: CRAFT ON TARGET WORLD WATCHES START OF MAN'S ATTEMPT TO ACHIEVE LANDING ASTRONAUTS SPEEDING TOWARD THE MOON; FIRST DAY OF APOLLO 11 FLIGHT IS FLAWLESS WORLD WATCHES THE START OF ATTEMPT FOR A LANDING." *New York Times (1923-Current File)*, Jul 17, 1969.
<https://search-proquest-com.dclibrary.idm.oclc.org/docview/118522154?accountid=46320>.

This article details the beginning stages of the Apollo 11 mission. The critical first stages were executed flawlessly. The spaceship's path to the moon, an average of 238,857 miles from Earth, was so precise that a previously planned corrective maneuver was deemed unnecessary. This allowed the crew to gain an extra two hours of sleep. Although it was still possible for the mission to fail, the National Aeronautics and Space Administration as well as the flight controllers were confident the moon landing would be a success based on the outcome of the initial stages.

John Noble Wilford Special to The New York Times. "Astronauts Confident of Moon Landing: Apollo Crew Appears Calm 11 Days before the Mission Apollo 11 Astronauts Confident of Moon Landing." *New York Times (1923-Current File)*, Jul 06, 1969.
<https://search-proquest-com.dclibrary.idm.oclc.org/docview/118528039?accountid=46320>.

This source highlights the days leading up to the moon landing and covers an interview that took place with the astronauts. They stated that they were confident about the moon landing and completely prepared to go. Also, they had to wear masks and suits to avoid getting sick or contaminated by anything that could possibly delay the moon landing that they could contract from the journalists. It is helpful to our project because of the nature of the source. It is a newspaper from the time, and therefore gives us the perspective from the events leading up to the moon landing. People were often quite nervous about whether the investment for the Apollo missions were going to be worth it, and therefore it would be important for the astronauts to seem confident. Overall, it contributes details about the final days before the Apollo mission took off, and what the atmosphere was like before the astronauts left.

Kennedy, John F. Speech transcript, Rice Stadium, Rice University, Houston, TX, September 12, 1962.

In John F Kennedy's famous "we choose to go to the moon" speech, he discusses the main point of the Apollo missions in order to convince the American public how important they are to the country. He focuses on why the US needs to be the first to remain a world leader and to bring peace and stability to the world. He describes how it will be for "the progress of all people" so that the nation can lead and fulfill their obligation to be the world's leading space-faring nation. This source is vital to our research because this speech was one of the leading factors of the US's success in the Space Race. Kennedy threw his full support behind this, and once he was killed the country felt an obligation to him in that they wanted to meet his goal. All of this contributes to our project because it provides the main reasoning behind the decision to go to the moon.

Kennedy, John Fitzgerald. "September 20, 1963. Address to the UN General Assembly." Speech, September 20, 1963.
<https://millercenter.org/the-presidency/presidential-speeches/september-20-1963-address-un-general-assembly>.

This source is a speech given by President John F. Kennedy on September 20, 1963, to the UN general assembly. Among other things, the President discussed the idea of starting a joint space program with the Soviet Union to combine their scientific forces and take on the task of reaching the moon. He had also tried this a few years prior when the program was in danger of cancellation, but the leaders of the Soviet Union refused, hardening Kennedy's determination to reach the moon until 1963 when the program was running out of funding, and relations had somewhat cooled off. Unfortunately, President Kennedy was killed shortly after this long-forgotten speech and Lyndon B. Johnson continued on with the spirit of competition. This source is important to our research

because it shows a lesser-known aspect of the Apollo missions. We wanted to try and show interesting parts of the history that weren't necessarily obvious to everyone.

"Kennedy in Fort Worth on November 22, 1963." In *The Cold War*, edited by Walter Hixson. American Journey. Woodbridge, CT: Primary Source Media, 2000. *Gale In Context: U.S. History* (accessed February 6, 2020).
https://link.gale.com/apps/doc/EJ2210036526/UHIC?u=dclib_main&sid=UHIC&xid=27e71a0e.

This source is a picture of President John F. Kennedy giving a speech before the fateful motorcade during which he was shot. It was his last speech, given in Fort Worth Texas, before he was killed in the afternoon of November 22, 1963. This source is important to our research because it shows President Kennedy giving a speech before he was killed. This is necessary for our documentary because we mention this event in the voiceover.

"Kennedy, John F." In *UXL Biographies*. Detroit, MI: UXL, 2011.
https://link.gale.com/apps/doc/EJ2210004288/MSIC?u=dclib_main&sid=MSIC&xid=5c3cc981.

This is an image of President John F. Kennedy, the 35th president of the United States. He played a large role in encouraging the country to pursue space and got money from congress to fund the missions. This picture is helpful to us because we need an image of John F. Kennedy for our documentary.

KSC-69P-631. Photograph. NASA. July 16, 1969. Accessed February 6, 2020.
<https://images.nasa.gov/details-KSC-69P-631>.

This source is an image of NASA mission control in Houston, Texas, watching the Apollo 11 take-off. They are rising up from their consoles to view the lift-off from their seats in the Launch Control Center. This source is included in the NASA image database and we are using it as a source because it shows a key moment in the Apollo program during which the scientists working on the project finally saw their work realized. This summarizes the moment where everything in the program comes together and their hard work paid off.

ksc-69pc-376. Photograph. NASA. July 16, 1969. Accessed February 1, 2020.
<https://images.nasa.gov/details-ksc-69pc-376>.

This source is a picture of Apollo 11 astronaut Neil Armstrong, the first man to step on the moon as he looked at flight plans for the planned mission before boarding the rocket. In the picture, he is in his spacesuit and is being assisted with it by a technician who is adjusting it as he prepares for departure which will take place shortly on launch pad 39A, and scheduled for 9:32 AM. This source is important to our research, and also to put in our final project because it was a key moment of preparation in the final moments before the countdown. It is also a visual representation of preparation which is useful in order to depict the research that was put into the project and all the planning, as well.

KSC-69PC-381. Photograph. NASA. July 16, 1969. Accessed February 1, 2020. <https://images.nasa.gov/details-KSC-69PC-381>.

This source is an image of astronaut Edwin A. Aldrin Jr as he finishes putting on his spacesuit in preparation for liftoff with the help of a spacesuit technician. It depicts Aldrin holding out his gloved hand to be adjusted, providing a demonstration of the intricacies and the research that went into the spacesuit when scientists made it. It is especially impressive to see the finished product being put on and adjusted because the spacesuit was only engineered in a few years. This source is important for our research and necessary for our project because it shows a spacesuit being put on, a spacesuit that took years and thousands of hours of research by hundreds of researchers and scientists. Before the 1960s, no spacesuit had been developed and in less than 10 years NASA engineered working spacesuits for astronauts that protected them from an atmosphere they had never experimented on before. This spacesuit was also very expensive.

KSC-LOC-62-7018. Photograph. NASA. September 11, 1962. Accessed February 6, 2020. <https://images.nasa.gov/details-KSC-LOC-62-7018>.

This image is a picture of President Kennedy walking through a launch complex on a tour as he is being escorted by Dr. Kurt H. Debus. He was often involved in seeing over NASA operations, both for publicity and for information. This source contributes to our project because our documentary focuses on President Kennedy in terms of breaking political and social/economic barriers. For this reason, we need many images of President Kennedy as he works on the moon missions.

KSC-PL62-76876. Photograph. NASA. September 11, 1962. Accessed January 22, 2020. <https://images-assets.nasa.gov/image/KSC-PL62-76876/KSC-PL62-76876~thumb.jpg>.

This source is an image of a large crowd of reporters greeting President Kennedy and John Glenn, the first American to orbit the earth as they discussed a console in the Mercury control center. This took place at Cape Canaveral, Florida and showed a frenzy of reporters taking pictures to share with the American people, who eagerly awaited news about the program as they regained enthusiasm for the space race. This source is important for our project and our research because it not only shows Kennedy's involvement in the program but also shows that, although he was not a scientist, he still did his best to discuss the more technical aspects. He also was very popular, with an 83 percent approval rating so people listened to him.

Liftoff - Apollo XI - Lunar Landing Mission - KSC. Photograph. NASA. July 16, 1969. Accessed February 5, 2020. <https://images.nasa.gov/details-S68-54841>.

The source cited here is a picture of the 363-foot tall Apollo XI Spacecraft that was used for the Apollo XI mission. It was taken from a camera mounted from a launch tower and it was launched at 9:32 am. This source contributes to our project because it shows a different view of a rocket launch, and not only this, but this rocket launch isn't the Saturn V rocket launch for Apollo 11 that people normally see. This launch was for a

different rocket that came before the Apollo missions and the Saturn V rocket that people normally would see.

"The Liftoff of Apollo 11." In *The Gale Encyclopedia of Science*, edited by K. Lee Lerner and Brenda Wilmoth Lerner. 4th ed. Detroit, MI: Gale, 2008.
https://link.gale.com/apps/doc/CV2210078872/UHIC?u=dclib_main&sid=UHIC&xid=e41dc737.

This source is an image of the Apollo 11 liftoff. In this image, you can see the Saturn V rocket taking off from the pad at Kennedy Space Center, on July 16, 1969. This image is important for our project because it is an iconic image of a very important moment in human history. This point was a milestone for humankind.

"Location of Large Subsurface Water-Ice Deposit in Utopia Planitia, Mars." images.nasa.gov. Last modified November 11, 2016. Accessed January 25, 2020.
<https://images.nasa.gov/details-PIA21138>.

This source is an image of a map of the location of large subsurface water-ice deposit in Utopia Planitia on Mars. The diagonal stripes on the map detail a portion of the Utopia Planitia region where a large subsurface deposit rich in water ice was assessed using the Shallow Radar, an instrument on NASA's Mars Reconnaissance Orbiter. This is relevant to our research because in our documentary we detail the importance of water being discovered on Mars.

Lopez-Alegria, Michael. Interview. Washington, DC, United States. April 22, 2020.

This interview was conducted between the city-wide and national competitions. We realized that we wanted another type of primary source, but we could not access any sources outside of the internet because we could not go out during the quarantine. However, we did some research on the internet and found Michael Lopez-Alegria, a retired astronaut who lives here in DC. We interviewed him over Zoom about his experiences and about his thoughts on the Apollo Program and the future of space travel. He helped bring a real experience to our documentary, while also helping us analyze the historical context of the event.

Lunar phases, 3rd century Roman mosaic. Photography. *Encyclopædia Britannica ImageQuest*. Accessed Jan 17, 2020.
https://quest.eb.com/search/132_1242273/1/132_1242273/cite.

This picture is of a third-century Roman mosaic of the phases of the moon which was made in the ancient city of Latium, in Italy. It shows how the moon moves throughout the sky during the month. This is important to our project because it shows how ancient civilizations studied the skies, all the way through to the present day where we still study the sky. The patterns in the night sky have always been important.

"Lyndon B. Johnson's First Address to Congress after John F. Kennedy's Assassination." Video file. August 23, 2016.
https://link.gale.com/apps/doc/PZQUOC801002705/UHIC?u=dclib_main&sid=UHIC&xid=fddf08a9.

This source was a speech given by Lyndon B. Johnson after President Kennedy was assassinated. It attempted to console the American people while urging them not to let him have died in vain. This contributes to our project because John F. Kennedy's assassination practically ensured that the United States would put their full effort into reaching the moon. This is because everyone wanted to honor the legacy of their dead president.

Map of Phoenix Digging Area. Photograph. images.nasa.gov. June 4, 2008. Accessed February 6, 2020. <https://images.nasa.gov/details-PIA10765>.

This source is an image of a map of the Phoenix digging area. The map indicates the digable areas in relation to the location of the Phoenix Mars Lander. It illustrates the areas where the Phoenix Scooper made its first and second scoop. This image contributes to our research by illustrating the technology used on the Phoenix mission.

Mesopotamia. Photograph. *Encyclopædia Britannica ImageQuest*. Accessed Jan 17, 2020. https://quest.eb.com/search/144_2849635/1/144_2849635/cite.T

This is an image of a Mesopotamian stone artwork showing the sun, the moon, and written on with cuneiform. It is dated to 3000 BC. This image is helpful to our project because it shows the importance of the moon landing. All throughout human history, people have looked up to the sky in wonder and imagined what it was like. Because of the Apollo Missions, we now know more about the Universe than ever before.

Miller Center. "May 25, 1961: The Goal of Sending a Man to the Moon." Video file, 46:20. May 1961. <https://millercenter.org/the-presidency/presidential-speeches/may-25-1961-goal-sending-man-moon>.

This video is President John F. Kennedy's message to congress in 1961 about obtaining funds for the Apollo Program. He was very focused on beating the Soviet Union in space in order to beat them on Earth, so he asked for increased funding to send a man to the moon, for unmanned space exploration, to develop a nuclear rocket, and to advance satellite technology. This video is important to our research because it shows President Kennedy's motivations and his push of NASA and the space program in order to win the Space Race. He also had to break political barriers in order to do this by getting large amounts of money from Congress to pay for t programs.

THE MOON. - The lunar barge of the ancient Egyptians, on which the moon travels over the sky to the west, and returns through the nether world to the east.. Fine Art. *Encyclopædia Britannica ImageQuest*. Accessed Jan 17, 2020. https://quest.eb.com/search/140_1650348/1/140_1650348.

This is an image of the lunar barge from the ancient Egyptians, who believed that the moon traveled this way through the sky and then returned in the morning. It is one of the thousands of drawings of the moon throughout history to try to represent how the moon moved and worked. This image is helpful to our project because it shows the

importance of the moon in many cultures. We want to depict how important the moon has been throughout history.

Moon observations, 1659 artwork. Photograph. *Encyclopædia Britannica ImageQuest.* Accessed Jan 17, 2020. https://quest.eb.com/search/132_1354746/1/132_1354746/cite.

This is a drawing of observations made about the moon in the 17th century which shows a full moon and a crescent moon. The cratered surface is detailed and is from Argoli's Ephemerides, which is a table of astronomical data. This image is important to our research because pictures like this one show the human curiosity about the sky and about the moon. People have always gazed at the Universe, and the Apollo mission is another example of that.

n/a. Photograph. NASA. November 1, 1967. Accessed February 5, 2020. <https://images.nasa.gov/details-6762211>.

This source is a picture of a facility where workmen are positioning the nose cone for an unmanned Apollo mission that would test the Apollo Lunar Module in Earth orbit. The facility here is Kennedy Space Center, renamed this after President Kennedy's death in an impromptu announcement after his wife asked for it to be named after him. This source is important to our research because it depicts a very large facility with a crane and workers, like in a construction site. It shows the vastness of the project and the number of different people with different expertise, from construction workers to rocket scientists who needed to be consulted for the project to work.

NACA Langley. *Bell Computer Apparatus.* Photograph. NASA. January 28, 1947. Accessed February 4, 2020. https://images.nasa.gov/details-LRC-1947-B701_P-51536.

This source is a picture of a computer at a NASA facility that was used for calculating by women who worked at NASA doing computing work. It is not so much of a computer as we think of today but an "apparatus". This image is important to our research because it shows the type of computers that the world had before the Apollo missions which they had to work with and improve in order to get an accurate guiding system. The rocket and capsule had to be computer-operated, something that couldn't be achieved when the program started. This caused it to be necessary to innovate new computers, and therefore NASA had to break technological barriers in that way.

NASA. *Apollo 8.* Photograph. National Aeronautics and Space Administration. December 29, 1968. Accessed January 21, 2020. <https://images-assets.nasa.gov/image/S69-16402/S69-16402~thumb.jpg>.

This source is an image of a large crowd of over 2000 waiting for the arrival of the Apollo 8 astronauts at 2 am in the morning in December. The astronauts Frank Borman, James A. Lovell Jr., and William A. Anders had been recovered from the Pacific ocean after returning from space and the Apollo 8 mission where they orbited Earth over a hundred times. The image is important to our research and our project because it shows how the astronauts were supported by the country. Although a lot of people thought the missions were a waste of money, most everyone thought that astronauts were the coolest

guys around. People stayed up all night to welcome them back from a mission that finally brought the United States ahead of the Soviet Union.

- . "Apollo 11 Press Kit." News release. July 6, 1969. Accessed April 14, 2020. https://www.nasa.gov/specials/apollo50th/pdf/A11_PressKit.pdf.

This source is a press kit released for Apollo 11. It was used for publicity purposes and was released to the press (press release) to give the public more information about it. There were kits like this released for Apollo missions 7-17 but we mainly used this one for our project and in our research. They provide detailed diagrams as well as everything from the Lunar Module structure to crew hygiene and medical supply information.

- . *Apollo Rendezvous Docking Simulator*. Photograph. NASA. November 2, 1964. Accessed February 1, 2020. https://images.nasa.gov/details-LRC-1964-B701_P-10192.

This source is an image of a Rendezvous Docking Simulator used for testing the motion of the Apollo Command Module where a pilot is shown completing maneuvers for docking with a to-scale Apollo command module. It was originally created for astronauts during the Gemini program, but later it was modified to practice docking for the Apollo program. This source is helpful to our project because it shows the testing facilities used for testing aspects of the Apollo program, as well as previous programs that lead up to the Apollo missions. It helps us understand the purposes of these different facilities and the amount of research and preparation that had to be done for the missions to be successful.

- . *Apollo-Saturn (AS)-204 Insignia- MSC*. Illustration. NASA. December 1, 1966. Accessed January 21, 2020. <https://images-assets.nasa.gov/image/S66-36742/S66-36742~thumb.jpg>.

This source is the Apollo 1 insignia, which was created for the first manned Apollo flight and were for the crew of Virgil I. Grissom, Edward H. White II, and Roger B. Chaffee. These three astronauts lost their lives on the launch pad during a fire ignited during a pre-flight test. This picture is important to our project because it symbolizes the Apollo 1 mission and all the work that went into it. It is a representation of the barriers broken for that specific mission.

- . *Kennedy-Gilruth*. Photograph. NASA. July 29, 2019. Accessed January 21, 2020. <https://images-assets.nasa.gov/image/Kennedy-Gilruth/Kennedy-Gilruth~thumb.jpg>.

This source shows President John F. Kennedy with the director of NASA's Johnson Space Center, as they look at a small model of the Apollo 11 command module. This took place in 1962, on September 1st, 7 years before Apollo 11 was launched. The image is important because it shows the planning the project took since the model Kennedy is holding was created so many years before Apollo even began. Before even that, they had Gemini and Mercury missions to further explore the future of space travel and develop the best technology possible for the Apollo missions. Kennedy was taken

with the idea of going to space, so he became very involved with NASA and its publicity.

———. *KSC-63P-0171*. Photograph. NASA. November 16, 1963. Accessed January 22, 2020. <https://images-assets.nasa.gov/image/KSC-63P-0171/KSC-63P-0171~thumb.jpg>.

This is an image of President John F. Kennedy as he toured Cape Canaveral, Florida, and standing in front of the Gemini spacecraft which was a precursor to the Apollo program. Also there are astronaut L. Gordon Cooper, astronaut Virgil I. Grissom, and G. Merritt Preston. This source details the beginning of the Space Race before the first Apollo mission was started. These missions started early, with programs such as Gemini and Mercury which prepared technology and science for those future missions.

———. *Project Apollo Flight Sequence*. Photograph. NASA. August 1, 1966. Accessed February 2, 2020. https://images.nasa.gov/details-LRC-1966-B701_P-05819.

This source shows a drawing of the Apollo Program's flight sequence that was planned before the missions to depict a typical mission. All five moon missions followed this flight plan almost exactly as nothing major went wrong. This source is important to our research because it shows the pre-planned mission flight plan. Also, it's consequential because it shows that the Apollo missions were prepared for so much that all 5 lunar landing missions followed the exact same flight plan.

"NASA STEM Presents - The Future of Space." images.nasa.gov. Last modified April 29, 2019. Accessed January 25, 2020.

https://images.nasa.gov/details-NHQ_2019_0808_NASA%20STEM%20Presents%20-%20The%20Future%20of%20Space.

This video details the steps that will be taken to further space exploration. The video discussed Nasa's approach for going forward to the moon, video profiles that provide behind-the-scenes looks at what it is like to work at NASA, and a live talk with astronauts aboard the International Space Station. Additionally, the video illustrated Nasa's moon to mars explorations. This source is important for our documentary and other research because it explains the aftermath of the success of Apollo 11, the success of the Apollo 11 mission made it possible for astronauts to return to the moon and conduct further missions to eventually stay on the moon and journey to mars.

NASA, Taub. *Little Joe Model Mercury Project*. Photograph. NASA. June 26, 1959. Accessed February 3, 2020. https://images.nasa.gov/details-LRC-1959-B701_P-04323.

This source is an image of a NASA technician and a model of a rocket, more specifically the Little Joe test vehicle which was used to qualify the abort system in flight conditions for future missions. It was a part of the Mercury Program, which was one of the precursors to Apollo, such as the Gemini program which helped gain the research and technology for the moon missions. This image is important to our project because the issue was used for publicity to represent the exciting idea of a rocket and a rocket scientist. It also helps encapsulate the idea of rocket-building that NASA had to do.

Neff, Gary, and John Knoll. "Apollo 11 - Landing on the Sea of Tranquility - July 20, 1969." Video file. Accessed January 18, 2020. <https://history.nasa.gov/alsj/a11/video11.html>.

This source is a clip of a video of the lunar module's descent onto the moon and contains the well-known, "the eagle has landed," quote after the capsule safely landed. You can also hear low fuel warnings, computer alarms, verbal warnings, and also mission control's relief at the landing announcement. This source is important to our research and our project because of the recognizable and historic lines in it, and also the video of the moon landing. Also, it is very important to show the actual event of our project in the documentary.

Nye, Bob. *Astronauts Conrad and Bean at Lunar Landing Research Facility*. Photograph. NASA. July 28, 1969. Accessed February 2, 2020. https://images.nasa.gov/details-LRC-1969-B701_P-05791.

This source is a photograph of astronauts for the Gemini and earlier Apollo missions, Bean and Conrad, at a Lunar Landing facility looking over files. The Lunar Landing Research Facility was used for many forms of research for the Apollo missions in order to gain a better understanding of landing on the moon. The source is helpful to our research because it shows the earlier astronauts of the program, including astronauts for Gemini, as well as an astronaut who was a backup for Apollo 9. These astronauts helped run tests as well, and Conrad also brought the United States into the lead for hours in space through Gemini V.

Official Emblem - Apollo 11 - FIRST (1st) Scheduled Lunar Landing Mission. Photograph. NASA. June 1, 1969. Accessed January 21, 2020. <https://images-assets.nasa.gov/image/S69-34875/S69-34875~thumb.jpg>.

This image is the emblem used for the Apollo 11 mission which was the first mission planned to land on the moon with a man on it. The astronauts on that mission were Michael Collins, Neil Armstrong, and Edwin (Buzz) Aldrin. This source is important to our project because it represents the Apollo 11 mission and symbolizes the project throughout the decade until 1969. Although the Apollo missions went on past Apollo 11, our project focuses on the barriers broken to get to the point of Apollo 11 and the first lunar landing.

Panorama View of Apollo 11 Lunar Surface Photos. July 19, 2019. Photograph. https://link.gale.com/apps/doc/PWLVB773249130/MSIC?u=dclib_main&sid=MSIC&xid=04e859a7.

This image is a panorama of the moon's surface, taken by Neil Armstrong during the Apollo 11 mission at Tranquility Base. It was released by NASA on July 16, 2019, around the 50th anniversary of the moon landing. This source was useful for our project because it was useful to show the moon's surface as seen by the astronauts of the Apollo 11 mission. A lot of the pictures chosen for this project symbolize the significance of the Apollo Program, and the barriers broken and we think this picture really shows the awesome nature of the moon.

Phoenix La Mancha Trench. Photograph. images.nasa.gov. October 9, 2008. Accessed February 6, 2020. <https://images.nasa.gov/details-PIA10718>.

This source is an image of the variations of trench excavated by the Phoenix scooper, and reveals the ice layer beneath the soil surface. The Phoenix was sent to Mars to study the history of water in the Martian arctic and to uncover any evidence of what once could have been a habitable area on Mars. This image is helpful to our research because it illustrates the purpose of the Phoenix mission. It is important to show the progress that has occurred since the Apollo missions. Due to the success of the Apollo 11 NASA has been able to expand its boundaries and adopt new goals.

Phoenix Scoop Inverted Showing Rasp. Photograph. images.nasa.gov. July 15, 2008. Accessed February 6, 2020. <https://images.nasa.gov/details-PIA10964>.

This source is a photograph of the Phoenix Scoop, a device used to search for evidence of what could have been a habitable zone on Mars. The Phoenix Scoop was used to excavate Martian soil and ice to provide insight on the planet's water cycle. This source is connected to our project because it illustrates the technology used on the Phoenix mission that proved there was water-ice on Mars.

Plaque Which Apollo 11 Astronauts Will Leave on the Moon. Image. NASA. July 14, 1969. Accessed January 20, 2020. <https://images.nasa.gov/details-S69-39334>.

This source is an image that is a recreation of a plaque that the Apollo 11 astronauts left on the moon to identify and commemorate the event as historic. It is signed by the three astronauts on the mission, Neil Armstrong, Edwin (Buzz) Aldrin, and Michael Collins, as well as Richard Nixon, the president at the time and states the date. It also reads, "We Came in Peace for All Mankind". This source is important to our research because it proves that Apollo 11 is a historic event that should be commemorated by all of humanity. Also, it is important to show this in our documentary because it shows the effort that went into the project.

Portrait - Prime and Backup Crews - Astronaut Edward H. Wright II. Photograph. history.nasa.gov. April 1, 1966. Accessed March 13, 2020. <https://history.nasa.gov/Apollo204/crew.gif>.

This source is a picture of the Apollo 1 crew who died tragically in a pre-launch test fire. This was January 27, 1967, which was shortly before the planned first mission of the Apollo Program. The judges at the school-wide competition recommended that we add a picture of this crew when we discussed the fire that started in the capsule, right after we show the image of the fire-ravaged seats.

"President John F. Kennedy in Dallas Motorcade Prior to Assassination." *Gale U.S. History Online Collection*, Gale, 1963. *Gale In Context: U.S. History*, https://link.gale.com/apps/doc/WGVKIQ896338891/UHIC?u=dclib_main&sid=UHIC&xid=7bfeabf9. Accessed 6 Feb. 2020.

This source is a picture of President John F. Kennedy just moments before he was shot and killed in the Dallas motorcade on November 22, 1963. It was a turning point in

the Apollo program because the American people didn't want Kennedy to have died in vain, so many began to support the project because they supported their president. This source contributes to our project because President Kennedy was such a vital figure to the Apollo program. It helps us understand just how impactful his death was.

"President Kennedy in the Dallas Motorcade." In *Gale in Context Online Collection*. Detroit, MI: Gale, 1963.

https://link.gale.com/apps/doc/PC4205130205/MSIC?u=dclib_main&sid=MSIC&xid=1e0478d.

This is an image of President John F. Kennedy just moments before he was shot in a motorcade in Dallas. This was a turning point in Apollo's history because the country realized that they wanted to honor his legacy by reaching the moon before the Soviets. This image is important to our project because it was a very important part of the decade we are focusing on and changed the course of history.

President Kennedy Visit - Apollo Model. Photograph. NASA. September 12, 1962. Accessed January 21, 2020.

<https://images-assets.nasa.gov/image/s62-05628/s62-05628~thumb.jpg>.

This source is an image of President John F. Kennedy speaking to the media at a gathering to discuss Apollo and NASA. Also in the picture are Vice-President Lyndon B. Johnson, Dr. Robert Gurlith, director of what is now the Lyndon B. Johnson Space Center, and the NASA administrator, James E. Webb. This source is important to us because it shows us how involved Kennedy was with the Apollo programs. He really was invested in getting the United States ahead in the space race.

Press Conference - Gemini-Titan (GT)-3 - FL. Photograph. NASA. March 3, 1965. Accessed January 22, 2020.

<https://images-assets.nasa.gov/image/s65-20864/s65-20864~thumb.jpg>.

The source here is a photograph of a news conference held after a Gemini mission which orbited Earth several times and was successfully completed. The people in the image were being interviewed about the past mission and about the future with NASA, and include the astronauts on the mission, as well as Dr. Robert Gilruth and the assistant administrator for the office of public affairs, NASA. This is important for our project because it shows a press conference, which was important for the publicity of press conferences as the American people needed assurance from NASA. After Kennedy's death, the Apollo program needed to have as much good publicity as possible because he wasn't there to support it.

Project LOLA or Lunar Orbit and Landing Approach. Photograph. NASA. November 11, 1964. Accessed February 2, 2020. https://images.nasa.gov/details-LRC-1964-B701_P-10753.

This source is a picture of an artist-creation of the lunar surface created to research issues related to landing on the moon and how the moon lander would have to be designed. It cost over 2 million dollars to create, but it gave pilots a view of the moon's surface in a detailed, 3D way so that they could know where they could

successfully land. The source contributes to our project because it is important to show the different aspects of preparation for the project. This includes pictures of the moon that artists created through painting and airbrushing as it shows the amazing detail of the project.

"Recalling the Joyous Public Response to the Apollo 11 Moon Landing." Video file. August 23, 2016.

https://link.gale.com/apps/doc/WVYTDR148510305/UHIC?u=dclib_main&sid=UHIC&xid=1734a4d1.

This video clip explains the effects that the success of Apollo 11 had on our nation. The video illustrates large crowds lined up to watch Neil Armstrong, Buzz Aldrin, and Michael Collins drive by -- it was a joyous occasion. The Apollo 11 mission encouraged people to dream, to commit themselves to achieving challenging goals. The moon landing gave people hope for a new era of life changing accomplishments. Armstrong adds that someone in the crowd held up a sign saying "through you we touched the moon", which indicates the significance of the moon landing. Barriers were broken, goals were achieved, and people rejoiced.

Reduced Gravity Walking Simulator. Photograph. NASA. February 11, 1963. Accessed February 2, 2020. https://images.nasa.gov/details-LRC-1963-B701_P-09964.

The source cited here is a photograph of a research center facility where conditions were simulated to test a low gravity atmosphere and how astronauts can walk, jump, and run in it. The scientists tested things such as fatigue limit, spent energy, and movement. Shown in the picture is a test subject suited in spacesuit-like gear by researchers as they prepare to run tests on him. This image is important to our research because it shows the importance of testing and the innovative solutions that NASA used to test conditions here on Earth by simulating them. They had to make sure that they tested different environments so that they knew what would happen on the moon.

ROBERT REINHOLD. "Kennedy Puts Earth Needs Ahead of Space Program: Kennedy Puts Needs of Earth Ahead of the Space Program." *New York Times (1923-Current File)*, May 20, 1969.

<https://search-proquest-com.dclibrary.idm.oclc.org/docview/118703897?accountid=46320>.

This source shows the controversy between public figures in the United States and the people, who frequently debated over whether the US should've put so much money into the Apollo programs, and whether they should tone down the budget in the future. While one Senator, Edward M. Kennedy claimed that funds needed to be used for more immediate issues on Earth, others argued that going to the Moon was the most important matter at hand. The topic was also split at the local level, where some people felt as though there wouldn't be any return on the investment while others supported it fully. This article contributes to our research because it shows the effort and dedication it took to fulfill the Apollo programs. Without 100 percent of the country's support behind it, issues sparked that needed to be resolved to continue on. It shows the barriers broken

politically on Earth were just as impressive as the technological barriers, seeing as it was one of the largest governmental projects in history.

"Saturn Apollo Program." images.nasa.gov. Last modified July 1, 1969. Accessed January 26, 2020. <https://images.nasa.gov/details-6900937>.

This picture is an image of Neil Armstrong stepping down from the lunar landing capsule. It was taken on a camera which is at an angle so that you can see him taking his first steps onto the surface of the moon as he descends a ladder. This source is important to our project because it shows Neil Armstrong's first step and shows the perspectives of size between the astronaut and the lander. The Saturn V rocket completed missions before Apollo 11 as well.

Saturn Apollo Program. Photograph. NASA. May 1979. Accessed January 21, 2020. <https://images-assets.nasa.gov/image/7995383/7995383~thumb.jpg>.

This source is a combination/montage of all the Apollo crewed missions' emblems, logos, and patches that were used to represent each mission and to identify each. All of these missions contributed to breaking barriers as they each had a role to play in order to learn something that NASA needed to know for the future. This source is important because it represents the totality of all the Apollo missions and how many different missions, crews, and scientists had to work on them to break barriers and to achieve their objectives in time. On top of that, the first Apollo mission was in 1967, long after the announcement of going to the moon by the end of the decade was made by Kennedy, so there were several other projects before Apollo to prepare for it.

Saturn Apollo Program. Photograph. images.nasa.gov. June 7, 1969. Accessed February 3, 2020. <https://images.nasa.gov/details-6902074>.

This source is an illustration of some of the activities of Neil Armstrong and Buzz Aldrin while on the moon. Both of the astronauts worked on setting up the scientific equipment and collecting samples to be brought back to Earth. Armstrong set up the television cameras early on so their activities could be watched from Earth. This source is important to our research because it helps provide perspective on the purpose of the mission. Additionally, it illustrates the time and effort put into the research behind the Apollo 11 project. Before the astronauts could begin their journey they had to have formulated a plan regarding the astronauts duties while on the moon.

Saturn Apollo Program. Photograph. images.nasa.gov. July 7, 1969. Accessed February 3, 2020. <https://images.nasa.gov/details-6900548>.

This source is an image of Neil Armstrong practicing climbing down the ladder from the Lunar Module while in his spacesuit. In preparation for the Apollo 11 mission crew members engaged in training activities that they would perform while on the moon. This source is important to our research because it details the dedication and immense preparation that went into the Apollo 11 mission, from challenges as difficult as adapting to living in a zero gravity environment to a little as climbing up and down the ladder to

the lunar module. Engineers had to tailor the spacesuits so that they could securely fit the astronauts while also allowing them to comfortably move around.

Saturn Apollo Program. Photograph. NASA. March 30, 1969.
<https://images.nasa.gov/details-8903695>.

This source is a picture of the Apollo 11 crew as they pose for a picture, sitting in front of another picture of the moon, all wearing their full gear. They are wearing their spacesuits in full except for their gloves, and are holding their helmets on their laps while smiling for the camera. The picture was taken just a few weeks before the moon landing occurred, and they became, excluding Collins, the first men to step foot on the moon. This source is important for our project because it is an iconic photo of the astronauts. It shows Neil Armstrong, Buzz Aldrin, and Michael Collins prepared wearing their full spacesuits for their journey to the moon and back.

Saturn Apollo Program. Photograph. NASA. January 1, 1968. Accessed February 5, 2020.
<https://images.nasa.gov/details-6862616>.

This image is a picture of the Saturn rocket as it is prepared for liftoff for Apollo 5, the 4th unmanned Apollo mission. All the missions after Apollo 1 until Apollo 7 were unmanned and were used for testing and research for the future of the manned missions. This source is important to our research because it shows a Saturn vehicle/rocket that wasn't Saturn 5, which is what we usually see. These other Saturn rockets were used for previous Apollo missions and were vital to the research done before 1969.

"Shadow of the Apollo 11 Lunar Module Silhouetted against Moon's Surface." images.nasa.gov. Last modified July 20, 1969. Accessed January 26, 2020.
<https://images.nasa.gov/details-as11-37-5475>.

This source is an image of the shadow of the Apollo 11 Lunar Module that is silhouetted onto the surface of the moon. The photograph was taken from inside the Lunar module. This picture was taken so the scientists at Nasa could gain a wider understanding of the surface of the moon. This source is helpful to our research because it illustrates the discoveries made by astronauts while on the moon that help us even to today gain a greater understanding of the solar system.

Shaw, Emerson. *Ames and IBM Personnel Discussing the installation of the computing system*. Photograph. NASA. September 6, 1961. Accessed February 4, 2020.
<https://images.nasa.gov/details-ARC-1961-A-28284>.

This image is a photograph taken of a group of people discussing the installation of a computer system. At that time, you'd have to install a whole room full of technology to create a computer, and you can see it in the background. This source is important to our research because it shows how basic the computers were before the Apollo missions, and how much they needed to be improved before space flight could take off. This is because they needed to create computers that could fit into a capsule, and in fact, this is how NASA invented the computer chip.

Slater, Stephen, and Andrew Chaikin. "One Small Step." Video file, 04:01. NASA. Accessed January 18, 2020. <https://history.nasa.gov/alsj/a11/a11.step.html#1093330>.

This video is a clip of Neil Armstrong collecting a sample from the moon as part of a contingency plan to ensure that, even in an emergency where the astronauts had to take off immediately, they'd still get a sample to bring back to Earth and study. Armstrong had a pocket in his spacesuit and carried the contingency sampler in his pocket as he disembarked from the lunar module. This source is important to our project because it's helpful to our documentary and to exhibit all the planning that went into the mission. NASA had to think of every possible thing that could go wrong and plan for it accordingly to avoid a complete mission failure in the case of a disaster.

Special to The New York Times. "KENNEDY WEIGHS APOLLO DECISION: COST OF MOON PROGRAM AND ITS URGENCY RESTUDIED DECISION TO BE MADE RUNNING OUT OF MONEY WEBB'S VIEWS STATED SKEPTICISM INCREASING." *New York Times (1923-Current File)*, Dec 14, 1962. <https://search-proquest-com.dclibrary.idm.oclc.org/docview/116271836?accountid=46320>.

This source describes the process of approving funds at the very beginning of the Apollo Program. President Kennedy pushed for funding because he believed that the United States had to show dominance in space exploration in order to beat the Soviet Union. This source adds to our research because it describes the challenges the program faced to take off. The country had to support the program in order for it to succeed, breaking many barriers in the process.

Stoll, John. "One Small Step." Video file. NASA. Accessed January 18, 2020. <https://history.nasa.gov/alsj/a11/video11.html#Step>.

This source is a video from the Apollo 11 Video library on the NASA website and shows Neil Armstrong walking away from the Lunar Module in order to set up a camera pod. As he walked, he took a look into a small crater on the side until he finished walking 18 meters away, where he placed the television camera to record activities. The video is important to our research because it shows a part of the mission that people don't normally see. When people look at videos of Apollo 11, they'd usually look at the rocket launch or the first steps.

Sun and Moon astrology, 16th century. Photograph. *Encyclopædia Britannica ImageQuest*. Accessed Jan 16, 2020. https://quest.eb.com/search/132_1429199/1/132_1429199/cite.

This is a 16th-century drawing of astrologers observing the stars and the moon. Ever since the beginning of time, people were fascinated by the stars, which later led to the desire to explore the moon. This image contributes to our project because it shows the precedent and the years and years of history behind the Apollo Program. The whole point of it was to push the boundaries of humankind and to explore the final frontier, so to speak.

Thornton, Willie Mae. "Hound Dog." On *Hound Dog*. Performed by Willie Mae Thornton. Peacock Records 2258, 1952, MP3.

This source is a video recording of a song by Willie Mae Thornton, better known as Big Mama Thornton, that was recorded in the fifties. It is "Hound Dog," which later rose onto the charts again after Elvis Presley recorded it a few years later. This source is important to our project because it helps set the scene with music from around the time period. Also, it sets the mood of the individual section which changes the tone from dramatic to fun and playful.

View of the Saturn V third stage from which the Apollo 8 has separated. Photograph. NASA. December 21, 1968. Accessed February 6, 2020. <https://images.nasa.gov/details-as08-16-2583>.

This source is an image taken from the Apollo 8 spacecraft looking back at the Saturn V. Saturn V rockets that were used on the Apollo missions had three stages. Each stage would burn its engines until it was out of fuel and would then separate from the rocket. The engines on the following stage would fire, and the rocket would be thrust into space. This photograph depicts the third stage from which the Apollo 8 spacecraft has separated following trans-lunar injection. This picture is relevant to our documentary because in our voiceover we explain that the Apollo 8 mission was the first mission that orbited the moon with a crew that did not land.

Von Drehle, David. "50 Years Later, Apollo 11 Is Still a Miracle." *The Washington Post*, July 16, 2019. https://link.gale.com/apps/doc/A593474288/UHIC?u=dclib_main&sid=UHIC&xid=af6712ff.

This source details the author's thoughts as an eight year old boy on the day of the moon landing. The author explains that Saturday morning he went to church and prayed for the safety of the astronauts. He returned home and awaited the landing of the Eagle, the Apollo 11 lunar module. This source is relevant to our topic because it presents a unique point of view. Previously we were only analyzing adult accounts, it was important to be exposed to a child's perspective. Additionally, the fact that an eight year old remembered and was able to understand the success of the Apollo 11 exemplifies the significance of the moon landing.

A Water Ice Map for Mars. Photograph. [images.nasa.gov](https://images.nasa.gov/details-PIA23514). December 12, 2019. Accessed January 25, 2020. <https://images.nasa.gov/details-PIA23514>.

This image is of a rainbow colored map showing underground water ice on Mars. Cool colors represent less than one foot (30 centimeters) below the surface, warm colors are over two feet (60 centimeters) deep. Large black zones represent dangerous areas to land a spacecraft, where landing a spacecraft would sink into fine dust. The outlined box on the map represents ideal areas to land a spacecraft with further complications, and be able to send astronauts to dig up water ice. This image contributes to our documentary because we did not know there was any source of liquid water until 2006, this exemplifies the progress Nasa has made since Apollo 1.

Wernher von Braun. Photograph. NASA. September 11, 1962. Accessed January 22, 2020. <https://images-assets.nasa.gov/image/9801808/9801808~thumb.jpg>.

This source is an image of President Kennedy with Wernher von Braun, a German scientist, as they toured several national space facilities at the Marshall center in 1962. Also there was vice President Lyndon B. Johnson. Wernher von Braun was one of the main minds behind the Apollo program and was very dedicated to reaching the United States' goals of reaching the moon because he mainly cared about the science, not the politics. This source is helpful to our project because it shows the people behind the scenes, particularly von Braun who isn't always mentioned in recountings of the missions. Also, the source illustrates President Kennedy's involvement with Apollo, which is something our project focuses on in the during and before stages.

Wernher Von Braun. Photograph. NASA. September 11, 1962. Accessed February 5, 2020. <https://images.nasa.gov/details-9806978>.

This image shows President John F. Kennedy, who was president during the early sixties, shaking hands with Wernher Von Braun, a German scientist who was one of the main forces behind the science in the Apollo program. The photo took place when President Kennedy arrived at the Marshall Space Flight Center in September of 1962. This source contributes to our research because it is another picture of President Kennedy that we can use to represent him in our documentary, which focuses a lot on his barrier-breaking actions. He pushed the program and was one of the main reasons it was accomplished, even though he was killed before he could see the results.

Secondary Sources

"Apollo 11 Launched 50 Years of Lunar Science | Washington University." Video file, 3:21. YouTube. Posted by Tom Malkowicz Washington University, July 19, 2019. Accessed October 14, 2019. <https://youtu.be/SEFsoe9ptfA>.

Fifty years after astronauts first stepped on the moon, scientists at Washington University continue to dig below the surface and improve our understanding of the solar system. The video states, at Washington University, a group of researchers led by physicist Robert M. Walker were the first to study lunar samples, 22 kilograms of moon rocks, lunar soil, and core samples from the moon's surface. Walker's team paved the road for many crucial scientific discoveries to come. Additionally, the video highlights Ryan Ogliore, an assistant professor of physics at Washington University, who studies the same lunar specimens from scientists half a century before him. Ogliore explains that over the past fifty years the precision and capability to discover minute amounts of water has increased. Lastly, this video contributes to the project because the Apollo 11 broke technological barriers, the lunar specimens lead to major discoveries that could never have been possible without the success of Apollo 11.

Chaikin, Andrew, and Alan Bean. "Apollo 11." In *Mission Control, This Is Apollo the Story of the First Voyage to the Moon*, 37-48. New York, NY: Penguin Group, 2009.

The Apollo 11 was the first successful manned mission to the moon. Before the flight, the astronauts were surrounded by supporters expressing comments of wonder and joy. At this time, the United States had yet to have a successful mission to land on the moon. Despite the joy and excitement surrounding the three astronauts, Neil Armstrong, Buzz Aldrin, and Michael Collins, Armstrong expressed some concerns about the success of the mission. Throughout the mission, the astronauts encountered many hardships. Armstrong was about to begin their descent when he noticed the *Eagle* was hovering directly above a giant crater. Armstrong quickly flipped a switch and steered the *Eagle* to a safer spot. They were merely 100 feet up when Armstrong located a secure landing area. In the midst of their descent dust began to blow furiously clouding Armstrong's sight of the lunar surface. He could sense they were running out of fuel when Mission Control informed Armstrong that he had sixty seconds left of fuel before they would be forced to abort. In lieu of the various obstacles the astronauts faced, this indicates the significance of Apollo 11.

Cross, John F. "Setting the Stage: First Act of an Epic Lunar Journey." *Ad Astra*, Spring 2019, 35-40.

This article summarizes the details of the massive undertaking of the moon *Launch*, specifically. The main part of the article describes the story of the preparation done to land humans on the Moon. It also describes the Saturn V rocket and the many problems that scientists encountered with it, including the time constrictions on building it and the nuclear capacity. This information is relevant and contributes to the project because the hurdles that were conquered and the story of the preparation is a key part of the moon landing, and therefore contribute to the topic of breaking barriers. Since 2019 is the fiftieth anniversary of the moon landing and this article is part of a special edition for that event, the information provided will uncover a more detailed account of the story.

Donovan, James. *Shoot for the Moon: The Space Race and the Extraordinary Voyage of Apollo 11*. New York, NY: Hachette Book Group, 2019.

This book clearly presents the challenges and determination of the Apollo workers and scientists. It includes the lead-up and the lasting effects of the Apollo mission. Because the book provides insight on the behind the scenes details during the Apollo missions, it greatly contributes to our project. To add on, it highlights the technical aspects of the project, and how the contributors worked them out. Finally, unlike other sources on the topic, the book was published recently and therefore can use historical context that we have today to further analyze the event.

Fishman, Charles. "Inside America's Greatest Adventure." *Smithsonian*, June 2019, 23-35.

An unlikely triumph, Apollo 11 is considered America's greatest achievement. This article discusses the challenges and tribulations faced by the scientists working on the project and all the work they did in order to get to the moon. This article contributes to the project because it focuses mainly on the journey to the moon landing and all the

technological barriers scientists overcame. Finally, it describes the background situation ongoing around the Apollo projects and how that affected the overall mission.

Harwood, William. "50 Years Later, Apollo 11's 'One Giant Leap' Remains a Defining Moment in Human History." cbsnews.com. Last modified July 14, 2019. Accessed September 25, 2019.

<https://www.cbsnews.com/news/apollo-11-50th-anniversary-of-moon-landing-defining-moment-in-history>.

This article illustrates the idea that after we successfully landed the first manned mission on the moon, people began to change their perception of what was possible. The article indicates that the moon landing evoked a new stage for man where we could achieve the unimaginable. Apollo 11 paved the way for many manned lunar landing missions to follow. Additionally, the article targets the magnitude of the moon landing. Another way this article contributes is that even though various missions leading up to the Apollo 11 were unsuccessful, they were persistent in getting a man to the moon. The fact that numerous missions failed emphasizes the significance of the Apollo 11's success.

Loff, Sarah, ed. "Apollo 11 Mission Overview." NASA.gov. Last modified May 15, 2019. Accessed 10 1, 2019.

https://www.nasa.gov/mission_pages/apollo/missions/apollo11.html.

This source provides a general summary of the Apollo 11 mission directly from the agency that organized it. It shows the mission highlights and the step by step timeline of the various events that occurred during Apollo 11, specifically. This adds to the project the mission objective and what NASA's goal was, as well as details about the flight and landing processes. It also contributes the list of the many other previous flight tests that system checks done and therefore the hidden workload scientists and engineers worked on.

Nelson, Craig. *Rocket Men: The Epic Story of the First Men on the Moon*. New York, NY: Penguin Group, 2009.

Although often taken for granted, the journey and pathway to the moon landing was immensely challenging and difficult. Excluding all the previous missions taken to make it possible, the Apollo 11 rocket had over 6 million parts, and this source highlights the path NASA took in order to reach the moon, as well as the intricate details and thousands upon thousands of people and hours taken to make it possible. This source is helpful to our project because it provides a detailed history of the process taken to prepare the astronauts and the rocket. Another contributing factor is the fact that it describes the technological barriers broken and how scientists overcame it.

Reichl, Eugen. *The Early Years, 1960-1967*. Translated by David Johnston. Vol. 1 of *Project Apollo: The Early Years, 1960-1967*. Project Apollo. Atglen, PA: Schiffer Publishing, 2016.

This source is a factual account of the Apollo missions, summarizing the important aspects of the story. It covers the earlier years of the Apollo mission, where it describes the process of building the rockets, lander, and technology used for them. This contributes to our project because there is a lot of information, particularly summarized in chronological order. It travels through the years of Apollo missions until a few years before the legendary Apollo 11 mission.

———. *The Moon Landings, 1968-1972*. Vol. 2 of *Project Apollo: The Moon Landings, 1968-1972*. Project Apollo. Atglen, PA: Schiffer Publishing, 2017.

The second part of a two-book series, this source is unique in that it continues on after the first moon landing and covers the next few landings. The challenges of the next moon landings were vastly different from the original missions to the moon. This contributes to the project because it continues on after the moon landing. It is specific to a time period so it is simple to find information from that period.

“We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard.”

Editor’s Note: This article is part of a series reflecting on the Apollo 11 mission, 50 years later. Fifty years after Neil Armstrong took that first step, the moon landing sticks in the public imagination as one of the most important moments in human history. But as is often the case with collective memory, its meaning splits in more than one direction. It was a beautiful adventure that inspired people around the globe; it was a rushed, deadly effort by one nation to best another. The Apollo program was the name of NASA’s project to land humans on the moon in the 1960s and early 1970s. With the success of Apollo 11 in 1969, which put astronauts on the lunar surface for the first time in history, the U.S. was able to declare victory in the space race against the Soviet Union during the Cold War. Beginning in 1961, the Apollo program consisted of 11 total spaceflights; four of those tested equipment, and six of the other seven flights landed people on the moon, according to NASA. The first crewed flight occurred in 1968, and the final mission occurred in 1972. By the