

The Apollo 1 Disaster:

The Tragedy That Landed a Man on the Moon

<https://youtu.be/QWp9Wy31G80>

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When we began our project, we created a list of topic ideas. We both have an interest in the history of astronomy and spaceflight, so we began to explore topics relating to the Space Race. As we started in-depth research on a few of our ideas, we discovered that in addition to having palpable ties to tragedy, the Apollo 1 disaster had many fascinating connections to Apollo 11's first manned lunar landing and the American triumph in the Space Race. We learned that after the disaster, safety protocols and operations were transformed, making it possible to land on the Moon safely. We were intrigued, and selected this as our topic. After further research, we found that the United States winning the Space Race was a key turning point in the Cold War.

The majority of our research was conducted in the Boulder Public Library and University of Colorado Norlin Library databases. Some of the sources we found this way were New York Times articles about the fire dating back to 1967. We also studied the complete report of the NASA review board that investigated the fire. It details all of the changes that were made to the Command Module after the fire, and examines the events leading up to the fire. In addition, we discovered online an interview with an Apollo 1 launch pad technician, Stephen Clemmons, who was on the launch pad during the fire and attempted to rescue the astronauts. He relayed an extremely detailed account of the fire and subsequent changes, having experienced both first-hand.

We chose documentary as our project category because we were both interested in making a visual and auditory representation of our research to bring these events to life. In our research, we found authentic footage, photos, newspapers, and audio that we wanted to display. Creating a documentary gave us the opportunity to learn about video production techniques and how to use editing software. We also created and performed our own music to add to the tone of our documentary. Overall, a documentary was a great way to creatively display all of our research.

The Apollo 1 fire fits the theme of tragedy because on January 27, 1967, the mission disastrously failed during a ground test. A capsule fire, caused by major design flaws and safety oversights, resulted in the deaths of the first three Apollo astronauts. This disaster profoundly affected the spirit of the nation since the Space Race had been a source of hope for Americans during the paranoia of the Cold War. Our topic fits the theme of triumph because the review board created shortly after the fire found many safety issues with the capsule and operations that were remedied, making the Moon program more efficient and less hazardous. These changes also prevented further fatalities in the Apollo Program. Saving the Apollo program allowed the United States to beat the Soviet Union to the Moon, which was a major triumph as well as a symbol of technological and scientific superiority.

Annotated Bibliography

Primary Sources

Aftermath. Space.com, www.space.com/10674-apollo-1-fire-nasa-disaster.html.

This photograph shows the burned exterior of the Apollo 1 capsule after the fire. It helped us realize the full extent of the damage caused by the fire. We used this image in our documentary to show the viewers how real and how serious the fire was.

After the Fire. Space.com, www.space.com/10674-apollo-1-fire-nasa-disaster.html.

This photograph shows the Apollo 1 command module on January 28, 1967, the day after the fire. It clearly shows how the intense heat of the fire affected the interior of the capsule, so we used it in our documentary.

Agna Target Docking Vehicle. Wikipedia, upload.wikimedia.org/wikipedia/commons/4/47/Gemini_10_-_Agna_Target_Docking_Vehicle.jpg.

The photograph was taken during the Gemini 10 mission and shows the Agena Target Docking Vehicle and Gemini 10 spacecraft during rendezvous (docking). The Agena was launched 100 minutes before Gemini 10, and one of the goals of the mission was to complete a successful rendezvous in space. We showed this image in our documentary when we talked about the Mercury and Gemini Programs and rendezvous.

Angle on Apollo. Space.com, www.space.com/10674-apollo-1-fire-nasa-disaster.html.

This image shows mechanics working on the Apollo 1 command module heat shield from the z-axis. This would have prevented the command module from burning up upon reentry into Earth's atmosphere.

APOLLO DEATHS LAID TO CHANGE IN PLANS. (1967, Apr 22). New York Times (1923-Current File) Retrieved from https://O-search-proquest-com.nell.flatironslibrary.org/docview/118084122?accountid=48257

This primary source article helped us understand that the safety of the Apollo 1 crew was not taken into consideration when many poor decisions were made. It taught us

that the original plan for the test on January 27, 1967, was to have the hatches open, but in October 1966, NASA changed it to a closed hatch test, claiming it would not be hazardous. They were very wrong.

Apollo 11 astronaut Buzz Aldrin stands next to a flag on the Moon on July 20, 1969. *Business Insider*,
www.businessinsider.com/american-flags-moon-color-bleached-white-2017-4.

This image shows astronaut Buzz Aldrin standing next to the American flag on the Moon. This image was taken on July 20, 1969, during the Apollo 11 mission, which was also the first manned lunar landing.

Apollo 11 Launch Team. Nalfl.com, www.nalfl.com/?page_id=2523&cpage=1

This image shows the Apollo 11 mission control team. We used this image in our documentary to illustrate how organized and professional NASA became after the accident.

"APOLLO 1, ABC news coverage, interview with the crew, Jan. 27, 1967." *YouTube*, uploaded by Dan Beaumont Space Museum, 14 Dec. 2011,
www.youtube.com/watch?v=pm3_kwTD2SM

This primary source video news coverage contains interviews with all three crew members from the morning before the fire, which was helpful footage when making our documentary. The crew members talk about their philosophy about the risks in spaceflight, and after watching it, we realized that all three of them accepted that they had a dangerous job and were prepared to give their lives for their country.

Apollo 1 Astronauts Training. Space.com,
[/https://www.space.com/10674-apollo-1-fire-nasa-disaster.html](https://www.space.com/10674-apollo-1-fire-nasa-disaster.html)

This image shows the Apollo 1 command module undergoing an altitude chamber test, which would simulate the conditions in space. We used it in our documentary.

Apollo 1 Audio - 27 January, 1967. NASA, 2016. YouTube,
www.youtube.com/watch?v=274lQSbpkRg

This primary source audio recording helped us see what transmissions were made during the test and fire. This helped us understand exactly how everything happened, and how mission control at NASA reacted when they heard there was a fire. We used parts of this in our documentary.

Apollo 1 Capsule Hoisted to Rocket. Space.com,
[/https://www.space.com/10674-apollo-1-fire-nasa-disaster.html](https://www.space.com/10674-apollo-1-fire-nasa-disaster.html)

This image shows the Apollo 1 command module being loaded onto the AS-204 rocket at launch pad 34 in Cape Kennedy. We did not put this image in our documentary, but it helped us understand what the rocket and capsule looked like when we started our project.

The Apollo 1 Command Module. Space.com,
[/https://www.space.com/10674-apollo-1-fire-nasa-disaster.html](https://www.space.com/10674-apollo-1-fire-nasa-disaster.html)

This image shows the Apollo 1 command module, built by North American Aviation, during a pre-shipping phase. We used this image in our documentary.

Apollo 1 Crew. Space.com, www.space.com/10674-apollo-1-fire-nasa-disaster.html

This image shows, from left to right, astronauts White, Grissom and Chaffee posing for the crew portrait for the Apollo 1 mission. We used this in our documentary to introduce the viewers to the crew.

The Apollo 1 crew expressed their concerns about their spacecraft's problems by presenting this parody of their crew portrait to ASPO manager Joseph Shea on August 19, 1966.
Wikipedia, en.wikipedia.org/wiki/Apollo_1

This image shows the Apollo 1 crew praying to a model of their command module as a parody of their crew portrait. The astronauts were mock-praying as a testament hoping nothing would go wrong due to the many problems of the spacecraft. This showed us that the crew was aware of all of the problems their capsule was having and that they were concerned about the safety of the mission. We used this in our documentary because it showed that the crew was concerned and tragically foreshadowed the accident.

The Apollo 1 Crew, from Left to Right, Roger Chaffee, Ed White and Gus Grissom. Space.com,
www.space.com/17338-apollo-1.html

This image shows the Apollo 1 crew. From left to right, it shows Roger Chaffee, Ed White, and Gus Grissom seated in the capsule during a test.

Apollo 1 Crew Members Walk Across a Catwalk to the Launch Pad 34 Whiteroom to Board Their Spacecraft on Jan. 27, 1967. Collect Space,
www.collectspace.com/news/news-012707a.html

This image shows the Apollo 1 crew walking across the catwalk to the white room, a small chamber that would help them access the command module, right before the start of the test. This image is among the last taken of the crew before the fire.

Apollo 1 Crew Outdoors. Space.com, www.space.com/10674-apollo-1-fire-nasa-disaster.html

This image was taken on a press day, a day for the crew to answer questions and comment to the newspaper. From left to right, it shows Virgil “Gus” Grissom, Edward “Ed” White, and Roger Chaffee.

The Apollo 1 Disaster As It Happened: The Day After Live On TV. NASA, 2017. YouTube,
www.youtube.com/watch?v=BX1Wgz1mS2Q.

This video helped us understand how the devastating loss of the Apollo 1 crew impacted the country, but people still managed to move on and persevere so that their loss would not be in vain. Even though this tragedy occurred, we still managed to land a man on the Moon by 1970.

The Apollo 1 Fire. Space Safety Magazine,
<http://www.spacesafetymagazine.com/space-disasters/apollo-1-fire/>.

This image shows the disassembly of the Apollo 1 capsule as part of the investigation of the cause of the fire. In addition to this means of investigation, NASA also simulated the situation where the fire occurred to try and better understand how to prevent it from happening again. In our documentary, we used this picture when we talk about the investigation.

Apollo 1 Fire 1967. Universal Newsreel, 1967. Youtube,
www.youtube.com/watch?v=llk9sP9pEPM.

This primary source news broadcast from 1967 helped us understand the media's reaction to the fire back then and how it was perceived by the public right after it happened.

Apollo 1 Fliteline Medallion Flown on Apollo 9 by Jim McDivitt. Wikipedia,
[en.wikipedia.org/wiki/Apollo_1#/media/File:Apollo_1_Silver-Colored_Fliteline_Medallion_\(Flown_on_Apollo_9\).jpg](https://en.wikipedia.org/wiki/Apollo_1#/media/File:Apollo_1_Silver-Colored_Fliteline_Medallion_(Flown_on_Apollo_9).jpg).

This image shows the commemorative Apollo 1 medallion, which was flown on the Apollo 9 mission to honor Gus Grissom, Roger Chaffee, and Ed White. This was useful to us when we were learning about memorials and how they are remembered today.

Apollo 1 is removed from rocket. (1967, Feb 18). *New York Times (1923-Current File)* Retrieved from
<https://O-search-proquest-com.nell.flatironslibrary.org/docview/118078058?accountid=48257>

This article told us that after the fire, the Apollo 1 command module was removed from the spacecraft for the investigation into the cause of the fire. It also helped us learn how safety space features were changed after the fire.

Apollo 1 Prime and Backup Crews. *Wikipedia,*
commons.wikimedia.org/wiki/File:Za%C5%82ogi_misji_Apollo_1_S66-30238.jpg.

This image shows the Apollo 1 crew portrait with the back-up crew behind the original three astronauts. Seated in the front is Edward White II, Virgil "Gus" Grissom, and Roger Chaffee. Standing in the back (the backup crew) is David R. Scott, James A. McDivitt, and Russell L. Schweickart.

"Apollo One Recording." *Wikimedia,*
upload.wikimedia.org/wikipedia/commons/3/36/Apollo_One_Recording.ogg.

This is the official recording from the test on January 27 of all of the transmissions over the communications system during the fire. It starts when the astronauts discover the fire and ends during the rescue attempts. It made the fire seem more real to us, especially with the scream at the end. It made us fully realize that this fire really happened and took the lives of three people. We used it multiple times in our documentary, as it is very emotional.

"Apollo Program." *Wikipedia,* en.wikipedia.org/wiki/Apollo_program.

This image shows the Apollo insignia, the symbol for the Apollo program. This was useful in our documentary when we introduced the Apollo program in our documentary.

AS-204 Patch. Space.com, www.space.com/10674-apollo-1-fire-nasa-disaster.html.

This image shows the Apollo 1 badge that was designed by Roger Chaffee. The badge shows the Apollo 1 capsule orbiting the Earth, but in reality, it never left the ground.

The Block I Hatch. *Astronomy.com, www.astronomy.com/news/2017/01/apollo-1-scorched-hatch*

This image shows the inefficiently designed hatch that sealed the fate of the Apollo 1 astronauts. It consisted of two pieces and required pressure inside the cabin be no greater than atmospheric in order to open. We had learned that the hatch was very poorly thought out, so it was helpful to see a picture of the hatch. For this reason, we also showed this picture in our documentary.

Brich, George. Command Pilot Gus Grissom speaks during a news conference in California, a mockup of the spacecraft next to him. Two backup crew members are there too. *Missoulian, missoulian.com/news/national/photos-remembering-the-apollo-tragedy-years-later/collection_264df471-907b-5d00-8d9d-c068a8f1151a.html.*

This image shows Gus Grissom speaking at a press interview. This showed us that he was a very well respected pilot and astronaut, and he was NASA's first choice to be the first man on the Moon.

Building the Apollo 1 Craft. Space.com, [/https://www.space.com/10674-apollo-1-fire-nasa-disaster.html](https://www.space.com/10674-apollo-1-fire-nasa-disaster.html)

This primary image shows engineers working on the Apollo 1 capsule, also called Spacecraft 12. It was helpful for us to have a visual after learning about all of the engineering problems in the Apollo 1 capsule. This image was very useful in our documentary because it shows the problematic capsule being put together.

By JOHN NOBLE WILFORD Special to The New York Times. "NASA Engineers Criticize Test Schedule Pace." *New York Times* (1923-Current file), Feb 08, 1967, pp. 8. ProQuest,

<https://O-search-proquest-com.nell.flatironslibrary.org/docview/118181804?accountid=48257>.

This article was written as a reaction to the fire because people were trying to figure out who was to blame and what went wrong. We learned that an engineer who worked on the capsule, Jesse Bradley, admitted that NASA's haste to meet John F. Kennedy's goal contributed to all of the neglectful safety oversights. This article was also useful for our documentary, as we use a quote from Jesse Bradley.

By JOHN NOBLE WILFORD Special to The New York Times. (1967, Feb 06). Apollo's life support system is sifted for clues. *New York Times (1923-Current File)* Retrieved from <https://O-search-proquest-com.nell.flatironslibrary.org/docview/118189044?accountid=48257>

This New York Times article from less than two weeks after the fire outlines the steps NASA took as part of their investigation. We learned that NASA was very meticulous in the investigation and sifted the whole capsule for clues to the cause of the fire.

By JOHN NOBLE WILFORD Special to The New York Times. (1967, Jan 30). Greatest Apollo damage found at lifeline to cabin. *New York Times (1923-Current File)* Retrieved from <https://O-search-proquest-com.nell.flatironslibrary.org/docview/117753931?accountid=48257>

This article from the New York Times gives a thorough description of the damage to the Apollo 1 capsule after the fire. Published three days after the fire, it helped us grasp how severe the fire was.

By The, A. P. (1967, Jan 28). 3 APOLLO ASTRONAUTS DIE IN FIRE; GRISSOM, WHITE, CHAFFEE CAUGHT IN CAPSULE DURING A TEST ON PAD. *New York Times (1923-Current File)* Retrieved from <https://O-search-proquest-com.nell.flatironslibrary.org/docview/118153744?accountid=48257>

This is the news coverage of the disaster one day after it took place. This helped us see how the news was interpreted by the public and gave us a glimpse into the fear and suspicion after the fire.

By United, Press I. "Magazine Says Engineer Warned on Apollo 1 Fires." *New York Times (1923-Current file)*, Sep 13, 1971, pp. 30. ProQuest,

<https://O-search-proquest-com.nell.flatironslibrary.org/docview/119096727?accountid=48257>.

From this article, we learned how much the engineers who worked on the mission were rushing during the preparation. It helped us see how hasty they were and how easily there was an accident as a result of that. We also learned that there were many complaints and warnings about the safety of the capsule to NASA.

"CBS News Special Report Apollo 1 Fire and Tragedy." *Youtube*, www.youtube.com/watch?v=HmoYplqPGC8.

This video is the original CBS news report of the tragedy just after the fire. It contains interviews with astronauts as well as NASA officials and provides an interesting perspective, as this is how the tragedy was perceived 50 years ago. We used an interview with Gus Grissom in our documentary.

Clemmons, Stephen B. "40 Years Later, Pad Tech Recalls Apollo Fire." *Collect Space*, 2018, www.collectspace.com/news/news-012707a.html. Interview.

This source, an interview with an Apollo 1 launch pad technician, Stephen B. Clemmons, gave us a first-hand account of the fire from the point of view of someone trying to save the astronauts in the fire. It helped us understand the sequence of events during the fire from someone who was actually there. It also helped us understand how the atmosphere of NASA changed after the fire. After the fire, safety and precaution outweighed scheduling. Having actually experienced the change, Mr. Clemmons' account is extremely detailed.

Command Module 012, Labeled Apollo One, Arrives at Kennedy Space Center, August 26, 1966. *Wikipedia*, en.wikipedia.org/wiki/Apollo_1

This image shows the Apollo 1 command module arriving at Cape Kennedy, Florida, the Apollo 1 launch site. We had learned that it had had many problems when it was being tested before it was sent to Cape Kennedy, so it was interesting to see a primary source photograph of the packaged capsule arriving at the launch site.

A completed central heat shield is lowered into place over the primary structure in May 1966. *NASA*, www.hq.nasa.gov/pao/History/SP-4205/ch4-2.html.

This image from NASA's archives shows the heat shield being added to the Apollo 1 capsule in 1966. The heat shield would have prevented the capsule from burning up upon reentry into the Earth's atmosphere.

Day of Remembrance -- Apollo 1. The Astronauts Memorial Foundation,
www.amfcse.org/apollo-1/.

This is a memorial video to the Apollo 1 astronauts made by the Astronaut Memorial Foundation. It contains useful biography information as well as many photographs of the astronauts and videos of their funerals. It was nice to see that a video like this was made to remember them. We used clips of this video in our documentary.

Ed(ward Higgins) White III. Gale Biographies in context, Gale,
O-go.galegroup.com.nell.flatironslibrary.org/ps/retrieve.do?tabID=Images&resultListType=RESULT_LIST&searchResultsType=MultiTab&searchType=PersonSearchForm¤tPosition=1&docId=GALE%7CPC4295810629&docType=Image&sort=Relevance&contentSegment=&prodId=BIC&contentSet=GALE%7CPC4295810629&searchId=R2&userGroupName=bpls_main&inPS=true.

This image is Ed White's portrait when he was a Lieutenant Colonel in the United States Air Force. This photograph helped us understand what Gus Grissom's life was like before he became an astronaut. For this reason, we chose to include this image in our documentary.

Edward H. White II. Britannica.com, www.britannica.com/biography/Edward-H-White-II.

This image shows Ed White posing for his official NASA portrait. On June 3, 1965, he became the first American to walk in space in his Gemini 4 mission.

Ed White during Gemini 4 EVA. Internet Archive, archive.org/details/S65-30432.

This image shows Ed White during his Gemini 4 spacewalk. He was the second person to ever do so, only beaten by the USSR's Alexi Leonov. This showed us that all of the astronauts had had many triumphs in their careers before the Apollo 1 disaster that claimed all of their lives.

"FLIGHT OF APOLLO 1 MAY BE OFF FOR '66." *New York Times (1923-Current file)*, Oct 28, 1966, pp. 20. *ProQuest*,

<https://O-search-proquest-com.nell.flatironslibrary.org/docview/117137309?accountid=48257>.

This New York times article helped us understand all the problems that caused the flight of Apollo 1 to be delayed. According to the article, problems in the cooling system along with other issues postponed the launch of Apollo 1 for months, and not all of the issues were fixed before the test on January 27.

Funeral of Virgil I. Grissom. Space.com,
[/https://www.space.com/10674-apollo-1-fire-nasa-disaster.html](https://www.space.com/10674-apollo-1-fire-nasa-disaster.html).

This image shows Gus Grissom's funeral at Arlington Cemetery. This showed us how respected he was as a person, pilot, and astronaut because almost all of NASA's astronauts attended the funeral and walked alongside the procession. We used this in our documentary to emphasize the tragedy of the Apollo 1 fire.

Gemini 4 | NASA's First Ever Space Walk - Narrated by Ed White (June 3, 1965). NASA. Youtube,
www.youtube.com/watch?v=7K5DiKsZhTk.

This video shows Ed White's Gemini 4 spacewalk, narrated by himself. We included this in our documentary to add to the triumphant aspects of our topic because, despite the tragic end of his life, Ed White had many triumphs in his career, the most important of which was being the first American to spacewalk.

"Glory to the Soviet people—the pioneer of space!" Business Insider,
amp.businessinsider.com/images/4f983d45eab8ea4337000000-480-741.jpg.

This image shows a Soviet propaganda poster from the Space Race that says "Glory to the Soviet people—the pioneer of space!" This helped us understand how competitive both sides were in the Space Race, and that the Soviets turned to psychological warfare by making posters like these. Winning the Space Race became a matter of pride for both the United States and the Soviet Union. We showed this image in our documentary, and it helped us put our project in context.

Grissom Lemon. collectSpace, www.collectspace.com/ubb/Forum29/HTML/001917.html.

This image shows the lemon that Gus Grissom hung on the Apollo 1 capsule. This showed us that the astronauts of the Apollo 1 mission were not confident in their

capsule. We added this story in our documentary because it adds a small bit of humor to a very tragic topic.

Gus Grissom. Wikipedia,

[en.wikipedia.org/wiki/Gus_Grissom#/media/File:Virgil_I._\(Gus\)_Grissom_portrait.jpg](https://en.wikipedia.org/wiki/Gus_Grissom#/media/File:Virgil_I._(Gus)_Grissom_portrait.jpg).

This image shows Gus Grissom's astronaut portrait. He accomplished many things before Apollo 1, including being the first man to go to space twice. He was one of the Mercury 7, NASA's first astronauts, and was the second American to go to space. He had been told confidentially that he would be the first man on the Moon. We used this image in our documentary.

Gus Grissom getting carried to Arlington cemetery. Missoulian,

missoulian.com/news/national/photos-remembering-the-apollo-tragedy-years-later/collection_264df471-907b-5d00-8d9d-c068a8f1151a.html#3.

This image shows Gus Grissom getting carried to Arlington military cemetery. This image showed us that his loss was greatly mourned by NASA and all of the other astronauts.

Gus Grissom with family. CBS News,

www.cbsnews.com/pictures/astronaut-family-portraits/6/.

This image shows Gus Grissom with his family. Seeing this picture helped us realize that the three astronauts who died were real people with families, and it is hard to think about the fact that these children grew up without a father.

Image of a newspaper article about the fire/. Tucson.com` ,

tucson.com/news/national/photos-apollo-crew-and-fire-in/collection_f066901a-e41d-11e6-aff5-7baf4007ee20.html#2.

This image shows an Arizona Daily Star article about the fire from January 28, 1967, the day after the fire, with the headline "Astronauts Die In Fiery Capsule." This image was very useful in our documentary because it shows that the public was shocked.

In 1962, President Kennedy delivered a speech that ramped up the space race, uttering the famous lines, "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." *I Can Make You Think*, icanonlymakeyouthink.blogspot.com/2015/03/space-race-photographs.html.

This image shows President John F. Kennedy giving a speech that challenged the nation to get to the Moon by the end of the decade. This made us realize the power that the president has. Because of the goal of one person, the Apollo 1 capsule was designed and built in haste, and many important safety measures were entirely overlooked. We showed this image in our documentary when we talked about the Space Race.

The Interior of the Capsule after the Tragic Fire. Space.com,
[/https://www.space.com/10674-apollo-1-fire-nasa-disaster.html](https://www.space.com/10674-apollo-1-fire-nasa-disaster.html)

This image shows the inside of the capsule after the devastating fire. The interior of the Command Module shows the effects of the intense heat of the flash fire which killed the crew. This showed us how much damage the fire caused, and for that reason, it was very useful in our documentary as well.

"John F. Kennedy 'Landing a man on the Moon' Address to Congress - May 25, 1961." *YouTube,*
1 July 2010, www.youtube.com/watch?v=TUXuV7XbZvU. Accessed 11 Jan. 2019.

This is the video clip shows John F. Kennedy setting a goal to get a man to the Moon and back by 1970. This goal put immense political pressure on the newly formed US space agency, NASA, which caused them to design and build the Apollo 1 capsule with extreme haste and with little to no regard to crew safety.

Joseph Stalin. Atomic Heritage Foundation, www.atomicheritage.org/profile/joseph-stalin.

This image shows Joseph Stalin, the General Secretary of the Communist Party of the Soviet Union. We saw this picture when we were learning about the start of the Cold War and the Cuban Missile Crisis, and used it in our documentary.

JSC-1592A_Apollo_1_FACTS.wmv. NASA/JSC. Internet Archives,
[archive.org/details/JSC-1592A_Apollo_1_FACTS.wmv.](http://archive.org/details/JSC-1592A_Apollo_1_FACTS.wmv)

This video is the official NASA film archival compilation from the Apollo 1 mission training and fire and contains all video ever taken by NASA relating to Apollo 1. It is one hour of footage, and it was immensely useful for our documentary. It shows the crew training, the review board, interviews with the crew, and much more.

Laika, a mixed-breed dog, was the first living being in orbit. She was launched on the Soviet Union's Sputnik 2 mission in November 1957. *Space.com*, www.space.com/17764-laika-first-animals-in-space.html.

This image shows the Soviet dog Laika, the first living being in orbit. This was useful in our documentary because it demonstrated how far ahead of us the Soviets were in the space race.

LC-34 with Saturn I Rocket SA-4 on 28 March 1963. Wikipedia, en.wikipedia.org/wiki/Cape_Canaveral_Air_Force_Station_Launch_Complex_34. Accessed 19 Dec. 2018.

This image shows launch complex 34, where the fire took place, with a Saturn I rocket on it. It helped us establish a setting for the fire. Today, there is a memorial to the Apollo 1 astronauts on launch complex 34.

LCDR Roger Bruce Chaffee. Find a Grave, https://images.findagrave.com/photos/2018/168/186_8bea5898-4422-4231-aa7f-d60fff9835b8.jpeg

This image shows the gravestone of Roger Chaffee in Arlington cemetery. We showed this image in our documentary to emphasize the tragedy of our topic.

LTC Edward Higgins White, II. Find a Grave, https://images.findagrave.com/photos/2018/168/186_8bea5898-4422-4231-aa7f-d60fff9835b8.jpeg.

This image shows the gravestone of Edward White located in the cemetery at West Point Military Academy, where he went to school. We showed this image in our documentary to emphasize the tragedy of our topic.

"Mercury Seven Astronauts." *Astronomy & Space: From the Big Bang to the Big Crunch*, Gale, 1997. *Biography In Context*, http://O-link.galegroup.com.nell.flatironslibrary.org/apps/doc/CV2210051766/BIC?u=bpls_main&sid=BIC&xid=2db5ded0. Accessed 19 Dec. 2018.

This image shows the Mercury 7 with Gus Grissom in the center of the back row. The Mercury 7 were the very first US astronauts. The fact that Gus Grissom was chosen to

be one of the first US astronaut meant that Gus Grissom had a reputation as a very hard worker and a formidable pilot.

The Mercury 7 & Shepard's Launch. Youtube, www.youtube.com/watch?v=TopvAhMjIPU.

This video shows the launch of Mercury 7, which carried the first American man to go into space, Alan Shepard. We showed this video in our documentary when we talked about the Mercury program.

NASA. *Apollo and America's Moon Landing Program: Apollo 1 Tragedy (Grissom, White, and Chaffee) Apollo 204 Pad Fire, Complete Review Board Report, Technical Appendix Material, and Medical Analysis Panel*. Compiled by NASA, Progressive Management. Apollo and America's Moon Landing Program.

This book furthered our research because it is the official report of the review board that investigated the fire. It gave us multiple first-hand accounts and detailed biographical information, as well as exact details of the events in the test leading up to the fire. It told us that the review board was formed to investigate the accident, and it details all of their findings, determinations, and recommendations. The findings, determinations, and recommendations gave us information on how they improved safety procedures as a result of the fire, which showed how the Apollo 1 fire allowed us to reach the Moon safely.

"Neil Armstrong - First Moon Landing 1969." *Youtube, www.youtube.com/watch?v=cwZb2mqldOA.*

This video shows the first manned lunar landing on July 20, 1969. We learned that without the Apollo 1 disaster, Apollo 11 would not have succeeded because safety protocols were not advanced enough to send a man to the Moon safely. We showed this video several times in our documentary.

1967, Command/Service module getting prepared for the AS-204 mission. *Missoulia, missoulia.com/news/national/photos-remembering-the-apollo-tragedy-years-later/collection_264df471-907b-5d00-8d9d-c068a8f1151a.html#6.*

This image shows the Apollo 1 command module getting prepared for the mission. We found it interesting to get a glimpse into NASA's preparations for the launch, because those kinds of photos are usually not available to the public.

Portrait: Roger Chaffee became the youngest person ever selected by NASA for astronaut training in October 1963. *America Space*, www.americaspace.com/2015/02/15/remembering-the-life-and-legacy-of-roger-chaffee-on-his-80th-birthday/.

This image shows Roger Chaffee's official astronaut portrait. He was the youngest person ever selected to be a NASA astronaut. He had served in the Navy prior to becoming an astronaut, and Apollo 1 would have been his first mission. We used this photograph in our documentary.

President Harry S. Truman addressing a joint session of Congress asking for \$400 million in aid to Greece and Turkey. This speech became known as the "Truman Doctrine" speech. *New Hampshire Public Radio*, www.nhpr.org/post/us-foreign-policy-and-truman-doctrine#stream/O.

This image shows President Harry Truman. He was president from 1945 to 1953, having taken over when Franklin D. Roosevelt died. He was president during the start of the Cold War, so we showed his picture in our documentary when we talked about the Cold War.

Remembering the Apollo 1 Crew. Space.com, [/https://www.space.com/10674-apollo-1-fire-nasa-disaster.html](https://www.space.com/10674-apollo-1-fire-nasa-disaster.html).

This is a picture of the Apollo 1 crew on their press day. From left to right, it shows Gus Grissom, Edward White, and Roger Chaffee. These astronauts are not as remembered as the Apollo 11 astronauts, but without their sacrifice, there would have been no Moon landing.

Remembering the Apollo 1 Disaster. Extreme Tech, 2.bp.blogspot.com/-mqTYoXcFPro/VpJrmJyS5xI/AAAAAAAAAKPA/XXYgjPoXGao/s1600/Apollo%2B1%2BAstronauts%2BBurned%2BSuits.jpg.

This image shows the burned spacesuits of the Apollo 1 crew as used for investigation by NASA. This image made us realize that this fire really happened, and three real people died horrible deaths because of it. It was perfect for our documentary because it is difficult to look at and evokes powerful emotion.

Roger and Martha Chaffee, with their children Sheryl and Stephen. *America Space*,
www.americaspace.com/2015/02/15/remembering-the-life-and-legacy-of-roger-chaffee-on-his-80th-birthday/.

This image shows Roger Chaffee with his family. Seeing this picture helped us realize the scope of the tragedy of the accident, because seeing it made us think of Martha Chaffee having to tell her children that their father was never coming home. We also realized that Roger Chaffee was very young when he died.

Saturn 1 Launch Vehicle. Space.com,
[/https://www.space.com/10674-apollo-1-fire-nasa-disaster.html](https://www.space.com/10674-apollo-1-fire-nasa-disaster.html).

This image shows the Saturn I Rocket being transported to launch pad 34. Unfortunately, this rocket never launched. We showed this picture in our documentary.

Senate Hearing regarding Apollo 1. Space.com,
[/https://www.space.com/10674-apollo-1-fire-nasa-disaster.html](https://www.space.com/10674-apollo-1-fire-nasa-disaster.html).

This image shows the Senate hearing and investigation of the Apollo 1 fire. It helped us understand that the fire was thoroughly investigated by three entities: NASA, the Senate, and the House of Representatives.

"Sons of October—Pioneers of the Universe!" Business Insider,
www.businessinsider.com/here-are-the-soviets-extremely-intense-space-race-propaganda-posters-from-1958-1963-2012-4#the-soviets-declared-that-it-was-now-time-for-man-to-orbit-the-earth-10.

This image shows a Soviet Space Race propaganda poster. It says "Sons of October—Pioneers of the Universe!" This helped us understand how competitive both sides had become in the Space Race; winning the Space Race became a matter of pride for both the United States and the Soviet Union. We showed this image in our documentary, and it helped us put our project in context.

Space tragedy. (1967, Jan 29). *New York Times (1923-Current File)* Retrieved from
<https://o-search-proquest-com.nell.flatironslibrary.org/docview/118184906?accountid=48257>

This article from two days after the tragedy helped us understand the nation's reaction to the loss of three astronauts, and how it impacted the country. It showed us the President's reaction as well as the people's immediate questions. It taught us that no astronauts had ever been lost before in an official test or flight, so this was a big blow and could have ended the manned spaceflight program.

Sputnik I. Sutori,

www.sutori.com/story/soviet-union-and-united-states-space-race--7HtYt6gPkDyflWTL2qhrfSMv.

This image shows the Soviet satellite Sputnik I, the first artificial satellite. It represented the Soviets' first victory in the Space Race, and put the United States even farther behind. This caused John F. Kennedy to set his famous goal in 1961, which put immense political pressure on NASA.

Three Crew Members Check Couch Installation. Space.com,

[/https://www.space.com/10674-apollo-1-fire-nasa-disaster.html](https://www.space.com/10674-apollo-1-fire-nasa-disaster.html).

This image shows the three astronauts together, ready to check that the installation of the couch into their capsule. It was interesting to see a picture of the crew that was not an official portrait, so we included this picture in our documentary.

"Two to be Buried at Arlington, Third at West Point." New York Times (1923-Current file), Jan 29, 1967, pp. 49. ProQuest, <https://o-search-proquest-com.nell.flatironslibrary.org/docview/118160914?accountid=48257>.

This New York Times article from two days after the fire announced where the members of the crew were going to be buried. This helped us understand how these astronauts were honored.

Unwilling to fly a desk in the aftermath of World War II, Grissom left the U.S. Air Force, but subsequently rejoined the service and rose to become one of its most accomplished fliers. *America Space,* www.americaspace.com/2019/01/27/isnt-that-enough-remembering-grissom-white-and-chaffee-fallen-crew-of-apollo-1/.

This image shows Gus Grissom when he was a Lieutenant Colonel in the Air Force. This photograph helped us understand what Gus Grissom's life was like before he

became an astronaut. For this reason, we chose to include this image in our documentary.

VACUUM UNIT TESTS PASSED BY APOLLO 1. (1966, Dec 31). *New York Times (1923-Current File)* Retrieved from

<https://0-search-proquest-com.nell.flatironslibrary.org/docview/117574280?accountid=48257>

This article in the New York Times helped us understand what happened to the capsule before the fire. It showed us that despite its many problems, it still passed the vacuum chamber test, which meant that functioned normally in a vacuum.

"Virgil Grissom." *Gale Biography in Context*, Gale, 2010. *Biography In Context*,

http://0-link.galegroup.com.nell.flatironslibrary.org/apps/doc/PC4295808393/BIC?u=bpls_main&sid=BIC&xid=79a910e1. Accessed 19 Dec. 2018.

This image shows Gus Grissom, one of the astronauts in the Apollo 1 fire, in his Mercury space suit.

Virgil "Gus" Grissom. Nwetimes.com,

www.nwetimes.com/news/history/famous-hoosiers/virgil-gus-grissom/article_56d55b2f-0251-5c07-9250-81382a867529.html.

This image shows Gus Grissom next to his capsule when the pilot of Mercury-Redstone 4, the second American suborbital flight. He named his capsule Liberty Bell 7. This image helped us understand the missions that Gus Grissom was on before Apollo 1, and we chose to use this image in our documentary.

Virgil Ivan Grisson. Arlington Cemetery, www.arlingtoncemetery.net/thomaset.htm.

This image shows the gravestone of Gus Grissom in Arlington Cemetery. We showed this image in our documentary to emphasize the tragedy of our topic.

Vostok 1 launch Humankind's first spaceflight. ISpaceChronicals. YouTube,

www.youtube.com/watch?v=TaD-yiguj_8.

This video shows the launch of Vostok 1, the rocket containing Yuri Gagarin, the first man in space. This triumph for the Soviets put America very far behind in the Space Race. This was useful footage when talking about the Space Race.

Water Egress Training. Space.com,

[/https://www.space.com/10674-apollo-1-fire-nasa-disaster.html](https://www.space.com/10674-apollo-1-fire-nasa-disaster.html).

This image shows the three astronauts of the ill-fated Apollo 1 mission in training. This particular part of training was for exiting the spacecraft when it hit the water after reentering the Earth's atmosphere. This gave us a clearer picture of the training the Apollo 1 astronauts did for their mission.

Young Gus Grissom. The Famous People,

www.thefamouspeople.com/profiles/gus-grissom-8351.php.

This image shows young Gus Grissom in an airplane. This showed us that Gus Grissom had always loved to fly and that he loved his job as an astronaut. We added this image to our documentary so that viewers could get to know the astronauts.

Yuri Gagarin. Sutori,

www.sutori.com/story/soviet-union-and-united-states-space-race--7HtYt6gPkDyflWTL2qhrfSMv.

This image shows the Soviet cosmonaut Yuri Gagarin, the first man in space. After his flight, he became a hero, because to the Soviets, his success represented communism triumphing over capitalism.

Yuri Gagarin Propaganda. Red Bubble,

ih0.redbubble.net/image.399509591.4023/flat,550x550,075,f.u1.jpg.

This image shows Soviet propaganda from the Space Race. It shows the cosmonaut Yuri Gagarin, the first man in space, with wings. Flying with him are flags from the modern day countries that were part of the communist Soviet Union. This showed us that to the Soviets, the triumph of getting a man in space represented victory for communism.

Secondary Sources

"Apollo Hatch Redesign." *Info Sheet*, no. 2, Dec. 1996. *Space1.com*,

www.space1.com/pdf/news1296.pdf.

This article taught us about the inefficiency of the design of the hatch on the Apollo 1 command module and how they changed it after the fire. We learned that the original Apollo 1 hatch took 90 seconds to open and had 3 different layers. This helped us understand just how complicated the hatch was and one reason why the Apollo 1 astronauts were unable to escape their capsule. It also helped us understand what changes were made to the hatch after the fire. The new hatch could be opened in only 3 seconds.

"APOLLO 1 (AS-204)." *Smithsonian National Air and Space Museum*, airandspace.si.edu/explore-and-learn/topics/apollo/apollo-program/orbital-missions/apollo1.cfm.

This article from the Smithsonian National Air and Space Museum showed us the series of events in which the fire took place. It also showed us how changes were then made, such as simplifying the hatch, so that future spacecraft would not fall to the same fate. Unlike some other sources, this article went very in-depth on the changes that were made after the fire and gave us many details and statistics, making it extremely useful.

Apollo 1 fire rocked NASA, U.S., world 50 years ago: 60-Second Know-It-All. Cleveland, 2017. *YouTube*, www.youtube.com/watch?v=7cN6P1xtdz8.

This video is a 60 second fact filled video with helpful animations and primary source clips that were useful in our documentary. The animations gave us a helpful visualization of the launch pad during the fire.

Apollo 1 - In the Shadow of the Moon. *Vimeo*, vimeo.com/58287638.

This video clip is from a documentary about the Apollo program. It contains fascinating quotes from people who were at NASA during the fire, an interview with a mission control member, and footage from the disaster which we used in our documentary.

"Astronaut Bio: Roger B. Chaffee." *NASA*, Dec. 1997, www.jsc.nasa.gov/Bios/htmlbios/chaffee-rb.html.

This article is a biography of Roger Chaffee. It was very helpful when making his biography section in our documentary. This source helped us understand what Roger Chaffee's life was like before Apollo 1, and his accomplishments.

Beetz, Kirk H. "Virgil I. Grissom." *The Scribner Encyclopedia of American Lives, Thematic Series: The 1960s*, edited by William L. O'Neill and Kenneth T. Jackson, Charles Scribner's Sons, 2003. *Biography In Context*, http://O-link.galegroup.com.nell.flatironslibrary.org/apps/doc/K3436600218/BIC?u=bpls_main&sid=BIC&xid=9ed4c8b8. Accessed 19 Dec. 2018.

This encyclopedia article helped us understand Gus Grissom's early life and college time, as well as his time in the air force. We used information from this article when we wrote Gus Grissom's biography in our documentary.

Beetz, Kirk H. "Edward Higgins White." *The Scribner Encyclopedia of American Lives, Thematic Series: The 1960s*, edited by William L. O'Neill and Kenneth T. Jackson, Charles Scribner's Sons, 2003. *Biography In Context*, http://O-link.galegroup.com.nell.flatironslibrary.org/apps/doc/K3436600638/BIC?u=bpls_main&sid=BIC&xid=81bce9d9. Accessed 19 Dec. 2018.

This encyclopedia article helped us understand the previous career of Ed White and why he was selected as an astronaut. We learned about previous triumphs in his career, and this article was very useful when writing a biography about him.

Editors, Charles River, compiler. *The Apollo 1 Disaster: The Controversial History and Legacy of the Fire That Caused One of NASA's Biggest Tragedies*.

This book helped us understand the timeline of the fire as well as how it affected the space program. Unlike our other sources, this book focused more on the legal effects of the fire on the Space Program, as well as the context of the disaster in the Space Race. The book also contained many fascinating photographs, such as the Apollo 1 memorial, the NASA review board, and much more.

Hollingham, Richard. "The Fire that May Have Saved the Apollo Programme." *BBC*, www.bbc.com/future/story/20170125-the-fire-may-have-saved-the-apollo-programme.

This article helped us understand how the Apollo 1 disaster made the Apollo 11 lunar landing possible and prevented further fatalities in the space program. It gave us

many technical details of the capsule design changes and gave us a broader perspective on the Apollo program and the Space Race.

Howell, Elizabeth. "Apollo 1: The Fatal Fire." *Space.com*, www.space.com/17338-apollo-1.html.

This article gave us general knowledge about the fire when we were starting our project. It was a great place to start our research because even though it does not go into much detail, it gave us an overview of the disaster.

Kluger, Jeffrey. "'Countdown' Podcast Episode 3: The Tragedy of Apollo 1." *Time.Com*, Aug. 2017, p. 4. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=f5h&AN=124579330.

This space history podcast helped us understand the triumph of our topic by stating the individual triumphs of the astronauts and talking about how the fire made the Apollo 11 Moon landing possible. It helped us see the positive aspects of the fire.

Moskowitz, Clara. "How the Apollo 1 Fire Changed Spaceship Design Forever." *Space.com*, www.space.com/14379-apollo1-fire-space-capsule-safety-improvements.html.

This article helped us learn about all of the changes that they made to the capsule after the fire. It also created connections between engineering changes to the Apollo capsule and modern day spacecraft design by relating the Apollo capsule to the more recent Orion capsule.

"Photos of the Apollo 1 Fire: NASA's First Disaster." *Space.com*, 27 Jan. 2013, www.space.com/10674-apollo-1-fire-nasa-disaster.html.

This website gave us access to numerous primary pictures of the crew and the aftermath of the fire. Each picture had a caption describing it, and the captions gave us useful information, such as what type of rocket the Apollo 1 mission had.

"Remembering Apollo 1." *Spaceflight*, vol. 59, no. 2, Feb. 2017, p. 54. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=mih&AN=120707765.

This article from the magazine *Spaceflight* gave us more detailed information on the rocket and the events leading up to the fire. It told us what type of rocket was used and gave us technical details about that rocket, as well as information on where the rocket was built.

Rothman, Lily. "The Apollo 1 Tragedy and the 'Challenge of the Impossible.'" *Time Magazine*, [time.com/4651553/apollo-1-tragedy-50-years-history/](https://www.time.com/4651553/apollo-1-tragedy-50-years-history/). Accessed 27 Jan. 2017.

This TIME article compared how the fire was perceived 50 years ago and how it is perceived now. It helped us understand the nation's reaction to the fire as well as the fact that the space program was almost shut down.

Seppala, Timothy J. "NASA will use Apollo 1 hatch to honor fallen crew." *Engadget*, Jan. 2017, www.engadget.com/2017/01/27/nasa-will-use-apollo-1-hatch-to-honor-fallen-crew/. Accessed 10 Jan. 2019.

This article helped us understand the importance of the Apollo 1 tragedy and how its significance prevails even 50 years after the event. It also told us how NASA is honoring their sacrifice today.

Smith remarks on remembering apollo 1, challenger and columbia. (2018). (). Washington: Federal Information & News Dispatch, Inc. Retrieved from ProQuest Central; Social Science Premium Collection Retrieved from <https://colorado.idm.oclc.org/login?url=https://search-proquest-com.colorado.idm.oclc.org/docview/1992254003?accountid=14503>

This article taught us how many politicians reacted to the accident after it happened. It also gave us insight into how people view the Apollo 1 disaster today.

The Story of Apollo 1 pt.2. Youtube, www.youtube.com/watch?v=OPh_f2mhWe4.

This video clip was part of a documentary on the Apollo program, and contains footage of all three astronaut's lives before Apollo 1, such as Roger Chaffee flying reconnaissance over Cuba during the Cuban missile crisis and Gus Grissom during Gemini 3.

The Story of Apollo 1 pt.3. YouTube, www.youtube.com/watch?v=GErfc7llWE4.

This video clip was part of a documentary on the Apollo program, and contained useful footage from the fire, including footage of the burned capsule and the window of the capsule during the fire.

Tate, Karl. "Remembering the Apollo 1 Fire." *Space.com*,
www.space.com/14377-nasa-apollo-1-fire-disaster-explained-infographic.html.
Infographic.

This infographic gave us preliminary research and a basic understanding of the Apollo 1 fire. It taught us about the crew and gave us a visual understanding of what the launch pad and capsule looked like.

"This is How the Space Race Changed the Great Power Rivalry Forever." *National Interest*, 27 July 2017,
nationalinterest.org/feature/how-the-space-race-changed-the-great-power-rivalry-forever-21690.

This article helped us understand how winning the Space Race impacted the United States and how it changed international relations between the United States and the Soviet Union. It showed us that there was much more to the Space Race than just getting to the Moon, and how winning represented capitalism triumphing over communism.

Walsh, Patrick J. *Spaceflight: A Historical Encyclopedia*. 3 vols.

This encyclopedia gave us information on the previous Gemini and Mercury flights. It told us how the rockets were named and what the purposes of each mission were, as well as the differences between the Saturn I, IB, and V rockets.