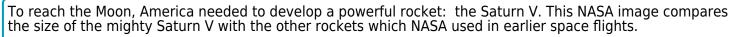


- 0. TO THE MOON Story Preface
- 1. WILBUR AND ORVILLE WRIGHT
- 2. AIRCRAFT CONTROL
- 3. LIFT AND DRAG
- 4. KITTY HAWK
- 5. THE FIRST FLIGHT
- 6. FLYER 3 and OTHER FAMOUS FLIGHTS
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- 11. THE FIRST MAN & WOMAN IN SPACE
- 12. ALAN SHEPARD'S FLIGHT
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### **15. TO THE MOON**

- 16. APOLLO 11
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- 18. THE SHUTTLE'S DESIGN FLAW



One major triumph brought a moon flight much closer to reality. The United States developed, and successfully launched, the mighty <u>Saturn V</u>. Taller than a 36-story building, it was the <u>largest</u> and most powerful <u>three-stage</u> <u>rocket</u> ever built.

With three million parts, it was <u>a giant</u> just waiting for the right time to send a crew to the moon. Not one was ever lost, but not one would have ever flown had engineers (at the Marshall Space Flight Center in Huntsville, Alabama) not solved combustion-instability problems with the <u>F-1 engine</u> (which powered the Saturn V rocket).

Several Apollo missions were flown to lessen anxieties about a safe lunar landing (and return) while astronauts were preparing (in Arizona) to <u>walk on the moon</u>. Crew members of Apollo 8 were the first people to see an "<u>earthrise</u>" as their spacecraft made the first loop around the moon.

Five months later, Apollo 10 was the first mission to go into lunar orbit. Partially descending to the moon - which can, on rare occasions, appear as a "<u>SuperMoon</u>" to people on Earth - the crew tested the lunar module that would be critical to a safe moon landing.

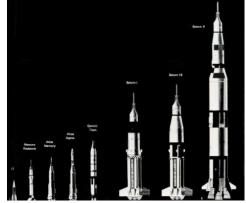
The Soviets, meanwhile, were also rushing ahead with plans for a <u>moon landing</u>. They even had <u>lunar suits</u> ready. An insurmountable problem blocked their way, however. They did not have a rocket comparable to the Saturn V. Prior rockets, sending cosmonauts into space, did not have sufficient power for a moon launch.

The <u>N-1</u>, Russia's best effort to successfully build a moon-launch rocket, was a failure. During the first <u>launch</u> <u>attempt</u> (in February, 1969), an engine fire caused the rocket to shut down and crash one minute after take-off. In July, 1969 the test rocket shut down seconds after lift-off, falling onto the launch pad where it exploded.

When the <u>launch site</u> was destroyed, so were all Soviet hopes that their crew could reach the moon before Apollo 11's flight. (Follow the link to a U.S. Corona reconnaissance satellite photo of the destroyed launch site.)

In a final attempt to at least retrieve lunar surface materials before the Americans, the Soviet Union sent an <u>unmanned robot</u> to the moon. It crash-landed on the moon's surface shortly after Neil Armstrong and Buzz Aldrin were the first human beings to step foot on the moon.





# See Alignments to State and Common Core standards for this story online at: http://www.awesomestories.com/asset/AcademicAlignment/TO-THE-MOON-History-of-Flight

## See Learning Tasks for this story online at: http://www.awesomestories.com/asset/AcademicActivities/TO-THE-MOON-History-of-Flight

# Media Stream



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Saturn V Rocket - Display Photo Image online, courtesy NASA. PD View this asset at: <u>http://www.awesomestories.com/asset/view/Saturn-V-Rocket-Display-Photo</u>

Saturn V - A Three-Stage Rocket NASA Schematic - image online, courtesy NASA. PD View this asset at: http://www.awesomestories.com/asset/view/Saturn-V-A-Three-Stage-Rocket

Saturn V - Launch Photo Image online, courtesy NASA. PD

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Five F-1 Engines and Dr. von Braun Photo by NASA Marshall Space Flight Center (NASA-MSFC), Image MSFC-0201422. PD

Quoted passage, from NASA STI (Scientific and Technical Information) Program. View this asset at: <u>http://www.awesomestories.com/asset/view/Five-F-1-Engines-and-Dr.-von-Braun</u>













#### First Earthrise Seen from the Moon Image online, courtesy NASA. PD

View this asset at: http://www.awesomestories.com/asset/view/First-Earthrise-Seen-from-the-Moon

Soviet Space Suit

Image online, courtesy the National Air and Space Museum, Smithsonian Institution. View this asset at: http://www.awesomestories.com/asset/view/Soviet-Space-Suit

Russian N-1 Rocket Image online, courtesy of RSC Energia via the Smithsonian Air and Space Museum. View this asset at: http://www.awesomestories.com/asset/view/Russian-N-1-Rocket

Destroyed Launch Site of Russia's N-1 Rocket Image online, courtesy the CIA via the Smithsonian National Air and Space Museum. View this asset at:

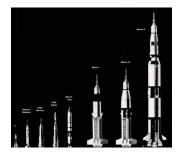
http://www.awesomestories.com/asset/view/Destroyed-Launch-Site-of-Russia-s-N-1-Rocket

### Russian N-1 Rocket Launch Attempt

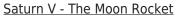
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Soviet Unmanned Robot - Built for Work on the Moon Surface Image online, courtesy RSC Energia via the National Air and Space Museum, Smithsonian Institution. View this asset at:

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TO THE MOON

From "Race for the Moon," episode four of *Space Race* (a BBC documentary/drama produced in cooperation with British, German, Russian and American teams). Copyright, BBC, all rights reserved. Clip provided here as fair use for educational purposes and to acquaint new viewers with the production.

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### Moon Walk - Preparation in Arizona

From "Moon," episode 4 of *The Planets*, a BBC series (from 1999) using historical space-race footage, computer graphics and interviews to tell the story of space exploration and discovery. The entire series is about 390 minutes. Copyright, BBC, all rights reserved. Clip provided here as fair use for educational purposes and to acquaint new viewers with the production.

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