Apollo: To the Moon

by Mary Hall Surface
Audience: Students in grades 3-8

Virginia Standards of Learning:

English: 3.1, 4.2, 5.1, 6.1, 6.2, 7.1, 7.2
History: 3.1, USII.1, USII.9
Science: 4.7, 4.8, 6.8, ES.3

Additional Resources:

21st Century Explorer, National Aeronautics and Space Administration (NASA)
https://education.jsc.nasa.gov/explorers/index.html

All About NASA Astronauts, National Aeronautics and Space Administration (NASA)
https://www.nasa.gov/astronauts

Apollo Program, National Aeronautics and Space Administration (NASA)

History of Space travel, National Geographic for Kids


Spot the [International Space] Station, National Aeronautics and Space Administration (NASA)
https://spotthestation.nasa.gov/sightings/

What was the Apollo program? National Aeronautics and Space Administration (NASA)
https://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-was-apollo-program-58.html

Share in the excitement of America’s race to the moon in this nationally acclaimed drama. Science, technology, engineering, and mathematics (STEM) merge with the arts and history in this one-of-a-kind performance that follows Scott Gibson, a young astronomer, who dreams of becoming an astronaut in the historic Apollo space program.

Gain insight into the “space race” between America and the then-U.S.S.R.; learn about other social and political topics of the 1950’s and 1960’s, such as the Vietnam War and the Civil Rights Movement; and enjoy popular music from that fast-changing era of American history. This one-man multimedia performance also features original downlink broadcasts from space and over 100 photographs from the National Aeronautics and Space Administration (NASA). So stow your backpacks, fasten your seatbelts, and get ready to blast off with Virginia Repertory Theatre’s Apollo: To the Moon.
In the play, Scott’s ultimate space dream is to travel to the moon. Today, NASA astronauts are involved in missions well beyond our own moon. In small groups, use Internet resources to research the NASA missions below. Record notes on what you learn. Then follow the guidelines at the bottom of the page to make an informative brochure about your NASA mission.

Group 1  International Space Station
Group 2  Juno: Mission at Jupiter
Group 3  New Horizons: Pluto and Beyond
Group 4  Cassini Mission at Saturn
Group 5  Curiosity Mars Rover
Group 6  Hubble Space Telescope

INSIDE: Include information about the following on the four interior pages of your brochure:

1. Mission overview and goal
2. History of the mission
3. What is happening now with the mission
4. Interesting facts about the mission

BACK: Include the names of all group members. Include a list of at least three books or websites where someone could go to learn more.

COVER: Include a drawing to represent the mission and the name of the mission.
Your Body in Space

Earth is very different from the environment in space. Space is one of the most hostile environments we will ever explore. As the astronaut’s environment changes, so does his/her body. Read the list of conditions that affect the body in space. Some are true; others are made up. Can you tell which is which? Mark the following with a “T” or an “F.”

1. There is less gravity in space. ___
2. Astronauts can float upside down without their blood rushing to their heads. ___
3. Astronauts report that their noses run while orbiting the Earth. ___
4. Blinking is difficult in space. ___
5. Astronauts can get space sickness, a feeling similar to motion sickness on Earth. ___
6. About one in four astronauts reports getting hiccups in space. ___
7. Astronauts’ faces can get puffy and they sometimes feel like they have a cold. ___
8. Reduced gravity over time can lead to a loss in calcium in the bones and weaker muscles. ___
9. Bones cannot break in space. ___
10. The body’s internal “clock” (called circadian rhythm) is disrupted when orbiting the Earth. ___

IMAGINE AND WRITE

Imagine you are an astronaut on the International Space Station. It is your first mission to space. Write a journal entry describing how you feel as you prepare to blast off, as you enter the Space Station, and as you look back at the Earth from space.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(Answers: True—1, 2, 5, 7, 8, 10; False—3, 4, 6, 9. Source: NASA, at education.jsc.nasa.gov/explorers/p3.html.)

Body Weight: It’s All Relative!

Did you know that what you weigh on Earth is different than what you’d weigh in various places in the universe?

Visit the Exploratorium website and explore how your weight would change as you traveled through space.

exploratorium.edu/ronh/weight/
The following is an excerpt from John F. Kennedy’s “Moon Speech,” given at Rice University in Houston, Texas on September 12, 1962. A speech is an example of primary source material. Read the excerpt below, and complete the activity on the following page.

There is no strife, no prejudice, no national conflict in outer space as yet. Its hazards are hostile to us all. Its conquest deserves the best of all mankind, and its opportunity for peaceful cooperation may never come again. But why, some say, the moon? Why choose this as our goal? And they may well ask why climb the highest mountain? Why, 35 years ago, fly the Atlantic? Why does Rice play Texas?

We choose to go to the moon. 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, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too.

It is for these reasons that I regard the decision last year to shift our efforts in space from low to high gear as among the most important decisions that will be made during my incumbency in the office of the Presidency.

In the last 24 hours we have seen facilities now being created for the greatest and most complex exploration in man’s history. We have felt the ground shake and the air shattered by the testing of a Saturn C-1 booster rocket, many times as powerful as the Atlas which launched John Glenn, generating power equivalent to 10,000 automobiles with their accelerators on the floor. We have seen the site where the F-1 rocket engines, each one as powerful as all eight engines of the Saturn combined, will be clustered together to make the advanced Saturn missile, assembled in a new building to be built at Cape Canaveral as tall as a 48 story structure, as wide as a city block, and as long as two lengths of this field.

Within these last 19 months at least 45 satellites have circled the earth. Some 40 of them were “made in the United States of America” and they were far more sophisticated and supplied far more knowledge to the people of the world than those of the Soviet Union.

The Mariner spacecraft now on its way to Venus is the most intricate instrument in the history of space science. The accuracy of that shot is comparable to firing a missile from Cape Canaveral and dropping it in this stadium between the the 40-yard lines.

Transit satellites are helping our ships at sea to steer a safer course. Tiros satellites have given us unprecedented warnings of hurricanes and storms, and will do the same for forest fires and icebergs.

We have had our failures, but so have others, even if they do not admit them. And they may be less public.

To be sure, we are behind, and will be behind for some time in manned flight. But we do not intend to stay behind, and in this decade, we shall make up and move ahead.

Read the speech in its entirety at er.jsc.nasa.gov/seh/ricetalk.htm.
After reading the excerpt on the previous page, answer the following:

In his speech, President Kennedy said, “We choose to go to the moon in this decade ... not because [it is] easy, but because [it is] hard....” What do you think he meant by that? What challenges are we choosing to conquer today “because they are hard?”

Why do you think it’s important for people to study and analyze primary sources?

Read the speech excerpt critically. What statements did President Kennedy make that demonstrate the U.S. was in a “Race for Space” with the Union of Soviet Socialist Republics (U.S.S.R.)?

Extend Your Thinking:
During the “Race for Space,” the U.S. and the U.S.S.R. were locked in a battle for preeminence. Today, there is more collaboration and less competition. Read “How the World Explores Space Together,” by Caleb Wong, on the Smithsonian National Air and Space Museum website at https://airandspace.si.edu/stories/editorial/how-world-explores-space-together. Why do you think this change has occurred?

Enrichment Opportunity:
NASA’s space program has resulted in many technologies that affect our everyday lives. Research what technological advances have resulted from our space programs.
Many people with different skills and talents work together to make a production such as Apollo: to the Moon come to life. Can you match these theater jobs with their descriptions?

- **set designer**
  a person who plays a role or character in stage plays, motion pictures, television broadcasts, etc.

- **playwright**
  a person who creates the look of each character by designing clothes and accessories the actors will wear in performance.

- **stage manager**
  this person’s job is to pull together all the pieces and parts of a play – the script, actors, set, costumes, lighting and sound, and music to create a production.

- **actor**
  this job focuses on using light to create effects that match the mood of various scenes in a performance.

- **costume designer**
  this person is a writer of scripts for plays. The script tells a story through the actions and words of the characters.

- **lighting designer**
  this person creates the physical surroundings of a play, including any scenery, furniture, or props used throughout the play.

- **director**
  this person helps the director and helps organize the actors, designers, stage crew, and technicians throughout the production of a play.

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**Theater Etiquette**

**Clap, but know when to do so.**
You should clap after a play, act, or song, or right before intermission. If you loved the show, you can give a “standing ovation” at the end. That’s when you stand up while applauding.

**It’s quiet time (sort of).**
If the play makes you laugh or cry, that is fine, but you can chat with your friends afterwards. Be respectful and quiet so the actors can focus on their roles. Being quiet allows the rest of the audience to concentrate on the play.