

Understanding the American Space Program

Lesson Plan

Grade Level: 9-12

Curriculum Focus: Space Exploration

Lesson Duration: Two class periods

Student Objectives

- Learn about major events in the history of NASA (National Aeronautics & Space Administration).
- Create a time line of the goals, heroes, and outcomes of select missions.

Materials

- Discovery School video on *unitedstreaming: Great Books: The Right Stuff*
Search for this video by using the video title (or a portion of it) as the keyword.

Selected clips that support this lesson plan:

- Yury Gagarin vs. Alan Shepard: The Space Race Heats Up
 - Alan Shepard's Freedom 7 Rocket Flight
 - Astronaut Gus Grissom's Role in the Space Race
 - The First Man in Earth Orbit: John Glenn and the Atlas
 - Gordon Cooper and the Final Mercury Mission
- Video on *unitedstreaming: Destination Space*
Search for this video by using the video title (or a portion of it) as the keyword.

Selected clips that support this lesson plan:

- The Glory Days: The Apollo XI Mission to the Moon
 - Decline: Apollo XIII, the Challenger Disaster, and the Mars Probe
- Newsprint
 - Paper and markers (for each group)
 - Internet access

- Print resources about NASA's history and its programs from Mercury to the International Space Station

Procedures

1. Ask students to brainstorm names of astronauts from U.S. space missions. Ask students if they know why each astronaut's mission was significant.
2. You may choose to give students some background on the Cold War. Explain that the Cold War was a pervasive tension that existed between the United States and the former Soviet Union for several decades following World War II. The primary source of conflict and tension between the two countries was rooted in the United States' distrust of communism, the Soviet form of government. When communism ended there, the Cold War ended, too. Later the Soviet Union dissolved, leaving independent nations, the largest of which is Russia.
3. Explain to students that NASA (National Aeronautics & Space Administration) was founded in 1958, a year after the Soviets launched Sputnik 1, the world's first artificial satellite. During this period, the U.S. and the Soviet Union had been engaged in the Cold War, so Americans saw Soviet advances in this "space race" as a dangerous technological gap between the two nations. Throughout its history, NASA has made many achievements in aeronautics, space science, and space applications, but it may be best known for seven major manned-space programs, each with a unique set of missions. NASA manned-space programs include:
 - **Mercury:** the first U.S. program for human spaceflight
 - **Gemini:** the first two-man crews, longer missions
 - **Apollo:** the first spaceflights to the moon
 - **Skylab:** a place where humans live and work in space for extended periods of time
 - **Apollo-Soyuz:** first international manned spaceflight
 - **Space shuttle:** the first reusable low-cost spacecrafts
 - **International Space Station:** a multinational effort to create a permanent orbiting laboratory in space
4. Divide students into seven groups, and assign each group one of the manned-space programs above. Have each group visit the Web sites below to write a paragraph to answer each of the following questions about their assigned program:
 - What were the program's main objectives?
 - When did the program run?
 - What type of vehicle was used for this program?
5. Have students record basic facts about one or two of the most significant missions of the program, using one index card for each mission: name, dates, goals, heroes, and outcomes. Encourage students to print out or sketch images of spacecraft, astronauts, and any other pictures from a mission.

- NASA Human Spaceflight Programs History
<http://www.hq.nasa.gov/office/pao/History/humansp.html>
- NASA Space Flight History
<http://www.spaceflight.nasa.gov/history/>
- Image and Media Gallery
<http://spaceflight.nasa.gov/gallery/index.html>
- Chronology of U.S. Astronaut Missions (1961-1972)
http://nssdc.gsfc.nasa.gov/planetary/chrono_astronaut.html
- NASA's First 100 Human Space Flights
<http://www-pao.ksc.nasa.gov/kscpao/factoids/hundred.htm>
- The Apollo Program
<http://www.nasm.edu/apollo/>

Encourage all students to present a different part of their findings: One or two students in the group should give an overview of the program, other students may present information on a specific flight, and others may describe the images from the missions.

6. Create a time line on a bulletin board that spans the years 1961 to the present. Have students hang their overviews for each program above the time line in the appropriate period. Then have students post their index cards and images about individual missions at specific dates.
7. End the lesson with a class discussion about how human spaceflight has evolved over the past 40 years. Which events do students believe were the most important achievements in the space program? What were some of the major challenges? How do they envision the next 40 years of human spaceflight?

Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- **3 points:** Students participated actively in class discussion; demonstrated above-average research and writing skills in a clear, thorough presentation that included several details about their assigned space program.
- **2 points:** Students participated in class discussion; demonstrated on-grade level research and writing skills in a complete presentation that included some details about their assigned space program.
- **1 point:** Students participated little in class discussion; demonstrated below-average research and writing skills in an incomplete presentation with few or no details about their assigned space program.

Vocabulary

astronaut

Definition: A person who pilots a spacecraft or works in space; a space traveler, particularly one from the United States

Context: Alan Shepard was the first U.S. astronaut to enter space in 1961.

Johnson Space Center

Definition: The headquarters for all U.S. manned spacecraft projects conducted by NASA; the location of the Mission Control Center for manned space flights

Context: After a spacecraft launches from Kennedy Space Center, the Mission Control Center at Johnson Space Center monitors the systems that keep the spacecraft functioning.

Kennedy Space Center

Definition: The launch facility for all U.S. space missions that carry crews

Context: Kennedy Space Center is located in Cape Canaveral, Florida.

launch vehicle

Definition: A powerful rocket used to launch a spacecraft or satellite into space

Context: A launch vehicle is powerful enough to help a spacecraft overcome gravity.

space station

Definition: An orbiting spacecraft designed to be occupied by teams of astronauts or cosmonauts over a long period

Context: Skylab, the first U.S. space station, launched into orbit in 1973.

Academic Standards

National Council of Teachers of English (NCTE)

The National Council of Teachers of English (NCTE) and the International Reading Association have developed national standards to provide guidelines for teaching the English language arts. To view the standards online, go to <http://www.ncte.org/about/over/standards/110846.htm>.

This lesson plan addresses the following standards:

- Students read a wide range of print and nonprint texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world.
- Students use a variety of technological and information resources to gather and synthesize information and to create and communicate knowledge.

Mid-continent Research for Education and Learning (McREL)

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit link:

<http://www.mcrel.org/compendium/browse.asp>



This lesson plan addresses the following national standards:

- Language Arts—Reading: Uses reading skills and strategies to understand and interpret a variety of informational texts
 - History—United States History: Understands how the Cold War and conflicts in Korean and Vietnam influenced domestic and international politics
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Support Materials

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- <http://school.discovery.com/teachingtools/teachingtools.html>