



A Math and Science @ Work Special Series

CELEBRATING APOLLO

AP* US HISTORY Educator Edition



TECHNOLOGICAL IMPACT OF THE APOLLO PROGRAM

Instructional Objectives

Students will

- analyze primary and secondary source documents to be used as supporting evidence;
- incorporate outside information (information learned in the study of the course) as additional support; and
- write a well-developed argument that answers the document-based essay question regarding the impact of the Apollo program and the technology acquired upon the economic and social fabric of the United States and the world.

Degree of Difficulty

For the average AP US History student the problem may be at a moderate difficulty level.

Preparatory Resources

This problem requires study beyond the textbook in order for students to be knowledgeable on what technology has been developed from the Apollo program. In addition to resources available at www.nasa.gov, two other documents are provided for download to be used for classroom discussion – NASA Facts.pdf and Supplemental Document.pdf.

Background

This problem is part of a series of Social Studies problems celebrating the contributions of NASA's Apollo Program.

On May 25, 1961, President John F. Kennedy spoke before a special joint session of Congress and challenged the country to safely send and return an American to the Moon before the end of the decade. President Kennedy's vision for the three-year old National Aeronautics and Space Administration (NASA) motivated the United States to develop enormous technological capabilities and inspired the nation to reach new heights.

Eight years after Kennedy's speech, NASA's Apollo program successfully met the president's challenge. On July 20, 1969, the world witnessed one of the most astounding technological achievements in the 20th century. Neil

Grade Level

10-11

Key Topic

U.S. space efforts from 1957 - 1969

Degree of Difficulty

Moderate

Teacher Prep Time

2 hours

Problem Duration

60 minutes:

- 15 minute document analysis
- 45 minute essay writing

AP Course Topics

- The United States and the Early Cold War
- The 1950's
- The Turbulent 1960's

NCSS Social Studies Standards

- Time, Continuity and Change
- People, Places and Environments
- Science, Technology and Society
- Globalization

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Armstrong and Edwin “Buzz” Aldrin became the first humans to set foot on the Moon, while Mike Collins orbited the Moon in the Command Module. Armstrong’s words, “That’s one small step for [a] man, one giant leap for mankind,” were heard around the world and inspired a generation. This amazing accomplishment required the collaboration of hundreds of thousands of determined individuals and the committed resources of our nation.

The United States, in response to competition from the Soviet Union, sought to develop advanced technologies and explore new frontiers. The creation of NASA became pivotal in the technology arena as they worked to regain the nation’s confidence as a leader in space exploration. NASA became a mechanism for the government to develop technology separate from the military efforts that they had relied heavily on in the past.

NASA came through as a leader in technological developments with Project Mercury on October 7th, 1958. America had now joined the space race. By 1967 the Apollo program was underway and working towards achieving the goal set by President Kennedy. NASA was now striving to launch the first human into space and to reach the moon by the end of the decade. The complexity and the social impact of the Apollo program would direct the future of technology for the nation. The advancements in technology that were made by the Apollo program and by NASA’s many other programs have become an integral part of our lives today.

For more information about NASA’s Apollo program visit www.nasa.gov.

Themes in AP U.S. History

- American Identity
- Culture
- Economic Transformation
- Globalization
- Reform
- War and Diplomacy

AP Course Topics

The United States and the Early Cold War

- Diplomatic strategies and the policies of the Eisenhower and Kennedy Administrations

The 1950’s

- Impact of changes in science

The Turbulent 1960’s

- From the new frontier to the great society

Politics and Economics at the End of the Twentieth Century

- Nixon’s challenges

Society and Culture at the End of the Twentieth Century

- Revolutions in biotechnology, mass communication, and computers



NCSS Social Studies Standards

- Time, Continuity, and Change
- People, Places, and Environments
- Production, Distribution, and Consumption
- Science, Technology, and Society
- Global Connections

Document-Based Essay Question (DBQ)

Directions

The following question requires you to construct a coherent essay that integrates your interpretation of documents A – H *and* your knowledge of the period referred to in the question. High scores will only be earned by essays that both cite key pieces of evidence from the documents and draw on outside knowledge of the period.

Question

To what extent did the technology of the Apollo program bring about changes to health and safety in the United States?

Use the documents and your knowledge of the time period 1961-1977 to construct your response.

Document A

Source: National Archives, President Dwight D. Eisenhower, Farewell Address to the Nation, January 17, 1961.

Today, the solitary inventor, tinkering in his shop, has been overshadowed by task forces of scientists in laboratories and testing fields. In the same fashion, the free university, historically the fountainhead of free ideas and scientific discovery, has experienced a revolution in the conduct of research. Partly because of the huge costs involved, a government contract becomes virtually a substitute for intellectual curiosity. For every old blackboard there are now hundreds of new electronic computers...Another factor in maintaining balance involves the element of time. As we peer into society's future, we—you and I, and our government—must avoid the impulse to live only for today, plundering for, for our own ease and convenience, the precious resources of tomorrow. We cannot mortgage the material assets of our grandchildren without asking the loss also of their political and spiritual heritage. We want democracy to survive for all generations to come, not to become the insolvent phantom of tomorrow.



Document B

Source: *The Washington Daily News*, Monday July 28, 1969.

'WHAT HAVE THEY BEEN FEEDING YOU?'



Document C

Source: National Aeronautics and Space Administration, Press Release No: 76-02, Lyndon B. Johnson Space Center, January 18, 1976.

Food technology and packaging techniques developed by the NASA Johnson Space Center, Houston, to feed Apollo and Skylab crews during space flight are being applied in a pilot program to help provide balanced meals to elderly who live alone. Physicians, nutritionists and biomedical engineers at the Center are working together to design and develop a meal system to supplement the existing National Nutrition Programs for the Elderly.

The effort is part of the agency's Technology Utilization program in which space-developed technology is applied in the solution of earth-bound problems...called Meal Systems for the Elderly, Primeaux says: "Its goal is to develop nutritious, shelf-stable, convenient and easily deliverable meals for the elderly."



Document D

Source: “Breast Cancer Detection,” article in NASA’s *Spinoff*, 1976 edition.

“While ultrasonic imaging is under development at NASA to replace X-rays in many applications, commercial development and widespread usage will take several years at best. Meanwhile, Jet Propulsion Laboratory scientists have come up with another technique to decrease exposure to harmful X-rays, especially in mammography, or breast radiography...The NASA laboratory recently tried this control system at the Huntington Memorial Hospital in Pasadena—with overwhelming success...Through a Technology Utilization Office applications engineering project, NASA now is attempting to transfer this technology to the X-ray industry.”

Document E

Source: National Aeronautics and Space Administration, Press Release No: 75-03, Lyndon B. Johnson Space Center, January 22, 1975.

The Lyndon B. Johnson Space Center, Houston, Texas, will sponsor a major Earth Resources Symposium during the week of June 8 through 13, 1975. The symposium’s primary focus will be on the practical applications of earth resources survey data gathered by both satellites and aircraft. Such data are being utilized and evaluated in a variety of applications, such as regional planning, environmental impact assessment, energy and mineral resources location, water resources management and agriculture...A primary tool in this effort has been LANDSAT-1, launched in July 1972...High quality imagery from a multi-spectral scanner has revealed many previously unknown features of the Earth’s geological structure, possible mineral deposits, pollution sources, urban growth patterns etc...

Document F

Source: John T. Woolley and Gerhard Peters. Telephone conversation with Richard Nixon and the Apollo 11 Astronauts on the Moon: July 20th, 1969. *The American Presidency Project*. Retrieved August 13, 2009, from <http://www.presidency.ucsb.edu/ws/index.php?pid=2133>.

“Hello Neil and Buzz, I am talking to you by telephone from the Oval Room at the White House, and this certainly has to be the most historic telephone call ever made from the White House...For one priceless moment in the whole history of man all the people on this earth are truly one—one in their pride in what you have done and one in our prayers that you will return safely to earth.”



Document G

Source: “Space Food Techniques Used In Pilot Program for Elderly,” article in NASA-Johnson Space Center’s *Roundup*, January 16, 1976.

“Project Engineer Gary R. Primeaux reported that surveys have shown that many elderly Americans do not receive adequate nutrition. He cites as contributing factors lack of single-serving products, limited mobility, loss of skills needed to prepare balanced meals, limited finances and often a sense of loneliness or rejection that reduces the incentive to cook and eat nutritious meals alone... The program is expected to cost 240,000 of which NASA will fund 125,000; Johnson School of Public Affairs, \$90,000; Texas Research Institute of Mental Sciences, \$8,000; and United Action for the Elderly, Inc. \$17,000. Technology, Inc. and Martin Marietta Corp. are contractors in the development program.”

Document H

Source: “Fire Safety Office, NASA Conference on Material for Improved Fire Safety”, Key Note Address: Rep. Jerry L. Pettis, May 6, 1970, Box 16-6. Johnson Space Center History Collection, University of Houston-Clear Lake.

“The problems of our cities—poverty, crime, drugs and militant unrest—the problem of environmental pollution—of adequate housing or equal educational opportunity -- not to forget the maintenance of our nation’s security in a very troubled, sometimes explosive world—all these requirements have their champions. All get a share of publicity... So more and more are asking ‘What Earthly Good Is Space?’ And we must be able to answer. ‘What good is new experience?’ ‘Or new knowledge?’ None of it is any ‘earthly good’—unless it can be applied to the common good. That’s a full time job for all of us – if we care enough – ‘If we care enough to SHARE the very best.’ ...The successful R&D program conducted by NASA in the non-metallic fireproof materials field has produced what has been described as a ‘quantum jump’ that can greatly affect many major industries and has profound life-preserving implications. The breakthrough in materials technology is a direct result of NASA’s dedicated effort to eliminate any possibility of a recurrence of the Apollo 204 fire.”



Scoring Guide

To what extent did the technology of the Apollo program bring about changes to health and safety in the United States?

8-9

- Contains a clear, well-developed thesis that demonstrates the extent that the Apollo program impacted and supported technology within the areas of health and safety.
- Supports thesis with substantial, relevant information covering the time period and the technological advances due to the Apollo program.
- Provides effective analysis of the role of technology in the areas of health and safety and positive changes due to the Apollo program.
- Effectively uses a substantial number of documents.
- Supports the thesis with substantial and relevant outside information.
- Understands the complexity of the question.
- May contain minor errors that do not detract from the overall essay.

5-7

- Contains a thesis with limited development of the role of technology due to the Apollo program.
- Supports thesis with some factual information relevant to the question.
- Addresses the question in a general way; may lack depth.
- Effectively uses some documents.
- Supports the thesis with some relevant outside information.
- Provides limited analysis.
- May contain errors.

2-4

- Contains an undeveloped thesis about the role and impact of technology due to the Apollo program.
- Lacks supporting information relevant to the question.
- Merely paraphrases, quotes, or briefly cites documents.
- Contains little outside information or information that is inaccurate or irrelevant.
- Provides little or no analysis.
- May contain major errors.

0-1

- Does not contain a thesis.
- May simply paraphrase or restate the question.
- Demonstrates little or no understanding of the question.
- Completely off topic.



Possible Outside Information

The 1960's

- Echo I
- IBM Selectric typewriter
- February 1962-John Glenn
- Kodak first film cartridge
- Cassette tape recorder
- Election of JFK
- Alan Shepard
- John Glenn
- New Frontier
- Gemini Program
- Apollo Program
- Apollo 1 fire
- Assassination of John Kennedy
- Lyndon B. Johnson
- Rice University
- Exxon Oil Company
- Friendswood Development
- Johnson Space Center
- Kennedy Space Center
- Great Society
- Medicare Act of 1965
- Election of 1968
- July 20th, 1969
- Apollo 11
- Neil Armstrong
- Détente
- Carl Sagan
- Lunar Orbiter
- Saturn 1
- Saturn 1B
- Saturn V

The 1970's

- Skylab
- Honeywell "time sharing"
- Moon rover
- Extravehicular activity (EVA)
- Moon rocks
- Apollo-Soyuz Test Project
- Space Station Prototype Testing - JSC
- Skylab Medical Experiment Altitude Test
- Apollo 13
- Apollo 14 - Alan Shepard
- Computer Programming
- December 13, 1972
- Apollo 17



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Celebrating Apollo – Technological Impacts of the Apollo Program

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