



A Math and Science @ Work Special Series

CELEBRATING APOLLO

AP* HUMAN GEOGRAPHY Educator Edition



THE IMPACT OF NASA CENTER LOCATIONS

Instructional Objectives

Students will

- list the physical and human advantages associated with the site selection of two NASA centers;
- discuss the political influence involved in the selection; and
- identify geographical implications that would minimize the effectiveness of the locations selected.

Preparatory Resources

In order for students to be successful in answering this question, they will need to be knowledgeable about the origins of NASA's Johnson Space Center and Kennedy Space Center. Supporting materials and background information can be found electronically at the following sites:

http://www.nasa.gov/centers/johnson/about/history/jsc40/jsc40_pg2.html

<http://www.nasa.gov/centers/kennedy/about/history/story/ch1.html>

An activity is available for download that provides questions for students as they research these sights (Preparatory Activity: The Origins of JSC and KSC).

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 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

Grade Level

9-12

Key Topic

Site and Situation

Degree of Difficulty

Moderate

Teacher Prep Time

1 hour

Problem Duration

Preparatory Activity:

45-60 minutes

Free-Response Question:

25 minutes

AP Course Topics

- Geography: Its Nature and Perspectives
- Political Geography
- Industrialization and Economic Development

NCGE Geography Standards

- The World in Spatial Terms
- Human Systems
- Environment and Society

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thousands of determined individuals and the committed resources of our nation.

NASA officially began operations on October 1, 1958; a few months after President Dwight D. Eisenhower signed the National Aeronautics and Space Act providing for research into the problems of flight within Earth's atmosphere and space. As the Cold War heated up a race to space between the United States and the Soviet Union, NASA's importance continued to grow. It soon became evident that specialized facilities would be necessary to house the developing space flight program. Various existing military and research facilities around the country were used as the program began its initial phase, but as the focus continued to expand, new sites were needed that would fall completely under the direction of NASA.

Two of the most significant NASA facilities were designated and developed in Texas and Florida. Each location contributed crucial elements to the success of the space program and became the focal points of man's quest to reach the moon and beyond. On October 24, 1961, the Manned Spacecraft Center, which was later renamed the Johnson Space Center (JSC), was formally established in Houston, Texas. It became the home of Mission Control and astronaut training, as well as many other functions, including research and development that spawned a peripheral support economy. The Kennedy Space Center (KSC), originally called the Launch Operations Center, was opened in 1962 on Merritt Island adjacent to Cape Canaveral, Florida. Its proximity to the U.S. Air Force's Cape Canaveral launch site made it an ideal location to launch and process the rockets that took men to the Moon.

Due to the political and geographical components of their locations, these NASA facilities developed into linchpins of the manned space program's early success. Each center has also overcome challenges associated with the geographical implications of their locations. People continue to flock to JSC and KSC to learn about the history of space exploration as well as NASA's plans for the future.

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

AP Human Geography Course Goals

- Define regions and evaluate the regionalization process
- Understand and interpret the implications of associations among phenomena in places

AP Course Topics

Geography: Its Nature and Perspectives

- Key concepts underlying the geographical perspective: location, space, place, scale, pattern, regionalization, and globalization

Political Organization of Space

- Territorial dimensions of politics
 - Influences of boundaries on identity, interaction, and exchange
 - Spatial relationships between political patterns and patterns of ethnicity, economy, and environment

Industrialization and Economic Development

- Growth and diffusion of industrialization
 - The changing roles of energy and technology
 - Geographic critiques of models of economic localization, industrial location, economic development, and world systems
- Contemporary patterns and impacts of industrialization and development
 - Local development initiatives: government policies



NCGE Geography Standards

The World in Spatial Terms

- How to analyze the spatial organization of people, places, and environments on Earth's surface.

Human Systems

- The patterns and networks economic interdependence on Earth's surface.

Environment and Society

- How human actions modify the physical environment.
- How physical systems affect human systems.

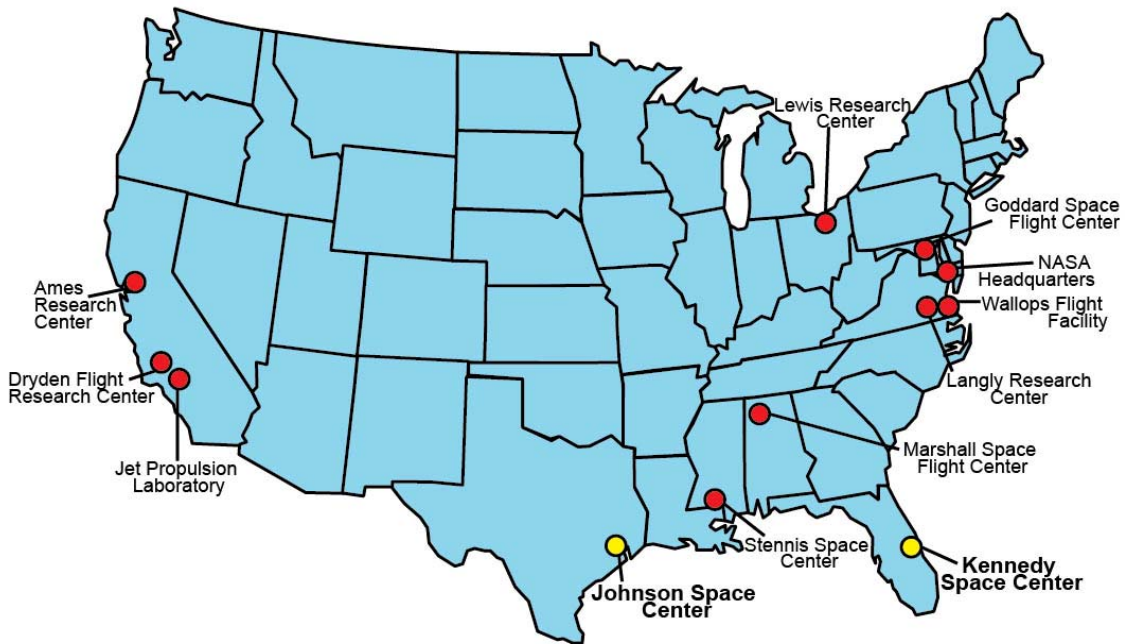


Free-Response Question

Directions

You have 25 minutes to answer all parts of the following question. While a formal essay is not required, it is not enough to answer a question by merely listing facts. Your answer should be based upon your critical analysis of the question posed. It is recommended that you spend 5 minutes of your allotted time to plan or outline your response. Make sure you letter each of your answers with the corresponding question.

NASA Center Locations



Question

Johnson Space Center in Houston, Texas and Kennedy Space Center near Cape Canaveral, Florida are two of NASA's key sites for human space flight missions. Answer the following questions as they relate to the aforementioned NASA locations.

- With regards to the geographical advantages and disadvantages of the space flight centers, site one primary physical advantage and one primary human advantage that made each of these centers an ideal location for their various functions and responsibilities.
- With regard to one of the aforementioned sites, explain how politics may have played a role in the site selection of those two locations.
- Identify two significant geographical problems relating to weather, that may hamper the effectiveness of NASA's JSC and KSC. Cite specific examples to illustrate these problems.



Scoring Guide:

Suggested 7 points total to be given.

Question	Distribution of points
<p>A 2 points</p>	<p>1 point for identifying one physical advantage for each center.</p> <p><i>JSC advantages included:</i> the mild climate that would allow year-round outdoor work; readily available supply of water</p> <p><i>KSC advantages included:</i> mild climate that would allow year-round outdoor work; access to open uninhibited water making it possible to drop stages of a launch vehicle without hurting anyone.</p> <p>1 point for identifying one human advantage for each center.</p> <p><i>JSC advantages included:</i> Urban area with a well established pool of industrial and contractor support; Availability of water transport and a first-class all-weather airport; proximity to a major telecommunication network; culturally attractive community with proximity to multiple regional universities; close proximity to military facilities (such as Ellington U.S. Air Force base and San Jacinto Ordinance Depot).</p> <p><i>KSC advantages included:</i> Undeveloped area allowing missile launches without danger to communities; several small communities within easy driving range, and larger cities only slightly further; access of water transport; proximity to U.S. Air force facilities (Patrick) and the Atlantic Missile Range.</p>
<p>B 3 points</p>	<p>2 points for explaining the probable political considerations that were involved in the establishment of the Johnson Space Center in Houston. This should include the impact of the Democratic Administration of John F. Kennedy and the local politics connected to the land donation to the newly formed NASA involving both Humble Oil Company and Rice University.</p> <p>1 point for explaining the probable political considerations that were involved in the establishment of Kennedy Space Center in Florida. This can be related to the Democratic Administration, Congressional lobbying, or Air Force influence.</p>
<p>C 2 points</p>	<p>1 point for identifying the significance of stable weather patterns necessary for the launch site in Florida for the launch of the Apollo missions until today.</p> <p>1 point for explaining the significant damage and problems related to tropical storms or hurricanes that not only might delay launch, but also inflict financial damage on the facilities in both Houston and Florida.</p>



Contributors

Thanks to the subject matter experts for their contributions in developing this problem:

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Celebrating Apollo – The Impact of NASA Center Locations

Feedback Form

Please take a minute to complete this feedback form. Your input will help improve this product and will help us create new, useful material.

Fax the completed form to: (281) 461-9350 – Attention: Natalee Lloyd

Or type your responses in an email and send to: natalee.lloyd@tietronix.com

Please circle the appropriate response and include an explanation where desired.

1. This problem successfully accomplished the stated instructional objectives. YES NO

2. The problem was at an appropriate level of rigor to be used in an AP class. YES NO

3. The problem will help prepare students to answer free-response questions on the AP exam. YES NO

4. I will use this problem again. YES NO

5. Please provide suggestions for improvement of this problem and associated material:

Thank you for your participation.