



A Math and Science @ Work Special Series

CELEBRATING APOLLO

AP* HUMAN GEOGRAPHY



*AP is a trademark owned by the College Board, which was not involved in the production of, and does not endorse, this product.

PREPARATORY ACTIVITY: THE ORIGINS OF JSC AND KSC

Analyzing the Selection Process for Site Locations of JSC and KSC

(A preparatory activity for use with the free-response problem, *The Impact of NASA Center Locations*)

Teacher Prep Time: 15 - 20 minutes

Duration of Activity: 30 - 40 minutes

Materials Needed: Computers with internet access

AP Course Topics and NCGE Standards: A detailed list of each can be found in the related free-response question.

Instructional Objectives

Students will

- read about the origins of NASA's Johnson Space Center (JSC) and Kennedy Space Center (KSC); and
- determine the factors involved in NASA's process of selecting the site locations for JSC and KSC.

Educator Instructions

Teacher Preparation

To be familiar with the aspects of this activity read about the origins of JSC and KSC found at the following websites.

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

Note: This will take you to the first of three pages on the origins of JSC. Links for the remaining pages are located at the bottom of the page.

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

Teacher Instructions

Students can review the websites provided and complete the included questions either in a computer lab or as a homework assignment depending on the facilities and time available. After completing the questions, have the students discuss their answers in small groups or with the class.



Selecting Locations for NASA Sites – Solution Key

Johnson Space Center (JSC)

1. In the early 1960's, what event led NASA to need to quickly find sites for centers to be built?

The goal set out by President Kennedy in May of 1961 for the United States to land humans on the Moon and return them safely to Earth before the end of the decade.

2. What was the intended purpose for the center that was designated the Manned Spacecraft Center (MSC), the original name of what is now the Johnson Space Center (JSC)?

It was to be the lead center for all space missions involving astronauts.

3. List at least 5 different criteria that NASA's site selection team used to determine the location of the MSC?

Answer should include 5 of the following criteria:

- *availability of water transport*
- *a first-class all-weather airport*
- *proximity to a major telecommunications network*
- *a well established pool of industrial and contractor support*
- *a readily available supply of water*
- *a mild climate*
- *a culturally attractive community*

4. Describe the reasons why these criteria were important to NASA for two of the criteria you listed in question 3.

Answer should include 2 of the following:

- *availability of water transport – to transport spacecraft by barge*
- *a first-class all-weather airport – to handle spacecraft and conduct certain kinds of flight tests*
- *proximity to a major telecommunications network – to support a new high-technology institution*
- *a well established pool of industrial and contractor support – to fill the positions that would be required*
- *a readily available supply of water – to accommodate a launch over the water*
- *a mild climate – to permit year-round outdoor work*
- *a culturally attractive community – to draw additional workforce to the area*

5. What were the initial reasons for Houston being selected as a possible site location for the MSC?

The proximity of the San Jacinto Ordinance Depot nearby and its recognized, prominent universities, Rice and Texas A&M

6. What factors made Houston seem less than desirable to the site selection committee on their initial visit to the city?



They found a flat cow pasture with brisk winds off Galveston Bay. Damage from Hurricane Carla was evident as they saw boats that had been hurled into the highway, pieces of houses and buildings, flattened trees and flooded pastures. They also found Ellington Air Force Base, which would provide temporary housing, to be dreary and in a state of disrepair.

7. What connection did Humble Oil and Rice University have to the selection of Houston as the location for the MSC?

1,000 acres of land that was owned by Humble Oil was given to Rice which in turn donated this land to the government.

8. How did the presence of NASA's MSC affect the city of Houston and the surrounding area?

Space fever swept the area. The baseball team was named the Astros and the basketball team called the Rockets. The Astrodome, Astroworld and numerous businesses with "space city" in the title developed over the years.

Kennedy Space Center (KSC)

9. When did Cape Canaveral become a location for testing missiles? This testing was performed under the direction of what government organization?

In October 1949; the U.S. Army

10. What made Cape Canaveral an ideal location for testing missiles?

It was virtually undeveloped which enabled personnel to inspect fuel and launch missiles without danger to nearby communities; the climate permitted year-round operations; rockets could be launched over water instead of populated areas; a chain of islands provided sites for tracking stations to follow the progress of missiles in flight.

11. Although Cape Canaveral began as a facility used to launch missiles for the military, opportunities arose in the mid 1950s to launch vehicles for a more scientific purpose. Describe the competition among different branches of the military that were involved in launching the United States' first satellite. What milestones were achieved by the Army and the Navy as part of this competition?

The armed services were competing for the honor of launching America's first satellite. The Army, the Air Force, and the Navy all had different proposals for achieving this. The U.S. selected the Navy's proposal, called the Vanguard Project, because it provided an opportunity to develop a new rocket system for civilian rather than military purposes. They favored the idea that it was a scientific program.

The Army moved forward with its plan and launched the United States first satellite into orbit called the Explorer 1. It had onboard an experiment that detected the Earth's radiation belt, named the Van Allen Radiation Belt after the designer of the experiment.

The Navy's Vanguard project placed America's second satellite into orbit called the Vanguard 1. It was 3.5 lbs and designed to stay aloft for 2,000 years. It carried the first solar cells into space and is now the oldest and smallest spacecraft in orbit.



12. The successful launch of Sputnik by the Soviet Union, preceding any successful satellite launches by the U.S., led to the creation of NASA in 1958. It was not long after that NASA's Apollo Program began. Explain the objective of the Apollo program and how this program led to the need for a new launch facility to be built.

President Kennedy announced that the United States would fly humans to the Moon and back within the decade. The Apollo program would achieve that mission. It required rockets far more powerful than any launched before. Larger facilities than those located on the Cape were necessary to assemble service and launch this new vehicle.

13. What locations were considered for the new facility?

Hawaii, Texas, the California Coast, an island of the coast of Georgia, islands in the Caribbean, and Merritt Island (adjacent to the Cape)

14. What advantages did Merritt Island (adjacent to Cape Canaveral) offer?

Several small communities within easy driving range; larger cities fairly close; the proximity to the Atlantic Missile Range where they could share facilities avoiding costly duplications; the ability to continue operations at the Cape Canaveral complex which was adjacent to Merritt Island.



Name _____

Date _____

Selecting Locations for NASA Sites

Instructions: Read about the history of the Johnson Space Center (JSC) and the Kennedy Space Center (KSC) located at the websites listed below. Use the information found there to answer the following questions.

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

Note: This will take you to the first of three pages on the origins of JSC. Links for the remaining pages are located at the bottom of the page.

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

Johnson Space Center (JSC)

1. What events led to the need for NASA to quickly find sites for centers to be built in the late 50's?
2. What was the intended purpose for the center that was designated the Manned Spacecraft Center (MSC), the original name of what is now the Johnson Space Center (JSC)?
3. List at least 5 different criteria NASA's site selection team used to determine the location of the MSC?
4. Describe the reasons for two of the criteria you listed in question 3.
5. What were the initial reasons for Houston being selected as a possible site location for the MSC?
6. What factors made Houston seem less than desirable to the site selection committee on their initial visit to the city?
7. What connection did Humble Oil and Rice University have to the selection of Houston as the location for the MSC?
8. How did the presence of NASA's MSC affect the city of Houston and the surrounding area?

**Kennedy Space Center (KSC)**

9. When did Cape Canaveral become a location for testing missiles? This testing was performed under the direction of what government organization?
10. What made Cape Canaveral an ideal location for testing missiles?
11. Although Cape Canaveral began as a facility used to launch missiles for the military, opportunities arose in the mid 1950s to launch vehicles for a more scientific purpose. Describe the competition among different branches of the military that were involved in launching the United States' first satellite. What milestones were achieved by the Army and the Navy as part of this competition?
12. The successful launch of Sputnik by the Soviet Union, preceding any successful satellite launches by the U.S., led to the creation of NASA in 1958. It was not long after that NASA's Apollo Program began. Explain the objective of the Apollo program and how this program led to the need for a new launch facility to be built.
13. What locations were considered for the new facility?
14. What advantages did Merritt Island (adjacent to Cape Canaveral) offer?