



A Math and Science @ Work Special Series

# CELEBRATING APOLLO

AP\* HUMAN GEOGRAPHY Student Edition



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## IMMIGRATION AND ITS EFFECTS ON NASA

### Background

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 20<sup>th</sup> 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 thousands of determined individuals and the committed resources of our nation.

The success of the nine-year long Apollo space program was celebrated by individuals from more than a dozen countries who had migrated to the US along with their talent and ideas. Two examples of immigrants contributing to NASA's space program would be Wernher Von Braun and Eugene Cernan.

Wernher Von Braun was originally from Wyrzysk, a town in the German Empire (now Wyrzysk, Poland). Von Braun's interest in space exploration as a child led him to master the physics of rocketry. He became the leader of what has been called the "rocket team" developing the V-2 ballistic missile for the Nazis during World War II. Von Braun and 500 top rocket scientists, along with plans and test vehicles, surrendered to the Americans and began working with the U.S. Army developing ballistic missiles. 15 years later the "rocket team" was brought to the U.S. from a defeated Germany as part of a military operation. At the establishment of NASA, Von Braun's team was transferred from the Army to the Marshall Space Flight Center where he was appointed as director. Von Braun became the chief architect of the Saturn V launch vehicle, the rocket booster that propelled human's first journey to the Moon.

Eugene Cernan, the son of Czechoslovakian immigrants, also made significant contributions to the Apollo Program. Cernan was selected as an astronaut by NASA in 1963. During his career he logged over 500 hours in space; 73 of them spent on the surface of the Moon. He was the commander of the Apollo 17 mission, NASA's last scheduled manned mission to the Moon, and was the last American to walk on the lunar surface. He later served as Special Assistant to the Program Manager of the Apollo Spacecraft Program where he assisted in the planning, development, and evaluation of the joint United States/Soviet Union Apollo-Soyuz Test Project. He was also the senior negotiator in direct discussions with the USSR on the project. Cernan was awarded two NASA Distinguished Service Medals for his service in space exploration.



These immigrants, along with numerous others involved in the Apollo program, impacted what is called the Human Development Index (HDI). The HDI is an index used to rank countries according to various levels of development, implying whether a country is developed, developing, or underdeveloped. The HDI combines social, economic, and demographic indicators in order to determine a country's ranking. Since migration can impact a country's economic, social, and demographic indicators of development, it is a factor that can alter a country's HDI ranking. The HDI ranking of the United States was impacted by this immigration but so were the immigrants' countries of origin. Parts of the world lost some of their most talented scientists when they came to America to work in NASA's Space Program. The U.S. reaped the benefits becoming a major leader in Space Exploration and in the advancement of technology.

For more information about NASA's Apollo program visit [www.nasa.gov](http://www.nasa.gov).

## 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.

### Question

The success of NASA's Apollo Program was achieved by individuals originating from countries around the globe. Immigrants from Eastern European countries were some of the key players in that success.

Based on your knowledge of global migration and economic development in the mid-20<sup>th</sup> century, analyze the economic and social effect of migration as you answer the following questions.

- A. Explain the percentage of work force in the tertiary for both Eastern Europe and the United States.
- B. Contrast two different HDI social indicators for Eastern Europe and the United States.
- C. Define push factor and give an example for Eastern Europe in the mid-20<sup>th</sup> century.
- D. Define pull factor and give an example for the United States in the mid-20<sup>th</sup> century.