### U.S. History II: Week 3 - General Education

#### Packet 3 Overview:

<table>
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<tr>
<th>ESSENTIAL QUESTION:</th>
<th>How did the Space Race develop out of Cold War tensions between the United States and the Soviet Union?</th>
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| PROCEDURES:         | **Day 1:** Read the text and respond to the multiple choice questions.  
                      | **Day 2:** Respond to the brief response question.  
                      | **Day 3:** Use the text to respond to the discussion questions |
| WORK TO BE RETURNED:| **Assignment 1:** Text Dependent Questions (multiple choice)  
                      | **Assignment 2:** Brief Response  
                      | **Assignment 3:** Discussion Questions |
| RESOURCES:          | - (FL History/1950-Present: "Cape Canaveral: Launchpad to the Stars")  
| TIME ALLOCATED:     | 3 (20) minute lessons |

#### “The Cold War and the Beginning of the Space Race”

**Summary:** In the years after World War II, the United States and its former ally, the Soviet Union, became involved in a bitter rivalry on a world stage. This struggle became known as the Cold War. Stakes were high in the post-WWII world, especially in Third World countries that might side with one power or the other according to which side had the perceived upper-hand. American prospects in this global tussle grew darker with the advent of the Space Race of the 1950’s, which saw the Soviets pull ahead in the conquest of space. This lesson addresses this race as well as the impact of this Space Race on Florida.

**The End of World War II and the Beginnings of the Cold War**

[Pg 1] Germans invented new rockets called the "Vengeance Weapon #2," or V-2, they were used in a last-ditch effort to stave off defeat in World War II; Hitler ordered his military to launch over 3,700 V-2s in attacks against the Allies. Many of these V-2 rockets hit Great Britain, to no avail. Germany was soon defeated, and the Allies and the Russians quickly moved in to confiscate the Nazis’ missile technology.

[Pg 2] At the end of the war the Americans captured 100 partially-assembled V-2 rockets, and 125 top rocket specialists and brought them back to the United States in "Project Paperclip." The Soviets only captured a handful of top engineers, but they also found other secret laboratories, hundreds of regular engineers and technicians, and lists of suppliers for rocket parts, many of which were located in the Soviet-controlled sectors of East Germany after the war. The Soviets transported these people back to the USSR and took as much information about rocket science as they could.

[Pg 3] Both nations began to arm themselves for the possibility of another, larger conflict. Both sides quickly began to build arsenals of weapons that were much more destructive than the atomic bombs dropped on Japan. Each nation hoped to prevent the other from striking first through a policy known as "MAD," or "mutually-assured destruction." In other words, whichever nation launched a first strike against the other would be assured of also being destroyed.

[Pg 4] The U.S.S.R. began exploration of the upper atmosphere with captured V-2s in the fall of 1947. Within two years, however, Soviet production was underway on a single-stage rocket called the T-1, an improved version of the V-2. The first rocket divisions of the Soviet Armed Forces were instituted in 1950. In 1954, development work began on a multistage rocket to be used both as a weapon and as a vehicle for space exploration. And in the spring of 1956 Communist Party Chairman Nikita Khrushchev warned that "soon" Russian rockets carrying thermonuclear warheads would be able to hit any target on Earth.

[Pg 5] Meanwhile the United States, convinced of the long-term superiority of her intercontinental bombers, pursued national security by means of airpower. The extremely heavy weight of atomic warheads meant that they would have to
be delivered by large bombers, or by a much bigger rocket than anyone in the military was willing to ask Congress to fund. The V-2s captured in Germany and put together by the United States Army from captured components were used for upper-atmosphere scientific research in the early postwar years. Virtually all the rockets were heavily instrumented, and many of them carried plant life and animals. V-2s carried monkeys aloft on four occasions; telemetry data transmitted from the rockets showed no ill effects on the primates until each was killed in the crash back to Earth.

A new chapter in space flight began in 1950 July with the launch of the first rocket from Cape Canaveral, Florida: the Bumper 2. The Bumper 2 was an ambitious two-stage rocket program that topped a V-2 missile base with another rocket. The upper stage was able to reach the record altitudes of almost 400 kilometers, higher than even modern space shuttles fly today. The Bumper 2 was used primarily for testing rocket systems and for research on the upper atmosphere. Bumper 2 rockets carried small payloads that allowed them to measure attributes including air temperature and cosmic ray impacts.

**Cape Canaveral**

V-2 rocket testing had begun at the White Sands Proving Ground in New Mexico, in 1945, but a more adequate base was needed. The first choice was in California, near the border with Mexico, but because of objections from the Mexican government, a second choice was soon found: the Banana River in Florida.

The Banana River location was the best choice, anyway, for several reasons:

1. There was already an existing naval air station in the vicinity that could be used as a support base for launches (the Banana River Naval Air Station had been home to patrol bombers protecting Allied shipping along the east coast of Florida during WWII)
2. There was an ideal launching site, the relatively unpopulated Cape Canaveral, which jutted eastward into the Atlantic Ocean only fifteen miles north of the air base;
3. There were no major centers of population anywhere nearby, so the danger to civilians was minimal;
4. Rockets launched from the Cape could take advantage of the rotational speed of the Earth, which is greatest at the Equator. Therefore, the relative position of Cape Canaveral required less rocket engine thrust than would have been necessary elsewhere.
5. The climate was mild year-round and provided a great deal of launching opportunities.

The United States Air Force acquired the land at Cape Canaveral, and in late 1950, it opened a missile testing station there. On July 24, 1950, a small rocket was launched from “the Cape,” marking the true beginning of the United States space program. Rockets were launched throughout the next decade in an effort to keep up with the Soviet Union’s own space program.

**The Soviets Surge Ahead**

Meanwhile, the Soviet Union exploded her first atomic device in 1949, ending the United States’ postwar monopoly on nuclear weapons. After a few more years of secret testing of German V-2 rockets, the Soviets shocked the world. On August 26, 1957, Tass, the official Soviet news agency, announced that the U.S.S.R. had successfully launched a "super long-distance intercontinental multistage ballistic rocket," a booster rocket with a thrust of over 400,000 pounds called the T-3. This “ICBM” could be launched from one continent, pass through the atmosphere into space, and then re-enter the atmosphere over its target on another continent. No longer were the Americans safe, half a world away, separated from the Soviets by two oceans. Soviet missiles could be produced with the ability to destroy American cities in a matter of minutes.

The Soviets weren’t done. On October 4, 1957, the Soviet Union successfully placed the world’s first artificial satellite into orbit around Earth. Sputnik I (which meant “fellow traveler of the Earth”), a 184-pound basketball-sized bundle of instruments, had two radio transmitters and broadcast the “beep-beep-beep” that ushered in the space age. Less than a month later, on November 3rd, Soviet engineers and rocket scientists sent a second capsule, Sputnik II, into orbit. Sputnik II was much heavier than the first one, weighing 1,120 pounds, and contained a Siberian husky-mix dog named Laika, which meant “Barker” in English. The American press quickly nicknamed the dog “Muttnik.” With this launch, the Soviets had achieved another remarkable first: the first animal in space. Unfortunately, no arrangements were made for Laika’s safe return to Earth. Though supplied with plenty of food and water, the batteries for her life support system eventually ran out, as did the air supply in her capsule. Months later, Sputnik II disintegrated as it reentered Earth’s atmosphere.

The ICBM launch in August was difficult enough for the Americans to accept. They had always been confident in their technological superiority over other nations, especially the Soviet Union. According to John Simpson, who was then
needed to restore America's confidence and intended not merely to match the Soviets in space, but surpass them. On May
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Then, in 1961, the nation suffered another shock when Soviet cosmonaut Yuri Gagarin became the first man to
orbit a manned spacecraft around Earth, investigate the ability of astronauts to function in space, and recover astronauts
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weighing a little over 3 pounds into an orbit that was expected to keep the satellite up from 200 to 1,000 years. Vanguard
Explorer I transmitted data revealing the existence of a deep zone of radiation girdling Earth, dubbed the "Van Allen belt." The following March 17, the much maligned Vanguard finally accomplished its purpose, lifting a scientific payload weighing a little over 3 pounds into an orbit that was expected to keep the satellite up from 200 to 1,000 years. Vanguard proved what geophysicists had long suspected, that Earth is not a perfect sphere but is slightly pear-shaped, bulging in the aqueous southern hemisphere. Explorer III, with an instrumented weight of 18½ pounds, was fired into orbit by a Jupiter C nine days later. But in May a mammoth Soviet rocket launched a satellite with the then staggering weight of nearly 3,000 pounds, some 56 times as heavy as the combined weight of the three American satellite payloads.

The American Response
National attention soon turned to Cape Canaveral when it was announced by the White House that scientists and
engineers from the Naval Research Laboratory and its industrial contractors would attempt to put in orbit a grapefruit-sized package of instruments as part of Project Vanguard, the American satellite effort. In reality the Vanguard group was planning only to use a test satellite in the first launch of all three active stages of the research rocket. To their dismay swarms of newsmen descended on Cape Canaveral to watch what the public regarded as this country's effort to get into the space race. On December 6, before a national television audience, the Vanguard rose little more than three feet off of its launching pad before it fell back. The first stage exploded and the rest of the rocket collapsed into the wet sand surrounding the launch stand.

In the face of the fact that "they" orbited satellites before "we" did, together with the apparent complacency of official Washington, the Vanguard blowup took on disastrous proportions. America had seemingly fallen far behind their Soviet rivals in the Space Race and, more importantly, in the Cold War. At the federal level, a consensus formed: the nation needed a more concerted effort to nurture the sciences and develop new technologies. Two major legislative actions followed: the National Defense Education Act, signed into law by President Dwight D. Eisenhower on September 2, 1958; and the establishment of National Aeronautics and Space Administration (NASA) on October 1st of the same year.

The National Defense Education Act, or NDEA, was passed because Sputnik had jolted the American education system. The United States felt Soviet students must have been getting a better science and math education than were American students. The NDEA approved $887 million spread across primary, secondary, vocational, and higher education programs with an emphasis on identifying students gifted in science, mathematics, and modern foreign languages. The establishment of the National Aeronautics and Space Administration, or NASA, was equally important. Now, a federal agency was chartered to conduct space operations, while the military continued its weapons research.

After the failed Vanguard launch, the United States space program began to achieve some of its objectives, though not on a par with the Soviets. On January 31, 1958, a Jupiter C carrying satellite instruments developed for Project Vanguard by University of Iowa physicist James A. Van Allen boosted into orbit Explorer I, the first American satellite. The total weight of the pencil shaped payload was about 31 pounds, 18 pounds of which consisted of instruments. Explorer I transmitted data revealing the existence of a deep zone of radiation girdling Earth, dubbed the "Van Allen belt." The following March 17, the much maligned Vanguard finally accomplished its purpose, lifting a scientific payload weighing a little over 3 pounds into an orbit that was expected to keep the satellite up from 200 to 1,000 years. Vanguard proved what geophysicists had long suspected, that Earth is not a perfect sphere but is slightly pear-shaped, bulging in the aqueous southern hemisphere. Explorer III, with an instrumented weight of 18½ pounds, was fired into orbit by a Jupiter C nine days later. But in May a mammoth Soviet rocket launched a satellite with the then staggering weight of nearly 3,000 pounds, some 56 times as heavy as the combined weight of the three American satellite payloads.

To counter the launching of the first animals in space by the Soviets, the Americans soon began a program of launching primates into space. Although at first unsuccessful, American success culminated with a rhesus monkey named Sam. Launched aboard a Little Joe rocket on December 4, 1959, Sam experienced three minutes of weightlessness as he traveled 55 miles into space. Sam was later recovered alive by the U.S.S. Borie off the coast of North Carolina.

The Later years of the Space Race
A new space program, Project Mercury, was initiated two years later, during President Dwight D. Eisenhower's administration. Seven men were selected to take part in the program: Scott Carpenter, Leroy Gordon Cooper, John Glenn Jr., Virgil "Gus" Grissom, Walter Schirra Jr., Alan Shepard Jr., and Donald "Deke" Slayton. Project Mercury's goals were to orbit a manned spacecraft around Earth, investigate the ability of astronauts to function in space, and recover astronauts and spacecraft safely.

Then, in 1961, the nation suffered another shock when Soviet cosmonaut Yuri Gagarin became the first man to orbit the Earth. The United States, it seemed, was still falling behind. President Kennedy believed the United States needed to restore America's confidence and intended not merely to match the Soviets in space, but surpass them. On May
25, 1961, he stood before Congress to deliver a special message on "urgent national needs." He asked for an additional $7 billion to $9 billion over the next five years for the space program, proclaiming that "this nation should commit itself to achieving the goal, before the decade is out, of landing a man on the Moon and returning him safely to the earth." President Kennedy settled upon this dramatic goal as a means of focusing and mobilizing the nation's lagging space efforts.

To achieve this end, Congress appropriated the funding for NASA's Apollo lunar landing program. It took eight years of work and sacrifice, including the loss of three astronauts in a fire aboard Apollo 1, but President Kennedy's goal was finally achieved on July 20, 1969 when Neil Armstrong and Buzz Aldrin became the first men to walk on the Moon as part of the Apollo 11 mission.

**Assignment 1 - Text Dependent Questions**

**Directions:** For the following questions, choose the best answer. When you locate the answer for the multiple choice questions, please highlight the correct response using the highlight feature on the toolbar above (the highlight feature looks like a little marker).

1. In the post-WWII years of the Space Race, the _________ ________ had the clear advantage.
   a) United States
   b) Soviet Union
   c) Nazi Germany

2. At the end of WWII, both the Soviets and the Americans captured ____________ ____________ from Nazi Germany.
   a) V-2 rockets
   b) rocket scientists
   c) all of the above

3. The launching of ________________ brought the Soviet Union into the Space Age.
   a) Sputnik
   b) Laika
   c) Vanguard

4. The American response to the Soviets' ventures into space was:
   a) the formation of NASA and the passing of the National Defense Education Act
   b) the atomic bombing of several large cities in the USSR
   c) the launching of a cat into space

5. Which one of the following reasons WAS NOT a reason why Cape Canaveral was chosen as the base for the US space and missile research site?
   a) there were no major population centers anywhere close by
   b) the climate was advantageous for year-round launches
   c) the nearby beaches provided excellent recreational opportunities for the families of NASA scientists

**Assignment 2 - Brief Response**

**Directions:** Using the text, please respond in at least a paragraph to the question below.

1. Explain why Americans thought they were losing the space race and the steps they took to catch up to the Soviets. Use evidence from the text when possible. Type/write your response below.
Assignment 3 - Discussion Questions

Directions: Write your answers to the following questions in the space provided. Imagine you had to share your original ideas in a class discussion.

1. How did the fall of Germany during WWII jump start the space race between the previous allies of the United States and the Sovit Union?

2. Although the United States fell behind in the early stages of the Space Race and could not claim they were the first to accomplish many of the listed feats, they were able to land on the moon. Should this accomplishment outweigh all of the advancements the Soviets made and declare the United States the victors of the Space Race?