## Day 1: Tone

### English Language Arts

- Analyze the tone of President John F. Kennedy's 1962 "Moonshot" speech at Rice University. See attached sheets.

- Complete the Evidence-Based Selected Response Activity on Kennedy's Moonshot Speech. See attached sheet.

- If possible, view the speech here: https://er.jsc.nasa.gov/seh/ricetalk.htm

**Day 1: Tone**
**English Language Arts**

**ELA 7-8**
**John F. Kennedy Moon Speech - Rice Stadium**
**Evidence Based Selected Response (EBSR)**

**Introduction** On September 12, 1962, President John F. Kennedy addressed a crowd at Rice University in Texas. Some describe this speech as the most important speech about space ever delivered. In this transcribed version of Kennedy's Speech, consider the words that Kennedy utilizes to establish his **tone**. Tone can be described as the way the author expresses his or her attitude in his or her writing or, in this case, speaking.

This question has two parts. Answer Part One and then Answer Part Two.

PART ONE

1. What is a possible **tone** of President Kennedy's speech?
   A. Scared
   B. Inspirational
   C. Depressing
   D. Condescending

PART TWO

2. Which quotes from the passage supports the answer in Part One? Choose **two** answers.
   A. "We choose to go to the moon. We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard."
   B. "I appreciate your president having made me an honorary visiting professor, and I will assure you that my first lecture will be very brief."
   C. "We set sail on this new sea because there is new knowledge to be gained, and new rights to be won, and they must be won and used for the progress of all people."
   D. "To be sure, we are behind, and will be behind for some time in manned flight."

PART THREE

3. Kennedy stated that "Many years ago the great British explorer George Mallory, who was to die on Mount Everest, was asked why did he want to climb it. He said, "Because it is there." Why does Kennedy provide this quote to make his point? Answer the question, cite evidence (quote), and analyze your reasoning.

**TEXT OF PRESIDENT JOHN KENNEDY'S RICE STADIUM MOON SPEECH**

President Pitzer, Mr. Vice President, Governor, Congressman Thomas, Senator Wiley, and Congressman Miller, Mr. Webb, Mr. Bell, scientists, distinguished guests, and ladies and gentlemen:

I appreciate your president having made me an honorary visiting professor, and I will assure you that my first lecture will be very brief.

I am delighted to be here, and I'm particularly delighted to be here on this occasion.

We meet at a college noted for knowledge, in a city noted for progress, in a State noted for strength, and we stand in need of all three, for we meet in an hour of change and challenge, in a decade of hope and fear, in an age of both knowledge and ignorance. The greater our knowledge increases, the greater our ignorance unfolds.

Despite the striking fact that most of the scientists that the world has ever known are alive and working today, despite the fact that this Nation's own scientific manpower is doubling every 12 years in a rate of growth more than three times that of our population as a whole, despite that, the vast stretches of the unknown and the unanswered and the unfinished still far outstrip our collective comprehension.

No man can fully grasp how far and how fast we have come, but condense, if you will, the 50,000 years of man's recorded history in a time span of but a half-century. Stated in these terms, we know very little about the first 40 years, except at the end of them advanced man had learned to use the skins of animals to cover them. Then about 10 years ago, under this standard, man emerged from his caves to construct other kinds of shelter. Only five years ago man learned to write and use a cart with wheels. Christianity began less than two years ago. The printing press came this year, and then less than two months ago, during this whole 50-year span of human history, the steam engine provided a new source of power.

Newton explored the meaning of gravity. Last month electric lights and telephones and automobiles and airplanes became available. Only last week did we develop penicillin and television and nuclear power, and now if America's new spacecraft succeeds in reaching Venus, we will have literally reached the stars before midnight tonight.

This is a breathtaking pace, and such a pace cannot help but create new ills as it dispels old, new ignorance, new problems, new dangers. Surely the opening vistas of space promise high costs and hardships, as well as high reward.

So it is not surprising that some would have us stay where we are a little longer to rest, to wait. But this city of Houston, this State of Texas, this country of the United States was not built by those who waited and rested and wished to look behind them. This country was conquered by those who moved forward--and so will space.

William Bradford, speaking in 1630 of the founding of the Plymouth Bay Colony, said that all great and honorable actions are accompanied with great difficulties, and both must be enterprised and overcome with answerable courage.

If this capsule history of our progress teaches us anything, it is that man, in his quest for knowledge and progress, is determined and cannot be deterred. The exploration of space will go ahead, whether we join in it or not, and it is one of the great adventures of all time, and no nation which expects to be the leader of other nations can expect to stay behind in the race for space.

Those who came before us made certain that this country rode the first waves of the industrial revolutions, the first waves of modern invention, and the first wave of nuclear power, and this generation does not intend to founder in the backwash of the coming age of space. We mean to be a part of it--we mean to lead it. For the eyes of the world now look into space, to the moon and to the planets beyond, and we have vowed that we shall not see it governed by a hostile flag of conquest, but by a banner of freedom and peace. We have vowed that we shall not see space filled with weapons of mass destruction, but with instruments of knowledge and understanding.

Yet the vows of this Nation can only be fulfilled if we in this Nation are first, and, therefore, we intend to be first. In short, our leadership in science and in industry, our hopes for peace and security, our obligations to ourselves as well as others, all require us to make this effort, to solve these mysteries, to solve them for the good of all men, and to become the world's leading space-faring nation.

We set sail on this new sea because there is new knowledge to be gained, and new rights to be won, and they must be won and used for the progress of all people. For space science, like nuclear science and all technology, has no conscience of its own. Whether it will become a force for good or ill depends on man, and only if the United States occupies a position of pre-eminence can we help decide whether this new ocean will be a sea of peace or a new terrifying theater of war. I do not say the we should or will go unprotected against the hostile misuse of space any more than we go unprotected against the hostile use of land or sea, but I do say that space can be explored and mastered without feeding the fires of war, without repeating the mistakes that man has made in extending his writ around this globe of ours.

There is no strife, no prejudice, no national conflict in outer space as yet. Its hazards are hostile to us all. Its conquest deserves the best of all mankind, and its opportunity for peaceful cooperation many never come again. But why, some say, the moon? Why choose this as our goal? And they may well ask why climb the highest mountain? Why, 35 years ago, fly the Atlantic? Why does Rice play Texas?

We choose to go to the moon. We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too.

It is for these reasons that I regard the decision last year to shift our efforts in space from low to high gear as among the most important decisions that will be made during my incumbency in the office of the Presidency.

In the last 24 hours we have seen facilities now being created for the greatest and most complex exploration in man's history. We have felt the ground shake and the air shattered by the testing of a Saturn C-1 booster rocket, many times as powerful as the Atlas which launched John Glenn, generating power equivalent to 10,000 automobiles with their accelerators on the floor. We have seen the site where the F-1 rocket engines, each one as powerful as all eight engines of the Saturn combined, will be clustered together to make the advanced Saturn missile, assembled in a new building to be built at Cape Canaveral as tall as a 48 story structure, as wide as a city block, and as long as two lengths of this field.

Within these last 19 months at least 45 satellites have circled the earth. Some 40 of them were "made in the United States of America" and they were far more sophisticated and supplied far more knowledge to the people of the world than those of the Soviet Union.

The Mariner spacecraft now on its way to Venus is the most intricate instrument in the history of space science. The accuracy of that shot is comparable to firing a missile from Cape Canaveral and dropping it in this stadium between the the 40-yard lines.

Transit satellites are helping our ships at sea to steer a safer course. Tiros satellites have given us unprecedented warnings of hurricanes and storms, and will do the same for forest fires and icebergs.

We have had our failures, but so have others, even if they do not admit them. And they may be less public.

To be sure, we are behind, and will be behind for some time in manned flight. But we do not intend to stay behind, and in this decade, we shall make up and move ahead.

The growth of our science and education will be enriched by new knowledge of our universe and environment, by new techniques of learning and mapping and observation, by new tools and computers for industry, medicine, the home as well as the school. Technical institutions, such as Rice, will reap the harvest of these gains.

And finally, the space effort itself, while still in its infancy, has already created a great number of new companies, and tens of thousands of new jobs. Space and related industries are generating new demands in investment and skilled personnel, and this city and this State, and this region, will share greatly in this growth. What was once the furthest outpost on the old frontier of the West will be the furthest outpost on the new frontier of science and space. Houston, your City of Houston, with its Manned Spacecraft Center, will become the heart of a large scientific and engineering community. During the next 5 years the National Aeronautics and Space Administration expects to double the number of scientists and engineers in this area, to increase its outlays for salaries and expenses to $60 million a year; to invest some $200 million in plant and laboratory facilities; and to direct or contract for new space efforts over $1 billion from this Center in this City.

To be sure, all this costs us all a good deal of money. This year's space budget is three times what it was in January 1961, and it is greater than the space budget of the previous eight years combined. That budget now stands at $5,400 million a year--a staggering sum, though somewhat less than we pay for cigarettes and cigars every year. Space expenditures will soon rise some more, from 40 cents per person per week to more than 50 cents a week for every man, woman and child in the United Stated, for we have given this program a high national priority--even though I realize that this is in some measure an act of faith and vision, for we do not now know what benefits await us.

But if I were to say, my fellow citizens, that we shall send to the moon, 240,000 miles away from the control station in Houston, a giant rocket more than 300 feet tall, the length of this football field, made of new metal alloys, some of which have not yet been invented, capable of standing heat and stresses several times more than have ever been experienced, fitted together with a precision better than the finest watch, carrying all the equipment needed for propulsion, guidance, control, communications, food and survival, on an untried mission, to an unknown celestial body, and then return it safely to earth, re-entering the atmosphere at speeds of over 25,000 miles per hour, causing heat about half that of the temperature of the sun--almost as hot as it is here today--and do all this, and do it right, and do it first before this decade is out--then we must be bold.

I'm the one who is doing all the work, so we just want you to stay cool for a minute. [laughter]

However, I think we're going to do it, and I think that we must pay what needs to be paid. I don't think we ought to waste any money, but I think we ought to do the job. And this will be done in the decade of the sixties. It may be done while some of you are still here at school at this college and university. It will be done during the term of office of some of the people who sit here on this platform. But it will be done. And it will be done before the end of this decade.

I am delighted that this university is playing a part in putting a man on the moon as part of a great national effort of the United States of America.

Many years ago the great British explorer George Mallory, who was to die on Mount Everest, was asked why did he want to climb it. He said, "Because it is there."

Well, space is there, and we're going to climb it, and the moon and the planets are there, and new hopes for knowledge and peace are there. And, therefore, as we set sail we ask God's blessing on the most hazardous and dangerous and greatest adventure on which man has ever embarked.

Thank you.

**Day 1: Your Weight on each Planet**

**Math**

# Do you weigh the same on each planet???

Materials:

- Calculator

In this activity, you will learn that while your mass will not change, your weight does based on the gravitational pull of the planet. Your weight is determined by gravity. That means the more mass something has, the more gravity it tends to have. What that means is if you were to visit the planet with the largest mass, you would weigh the most there.

***What to do:***

First, you must determine how much mass you have (in lbs). If you are not certain, you can use an estimate. That's okay. Mass = _____

Next, convert it to kilograms (kg). **lbs. ÷ 2.20 = weight (kg)**

To find your weight on each planet, you will need to take your mass (kg) and multiply it by the gravity of each planet.

**Mass x gravity = weight (N)**

100 kg x 3.73 = 373 N

| **Planet** | **What is your mass (in kg)?** | **Gravitational pull of each planet** | **Weight (in Newtons)** |
|---|---|---|---|
| Mercury | | 3.73 | |
| Venus | | 8.87 | |
| Earth | | 9.8 | |
| Mars | | 3.71 | |
| Jupiter | | 24.79 | |
| Saturn | | 10.44 | |
| Uranus | | 8.87 | |
| Neptune | | 11.15 | |

On which planet would you weigh the most? _____

Which planet do you weigh the least? _____

## Day 1: Important People in Astronomy

### Science

- Obtain a notebook, or create an online journal, etc.
- Choose 1 person from the attached list & create a journal entry about their importance.
- List of astronauts in attached bio pages: Ellen Ochoa, Kalpana Chawla, Sally Ride, Mae Jemison, Guion Bluford, Alan Shepard
    - Make sure you keep these bio pages because you'll use them again for Day 2!

# *Biographical Data*

**Lyndon B. Johnson Space Center**
Houston, Texas 77058

**National Aeronautics and Space Administration**
**May 2018**

**ELLEN OCHOA (PH.D)**
**NASA ASTRONAUT**

**Pronunciation:** **EL**-en oh-**CHO**-ah

**PERSONAL DATA:** Born in 1958 in Los Angeles, California, but considers La Mesa, California, to be her hometown. Married to Coe Miles of Molalla, Oregon. They have two children.

**EDUCATION:** Graduated from Grossmont High School, La Mesa, California, in 1975; received a Bachelor of Science degree in Physics from San Diego State University in 1980, and a Master of Science degree and Doctorate in Electrical Engineering from Stanford University in 1981 and 1985, respectively. She is honored to have six schools named for her: the Ellen Ochoa Middle School in Pasco, Washington, the Ellen Ochoa Learning Center in Cudahy, California, the Ellen Ochoa STEM Academy at Ben Milam Elementary in Grand Prairie, Texas, the Amino Ellen Ochoa Charter Middle School in Los Angeles, and the Ellen Ochoa Prep Academy in Pico Rivera, California.

**ORGANIZATIONS:** Fellow of the American Institute of Aeronautics and Astronautics (AIAA), Fellow of the American Association for Advancement of Science (AAAS), Member of Phi Beta Kappa and Sigma Xi honor societies.

**SPECIAL HONORS:** NASA awards include the Distinguished Service Medal, Exceptional Service Medal, Outstanding Leadership Medal, and four Space Flight Medals. Recipient of numerous other awards, including the Harvard Foundation Science Award, Women in Aerospace Outstanding Achievement Award, HENAAC (Hispanic Engineer National Acheivement Awards) Engineer of the Year, the Hispanic Heritage Leadership Award, the California Hall of Fame and San Diego State University Alumna of the Year.

**NASA EXPERIENCE:** As a doctoral student at Stanford, and later as a researcher at Sandia National Laboratories and NASA Ames Research Center, Dr. Ochoa is a co-inventor on three patents, and author of numerous technical papers.

Selected by NASA in January 1990, Dr. Ochoa became an astronaut in July 1991. A veteran of four space flights, Dr. Ochoa has logged over 978 hours in space. She was a mission specialist on STS-56 (1993), was the Payload Commander on STS-66 (1994), and was a mission specialist and flight engineer on STS-96 (1999) and STS-110 (2002). Dr. Ochoa became Director of the Lyndon B. Johnson Space Center in Houston, Texas in 2012 and retired on May 25, 2018.

**SPACE FLIGHT EXPERIENCE:** STS-56 ATLAS-2 Discovery (April 8-17, 1993) was a 9-day mission during which the crew conducted atmospheric and solar studies in order to better understand the effect of solar activity on the Earth's climate and environment. On this mission, Dr. Ochoa became the first Hispanic woman in space.

Dr. Ochoa was the Payload Commander on the STS-66 Atlantis Atmospheric Laboratory for Applications and Science-3 mission (November 3-14, 1994). ATLAS-3 continued the series of Spacelab flights to study the energy of the sun during an 11-year solar cycle and to learn how changes in the sun affects the earth's climate and environment.

STS-96 Discovery (May 27 to June 6, 1999) was a 10-day mission during which the crew performed the first docking to the International Space Station, and went back again on STS-110 Atlantis (April 8-19, 2002) was the 13th space shuttle mission to visit the International Space Station.

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# *Biographical Data*

**Lyndon B. Johnson Space Center**
Houston, Texas 77058

**National Aeronautics and Space Administration**

**KALPANA CHAWLA (PH.D.)**
**NASA ASTRONAUT (DECEASED)**

**PERSONAL DATA:** Born in Karnal, India. Died on February 1, 2003 over the southern United States when Space Shuttle *Columbia* and her crew perished during entry, 16 minutes prior to scheduled landing. She is survived by her husband. Kalpana Chawla enjoyed flying, hiking, back-packing, and reading. She held a Certificated Flight Instructor's license with airplane and glider ratings, Commercial Pilot's licenses for single- and multi-engine land and seaplanes, and Gliders, and instrument rating for airplanes. She enjoyed flying aerobatics and tail-wheel airplanes.

**EDUCATION:** Graduated from Tagore School, Karnal, India, in 1976. Bachelor of science degree in aeronautical engineering from Punjab Engineering College, India, 1982. Master of science degree in aerospace engineering from University of Texas, 1984. Doctorate of philosophy in aerospace engineering from University of Colorado, 1988.

**AWARDS:** Posthumously awarded the Congressional Space Medal of Honor, the NASA Space Flight Medal, and the NASA Distinguished Service Medal.

**EXPERIENCE:** In 1988, Kalpana Chawla started work at NASA Ames Research Center in the area of fluid dynamics. Her research concentrated on simulation of complex air flows encountered around aircraft.

**NASA EXPERIENCE:** Selected by NASA in December 1994, Kalpana Chawla reported to the Johnson Space Center in March 1995 as an astronaut candidate in the 15th Group of Astronauts. After completing a year of training and evaluation, she was assigned as crew representative to work technical issues for the Astronaut Office EVA/Robotics and Computer Branches. Her assignments included work on development of Robotic Situational Awareness Displays and testing space shuttle control software in the Shuttle Avionics Integration Laboratory. In November, 1996, Kalpana Chawla was assigned as mission specialist and prime robotic arm operator on STS-87. In January 1998, she was assigned as crew representative for shuttle and station flight crew equipment, and subsequently served as lead for Astronaut Office's Crew Systems and Habitability section. She flew on STS-87 (1997) and STS-107 (2003), logging 30 days, 14 hours and 54 minutes in space.

**SPACE FLIGHT EXPERIENCE:** STS-87 *Columbia* (November 19 to December 5, 1997). STS-87 was focused on experiments designed to study how the weightless environment of space affects various physical processes, and on observations of the Sun's outer atmospheric layers. On this flight, she became the first Indian woman in space. Two members of the crew performed an EVA (spacewalk) which featured the manual capture of a Spartan satellite, in addition to testing EVA tools and procedures for future Space Station assembly. STS-87 made 252 orbits of the Earth, traveling 6.5 million miles in in 376 hours and 34 minutes.

STS-107 *Columbia* (January 16 to February 1, 2003). The 16-day flight was a dedicated science and research mission. Working 24 hours a day, in two alternating shifts, the crew successfully conducted approximately 80 experiments. The STS-107 mission ended abruptly on February 1, 2003 when Space Shuttle *Columbia* and the crew perished during entry, 16 minutes prior to scheduled landing.

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# *Biographical Data*

**Lyndon B. Johnson Space Center**
Houston, Texas 77058

**National Aeronautics and Space Administration**

**SALLY K. RIDE (PH.D.)**
**NASA ASTRONAUT (DECEASED)**

**PERSONAL DATA:** Born May 26, 1951, in Los Angeles, California. Died on July 23, 2012. She is survived by Tam O'Shaughnessy, her partner of 27 years.

**EDUCATION:** Graduated from Westlake High School, Los Angeles, California, in 1968; received from Stanford University a Bachelor of Science in Physics and a Bachelor of Arts in English in 1973 and a Master of Science and Doctorate in Physics in 1975 and 1978, respectively.

**EXPERIENCE:** Dr. Ride was selected as an astronaut candidate by NASA in January 1978. In August 1979, she completed a one-year training and evaluation period, making her eligible for assignment as a Mission Specialist on future space shuttle flight crews. She subsequently performed as an on-orbit Capsule Communicator (CAPCOM) on the STS-2 and STS-3 missions.

Dr. Ride was a Mission Specialist on STS-7, which launched from Kennedy Space Center, Florida, on June 18, 1983. She was accompanied by Captain Robert L. Crippen (spacecraft commander), Captain Frederick H. Hauck (pilot), and fellow Mission Specialists, Colonel John M. Fabian and Dr. Norman E. Thagard. This was the second flight for the orbiter Challenger and the first mission with a five-person crew. By being on this flight, she became the first American woman in space. Mission duration was 147 hours before landing on a lakebed runway at Edwards Air Force Base, California, on June 24, 1983.

Dr. Ride served as a Mission Specialist on STS 41-G, which launched from Kennedy Space Center on October 5, 1984. This was the largest crew to fly to date and included Captain Robert L. Crippen (spacecraft commander), Captain Jon A. McBride (pilot), fellow Mission Specialists, Dr. Kathryn D. Sullivan and Commander David C. Leestma, as well as two payloads specialists, Commander Marc Garneau and Paul Scully-Power. Mission duration was 197 hours and concluded with a landing at Kennedy Space Center on October 13, 1984.

In June 1985, Dr. Ride was assigned to the crew of STS 61-M. Mission training was terminated in January 1986 following the space shuttle Challenger accident. Dr. Ride served as a member of the Presidential Commission investigating the accident. Upon completion of the investigation, she was assigned to NASA Headquarters as Special Assistant to the Administrator for long-range and strategic planning.

In 1989, Dr. Ride joined the faculty at the University of California San Diego as a Professor of Physics and Director of the University of California's California Space Institute. In 2001, she founded her own company, Sally Ride Science to pursue her long-time passion of motivating girls and young women to pursue careers in science, math and technology. The company creates entertaining science programs and publications for upper elementary and middle school students and their parents and teachers.

A long-time advocate for improved science education, Dr. Ride has written five science books for children: *To Space and Back; Voyager; The Third Planet; The Mystery of Mars* and *Exploring Our Solar System*. She has also initiated and directed education projects designed to fuel middle school students' fascination with science.

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# *Biographical Data*

**Lyndon B. Johnson Space Center**
Houston, Texas 77058

**National Aeronautics and Space Administration**

**MAE C. JEMISON (M.D.)**
**NASA ASTRONAUT (FORMER)**

**PERSONAL DATA:** Born October 17, 1956, in Decatur, Alabama, but considers Chicago, Illinois, to be her hometown. Recreational interests include traveling, graphic arts, photography, sewing, skiing, collecting African Art, languages (Russian, Swahili, Japanese), weight training, has an extensive dance and exercise background and is an avid reader. Her parents, Charlie & Dorothy Jemison, reside in Chicago.

**EDUCATION:** Graduated from Morgan Park High School, Chicago, Illinois, in 1973; received a bachelor of science degree in chemical engineering (and fulfilled the requirements for a B.A. in African and Afro-American Studies) from Stanford University in 1977, and a doctorate degree in medicine from Cornell University in 1981.

**EXPERIENCE:** Dr. Jemison has a background in both engineering and medical research. She has worked in the areas of computer programming, printed wiring board materials, nuclear magnetic resonance spectroscopy, computer magnetic disc production, and reproductive biology.

On return to the United States, Dr. Jemison joined CIGNA Health Plans of California in October 1985 and was working as a General Practitioner and attending graduate engineering classes in Los Angeles when selected to the astronaut program.

**NASA EXPERIENCE**: Dr. Jemison was selected for the astronaut program in June 1987. Her technical assignments since then have included: launch support activities at the Kennedy Space Center in Florida; verification of Shuttle computer software in the Shuttle Avionics Integration Laboratory (SAIL); Science Support Group activities.
Dr. Jemison was the first African-American astronaut and was a science mission specialist on STS-47 Spacelab-J (September 12-20, 1992). STS-47 was a cooperative mission between the United States and Japan. The eight-day mission was accomplished in 127 orbits of the Earth, and included 44 Japanese and U.S. life science and materials processing experiments. The Endeavour and her crew launched from and returned to the Kennedy Space Center in Florida. In completing her first space flight, Dr. Jemison logged 190 hours, 30 minutes, 23 seconds in space.

Dr. Jemison left NASA in March 1993.

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# Biographical Data

**Lyndon B. Johnson Space Center**
Houston, Texas 77058

**National Aeronautics and Space Administration**
**May 2019**

**GUION S. BLUFORD, JR. PH.D (COLONEL, USAF, RET.)**
**NASA ASTRONAUT (FORMER)**

**PERSONAL DATA:** Born in Philadelphia, Pennsylvania, on November 22, 1942. Married to the former Linda Tull of Philadelphia, Pennsylvania. They have two grown children. Hobbies include reading, swimming, jogging, racquetball, handball, scuba diving and golf.

**EDUCATION:** Graduated from Overbrook Senior High School in Philadelphia, Pennsylvania, in 1960; received a bachelor of science degree in aerospace engineering from the Pennsylvania State University in 1964; a master of science degree with distinction in aerospace engineering from the Air Force Institute of Technology in 1974; a doctor of philosophy in aerospace engineering with a minor in laser physics from the Air Force Institute of Technology in 1978 and a master in business administration from the University of Houston, Clear Lake, in 1987. He has also attended the University of Pennsylvania, Wharton School of Business.

**EXPERIENCE**: Bluford graduated from Penn State University in 1964 as a distinguished Air Force ROTC graduate. He attended pilot training at Williams Air Force Base, Arizona, and received his pilot wings in January 1966. He then went to F-4C combat crew training in Arizona and Florida and was assigned to the 557th Tactical Fighter Squadron, Cam Ranh Bay, Vietnam. He flew 144 combat missions, 65 of which were over North Vietnam.

**NASA EXPERIENCE**: Bluford became a NASA astronaut in August 1979 and in 1983, he was the first African-American in space. His technical assignments have included working with space station operations, the Remote Manipulator System (RMS), Spacelab systems and experiments, space shuttle systems, payload safety issues and verifying flight software in the Shuttle Avionics Integration Laboratory (SAIL) and in the Flight Systems Laboratory (FSL). A veteran of four space flights, Bluford was a mission specialist on STS-8, STS 61-A, STS-39 and STS-53.

Bluford's first mission was STS-8, which launched from Kennedy Space Center, Florida, on August 30, 1983. This was the third flight for the orbiter Challenger and the first mission with a night launch and night landing. During the mission, the STS-8 crew deployed the Indian National Satellite (INSAT-1B), operated the Canadian-built RMS with the Payload Flight Test Article (PFTA), operated the Continuous Flow Electrophoresis System (CFES) with live cell samples, conducted medical measurements to understand biophysiological effects of spaceflight and activated four "Getaway Special" canisters. STS-8 completed 98 orbits of the Earth in 145 hours before landing at Edwards Air Force Base, California, on September 5, 1983.

Bluford then served on the crew of STS 61-A, the German D-1 Spacelab mission, which launched from Kennedy Space Center, Florida, on October 30, 1985. This mission was the first to carry eight crew members, the largest crew to fly in space, and included three European payload specialists. This was the first dedicated Spacelab mission under the direction of the German Aerospace Research Establishment (DFVLR) and the first U.S. mission in which payload control was transferred to a foreign country (German Space Operations Center, Oberpfaffenhofen, Germany). During the mission, the Global Low Orbiting Message Relay Satellite (GLOMR) was deployed from a "Getaway Special" (GAS) container, and 76 experiments were performed in Spacelab in such fields as fluid physics, materials processing, life sciences, and navigation. After completing 111 orbits of the Earth in 169 hours, Challenger landed at Edwards Air Force Base, California, on November 6, 1985.

Bluford also served on the crew of STS-39, which launched from the Kennedy Space Center, Florida, on April 28, 1991, aboard the orbiter Discovery. The crew gathered aurora, Earth-limb, celestial, and shuttle environment data with the AFP-675 payload. This payload consisted of the Cryogenic Infrared Radiance Instrumentation for Shuttle (CIRRIS-1A) experiment, Far Ultraviolet Camera experiment (FAR UV), the Uniformly Redundant Array (URA), the Quadrupole Ion Neutral Mass

With the completion of his fourth flight, Bluford has logged over 688 hours (almost 29 days) in space.

Bluford left NASA in July 1993.

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# Biographical Data

**Lyndon B. Johnson Space Center**
Houston, Texas 77058

**National Aeronautics and Space Administration**

**ALAN B. SHEPARD, JR. (REAR ADMIRAL, USN, RET.)**
**NASA ASTRONAUT (DECEASED)**

**PERSONAL DATA:** Born November 18, 1923, in East Derry, New Hampshire. Died on July 21, 1998. His wife, Louise, died on August 25, 1998. They are survived by daughters Julie, Laura and Alice, and six grandchildren.

**EDUCATION:** Attended primary and secondary schools in East Derry and Derry, New Hampshire; received a Bachelor of Science degree from the United States Naval Academy in 1944.

**SPECIAL HONORS:** Congressional Medal of Honor (Space); Awarded two NASA Distinguished Service Medals, the NASA Exceptional Service Medal, the Navy Astronaut Wings, the Navy Distinguished Service Medal, and the Navy Distinguished Flying Cross; recipient of the Langley Medal (highest award of the Smithsonian Institution) on May 5, 1964, the Lambert Trophy, the Kinchloe Trophy, the Cabot Award, the Collier Trophy, the City of New York Gold Medal (1971), Achievement Award for 1971. Shepard was appointed by the President in July 1971 as a delegate to the 26th United Nations General Assembly and served through the entire assembly which lasted from September to December 1971.

**EXPERIENCE:** Shepard began his naval career, after graduation from Annapolis, on the destroyer COGSWELL, deployed in the pacific during World War II. He subsequently entered flight training at Corpus Christi, Texas, and Pensacola, Florida, and received his wings in 1947. His next assignment was with Fighter Squadron 42 at Norfolk, Virginia, and Jacksonville, Florida. He served several tours aboard aircraft carriers in the Mediterranean while with this squadron.

He returned to Patuxent for a second tour of duty and engaged in flight testing the F3H Demon, F8U Crusader, F4D Skyray, and F11F Tigercat. He was also project test pilot on the F5D Skylancer, and his last five months at Patuxent were spent as an instructor in the Test Pilot School.

He has logged more than 8,000 hours flying time--3,700 hours in jet aircraft.

**NASA EXPERIENCE:** Rear Admiral Shepard was one of the Mercury astronauts named by NASA in April 1959, and he holds the distinction of being the first American to journey into space. On May 5, 1961, in the Freedom 7 spacecraft, he was launched by a Redstone vehicle on a ballistic trajectory suborbital flight--a flight which carried him to an altitude of 116 statute miles and to a landing point 302 statute miles down the Atlantic Missile Range.

Shepard made his second space flight as spacecraft commander on Apollo 14, January 31 - February 9, 1971. He was accompanied on man's third lunar landing mission by Stuart A. Roosa, command module pilot, and Edgar D. Mitchell, lunar module pilot. Maneuvering their lunar module, "Antares," to a landing in the hilly upland Fra Mauro region of the moon, Shepard and Mitchell subsequently deployed and activated various scientific equipment and experiments and collected almost 100 pounds of lunar samples for return to earth.

Rear Admiral Shepard has logged a total of 216 hours and 57 minutes in space, of which 9 hours and 17 minutes were spent in lunar surface EVA. He retired from NASA and the Navy on August 1, 1974.

## Day 1: Map Analysis, Perspectives of History

### Social Studies

- Discovering the Unknown: Analyze the 1795 map of "new" discoveries of North America. (1795, Library of Congress Geography and Map Division Washington, D.C. 20540-4650 USA dcu. London: Published Jan. 1, 1795 by A. Arrowsmith, No. 24 Rathbone Place)
- Online access: *www.loc.gov/resource/g3300.ct000584/?r=-0.034,0.165,1.087,0.786,0*

- Explore the early map of North American explorations and complete the map analysis questions below:

## Map Analysis Questions

**Directions**: Take a moment to explore this historic map. If viewing it digitally on the Library of Congress website, use the ability to zoom in on multiple parts of the map in great detail. If viewing it in print, carefully read the labels where you are able to do so. Next, consider the following questions while considering perspective and audience of the mapmaker and for whom it was published in 1795.

**Questions to Consider:**

Read the title of this map: A map exhibiting all the new discoveries in the interior parts of North America. As we consider this map almost 225 years after it was made, why might a historian consider this map title to be inaccurate? Explain.

1. How could this map title actually exhibit a bias?

2. What would a possible more accurate title be for this map?
   Bias: prejudice in favor of or against one thing, person, or group compared with another, usually in a way considered to be unfair.

3. There are multiple areas of the map that include heavy shading. Create a potential theory why the modern day areas of Florida, the Mississippi River, and Southern California be shaded in with color?

4. The East Coast of North America has many labeled geographic features. Why might the interior of North America have very few labels?

5. What is missing from this map?

6. What is one question or one area that you wonder about this map?