SHOOT FOR THE STARS

WITH

A MILLION MILES AWAY

A CAREER GUIDE

prime video

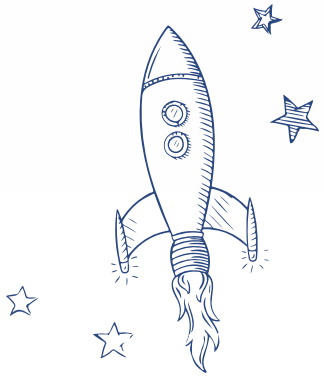
ALL RESOURCES IN THIS GUIDE WERE PROVIDED BY NASA

MISSION 1

EXPLORING THE VASTNESS OF SPACE CAREERS

Interested in a career in the field of space exploration? Maybe you have your eyes set on becoming an astronaut but don't know where to begin. Are you curious to know what other space-related careers are out there to be gazed upon?

LET'S LAUNCH INTO ALL OF THE OUT-OF-THIS-WORLD POSSIBILITIES...



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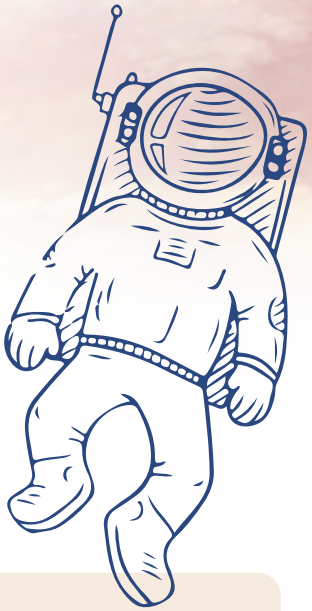
SO YOU WANT TO BE AN ASTRONAUT?

Have your eyes set on becoming a NASA astronaut, and wonder how you can set yourself on the right trajectory while you're still in school? Here's everything you need to know so you'll be ready to apply when the opportunity rolls around.



Maybe you've seen astronauts working on the International Space Station, or heard about NASA plans to send humans back to the Moon through the Artemis Missions or maybe you've been following the ongoing exploration of Mars and want to visit the planet for yourself one day! Whatever your inspiration has been, you know you want to become an astronaut. So how do you get there, and what can you do to make it possible?

Let's start with the basic requirements*:

- Be a U.S. citizen.
- Possess a master's degree in a STEM field, including engineering, biological science, physical science, computer science or mathematics, from an accredited institution.
- Have at least two years of related professional experience obtained after degree completion or at least 1,000 hours pilot-in-command time on jet aircraft.
- Be able to pass the NASA long-duration flight astronaut physical.

CLICK HERE for more details on current requitements.

*subject to change

If you're in high school, middle school or even elementary school, now is a great time to explore all of these fields of study to help you better understand the ones you like most, the ones for which you might have a natural talent, and even the ones you don't find as interesting.

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IDEAS ON HOW TO EXPLORE QUALIFYING STEM FIELDS OF STUDY

If you have the ability to choose your elective classes, take the challenging math, science and computer programming courses. This will help you to learn the fundamentals of science and math. If your school doesn't offer those classes, look online. There are many free online courses covering a wide range of math, science and programming topics.

WHAT ELSE CAN YOU DO?

- Join a school or community math, science, engineering or robotics club. If there are none in your school or community, start one!
- Participate in science and engineering fairs.
- Attend maker fairs and develop the skills to design solutions to a variety of problems.
- Begin to research an internship at NASA through **intern.nasa.gov.**

These are some of the steps you can take to better prepare yourself as you enter college. They just happen to be some of the same types of things many scientists and engineers did before starting their college careers that led them to a job with NASA.

Photo courtesy of NASA

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5 Myths About Becoming an Astronaut

Have you ever wondered if you have what it takes to become a NASA Astronaut? The term "astronaut" derives from the Greek word meaning "space sailor," and refers to all who have been launched as crew members aboard NASA spacecraft bound for orbit and beyond. Check out these myths and facts to discover more on what it takes to become an astronaut.

MYTH ----------> **FACT**

All astronauts have piloting experience.

You don't need to be a pilot to be an astronaut. Flying experience is not a requirement, but could be beneficial to have.

MYTH ----------> **FACT**

All astronauts have perfect vision.

It's okay if you don't have 20/20 vision. As of September 2007, corrective surgical procedures of the eye (PRK and LASIK) are now allowed, providing at least 1 year has passed since the date of the procedure with no permanent adverse after effects.

MYTH ----------> **FACT**

All astronauts have advanced degrees like, a PhD.

While a Bachelor's degree from an accredited university is necessary, an advanced degree is not required to become an astronaut.

MYTH ----------> **FACT**

Astronauts are required to have military experience in order to be selected.

Military experience is not required to become an astronaut.

MYTH ----------> **FACT**

You have to be a certain age in order to be an astronaut.

There are no age restrictions. Astronaut candidates selected in the past have ranged between the ages of 26 and 46, with the average age being 34.

Courtesy of nasa.tumblr.com

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NASA STEM STARS

Check out NASA STEM Stars, a webchat series for students to hear firsthand from NASA experts about various careers from the STEM Stars in the highlighted areas of focus. The areas fall under the following categories:

- Science and Technology
- Engineering and Mathematics
- Business, Management and Communication

The series is as inspiring as it is informative and also includes short STEM activities. Did we mention it also features an astrobiologist and graphic artist who transforms science to comics? Check out his amazing journey to NASA and so much more!

Additionally, other surprising STEM careers are highlighted in the series **Surprisingly STEM** on: YouTube

Photos courtesy of NASA

CLICK HERE to learn more

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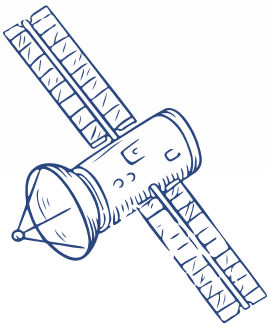
MISSION 2

PREPARATION MEANS BUILDING A SKILL SET FROM ELEMENTARY, MIDDLE AND HIGH SCHOOL YEARS.
SKILLS FOR SPACE ARE SKILLS FOR LIFE!



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AN ASTRONAUT'S TIPS FOR LIVING IN SPACE – OR ANYWHERE

One thing astronauts have to be good at: living in confined spaces for long periods of time. Here are some tips for all who find yourself in a similar scenario, and the five good expeditionary behavior skills:

SKILL 1 | COMMUNICATION

Definition: Communication means to talk so you are clearly understood. To listen, and question to understand. Actively listen, pick up on non-verbal cues. Identify, discuss, then work to resolve conflict.

To practice good Communication EB, share information and feelings freely. Talk about your intentions before taking action. Use proper terminology. Discuss when your or others' actions were not as expected. Take time to debrief after success or conflict. Listen, then restate messages to ensure they are understood. Admit when you are wrong.

SKILL 2 | LEADERSHIP/FOLLOWERSHIP

Definition: How well a team adapts to changed situations. A leader enhances the group's ability to execute its purpose through positive influence. A follower (aka a subordinate leader) actively contributes to the leader's direction. Establish an environment of trust.

To practice good Leadership/Followership EB, accept responsibility. Adjust your style to your environment. Assign tasks and set goals. Lead by example. Give direction, information, feedback, coaching and encouragement. Ensure your teammates have resources. Talk when something isn't right. Ask questions. Offer solutions, not just problems.

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SKILL 3 | SELF-CARE

Definition: Self-Care means keeping track of how healthy you are on psychological and physical levels. It includes hygiene, managing your time and your stuff, getting sleep, and maintaining your mood. Through self-care, you demonstrate your ability to be proactive to stay healthy.

To practice good Self-Care EB, realistically assess your own strengths and weaknesses, and their influence on the group. Learn from mistakes. Identify personal tendencies and their influence on your success or failure. Be open about your weaknesses and feelings. Take action to mitigate your own stress or negativity (don't pass it on to the group). Be social. Seek feedback. Balance work, rest, and personal time. Be organized.

SKILL 4 | TEAM CARE

Definition: Team Care is how healthy the group is on psychological, physical and logistical levels. Recognize that this can be influenced by stress, fatigue, sickness, supplies, resources, workload, etc. Nurture optimal team performance despite challenges.

To practice good Team Care EB, demonstrate patience and respect. Encourage others. Monitor your team for signs of stress or fatigue. Encourage participation in team activities. Develop positive relationships. Volunteer for the unpleasant tasks. Offer and accept help. Share credit; take the blame.

SKILL 5 | GROUP LIVING

Definition: Group Living skills are how people cooperate and become a team to achieve a goal. Identify and manage different opinions, cultures, perceptions, skills and personalities. Demonstrate resilience in the face of difficulty.

To practice good Group Living EB, cooperate rather than compete. Actively cultivate group culture (use each individual's culture to build the whole). Respect roles, responsibilities and workload. Take accountability; give praise freely. Then work to ensure a positive team attitude. Keep calm in conflict.

You can be successful in confinement if you are intentional about your actions and deliberate about caring for your team. When we work together, we will continue to be #EarthStrong.

Adapted from a Twitter Thread by astronaut Anne McClain

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BUILDING FOUNDATIONAL STEM SKILLS FOR FUTURE SUCCESS

It's important that kids start practicing the skills they will need to succeed academically and in a future internship or career.

"Developing those foundational STEM and language arts skills is incredibly important to future success," says Ota Lutz, a former classroom teacher, who leads JPL's K-12 education team, adding that, generally, students should practice what are called scientific habits of mind, "learning how to think critically, problem solve and do so in a methodical way as well as learning to examine data to determine trends without personal bias."

Coding skills, in particular, will serve students well no matter what career path they take, says Lutz. "Coding is something that is applicable across a broad range of subject areas and majors, so we strongly encourage students to learn some coding."

She points to the plethora of online courses and tutorials in coding and other STEM subjects that give students a chance to explore on their own and work on projects that interest them.

Parents and guardians can also help their kids develop foundational skills by allowing them to explore and tinker at home. "In every house, there's something that needs fixing," says Lutz. "Have the kid figure out how to fix a wobbly chair, but be patient with mistakes and encourage them to keep trying." That persistence and determination in overcoming obstacles will come in handy throughout their education and career path, whether it's learning how to code, getting into a robotics club in high school, applying and reapplying for internships, or figuring out how to land a spacecraft on Mars.

Similarly, it's never too early to start learning those ever-important soft skills such as teamwork, communication, and leadership. There's no single or right place to gain these skills, rather they come from a range of experiences that can include a school project, a part-time job, or a volunteer opportunity.

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Lutz grew up in a small town in Central California and says, "I was a smart kid, but these things called soft skills were beyond me, and I was the shyest kid in my class." That is until she joined her high school's service club. "Through volunteering, I ended up interacting with people from all walks of life and learned how to work with teams. My club advisor coached me, and I started taking on more leadership roles in the club and in class projects."

Later, it was that same club advisor and her youth pastor who encouraged Lutz to attend a college that would challenge her academically despite pressures to stay closer to home.

"You never know what experiences or conversations might open up opportunities for you," says Lutz, which is why she recommends that students get comfortable talking with peers and teachers – and especially asking questions. "It's really important to learn to ask questions so you build your confidence in learning and also develop relationships with people."

NASA teamed up with 4H to offer activities to strengthen skills for life, and for space!

CLICK HERE to check them out.

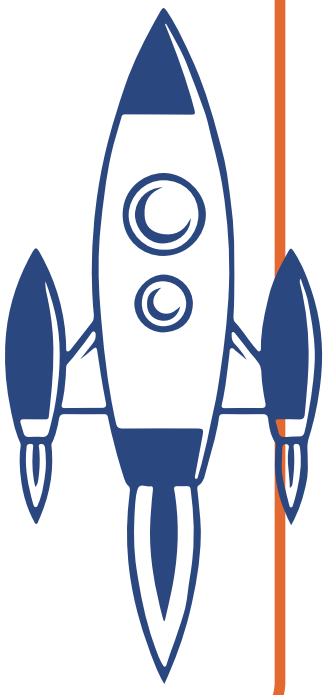
Launching into College

As Lutz experienced, those foundational skills can make all the difference when it comes to transitioning into college, too.

"When I got to college, I discovered I was woefully unprepared even though I had been at the top of my class in high school," says Lutz. "I never learned how to study, and I mistakenly believed that asking questions would make me look dumb. After struggling on my own for a couple of years, I learned that study groups existed and they helped me get to know my peers, build my confidence, and improve my GPA."

While building a support network is key, don't overload yourself the first year, Lutz says. But do start taking classes in the field you're interested in to see if it's the right fit. "The important thing is getting some experience in the field that you think you want to go into."

After that, internships, whether they're at JPL, NASA or elsewhere, will give you an even deeper look at what a future career might be like.



A MILLION MILES AWAY

prime video

MISSION 3

A LOOK BACK AS YOU REFLECT ON THE ROAD AHEAD

MISSION 3

A MILLION MILES AWAY

prime video

While you start to reflect on your own interests and visualize your path ahead, check out these trailblazing astronauts who prove the sky is the limit on what you can achieve! (We spy José Hernández, the real-life subject of the film A MILLION MILES AWAY!)

Joseph M. Acaba Born in 1967 in Inglewood, CA, and raised in Anaheim, CA. Acaba, a former science teacher, was selected by NASA in 2004 as part of the Educator Astronaut Program. He has logged a total of 306 days in space on three missions. In 2009, Acaba flew aboard STS-119 on the Space Shuttle Discovery to the International Space Station. In 2012, Acaba flew aboard a Soyuz spacecraft to the space station where he worked as Flight Engineer for the Expedition 31/32. Finally, he served as Flight Engineer on the International Space Station for Expedition 53/54. Acaba also is a former Peace Corps worker who spent two years in the Dominican Republic. He enjoys outdoor activities such as camping, hiking, mountain biking, kayaking, and scuba diving. He also enjoys reading, especially science fiction. He received a bachelor's degree in geology from the University of California-Santa Barbara in 1990 and a master's degree in geology from the University of Arizona in 1992.

Fernando "Frank" Caldeiro Born June 12, 1958, in Buenos Aires, Argentina, but considers New York City and Merritt Island, FL, to be his hometowns. NASA selected Caldeiro as an astronaut in 1996. In 2006, he joined the Agency's WB-57 High Altitude Research Program at Ellington Field, and he conducted atmospheric research experiments carried aboard the WB-57 aircraft. In 2002, he was appointed to serve in the President's Advisory Commission on Educational Excellence for Hispanic Americans. His hobby was building, flying, and racing his own experimental aircraft, in which he has logged more than 500 hours of flight time. Other interests were snorkeling, amateur radio (KE4RFI), and metalworking. He received an associate's degree in applied science in aerospace technology from the State University of New York at Farmingdale in 1978, a bachelor's degree in mechanical engineering from the University of Arizona in 1984, and a master's degree in engineering management from the University of Central Florida in 1995. Caldeiro passed away on Oct. 3, 2009, after a two-year battle with brain cancer.

Franklin R. Chang Diaz (Ph.D.) Born in 1950 in San José, Costa Rica. Chang Díaz became the first Hispanic astronaut when NASA selected him in 1980. He is a veteran of seven space flights: STS-61C in 1986, STS-34 in 1989, STS-46 in 1992, STS-60 in 1994, STS-75 in 1996, STS-91 in 1998, and STS-111 in 2002. He logged more than 1,500 hours in space, including 19 hours during spacewalks. He received a bachelor's degree in mechanical engineering from the University of Connecticut in 1973 and a doctorate in applied plasma physics from the Massachusetts Institute of Technology in 1977.

Sidney M. Gutierrez (Colonel, U.S. Air Force, Ret.) Born in 1951 in Albuquerque, NM. NASA selected Gutierrez as an astronaut in 1984. He is a veteran of two space flights. He served as the pilot on STS-40 in 1991 and the commander on STS-59 in 1994. He received a bachelor's degree in aeronautical engineering from the U.S. Air Force Academy in 1973 and a master's degree in management from Webster College in 1977.

José M. Hernández Born August 7, 1962, in French Camp, CA, but considers Stockton, CA, to be his hometown. In 2004, NASA selected Hernández as an astronaut. He had joined the Agency's Johnson Space Center in Houston as a materials research engineer in 2001. He served as a mission specialist on the Space Shuttle's STS-128 mission, 37th mission to space, in 2009. Hernández grew up as one of four children in a migrant farming family from Mexico. He learned to speak English when he was 12 years old. In 1999, the Society of Mexican American Engineers and Scientists honored him for his professional and community contributions. He received a bachelor's degree in electrical engineering from the University of the Pacific in 1984 and a master's degree in electrical and computer engineering from the University of California-Santa Barbara in 1986.

MISSION 3

A MILLION MILES AWAY

prime video

Serena M. Auñón-Chancellor (M.D.) Born on April 9, 1976, in Indianapolis, Indiana, but considers Fort Collins, Colorado, to be her hometown. She graduated from Poudre High School, Fort Collins, Colorado, 1993. Her hobbies include basketball, softball, martial arts, cricket, hiking and jet-skiing. Auñón-Chancellor received a bachelor of science degree in electrical engineering from The George Washington University, Washington, D.C., in 1997 and a doctorate of medicine degree from The University of Texas – Health Science Center at Houston in 2001. She completed a 3-year residency internal medicine at The University of Texas Medical Branch (UTMB) in Galveston, Texas, 2004 and then completed an additional year as chief resident in the Internal Medicine Department, 2005. She also completed an aerospace medicine residency at UTMB as well as a master of public health degree in 2007. She is board certified in Internal and Aerospace Medicine. NASA selected Dr. Auñón in July 2009. Dr. Auñón-Chancellor flew a mission aboard the International Space Station as part of Expedition 56/57.

Michael E. Lopez-Alegria (Captain, U.S. Navy, Ret.) Born May 30, 1958, in Madrid, Spain, and grew up in Mission Viejo, CA. NASA selected Lopez-Alegria as an astronaut in 1992. A veteran of four space flights, he has logged more than 257 days in space and performed 10 spacewalks totaling 67 hours and 40 minutes. He was a mission specialist during Space Shuttle missions STS-73 in 1995, STS-92 in 2000, and STS-113 in 2002. Between September 2006 and April 2007, he served as the commander of Expedition 14 on the International Space Station. During that mission, Lopez-Alegria conducted five spacewalks for station assembly and maintenance and conducted nearly 500 hours of science operations. As a pilot, he has accumulated more than 5,000 hours in 30 different aircraft. He enjoys sports, traveling, and cooking, and he is interested in national and international political, economic, and security affairs. He speaks Spanish, French, and Russian. He received a bachelor's degree in systems engineering from the U.S. Naval Academy in 1980 and a master's degree in aeronautical engineering from the U.S. Naval Postgraduate School in 1988. He is a graduate of Harvard University's Kennedy School of Government Program for Senior Executives in national and international security.

Christopher J. "Gus" Loria (Lieutenant Colonel, U.S. Marine Corps) Born July 9, 1960, in Belmont, MA, but considers League City, TX, to be his hometown. NASA selected Loria as an astronaut in 1996. He was assigned as the pilot for Space Shuttle mission STS-113, but he requested a reassignment due to an injury sustained at home and its subsequent impact on his training. Loria received a bachelor's degree in general engineering from the U.S. Naval Academy in 1983 and a master's degree in public administration from Harvard University in 2004.

National Aeronautics and Space Administration

Lyndon B. Johnson Space Center
Houston, Texas 77058
http://www.nasa.gov/centers/johnson

www.nasa.gov

Carlos I. Noriega (Lieutenant Colonel, U.S. Marine Corps, Ret.) Born October 8, 1959, in Lima, Peru, but considers Santa Clara, CA, to be his hometown. NASA selected Noriega as an astronaut in 1994. He is a veteran of two Space Shuttle missions: STS-84 in 1997 and STS-97 in 2000. He has logged more than 481 hours in space, including more than 19 hours conducting spacewalks. Noriega retired from the astronaut corps in 2005 and played a part in the Constellation Program at Johnson Space Center. He enjoys skiing, running, and spending time with his five children. Noriega received a bachelor's degree in computer science from the University of Southern California in 1981, followed by a master's degree in computer science and a master's in space systems operations from the Naval Postgraduate School in 1990.

Ellen Ochoa (Ph.D.) Born in 1958 in Los Angeles, CA, but considers La Mesa, CA, to be her hometown. She was the first female Hispanic astronaut to fly in space. NASA selected Ochoa as an astronaut in 1990. She spent nearly 1,000 hours in space during four Shuttle missions: STS-56 in 1993, STS-66 in 1994, STS-96 in 1999, and STS-110 in 2002. She then went on to serve as the 11th director of NASA's Johnson Space Center (JSC). She was JSC's first Hispanic director, and its second female director. Ochoa is the recipient of numerous awards, including the Harvard Foundation Science Award, Women in Aerospace's Outstanding Achievement Award, and the Hispanic Heritage Leadership Award. She is a classical flutist and pilot, and she also enjoys volleyball and bicycling. Ochoa received a bachelor's degree in physics from San Diego State University in 1980, followed by a master's degree and doctorate in electrical engineering from Stanford University in 1981 and 1985, respectively.

John D. "Danny" Olivas (Ph.D.) Born in 1966 in North Hollywood, CA, and raised in El Paso, TX. NASA selected Olivas as an astronaut in 1998. In 2007, he flew on the STS-117 Shuttle mission and conducted two spacewalks. Olivas conducted the first-ever on-orbit repair of a Shuttle during a spacewalk. Olivas served as a mission specialist on the STS-128 mission. He enjoys surfing, hunting, fishing, and spending time with his five children. He received a bachelor's degree in mechanical engineering from the University of Texas-El Paso, a master's degree in mechanical engineering from the University of Houston, and a doctorate in mechanical engineering and materials science from Rice University.

George D. Zamka (Colonel, U.S. Marine Corps) Born in 1962 in Jersey City, NJ, and raised in New York City; Irvington, NY; Medellín, Colombia; and Rochester Hills, MI. NASA selected Zamka as an astronaut in 1998. In 2007, he served as the pilot on the Shuttle' STS-120 mission to the International Space Station, his first space flight. Zamka served as the commander of the STS-130 crew. As a colonel in the U.S. Marine Corps, Zamka flew 66 combat missions over occupied Kuwait and Iraq during Desert Storm. He enjoys bicycling, scuba diving, and boating. Zamka received a bachelor's degree in mathematics from the U.S. Naval Academy in 1984 and a master's degree in engineering management from the Florida Institute of Technology in 1997.

A MILLION MILES AWAY

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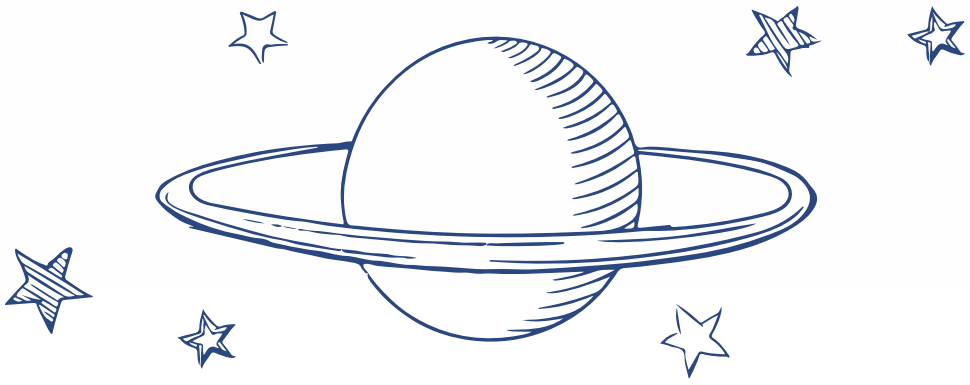
MISSION 4

COLLEGE IS NOT A GALAXY

FAR, FAR AWAY...



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A MILLION MILES AWAY

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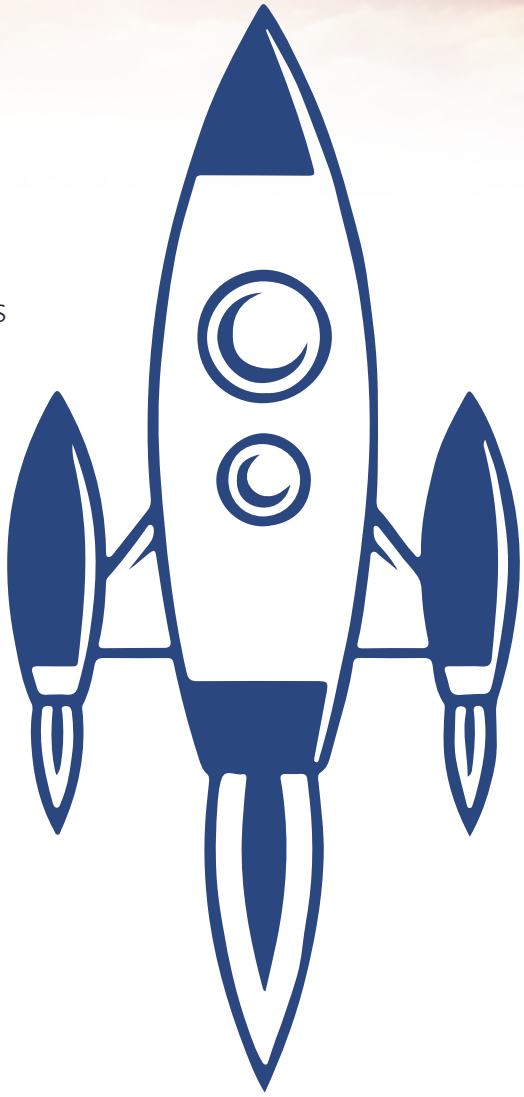
NASA AWARDS $14 MILLION TO UNIVERSITIES FOR SUPPORTIVE STEM EFFORTS

NASA is investing more than $14 million in 19 U.S. colleges and universities to grow their STEM capacity to participate in critical spaceflight research and prepare a new generation of diverse students for careers in the nation's science, technology, engineering, and math workforce.



"These awards help NASA reach students and institutions that traditionally have had fewer opportunities in cutting-edge spaceflight research," said Shahra Lambert, NASA's senior advisor for engagement. "We want the Artemis Generation to feel excited and prepared to join us in tackling the scientific and technological challenges of space exploration."

The new MUREP (Minority University Research and Education Project) Curriculum Award was established this year to help Minority-Serving Institutions strengthen their STEM academic offerings.

"Current research shows that developing new curricular pathways or adding to an existing STEM curriculum can help these colleges and universities attract more diverse groups of students to the kinds of research that align with NASA's needs," said Torry Johnson, the project's manager.

CLICK HERE to view all of the institutions who were awarded funding.

MISSION 4

A MILLION MILES AWAY
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UNDERGRADUATE STUDENT TEAMS DESIGN TOOLS FOR FUTURE SPACE EXPLORATION

As part of the Artemis program, the Micro-g Neutral Buoyance Experiment Design Team (Micro-g NExT) challenges undergraduate students to design, build and test a tool or device that addresses an authentic, current space exploration challenge. The 2023 Micro-g NExT challenges focused on astronaut training, Orion crew safety, spacewalk operations for the International Space Station, and moonwalk operations.

As part of the (Micro-g NExT) test week, which occurred June 5-7, 2023, teams of college students from across the U.S. tested their devices to address current space exploration challenges identified by NASA engineers as necessary in space exploration missions.

Eighteen teams were selected to spend three days at NASA's Johnson Space Center and NBL (Neutral Buoyancy Laboratory) testing their prototypes in the 6.2-million-gallon pool at the Sonny Carter Test Facility near NASA's Johnson Space Center in Houston that simulates a microgravity environment.

Professional divers tested the tools while students directed the divers from the test conductor room. After testing, student teams received feedback from the test subjects regarding the useability, functionality, and effectiveness of their prototypes for potential usefulness in future Artemis lunar missions.

NASA scientists and engineers served as mentors, providing advice and expertise to help guide their projects. Micro-g NExT challenge owners, also NASA engineers, provided additional guidance and support to ensure designs met challenge requirements.

After testing of their designs, teams presented their outreach program plans and development processes for their designs in a poster session at NASA Johnson.

This year's participants came from 14 different institutions, including four new institutions, and two minority serving institutions.

CLICK HERE for more on Micro-g NExT and other Artemis student challenges.

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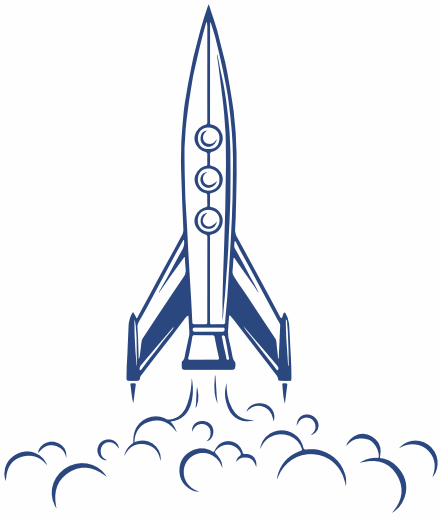
MISSION 5

YOUR FUTURE TAKES FLIGHT!



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AN ASTRONAUT'S GUIDE TO APPLYING TO BE AN ASTRONAUT

About every four years, NASA accepts applications for a new class of astronauts. As someone who went through this process, I know how stressful it can be. It is hard to want something so badly for your whole life, to have a dream so magical that it has kept you up at night, then try to contain all that excitement while concisely describing your experiences and skills for complete strangers via an application form. So I wanted to share some thoughts for all those who find themselves in that position.

It is totally worth it! For my whole life, I have wanted this job. I first told my parents that I wanted to be an astronaut when I was three years old. The goal shaped many decisions and sacrifices I made growing up and in adulthood. Thirty-six years after I first told my parents my dream, I got my shot to fly in space. And it was more amazing than I could have ever imagined! I spent six-and-a-half months living on the International Space Station, doing science and maintenance, spacewalks and robotics. I have been home for nine months now, and I will tell you this: I have never wanted to go to space more than I do right now. Everything we achieved during my first stay in space was just a short introduction to how much more there is to explore!

The reality is we astronauts spend a lot more time on Earth than we do in space. Luckily, training for space and supporting those currently in space is the second best job I can imagine. No two days are alike in this job. We participate in flight simulations, test and evaluate new equipment to prepare for new missions to the Moon, sit in Mission Control and talk to the crew on orbit, fly jets, and practice spacewalks

Photo Credit: NASA

under water. Most of this is based out of the agency's Johnson Space Center in Houston, but some travel is required. We work all over the world with people of all different cultures and nationalities. And yes, some days we sit in meeting after meeting or draft up policy memos. It cannot all be glamorous.

But every now and then (currently about once every five to seven years), we wake up, and it is launch day. It is hard to describe what it is like to walk to a rocket knowing you are about to blast off of planet, knowing that by the time you go to bed, you will be floating. There really is nothing like the first moments of weightlessness, watching your pencil float in front of you while looking back at the curvature of the Earth and knowing your dream has come true.

MISSION 5

A MILLION MILES AWAY

prime video

WHAT SHOULD APPLICANTS THINK SERIOUSLY ABOUT BEFORE APPLYING?

First, if you are qualified to apply to be an astronaut, you likely already are a successful professional. You may be at the top of your field, or you may have just gotten another dream job that you love. You are contributing, you are trusted, and you know what you are doing. You are probably a leader. Once you are selected though, you will join a diverse group of people and start work in a very unfamiliar environment – essentially, starting over. You will be asked to do things you have never done before, and you may even not be very good at some of them at first. As such, it is really important to be adaptable. We know you are good at what you do, but your success will be based on how well you can adapt.

Some periods of time you can be away from home for up to 50% of the time, and other times you may only be gone one or two nights every couple months. Make sure your family and friends are on board with your dream. You will need a strong ground support network because you will lean on them a lot for support! But don't worry – we will be here for you also. In the astronaut office, we don't just do our jobs together – we (and our families) do life together. As such, it is important that we can trust others and that we are trustworthy.

It is really hard to get selected as an astronaut. The 2013 class had more than 6,000 applicants and eight were selected. In 2017, more than 18,300 people applied, and 11 new astronauts just graduated from that class. The odds are in no one's favor! When I came to interview, a senior astronaut told me, "Just because you would be perfect here does not mean you will be selected." It made me realize a lot of really qualified people don't get selected. But 100% of people who do not apply will not be selected. You need to apply. And if you are not selected, apply again (and again, and again). It took most of us a few times – you need to be tenacious.

What you have done is as important as how you communicate it. Make sure your resume looks good. In this job, we trust each other with our lives – we need to know that you are detail oriented. Your resume is our first impression of this. Take the time to make it error-free, concise, and clear. Remember people with different backgrounds than you will review your resume, so don't use acronyms or a lot of really technical terms. Just tell us what you have done, and some things you learned along the way. Include everything – we look at both breadth and depth of experiences. And yes, we want to hear about your hobbies too!

One word of caution though: I have met some applicants who did everything they could just to build up their resume, and I do not recommend this! Don't do things so you can put them on a resume, do things because you have a passion for them. Fly because you love to fly, or scuba dive because you love to scuba dive, or go winter over in Antarctica because you love to be in remote places working on teams. If you do all these things just to be selected then are not selected, it can be very disappointing. But if you do what you love, you will not only perform better, but you will be happier too.

The funny thing that my whole class had in common is we were genuinely surprised when we were selected. We were very happy to be selected, but we were also very happy doing what we were already doing.

To sum it up: do what you love doing because you love doing it. Be adaptable, trustworthy, tenacious, and detail oriented.

Understand this job requires sacrifice by both you and your family. And most of all, go for it. Submit your application. It is SO worth it!

MISSION 5

A MILLION MILES AWAY

prime video

READY TO SUIT UP?

WHAT IS A SPACESUIT?

A spacesuit is much more than a set of clothes astronauts wear on spacewalks. A fully equipped spacesuit is really a one-person spacecraft. The formal name for the spacesuit used on the space shuttle and International Space Station is the Extravehicular Mobility Unit, or EMU. "Extravehicular" means outside of the vehicle or spacecraft. "Mobility" means that the astronaut can move around in the suit. The spacesuit protects the astronaut from the dangers of being outside in space.

WHY DO ASTRONAUTS NEED SPACESUITS?

Spacesuits help astronauts in several ways. Spacewalking astronauts face a wide variety of temperatures. In Earth orbit, conditions can be as cold as minus 250 degrees Fahrenheit. In the sunlight, they can be as hot as 250 degrees. A spacesuit protects astronauts from those extreme temperatures.

Spacesuits also supply astronauts with oxygen to breathe while they are in the vacuum of space. They contain water to drink during spacewalks. They protect astronauts from being injured from impacts of small bits of space dust. Space dust may not sound very dangerous, but when even a tiny object is moving many times faster than a bullet, it can cause injury. Spacesuits also protect astronauts from radiation in space. The suits even have visors to protect astronauts' eyes from the bright sunlight.

WHAT ARE THE PARTS OF A SPACESUIT?

The spacesuit consists of several pieces. The Hard Upper Torso covers the astronaut's chest. The arm assembly covers the arms and connects to the gloves. The helmet and Extravehicular Visor Assembly are designed to protect the astronaut's head while still allowing him or her to see as much as possible. The Lower Torso Assembly covers the astronaut's legs and feet. The flexible parts of the suit are made from several layers of material. The layers perform different functions, from keeping oxygen within the spacesuit to protecting from space dust impacts.

Underneath the spacesuit, astronauts wear a Liquid Cooling and Ventilation Garment. Tubes are woven into this tight-fitting piece of clothing that covers the entire body except for the head, hands and feet. Water flows through these tubes to keep the astronaut cool during the spacewalk.

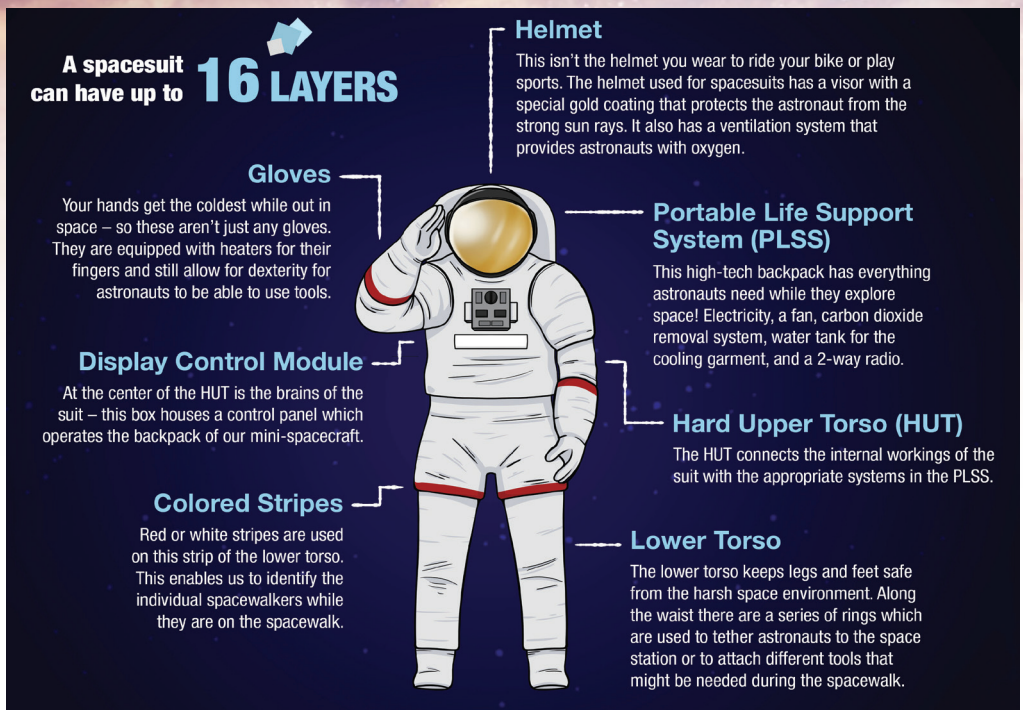
On the back of the spacesuit is a backpack called the Primary Life Support Subsystem. This backpack contains the oxygen that astronauts breathe during a spacewalk. It also removes carbon dioxide that astronauts exhale. The backpack also provides electricity for the suit. A fan moves the oxygen through the spacesuit and life support systems, and a water tank holds the cooling water that flows through the Liquid Cooling and Ventilation Garment.

Also attached to the back of the suit is a device called the Simplified Aid for Extravehicular Activity Rescue, or SAFER. SAFER has several small thruster jets. If an astronaut became separated from the space station, he or she could use SAFER to fly back.

MISSION 5

A MILLION MILES AWAY

prime video



WHAT OTHER SPACESUITS HAVE ASTRONAUTS WORN?

NASA's first spacesuits were developed for the Mercury program. Mercury was the first time NASA astronauts flew into space. These simple suits were based on pressure suits worn by U.S. Navy pilots. Astronauts did not go on spacewalks then. The Mercury suits were worn only inside the spacecraft.

NASA's first spacewalks took place during the Gemini program. The suits used for Gemini were more advanced than the Mercury suits. But the Gemini suits were simpler than today's spacesuits. These suits did not contain their own life support. Instead, they connected to life support systems on the Gemini spacecraft with a cord called the umbilical.

Spacesuits designed for the Apollo program had to do things the first suits did not. These spacesuits had to protect astronauts walking on the moon. Unlike the other suits, the Apollo suits had boots made to walk on a rocky surface. The Apollo suits also contained a life support system, similar to the Portable Life Support Subsystem on the current suit. Having a life support system on the spacesuit allowed the astronauts to explore away from the lunar lander.

Spacesuits similar to the Apollo suits were used on the Skylab space station. Like the Gemini suits, the Skylab suits connected to life support systems on the spacecraft via an umbilical.

WHAT SPACESUITS ARE WORN TODAY?

In addition to the EMU, NASA astronauts wear other suits today. The Advanced Crew Escape Suit is the orange suit that astronauts wear during launch and landing of the space shuttle. This suit cannot be worn during spacewalks. Sometimes, NASA astronauts will wear the Russian Orlan spacesuit. This suit is the Russian version of the EMU and is used for spacewalks. Another Russian suit is the Sokol. Like the Advanced Crew Escape Suit, the Sokol is designed only to be used inside a spacecraft. It is used on the Russian Soyuz spacecraft.

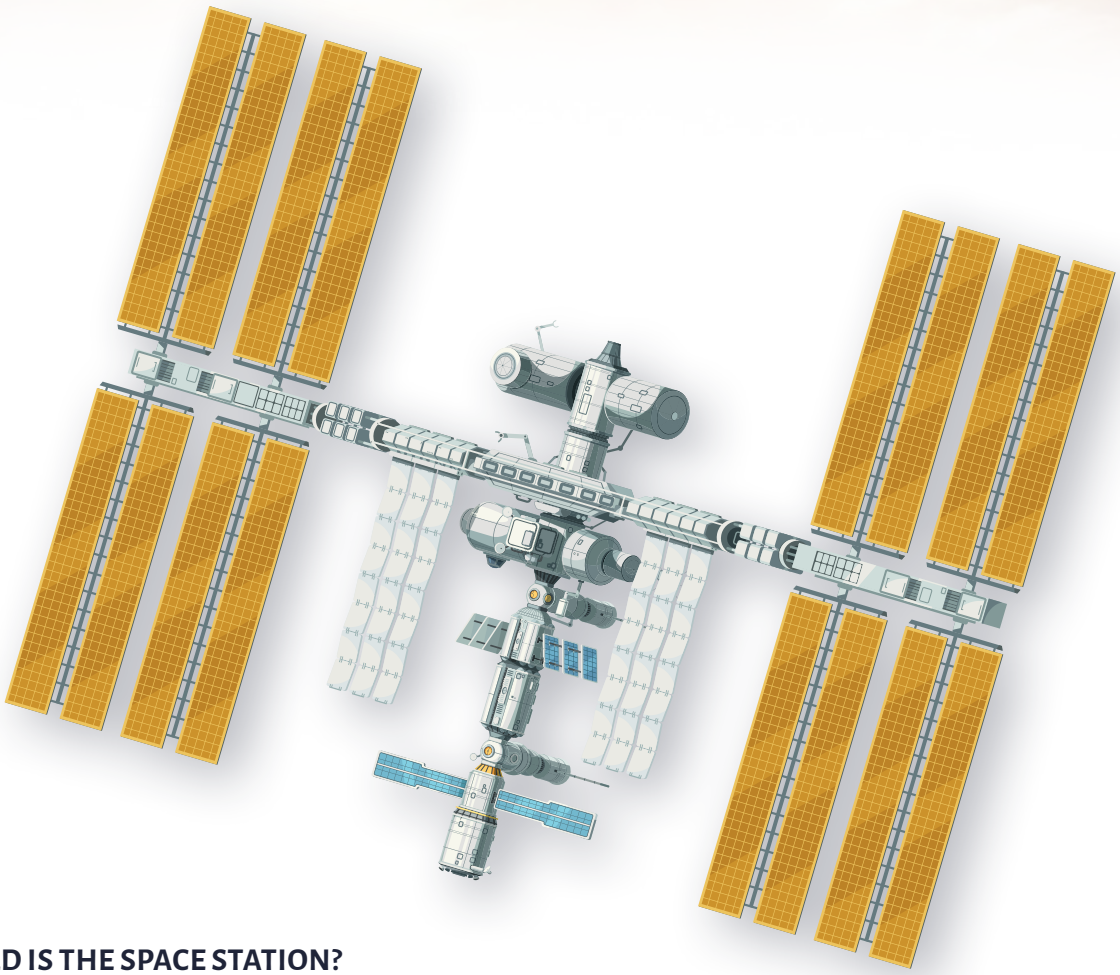
MISSION 5

A MILLION MILES AWAY

prime video

WHAT IS THE INTERNATIONAL SPACE STATION?

The International Space Station is a large spacecraft in orbit around Earth. It serves as a home where crews of astronauts and cosmonauts live. The space station is also a unique science laboratory. Several nations worked together to build and use the space station. The space station is made of parts that were assembled in space by astronauts. It orbits Earth at an average altitude of approximately 250 miles. It travels at 17,500 mph. This means it orbits Earth every 90 minutes. NASA is using the space station to learn more about living and working in space. These lessons will make it possible to send humans farther into space than ever before.



HOW OLD IS THE SPACE STATION?

The first piece of the International Space Station was launched in November 1998. A Russian rocket launched the Russian Zarya (zar EE uh) control module. About two weeks later, the space shuttle Endeavour met Zarya in orbit. The space shuttle was carrying the U.S. Unity node. The crew attached the Unity node to Zarya.

More pieces were added over the next two years before the station was ready for people to live there. The first crew arrived on November 2, 2000. People have lived on the space station ever since. More pieces have been added over time. NASA and its partners from around the world completed construction of the space station in 2011.

MISSION 5

A MILLION MILES AWAY

prime video

HOW BIG IS THE SPACE STATION?

The space station has the volume of a five-bedroom house or two Boeing 747 jetliners. It is able to support a crew of seven people, plus visitors. On Earth, the space station would weigh almost a million pounds. Measured from the edges of its solar arrays, the station covers the area of a football field including the end zones. It includes laboratory modules from the United States, Russia, Japan and Europe.

Photo Credit: NASA

WHAT ARE THE PARTS OF THE SPACE STATION?

In addition to the laboratories where astronauts conduct science research, the space station has many other parts. The first Russian modules included basic systems needed for the space station to function. They also provided living areas for crew members. Modules called "nodes" connect parts of the station to each other.

Stretching out to the sides of the space station are the solar arrays. These arrays collect energy from the sun to provide electrical power. The arrays are connected to the station with a long truss. On the truss are radiators that control the space station's temperature.

Robotic arms are mounted outside the space station. The robot arms were used to help build the space station. Those arms also can move astronauts around when they go on spacewalks outside. Other arms operate science experiments.

Astronauts can go on spacewalks through airlocks that open to the outside. Docking ports allow other spacecraft to connect to the space station. New crews and visitors arrive through the ports. Astronauts fly to the space station on the Russian Soyuz. Robotic spacecraft use the docking ports to deliver supplies.

WHY IS THE SPACE STATION IMPORTANT?

The space station has made it possible for people to have an ongoing presence in space. Human beings have been living in space every day since the first crew arrived. The space station's laboratories allow crew members to do research that could not be done anywhere else. This scientific research benefits people on Earth. Space research is even used in everyday life. The results are products called "spinoffs." Scientists also study what happens to the body when people live in microgravity for a long time. NASA and its partners have learned how to keep a spacecraft working well. All of these lessons will be important for future space exploration.

NASA currently is working on a plan to explore other worlds. The space station is one of the first steps. NASA will use lessons learned on the space station to prepare for human missions that reach farther into space than ever before.

A MILLION MILES AWAY

prime video

MISSION 6

DREAM BIG

(JUST LIKE THE ARTEMIS PROGRAM, YOUR GOALS ARE ALL WITHIN REACH!)

MISSION 6

A MILLION MILES AWAY

prime video

EIGHT WAYS STUDENTS CAN DIVE INTO NASA STEM IN 2023

FOR MORE RESOURCES...

1. Explore NASA's return to the Moon with Artemis

The success of Artemis I in 2022 sets the stage for increasingly ambitious Artemis missions that will ultimately return humans, including the first woman and person of color, to the lunar surface. Watch "To the Moon and Back: The Journey of Artemis I" and learn how NASA's massive Space Launch System – the most powerful rocket in the world – launched from the agency's Kennedy Space Center in Florida, sending the unpiloted Orion spacecraft on a pioneering journey around the Moon.

YouTube **CLICK HERE to watch**

2. Go on a reading adventure with Moonikin Campos

What will future Artemis astronauts experience aboard Orion? NASA flew a manikin in the spacecraft's commander seat during Artemis I to find out. Named "Commander Moonikin Campos" after Arturo Campos, a NASA electrical engineer who helped return the Apollo 13 crew to Earth, the manikin gathered vital data about vibration, acceleration, radiation, and more – information that will help protect future crews. Take a reading journey with the Adventures of Commander Moonikin Campos and Friends, a three-part online comic book series.

CLICK HERE to read

3. Dive into the Artemis STEM Learning Pathway

The Artemis I STEM Learning Pathway e-newsletter provided ready-to-use content throughout the mission, and even though the flight is complete, this series remains available online! Topics focus on launch, science on the Moon, return and splashdown, future missions, and more.

CLICK HERE to learn more

4. Join a Student Challenge

What better way to get involved in NASA's missions than through authentic STEM experiences? While many of the agency's Artemis Student Challenges are focused on higher education, there are K-12 options, too; teams of middle school and high school students are eligible to participate in Student Launch, and high school teams are also eligible to participate in the Human Exploration Rover Challenge and the Great Lunar Expedition for Everyone. Annual challenges begin in the fall, but the new year is a great time to research them and plan ahead. Visit NASA's STEM Search and click the "Contests and Challenges" checkbox for a complete list of current student challenges.

CLICK HERE to learn more

5. Create 'Wow!' moments through hands-on STEM activities

Discover your own abilities through hands-on activities developed by education experts with NASA's Next Gen STEM project. Visit the Next Gen STEM website for a wealth of K-12 lessons and activities focusing on a wide range of topics, from aviation and Earth science to the Moon and beyond.

CLICK HERE to learn more

6. Engage with astronauts aboard the International Space Station

Students and educators can engage directly with astronauts living and working aboard the International Space Station through educational Earth-to-space calls, or downlinks, offered by Next Gen STEM's "STEM on Station" initiative. During a downlink, astronauts answer students' questions during a live event, which is broadcast worldwide on NASA TV. Visit the website to see the schedule and learn how your school can apply to host a downlink.

CLICK HERE to learn more

7. Connect and subscribe to learn about new opportunities and resources

Teachers, parents, and students can sign up for the NASA EXPRESS digital newsletter, which delivers the latest STEM resources and opportunities every Thursday.

CLICK HERE to learn more

8. Imagine you are the first woman to walk on the moon

This set of hands-on activities accompanies NASA's "First Woman" graphic novel series, which tells the story of Callie Rodriguez, the first woman to explore the Moon. While Callie is a fictional character, the first female astronaut and person of color will soon set foot on the Moon. Intended for use in K–12 informal education settings such as after-school programs, summer camps, STEM nights, and weekend workshops, this First Woman Camp Experience Guide will bring the excitement of NASA's science and technology.

CLICK HERE to read


THANK YOU
FOR EXPLORING
WITH US
A MILLION
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