NATIONAL SPACE DAY

INSPIRING OUR FUTURE SPACE WORKFORCE

SWFT
SPACE WORKFORCE FOR TOMORROW

Courtesy of NASA

"Space is for everybody. It's not just for a few people in science or math, or for a select group of astronauts. That's our new frontier out there, and it's everybody's business to know about space."
—Christa McAuliffe

From designing the International Space Station (ISS) to innovating the new Lunar Gateway, the space workforce plays a critical role in advancing humankind's future in space. That's why growing the next space workforce is everybody's business.

Igniting students' interest in science, technology, engineering and mathematics (STEM) is the first step. By connecting curriculum to exciting historical events, missions and discoveries, along with profiles of diverse contributors to the field, students can learn the significance of space exploration. Engineering design challenges and student-centered activities, such as designing model space landers and building telescopes, are a few ways students can directly engage in problem-solving and innovation.

Ultimately, a curriculum that integrates compelling storylines, driven by students' own curiosity, with real-world space exploration phenomena can cultivate students' excitement, foster their scientific understanding and inspire them to consider a future in the field.

Space Workforce For Tomorrow has compiled a list of space education resources to launch your students' exploration on National Space Day and thereafter.

BLUE ORIGIN

NORTHROP GRUMMAN

Smithsonian
Science Education Center

L3HARRIS™

In cooperation with NASA

AEROSPACE

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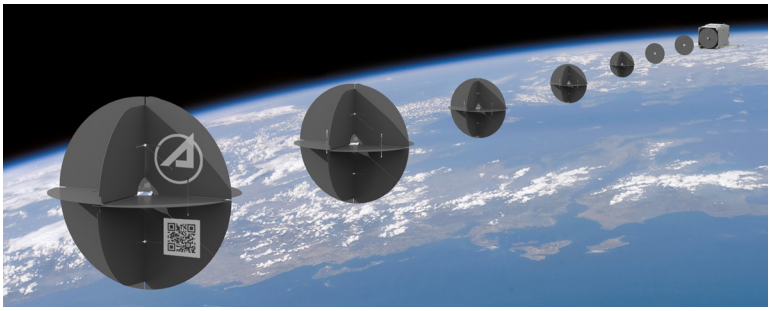
Space Education Resources

The Aerospace Corporation

Falling Stars Teaching Aids

Give your students the opportunity to engineer their own Falling Stars probe!

In this lesson, students will discover how these satellites are affected by the orbit, velocity, altitude and density of the atmosphere. Students will also learn how scientists and engineers work together using critical thinking, data, scientific modeling and inquiry to engineer satellites.



Courtesy of The Aerospace Corporation

Classroom Resources for Teachers

Our Aerospace STEM team has developed resources for teaching space in the classroom, including slide packages, videos, student worksheets and lesson plans on a variety of topics.

Blue Origin

Mission Bravo Oscar

Students break off into Blue Origin teams (data analysts, marketers, human resources, program managers, engineers, manufacturers, etc.) as they are tasked to work together on developing a launch strategy for Blue Origin's New Shepard rocket. There is also a Mission Bravo Oscar one-day mission.

Introduction to the Data Science Process

Students explore Microsoft Excel in a creative and inspiring manner. While learning the basic functions of Excel, students are tasked with deciding whether it's safe enough to launch Blue Origin's New Shepard rocket based off of real-life weather data surrounding a previous launch.

Postcards | Club for the Future

Students write or draw their vision on a postcard of what they think the future will look like—or any other message they would like to send to space. Students send their card(s) to Club for the Future, and they will launch it to space and back on a New Shepard rocket, stamp the postcard "Flown to Space" and return it to the student.

L3 Harris

Infusing lessons with science and technology information from the field is a wonderful way to link learning to industry. Here are links to three fact sheets:

- RS-25 Propulsion System Data Sheet
- RS-25 Incredible Facts
- RL10 Propulsion System Data Sheet

National Aeronautics and Space Administration (NASA)

Artemis Camp Experience

This set of hands-on activities tells the story of NASA's Artemis Program that will land the first woman and first person of color on the Moon. This education resource is sure to bring the excitement of returning to the Moon to the Artemis Generation of Explorers. The Artemis I Student Launch Map is a good companion piece.

Courtesy of NASA

Train Like an Astronaut

Inspire the next generation of astronauts! This program was developed in cooperation with NASA scientists and fitness professionals working with astronauts. The Train Like an Astronaut activities are a physical and inquiry-based approach to human health and fitness on Earth and in space. Students can participate in physical activities modeled after the real-life physical requirements of humans traveling in space.

STEMonstrations

Part of the NASA+ Explore Series, STEMonstrations is a series of videos of ISS astronauts conducting STEM demonstrations and activities in space. These episodes are wonderful to use as anchor phenomena to launch a unit or to reinforce STEM learning.

For Educators

Browse all the NASA K–12 educator resources to spark student curiosity using a variety of lesson plans and hands-on experiments that teach STEM concepts. Through these sustained engagement experiences with authentic content, hands-on inquiry-based experiences and partner-driven collaborations, students will engage in NASA mission activities and provide contributions to NASA's work.

Surprisingly STEM | NASA+

Surprisingly STEM is a video series that highlights exciting and unexpected jobs at NASA. Learn about the broad range of careers behind the agency's missions—beyond the typical associations of rocket scientists and astronauts—and how each person's path to NASA is as unique as the job that they do.

Northrop Grumman

Chat with Changemakers: Aerospace Engineers

Discover Engineering's "Chats with Change Makers" series invites students to meet STEM role models who are working hard to change the world. In this episode, students meet two engineers who worked on NASA's James Webb Space Telescope! Margaret Dominguez, optical engineer at NASA, and Stephanie Hernandez, systems engineer at Northrop Grumman. For more information and related activities about an aerospace career, see Aerospace Engineering Career Information.

Courtesy of NASA/Chris Gunn

Look into the Universe with the James Webb Space Telescope (JWST) Activity Kit

Northrop Grumman led the industry team for NASA's James Webb Space Telescope, the largest, most complex and powerful space telescope ever built. This kit contains a variety of JWST resources for your students to explore this engineering marvel. For more detailed information on the JWST, visit James Webb Space Telescope | Northrop Grumman.

Courtesy of NASA

[Explore the Engineering of the Artemis I Rocket Boosters!]

In November 2022, the Artemis rocket launched successfully from Kennedy Space Center. During the launch, the temperature of the five-segment booster motor chamber gases reached 5,600°F! In this Next Generation Science Standards–aligned lesson, students, as scientists, will use science ideas about energy transfer, insulation and matter to investigate the following question: "How does the design of the Artemis I five-segment booster minimize energy transfer from the rocket propellant to the metal case?"

Smithsonian Science Education Center

[Your Place in Space K–12 Federal Space STEM Resource Collection]

Your Place in Space is a one-stop collection of space-inspired K–12 STEM federal resources from the Smithsonian Institution, NASA, the National Oceanic and Atmospheric Administration, the National Science Foundation, the U.S. Geological Survey, the Department of Defense and other agencies who have space-focused missions.

[Sunlight on the National Mall | Smithsonian Science Education Center]

This 3D simulation from the Smithsonian Science Education Center allows early learners to view the arc of the Sun as it moves throughout the day over the Smithsonian Castle and in two separate seasons: winter and spring. Students can view the Sun rising and setting on the National Mall in full 360° and use the Sun Data Sheet to record their observations.

[Why is My Shadow Shorter Sometimes and Longer Other Times? | Smithsonian Science Education Center]

This sequence of videos from the Smithsonian Science Education Center leads students through activities to help them answer the question, "Why is my shadow shorter sometimes and longer other times?" Students make and record observations of shadows, develop and use a model to figure out the Sun's apparent daily pattern of motion in the sky, and check the accuracy of their model by observing photographs of the Sun.

Courtesy of Northrop Grumman