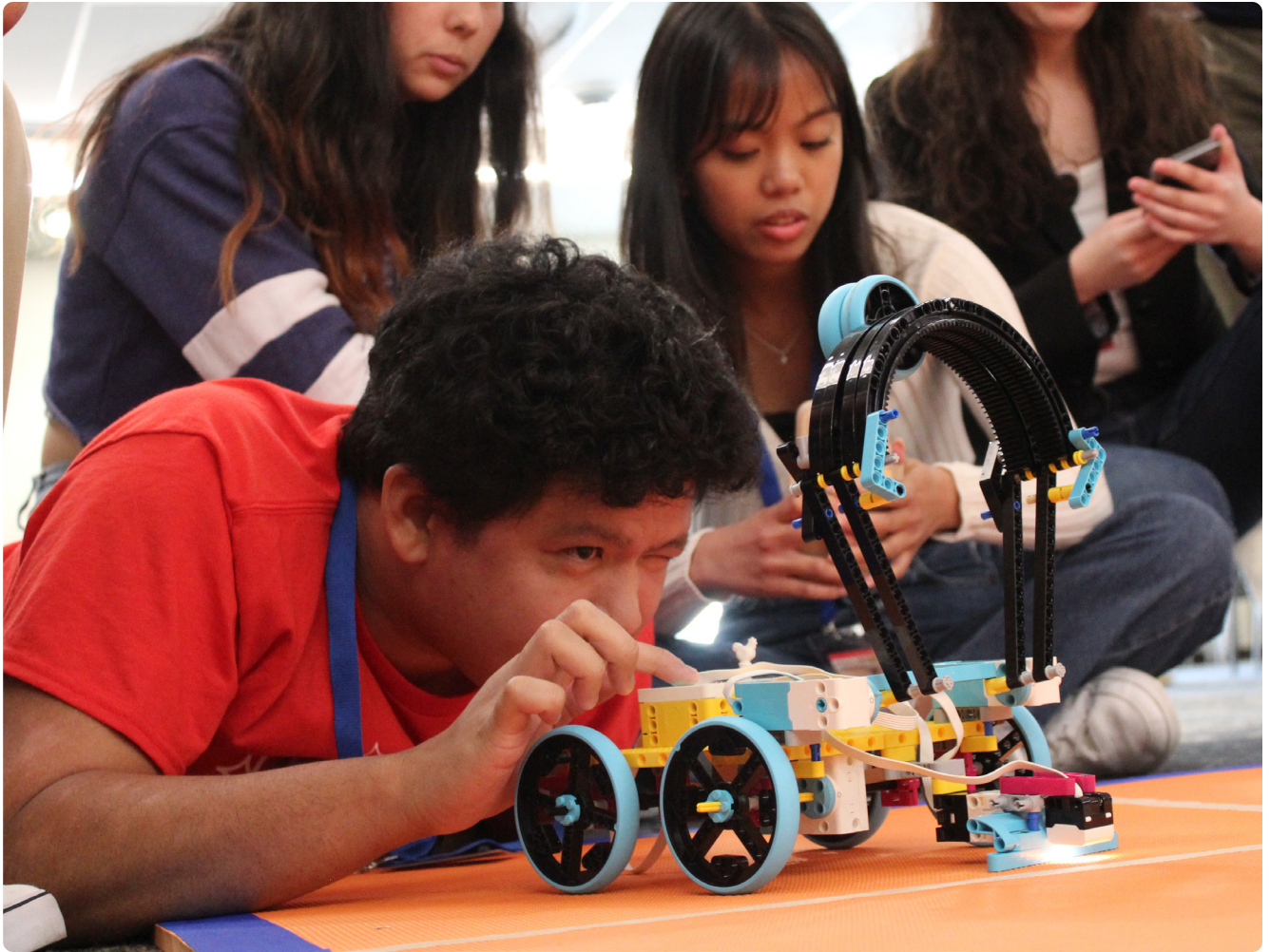




NASA STEM Engagement

Strategic Implementation Plan

2024-2026



College students test their rover before the NASA Community College Aerospace Scholars (NCAS) Mission 3: Innovate Robotics Competition held Aug. 16-19, 2023, at Orange Coast College in Costa Mesa, California. Credit: NASA

Cover: During a visit to the Martin Luther King Jr. Memorial Library in Washington, D.C., NASA astronauts Bob Hines, Kjell Lindgren and Jessica Watkins answered questions from elementary students and then helped conduct science demonstrations led by the Center of Science and Industry of Columbus, Ohio. Credit: NASA

About This Document

NASA's STEM Engagement Strategic Implementation Plan accompanies [NASA's 2022 Strategic Plan](#) Objective 4.3, *Build the next generation of explorers*, which outlines the agency's strategy with regard to Science, Technology, Engineering, and Mathematics (STEM) engagement. This document supports the implementation of the strategy and outlines systemic efforts that support the coordination and execution of NASA's STEM engagement work from 2024 through 2026, when NASA's Strategic Plan is expected to be revised.

About NASA STEM Engagement

NASA is committed to building the next generation of explorers by engaging students in its mission. NASA has a vested interest in attracting, engaging, and preparing future STEM professionals, and the national STEM ecosystem benefits from NASA's contributions to attract and retain students on STEM pathways. NASA's STEM engagement work is vital to ensuring the next generation of explorers have the technical skills needed to continue our nation's work in aeronautics and space into the future.

NASA engages students in its mission through a portfolio of STEM engagement opportunities and resources which are guided by **three strategic goals** from Objective 4.3:

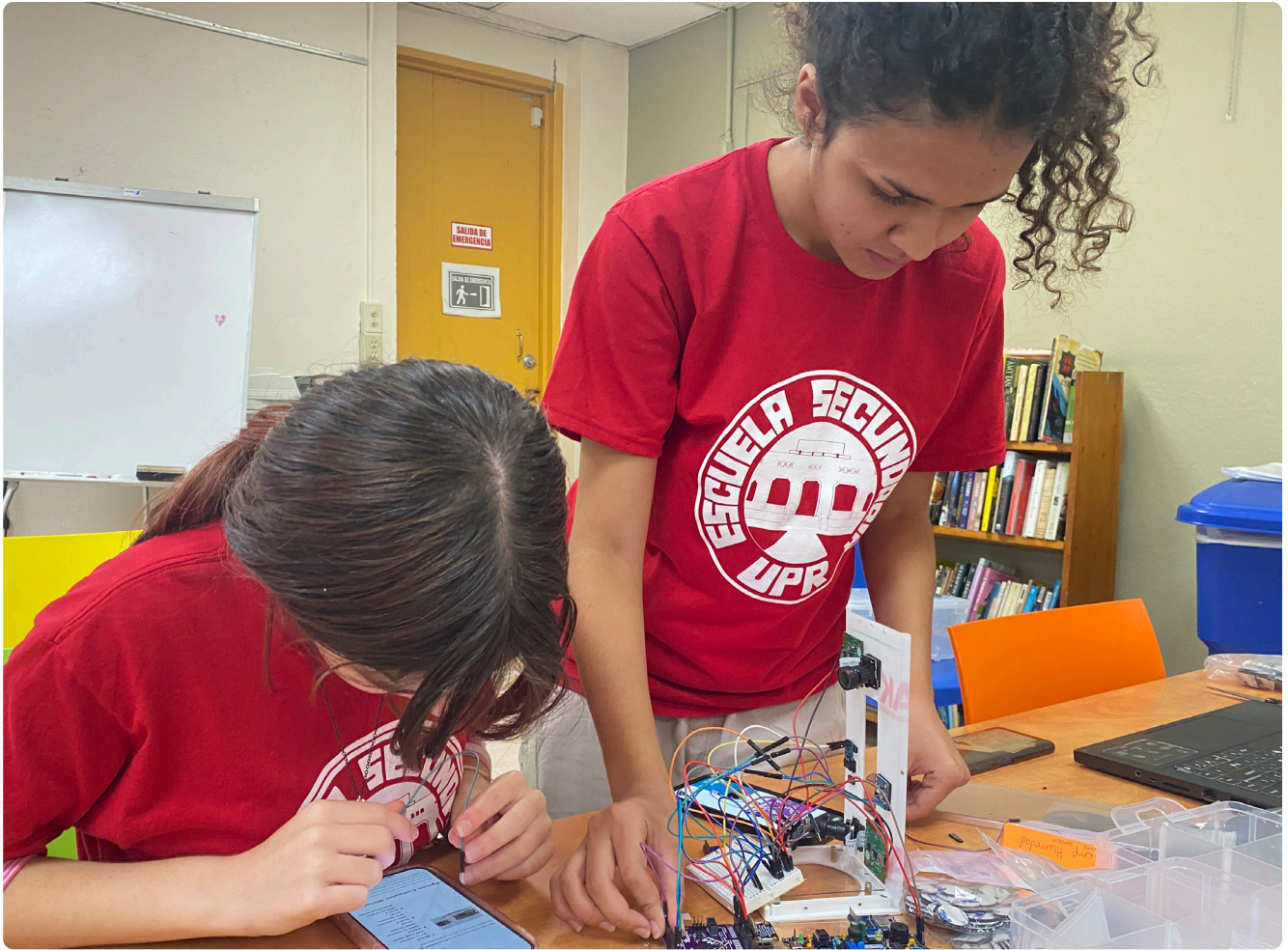
1. Attract diverse groups of students to STEM through learning opportunities that spark interest and provide connections to NASA’s mission and work.
2. Create unique opportunities for a diverse set of students to contribute to NASA’s work in exploration and discovery.
3. Build a diverse future STEM workforce by engaging students in authentic learning experiences with NASA’s people, content, and facilities.

NASA attracts diverse groups of students to STEM through a suite of opportunities and resources for students and educators in K-12 classrooms and informal learning environments. NASA provides internships, fellowships, and student research opportunities that allow a diverse set of students to contribute to NASA’s work in exploration and discovery. Student challenges and competitions allow students to engage in authentic learning experiences with NASA’s people, content, and facilities. NASA also collaborates with educators, educational institutions, and other strategic partners to better reach students across the country.

NASA invests in an integrated portfolio of STEM engagement activities, opportunities, and resources that engage students in authentic NASA learning experiences and build the capacity of educators and institutions to reach students through learning experiences with NASA’s people, content, and facilities. NASA’s investments build the diverse next generation of explorers by fostering student interest in STEM, encouraging pursuit and persistence in STEM degrees and careers, and increasing the capacity of teachers and institutions to engage in NASA’s mission and work.



Student teams ready their rockets for launch during NASA’s Student Launch competition near NASA’s Marshall Space Flight Center in Huntsville, Alabama, April 15, 2023. Credit: NASA



Escuela Secundaria de la Universidad de Puerto Rico’s team tested a wearable radiation sensor made from an algae biomass as part of NASA’s TechRise Challenge. They hope it could be used not only for future space applications but also to address marine algae overgrowth in Puerto Rico. Credit: Escuela Secundaria de la Universidad de Puerto Rico

NASA’s STEM Engagement Operational Structure

NASA provides mission-driven STEM engagement opportunities and resources through strategic and robust collaboration between NASA’s Office of STEM Engagement (OSTEM), NASA’s five mission directorates, and NASA’s field centers.

OSTEM manages [four projects](#) with their own direction, goals, and objectives that contribute to achieving NASA Strategic Plan Objective 4.3. In addition to administering these projects, OSTEM provides cross-cutting support functions to all organizations implementing STEM engagement efforts in NASA, including mission directorates and centers. These functions support:

- The development and implementation of STEM engagement IT tools and platforms, including NASA’s [Learning Resources website](#)
- An [integrated approach to performance and evaluation](#) of STEM engagement activities, including the execution of a [NASA STEM Engagement Learning Agenda](#)
- The development of [strategic partnerships](#) that broaden the reach of NASA’s STEM engagement resources
- An agency-wide approach to [student internships and fellowships](#).



A student team carries their rocket to the launch area during NASA's Student Launch competition near NASA's Marshall Space Flight Center in Huntsville, Alabama, April 15, 2023. Credit: NASA

NASA's [five mission directorates](#) support Objective 4.3 to build the next generation of explorers, and build the future workforce on which these directorates will rely to see their current and future programs and missions to fruition. They plan and execute a portfolio of STEM engagement activities that authentically leverage their current and future programs in space exploration, aeronautics research, and space and Earth system science, as well as their people, to inspire, engage, and educate the next generation. Likewise, NASA centers, which execute mission directorate missions and programs, support the execution of STEM engagement activities in their local communities and states.

NASA's STEM engagement efforts are coordinated through regular, collaborative communication across NASA's STEM engagement community. NASA's STEM Engagement Board facilitates the development of the agency's strategy for STEM engagement and provides high-level guidance on NASA STEM engagement policies and procedures. NASA's STEM Engagement team implements activities in accordance with federal laws, federal directives, and the agency's strategy, and supports day-to-day coordination of these activities.



Students participate in the culminating event of NASA's App Development Challenge at Space Center Houston on April, 16, 2023.
Credit: NASA

Implementing NASA's STEM Engagement Strategy

NASA strives to continuously improve the integration of its STEM engagement activities to better serve its beneficiaries. This document outlines key actions that NASA's STEM Engagement team will undertake to support the continued implementation of NASA's 2022 Strategic Plan between 2024-2026.

These actions are nested under four broad priority areas:

- Advance diversity, equity, inclusion, accessibility, and belonging in NASA's STEM engagement opportunities to **broaden participation** in STEM
- Build and strengthen **strategic partnerships and networks** to engage students, educators, and educational institutions in NASA's portfolio of STEM engagement opportunities
- Create a **beneficiary-focused organizational framework** of STEM engagement opportunities and resources based on NASA's diverse STEM engagement portfolio
- Facilitate **evidence-driven, continuous improvement** of NASA's STEM engagement portfolio to ensure NASA's STEM engagement opportunities are responsive to evolving beneficiary needs

These crosscutting priorities support NASA's STEM engagement efforts as a whole, and will enable more effective day-to-day implementation of NASA's suite of STEM engagement opportunities.

In alignment with the 2022 NASA Strategic Plan, NASA's STEM Engagement Learning Agenda, and federal government evidence-based policy initiatives, NASA has undertaken a rigorous process to assess its progress toward achieving its strategic goals and objectives. NASA's STEM Engagement function measures its progress toward achieving Strategic Objective 4.3 by implementing three performance goals which match the strategic goals. To learn more about NASA's efforts to meet its performance goals, visit the [NASA STEM Engagement Impacts website](#).

The priorities and actions outlined below further NASA's collective efforts toward achieving its strategic and performance goals and strengthen NASA's ability to meet the needs of its beneficiaries.

Advance diversity, equity, inclusion, accessibility, and belonging in NASA’s STEM engagement opportunities to broaden participation in STEM

NASA is committed to building a diverse and skilled future STEM workforce that reflects the diversity of the American people. NASA will continue to advance diversity, equity, inclusion, accessibility, and belonging in its STEM engagement opportunities to inspire and prepare a STEM workforce that includes talented individuals from all backgrounds and life experiences.

Key actions in support of this priority area include:

- Further evidence-based processes, practices, and policies to enable broadening participation within NASA’s STEM engagement opportunities
- Increase access to pre-college learning experiences that connect students with NASA’s people, content, and facilities
- Enable mission-driven connections with HBCUs, TCUs, and other MSIs to promote equity of participation in NASA’s mission and work
- Broaden participation in NASA’s internship programs to develop a diverse future STEM workforce



MUREP PSI students constructing a drone during Fayetteville State University’s 2022 summer residential experience. Credits: NASA

Build and strengthen strategic partnerships and networks to engage students, educators, and educational institutions in NASA’s portfolio of STEM engagement opportunities

NASA is an important part of a complex, national STEM ecosystem that helps engage, inspire, and support students in the pursuit of STEM knowledge and careers. Through partnerships and networks, NASA is able to maximize the impact and reach of its full portfolio of STEM engagement resources and ensure more equitable access to NASA’s inspiring mission and work.

Key actions in support of this priority area include:

- Strengthen external access to resources and technical expertise to bolster efforts to share NASA’s content and mission with students and educators
- Continue the implementation of NASA’s STEM engagement partnerships strategy

Create a beneficiary-focused organizational framework of STEM engagement opportunities and resources based on NASA’s diverse STEM engagement portfolio

NASA offers a diverse range of STEM engagement resources, tools, activities, and opportunities to meet the needs of a wide variety of audiences. The complexity and breadth of the STEM engagement portfolio can be difficult for beneficiaries to navigate, and connections between opportunities may seem unclear. NASA is committed to improving awareness and use of its STEM engagement portfolio to ensure students, educators, and institutions can take full advantage of the breadth of STEM engagement resources provided by NASA.



A student team member, left, instructs a diver on the proper way to test that team’s device in the Neutral Buoyancy Laboratory at NASA’s Johnson Space Center in Houston. The test, which took place in June 2023, was part of Micro-g Neutral Buoyancy Experiment Design Teams (Micro-g NExT), a challenge in which undergraduate student teams develop and test a tool that addresses a current technological need in space exploration. Credit: NASA

Key actions in support of this priority area include:

- Articulate pathways between NASA STEM engagement opportunities to support STEM career readiness
- Ensure communication with beneficiaries reflects the breadth of NASA’s STEM engagement portfolio

Facilitate evidence-driven, continuous improvement of NASA’s STEM engagement portfolio to ensure NASA’s STEM engagement opportunities are responsive to evolving beneficiary needs

The fields of science, technology, engineering, and mathematics constantly innovate and raise new challenges for the STEM education community. Additionally, the needs of the nation’s schools and students are ever evolving; NASA and the national STEM ecosystem must continue to adapt to ensure all students have opportunities to meaningfully engage in STEM. NASA is committed to evidence-based improvement of its STEM engagement portfolio to promote equity of participation in NASA’s STEM engagement opportunities and ensure NASA’s STEM engagement efforts effectively meet the needs of students, teachers, institutions, and other beneficiaries.

Key actions in support of this priority area include:

- Leverage an evidence-based design framework in the development of new STEM engagement opportunities and in the revision of existing opportunities
- Enhance data reporting tools and processes to capture the impact of NASA STEM Engagement more effectively

Engage With NASA STEM



Learn more about NASA STEM Engagement efforts and opportunities at stem.nasa.gov.



Keep up with the latest NASA STEM events and opportunities by subscribing to the **NASA EXPRESS** e-newsletter. Each weekly email features activities to inspire learning and exploration, as well as updates on workshops, internships, contests, and student challenges.



For more NASA STEM inspiration, follow NASA STEM on social media!



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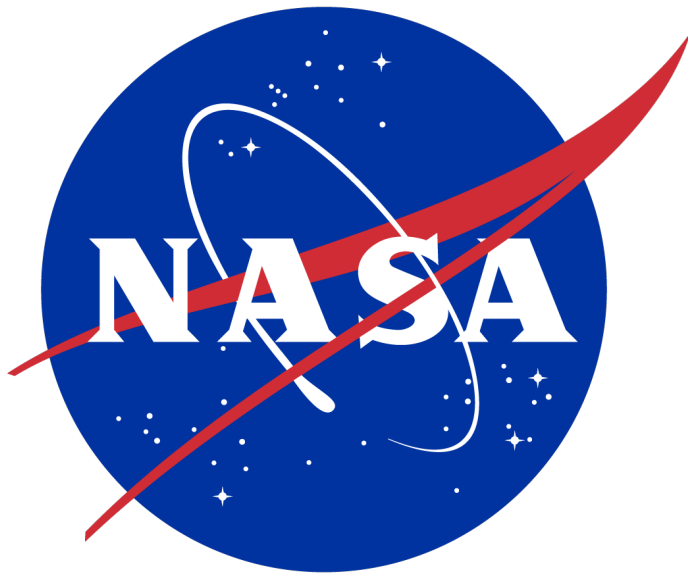


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Authorship note: This document was developed on behalf of NASA's STEM Engagement Council, NASA's internal STEM engagement governance body through May 2024. The Council was replaced by NASA's STEM Engagement Board in June 2024.



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