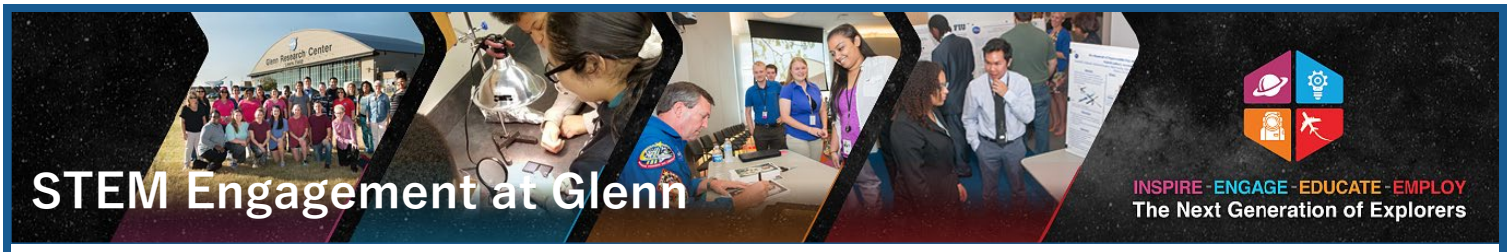

NASA Glenn Research Center – Office of STEM Engagement
Innovative Student Programming

Fall 2022 Solicitation

Solicitation posted:	August 19, 2022
Solicitation URL:	https://paragon-tec.com/funding-opportunities/
Proposal form URL:	**https://forms.gle/mTAbh2bA5dbMQprS7**
Proposal receipt deadline:	**September 16, 2022, 8:00 PM Eastern Time**
Notification of awards:	September 26, 2022
Virtual workshop date:	October 5, 2022
Implementation dates:	October 5, 2022 - November 15, 2022
Final report deadline:	December 1, 2022

PROJECT OVERVIEW

OPPORTUNITY DESCRIPTION

As a leader in innovation, NASA is marking a new era of exploration, discovery, and a quest for human knowledge. NASA is revolutionizing human exploration as we push forward to the Moon and on to Mars, landing the first woman and first person of color on the Moon, using innovative technologies to explore more of the lunar surface than ever before. Working to create a permanent human presence on the Moon, the opportunities for scientific discoveries are limitless. The launch of Artemis I this fall marks the first step in this giant leap back to the Moon.

Figure 1: NASA's Space Launch System (SLS) rocket with the Orion spacecraft aboard is seen atop the mobile launcher as it is rolled up the ramp at Launch Pad 39B, Wednesday, Aug. 17, 2022, at NASA's Kennedy Space Center in Florida.

In aeronautic exploration, NASA is working to create faster, quieter, and cleaner aircraft here on Earth. The possibilities of aircraft flying faster than the speed of sound with no sonic boom, all-electric aircraft, or even aircraft flying on other planets are becoming a reality. In the continued quest to further understand our planet, NASA continues to study the Earth and all it entails. This includes rising sea levels, our atmosphere, the weather, and assisting first responders during natural disasters.

As NASA continues to push the boundaries of exploration, education continues to push the boundaries of student learning. New and innovative ideas for learning have become an integral part of K-12 education to keep up with our ever-changing world. Student learning innovations continue to revolutionize how students learn and engage with STEM content. To effectively reach students, education settings require more new ideas, equipment and innovative digital resources than ever before.

NASA Glenn's Office of STEM Engagement has an interest in engaging local Ohio audiences to achieve the Agency's science, technology, engineering, and mathematics (STEM) education

goals. Goals include advancing the STEM education and workforce pipeline by increasing and enhancing STEM knowledge for students, particularly those currently underrepresented and underserved in STEM fields. To that end, Paragon TEC, Inc., the Education Support Services contractor for the NASA Glenn Office of STEM Engagement, is soliciting proposals from youth-serving organizations and formal and informal education institutions in Ohio to receive materials and supplies as well as virtual professional development for innovative, sustained models of STEM engagement implementing NASA STEM content.

This solicitation is requesting proposals to:

- Implement STEM content in virtual or in-person formal or informal settings
- Support students in grades K-12
- Implement chosen NASA activities between October 5, 2022, and November 15, 2022, with a proposed group of students
- Identify innovative opportunities for student learning and/or ways to address the digital divide

The funding received via this opportunity will create innovative opportunities and/or address the digital divide to ensure sustained models of STEM engagement in K-12 education settings. Students have the opportunity to work on real-world problems in collaborative, team-based environments. Students apply lessons learned to solve problems that STEM professionals may face while gaining a deeper knowledge of how NASA is a part of their everyday lives.

Funding will be awarded through a competitive application process in which up to 10 awards may each receive up to $5,000.00. Based on available funding, Paragon TEC, Inc., will issue full or partial awards on behalf of the Office of STEM Engagement.

This opportunity is designed to provide organizations with:

- Funding for materials and supplies needed to support sustained models of STEM engagement
    - Organizations will propose a number of students to participate fully in the NASA content at their location.
    - Organizations will propose a total amount of funding not to exceed $5,000 for materials and equipment to implement the NASA content virtually.
- NASA activity content documents and related resources
- Help-desk support to assist educators as needed in facilitating the content
- Opportunities for live web-based connections with NASA scientists and engineers

BACKGROUND

NASA GLENN'S OFFICE OF STEM ENGAGEMENT

NASA Glenn's Office of STEM Engagement delivers tools for young Americans and educators to learn and succeed. The office seeks to Create unique opportunities for a diverse set of students to contribute to NASA's work in exploration and discovery; Build a diverse future STEM workforce by engaging students in authentic learning experiences with NASA's people, content and facilities; and Attract diverse groups of students to STEM through learning opportunities that spark interest and provide connections to NASA's mission and work. To achieve these goals, NASA's Office of STEM Engagement strives to increase K-12 involvement in NASA projects, enhance higher education, support underrepresented communities, strengthen online education, and boost NASA's contribution to informal education. The intended outcome is a generation prepared to code, calculate, design, and discover its way to a new era of American innovation. For more information about STEM engagement at NASA Glenn Research Center, visit https://www.nasa.gov/centers/glenn/stem.

NASA OFFICE OF STEM ENGAGEMENT RESOURCES

NASA Glenn's Office of STEM Engagement recognizes the need for innovative, sustained models of STEM engagement, particularly with respect to the digital divide within K-12 education. Solicitation proposals must include a minimum of one chosen NASA activity and any intended or requested NASA resources for implementation. An emphasis should be placed on how the NASA resources will contribute to innovative opportunities for students. Below are example activities from each of NASA's explore campaigns and mission-focused activities. The activities outlined below are a small sampling of the many options available for implementation, however are not required to be used or included in proposals. For more available activities and resources, please visit https://www.nasa.gov/education/materials/.

NASA CONTENT SUMMARY

Module	Standards-Based Content Focus	Synopsis
Make it NASA: *How Would You Measure the Moon?* Grades 5-*8* *https://www.nasa.gov/centers/glenn/stem/make-it-nasa/content-modules/*	NGSS: Engineering Design	Using the Design Thinking Process, students plan and conduct a scientific mission to take measurements on the lunar surface. They design a scientific payload consisting of sensor-microcontroller-transmitter and mount it on a model lunar rover. Students then program the payload to take data and transmit it back to the team. They execute the program and conduct the mission on a 3-foot by 3-foot area of a simulated lunar surface, transmitting at least nine data points back to the team.

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Explore Earth: *Make a Volcano* Grades K-8 https://www.nasa.gov/stem-ed-resources/weather-and-climate-iquest.html	NGSS: ESS1.C,	Students can learn how geologists use stratigraphy, the study of layered rock, to understand the sequence of geological events. As students watch baking soda-vinegar "lava" flow from their clay volcanoes, they will see that the lava follows different paths. They will also learn how to distinguish between older and newer layered flows.
Explore Flight *Robotic Search and Rescue Challenge*Grades 5-8 https://www.nasa.gov/stem-ed-resources/robotic-search-and-rescue-challenge.html	NGSS: MS.ESS3-2, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4	Teams use a programmable robotic ball to design solutions and simulate an unmanned aerial vehicle entering a disaster zone. Set in a post-natural-disaster scenario, students will find solutions to problems that first responders may face.
Explore Humans in Space *Touchdown* Grades 3-8 https://www.nasa.gov/stem-ed-resources/otm-touchdown.html	NGSS: 3-5-ETS1-2, MS-ETS1-1	Students will design and build a shock-absorbing system that will protect two “astronauts” when they land. In this challenge, students follow the engineering design process to (1) design and build a shock-absorbing system out of paper, straws, and mini-marshmallows; (2) attach their shock absorber to a cardboard platform; and (3) improve their design based on testing results.
Explore Moon to Mars *Landing Humans on the Moon* Grades 5-12 https://www.nasa.gov/stem-ed-resources/landing-humans-on-the-moon.html	NGSS: MS-ESS2-2, MS-ETS1-3, MS-LS2-1, MS-PS2-2, MS-PS2-4	Four standards-aligned activities help students learn about the Moon and create a model of a human landing system for the lunar surface. Using science, engineering, and geometry, students design, build and test model spacecraft.
Explore Solar System and Beyond *Planetary (Egg) Wobble and Newton’s First Law* Grades 3-8 https://www.nasa.gov/stem-ed-resources/planetary-egg-wobble-and-newtons-first-law.html	NGSS: 3-PS2-1, MS-PS2-2	Students will observe the motions of spinning eggs to determine which are raw or hard-boiled to parallel how scientists determine whether the center of a planet is liquid or solid. This lesson helps build an understanding of Newton's first law of motion and the center of mass as well as of NASA’s Mars InSight spacecraft, which is gathering data that will help scientists determine the composition of the Martian core.
Explore Space Tech *Build Your Own Spacecraft* Grades K-8	N/A	In this activity, students will become the chief engineer for an important mission as they design a new satellite for NASA. Students will choose the instrumentation necessary to

Module	Standards-Based Content Focus	Synopsis
https://www.nasa.gov/stem-ed-resources/build-your-own-spacecraft.html		accomplish a chosen mission. Students will investigate the different uses of satellites, including helping to study things happening on Earth, taking pictures of planets in our solar system, keeping an eye on our Sun, or even finding planets elsewhere in the universe!
Aeronaut-X *Lower the Boom Citizen Science* Grades 5-8 https://www.nasa.gov/stem-ed-resources/nasas-lower-the-boom-citizen-science-activity.html	NGSS: MS-PS4-1, MS-PS4-2, MS-ESS3-3	Acting as citizen scientists, students will use a free mobile app to collect and submit levels of ambient noise. Students will investigate different noise levels throughout their day and environments. NASA's goal is to lower noise pollution from airplanes. Students' submitted data may be of value to NASA scientists or researchers trying to answer the question "How quiet is quiet enough?" for a sonic boom.
Moon to Mars *Design and Build a Space Habitat* Grades 5-8 https://www.nasa.gov/stem-ed-resources/gateway.html	NGSS: MS-PS2-1, MS-ETS1-1, MS-ETS1-3	Students will work as a team to design and build a model of a space habitat using the engineering design process.
Commercial Crew Program *Eggstronaut Parachute Challenge* Grades K-12 https://www.nasa.gov/stem-ed-resources/eggstronaut-parachute-challenge-educator-guide.html	NGSS: 3-5-ETS1-3, MS-PS2-2, MS-PS3-5, HS-PS2-3, HS-PS3-5	Students will use the engineering design process to construct, test, and analyze a prototype parachute designed to slow the descent of an egg and minimize the force of impact when landing, allowing the "eggstronaut" to land safely.

BENEFITS FOR PARTICIPATING ORGANIZATIONS

VIRTUAL FACILITATOR WORKSHOP

Facilitators or staff trainers will be provided a required virtual facilitator workshop hosted by NASA Glenn Research Center Education Specialists. The workshop will consist of multiple content-specific virtual webinar segments, occurring on October 5, 2022.

- Organizations will propose one or more facilitators to attend the virtual workshop. Proposing organizations should consider reasonable facilitator-to-student ratios when proposing the number of facilitators to be trained.
- Workshop content will be tailored to meet the needs and requests outlined in solicitation proposals.

Awarded organizations will confirm their workshop attendance upon notification of the award.

- Some content may be provided for facilitators to review in advance of workshop attendance, in the form of webinar sessions, instructional videos, or document reviews outlining characteristics of programming or demonstrating specific technology platforms to be used during the workshop.
- Sessions during the virtual workshop will focus on NASA content based on solicitation proposal awardee requests. Participants will have the opportunity to work through the content and equipment to prepare to implement the activities, including learning STEM background information and delivery techniques.

FUNDING

Awarded organizations will receive funding for requested materials to incorporate new and innovative opportunities and/or address the digital divide while implementing NASA content with students. Organizations can have an unlimited number of students and facilitators participate in NASA programming; however, total funding provided through this opportunity for student materials and equipment will not exceed $5,000.00. Upon successful completion of the facilitator workshop, the initial 75% of funding will be provided. The remaining 25% of materials support will be provided upon successful submission of final reporting requirements by December 1, 2022.

IMPLEMENTATION SUPPORT FROM NASA EXPERTS

Awardees will receive support throughout implementation via email and virtual meetings with NASA education specialists. Sites may request specific web-based facilitator training sessions as needed. As a collaborating organization with NASA Glenn, sites may request virtual connections between their students and NASA scientists and engineers to discuss the scientific and engineering concepts related to the NASA content and STEM careers.

ELIGIBILITY REQUIREMENTS

This solicitation seeks:

- Organizations located in Ohio.
- Organizations that will reach students in Kindergarten to 12th grade. Greater consideration is given to organizations that are able to reach underrepresented and underserved students. For the purposes of this solicitation, groups underrepresented in STEM fields include Hispanics and Latinos, African Americans, American Indians, Alaska Natives, Native Hawaiians, and Pacific Islanders, the economically disadvantaged, people with disabilities, and women and girls.
- Organizations that will facilitate the entire chosen NASA content during the timeframe of October 5, 2022, through November 15, 2022.
- Organizations that can recruit and retain the proposed number of students through the full NASA activity implementation. Organizations with greater student reach are highly desirable.
- Organizations that are committed to providing their staff with professional development opportunities, including the virtual facilitator workshop.

The proposed program must:

- Serve students in grades K-12.
- Provide all proposed students with the chosen NASA content and needed equipment to implement innovative opportunities and/or address the digital divide.
- Be conducted during the implementation period of October 5, 2022, through November 16, 2022.

Selected organizations must agree to the following:

- One or more designated facilitators must participate in the virtual training session hosted by NASA Glenn's Office of STEM Engagement's Education Specialists on October 5, 2022.
- Organizations must complete their chosen NASA content with the number of students written in their proposal.
- Organizations must provide a final report, including a description of any NASA content adaptations created as a result of the solicitation.

Evaluation Requirements:

All awarded organizations must provide a final data report. Details and a reporting template will be provided to awarded organizations. The final data report must include the following:

- A brief narrative of the implementation of the activities with the students
- Student and facilitator participation data (anonymized)
    - Number of students (by each grade level)
    - Number of educators/facilitators (certified teachers, pre-service teachers, informal educators)
    - Demographic data for students and educators/ facilitators (gender, ethnicity, and race)
- Model of implementation
    - When did the program take place (after school every day, half-days on Saturday, etc.)?
    - How were NASA content activities used?
        - Any NASA content adaptations created for implementation
    - When did virtual connections with NASA scientists and engineers occur?
- Signed budget summary
- Stories, images, and media release forms of all participants whose likenesses are featured
- Any partnerships and/or collaboration data pertaining to the NASA content implementation

SUBMITTING YOUR PROPOSAL

All proposals are to be submitted through the online proposal form, which is located here. Proposals must be submitted by 8:00 PM Eastern on September 16, 2022. Only proposals submitted online will be accepted.

Proposals must be completed in full at the time of submission, so it is encouraged to prepare responses prior to beginning the online proposal form. A list of the proposal form questions for reference is available here.

A budget document must be submitted as part of your proposal, indicating both funds requested from NASA and a description of any funds or supplies to be leveraged from other sources. An editable budget template is available here. The Facilitator Travel category does not apply to this opportunity and should be left blank.

PROPOSAL REVIEW PROCESS

Proposals are reviewed by a panel of experts. Full or partial awards may be granted. Award funds are distributed after participation in the virtual facilitator workshop.

Proposals will be evaluated to determine the likelihood of project success using the following criteria:

- Number of proposed student participants
- Percentage of students from underrepresented populations as defined in the solicitation
- Plans to recruit and retain student participation in the program
- Alignment of the program's goals and objectives to those of this opportunity
- Reasonability of funding requested based on expected numbers of participants and leveraging of additional resources beyond this solicitation
- Identified innovative opportunities and/or ability to address the digital divide to incorporate NASA content into student learning
- Likelihood for delivery of quality STEM programming demonstrated through relevant STEM experience

Proposing organizations will be notified of their award status by September 26, 2022.

AWARD ADMINISTRATION INFORMATION

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POINT OF CONTACT

If you have questions about the project or the online proposal form, contact:
NASA Glenn Research Center Office of STEM Engagement
GRC-Ed-Opportunities@mail.nasa.gov