

NASA SPARX Challenges and Competitions

NATIONAL PARTNER SOLICITATION

Next Gen STEM



Solicitation Opening Date: July 27, 2021

Solicitation Closing Date: August 15, 2021

Solicitation Award Date: August 27, 2021



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INTRODUCTION

As a leader in science, technology, engineering, and mathematics (STEM), the National Aeronautics and Space Administration (NASA) is committed to enhancing the STEM literacy of the public and inspiring the next generation to explore our planet, solar system, the universe and their own potential. To accomplish this, NASA's Office of STEM Engagement (OSTEM) explores innovative approaches to engage the nation in NASA's missions and research. NASA SPARX (**S**parking **P**articipation **A**nd **R**eal-world **E**xperiences in STEM) Challenges and Competitions is a pilot initiative from NASA's Next Gen STEM project that aims to broaden student participation in agency STEM opportunities with a focus on underserved and underrepresented communities. Applicants are encouraged to also read [Appendix C – Technical Narrative](#) to learn more about how this opportunity aligns with NASA OSTEM's strategic goals.

SOLICITATION OVERVIEW

Paragon TEC, a support services contractor for NASA's Office of STEM Engagement, is soliciting proposals from eligible organizations to support the 2021 – 2022 implementation and evaluation of NASA SPARX. This yearlong nationwide activity uses evidence-based educational challenges and competitions to engage pre-college youth and educators with NASA missions and STEM content. Paragon TEC is seeking six partner organizations to identify, recruit, and retain a minimum of 1,800 K-12 students to participate across 12 activities with varying levels of complexity and rigor.

Funding will be awarded through a competitive application process. The maximum award is \$50,000 each for up to six partners, with an overall solicitation funding total of \$300,000.

Proposals are due August 15, 2021 by 11:59 p.m. EDT. Awardees will be notified by August 27, 2021, and implementation will begin October 1, 2021.

The information in the subsections below details the benefits, eligibility requirements, timeline, and proposal instructions.

BENEFITS FOR AWARDEES

This opportunity will provide selected organizations with:

- Funding (up to \$50,000) for educator stipends, materials and supplies, computer equipment and services, and other educator tools needed to support the implementation of NASA SPARX Challenges and Competitions;
- NASA SPARX 2021-2022 activity content and engagement opportunities;
- Help desk support to assist facilitators as needed with implementation and evaluation requirements; and
- Opportunities for live online connections with NASA subject matter experts, as available.

ELIGIBILITY REQUIREMENTS

Eligible applicants are: (1) formal educational institutions, and (2) informal educational institutions, including organizations with established educator networks. For the purposes of this solicitation, formal education institutions are those providing traditional classroom education from kindergarten through 12th grade, including schools, school districts, state education departments and university systems. Informal educational institutions include museums, science and technology centers, and similar nonprofit education organizations that are organized to provide high-quality STEM experiences directly to students through educator networks outside of the classroom.

Additional eligibility requirements include:

- Must be a corporation, limited liability company or non-profit organized under U.S. law;
- Must establish a primary point of contact that is a U.S. citizen (or permanent resident), at least 18 years of age, and full-time employee of the organization;
- Must establish a secondary point of contact that is at least 18 years of age, and full-time employee of the organization or partnering organization identified in the application;
- Must agree to an acceptable use policy with respect to the NASA name, insignia, and all other branding in association with this solicitation;
- Must not concurrently be the recipient of a NASA grant or award; and
- Must sign a media release form granting Paragon TEC and NASA rights to reproduce or rebroadcast any content related to NASA SPARX and coordinate media release forms for educator and student participants as required.

TIMELINES AND KEY MILESTONES

The following timelines include important application, program implementation, and evaluation dates, including deliverables. **All times are Eastern Time Zone (ET).** Applicants are expected to engage for the entire period of performance. Timelines are tentative and subject to change. Awardees will be notified of any changes.

Solicitation Timeline

- July 27, 2021 - Application window opens
- July 29, 2021 (3:30 p.m. – 4:30 p.m. ET) - FAQ webinar 1 for applicants
- August 3, 2021 (12:00 p.m. – 1:00 p.m. ET) - FAQ webinar 2 for applicants
- August 15, 2021 – Application window closes at 11:59 p.m. ET
- August 27, 2021 – Selection of awardees and notification to applicants
- September 1, 2021 – Awardee acceptance and execution of Letters of Commitment
- Week of September 13, 2021 – Awardee Kickoff Meeting
- September 17, 2021 – 75 percent of award amount issued as check to awardees
- September 27, 2021 – Public announcement of awards
- October 1, 2021 – NASA SPARX implementation begins
- April 30, 2022 – NASA SPARX implementation ends
- May 16, 2022 – Final closeout report due
- June 13, 2022 – Approval of closeout report and final award of 25 percent to awardees

It is highly recommended that applicants attend one of the FAQ (Frequently Asked Questions) Webinars. Paragon TEC will present the same information at both FAQ webinars. The webinars will also be recorded and archived for those unable to attend the live session. Please register online at the following link: <https://forms.gle/NrGmR5jiz3nqWbh67>. Following your registration, you will receive an email with login instructions for Microsoft Teams and information on how to access the archived recording following the live session.

NASA SPARX Timeline

- September 23, 2021 – Deadline for educators to register for fall and yearlong sessions
- Week of October 4, 2021 – Start of fall and yearlong sessions
- December 2, 2021 – Culmination of fall session
- January 13, 2022 – Deadline for educators to register for spring session
- January 27, 2022 – Start of spring session
- Week of April 4, 2022 – Culmination of spring and yearlong sessions

Evaluation Timeline

- Week of September 13, 2021 – Introduction session/evaluation overview
- Late October to early November 2021 – Midpoint focus group for fall session
- Early December 2021 – Lessons learned focus group for fall session and midpoint focus group for yearlong session
- Late February 2022 – Midpoint focus group for spring session
- Mid- to late-April 2022 – Lessons learned focus groups for spring and yearlong sessions

PROPOSAL INSTRUCTIONS

Please review this entire solicitation document before submitting your proposal. Additional details about requirements and expectations can be found in the [Awardee Requirements and Expectations section \(page 9\)](#). The [Proposal Process](#) is also outlined with information about application scoring and review on page 13. All applications must be submitted through the online application form, which is located at: <https://forms.gle/CNtbwM1rU3y8ySTW8>.

All submissions are due by August 15, 2021, 11:59 p.m. EDT.

NASA SPARX PROGRAM DESIGN

The NASA SPARX Challenges and Competition will leverage Webb’s Depth of Knowledge (DoK) framework to organize NASA educational content by DoK level, allowing educators to select the appropriate level of engagement for their students.

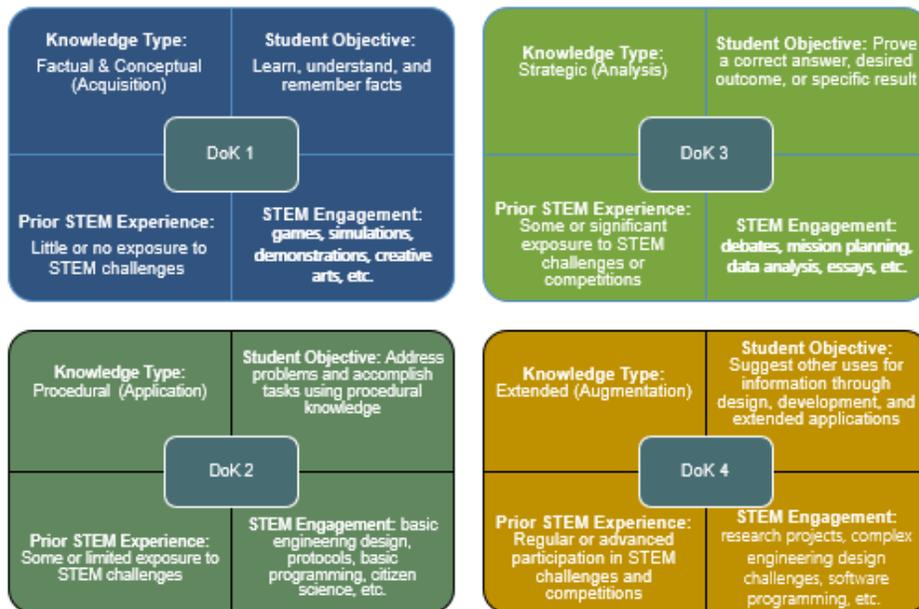
WEBB’S DEPTH OF KNOWLEDGE (DoK)

For more than two decades, Webb’s DoK has been used to categorize educational activities according to the level of complexity in thinking (e.g., Webb, 1999). The framework consists of four levels--with the first, DoK 1, being the least complex and the last, DoK 4, being the most complex. The goal of the DoK framework was to establish learning context in which students experience rigor and depth in learning. DoK provides a way of referencing and framing how students learn and engage with educational content. It helps to establish a common language for understanding “rigor,” or cognitive demand. The DoK framework aligns with Benjamin Bloom’s Taxonomy for Educational Objectives (or just Bloom’s Taxonomy). Briefly, each of the four DoKs as NASA will be implementing is as follows:

- **DoK 1:** This level encourages students to learn and understand facts and basic STEM processes. Participants will be engaged in activities to acquire knowledge such as games, simulations, demonstrations, creative arts projects, etc. Recommended for students with little or no exposure to STEM challenges.

- DoK 2:** This level will challenge participants to apply knowledge and accomplish basic STEM tasks. Participants will be engaged in activities such as basic engineering design, protocols, basic programming, citizen science, etc. Recommended for students with some or limited exposure to STEM challenges.
- DoK 3:** This level is a competition focusing on knowledge analysis to justify a solution. Registered teams will compete against other registered teams. Teams will be tasked to use strategic thinking and reasoning to analyze, evaluate and justify STEM-based decisions using activities such as debates, mission planning, data analysis and essays. Recommended for students with some or significant exposure to STEM challenges or competitions.
- DoK 4:** This competition level focuses on knowledge augmentation to complete complex challenges. Registered teams will compete against other registered teams. Participants are tasked to synthesize information from multiple sources in activities such as research projects, complex engineering design challenges, software programming, etc. Recommended for students with regular or advanced participation in STEM challenges and competitions.

The framework for NASA SPARX Challenges and Competitions by DoK level is outlined below.



Student engagement opportunities include educational challenges at DoK 1 and 2 and challenges with competitions at DoK 3 and 4. Through an online registration, selected awardees will identify educators with students in grades K-12 to participate in each of the DoK levels for all four of the NASA mission-focus areas.

NASA MISSION-FOCUS AREA STRANDS

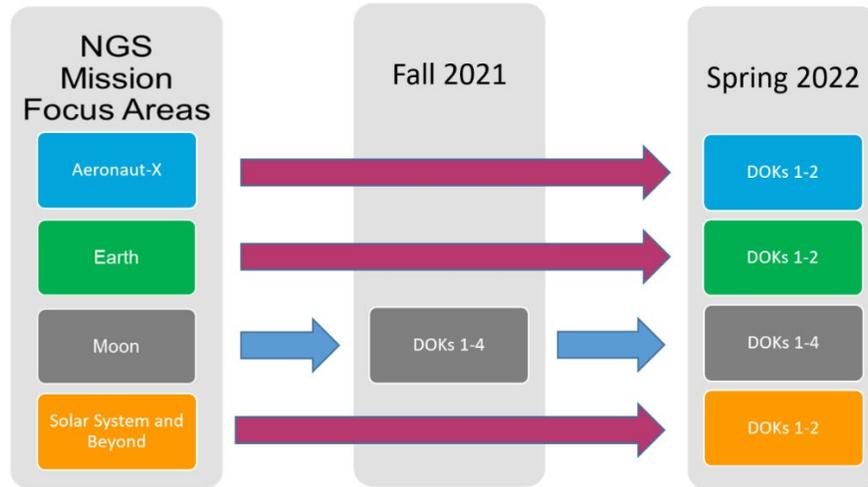
The NASA SPARX Challenges and Competitions will be organized into four strands aligned with different NASA mission-focus areas. These include Aeronaut-X, Earth, Moon and Solar System and Beyond.

- The **Aeronaut-X** strand will include challenges and competitions related to the science of flight and may utilize educational modules on NASA's X-Plane, the science of sound and the sonic boom, urban air mobility and unmanned aircraft systems.
- The **Earth** strand will include challenges and competitions connecting students to their home planet Earth, with a focus on STEM concepts for everything in and below low-Earth orbit including the International Space Station.
- The **Moon** strand will include challenges and competitions related to NASA's Artemis mission to return to the Moon as well as challenges regarding the agency's integrated space transportation systems and platforms including the Orion capsule, the Space Launch System (SLS) rocket and the Gateway orbiting lunar outpost.
- The **Solar System and Beyond** strand will include challenges and competitions related to our journey to Mars and beyond and may include educational modules focused on the Perseverance rover, Ingenuity robotic helicopter and the James Webb Space Telescope.

IMPLEMENTATION PERIOD

NASA SPARX Challenges and Competitions will be implemented during three sessions: fall, spring, and yearlong. The fall session will kick off in October 2021 and culminate in December 2021. The spring session will start in January 2022 and conclude in early April 2022. Yearlong competitions span both the fall and spring sessions. DoK levels 3 and 4 are yearlong commitments beginning in the fall and ending in the spring, while DoK levels 1 and 2 take place within a fall or spring session.

Awardees will be expected to identify, recruit and select educators and their students to participate in different sessions (fall and spring) for each of the DoK levels across all four NGS mission-focus areas. In the fall, NASA SPARX will include challenges and competitions for DoK levels 1 through 4 of the Moon strand. In the spring, the program will expand to include DoK levels 1 and 2 in the Aeronaut-X, Earth and Solar System and Beyond strands and will also repeat DoK levels 1 and 2 for the Moon strand.



Awardees will identify educators and students to participate in fall, spring, and yearlong implementation periods.

ADDITIONAL DETAILS ABOUT MISSION-FOCUS AREA CHALLENGES AND COMPETITIONS

At this time, DoK 1 and DoK 2 activities for Aeronaut-X, Earth and Solar System and Beyond strands are not finalized. The challenges will (1) include activities based on facts and concepts, (2) require little to no previous exposure to STEM principles, and (3) incorporate possible additional activities such as games, trivia or creative simulations. DoK 1 and DoK 2 activities will only be available in the spring for the Aeronaut-X, Earth and Solar System and Beyond strands.

Moon Strand DoK Levels Information

The Moon strand will pilot the following model in the fall, spring, and yearlong sessions.

Astro-Not-Yet (DoK 1)

Astro-Not-Yet is a challenge where students learn and understand facts about NASA’s Artemis program and basic needs to support living and working on the lunar surface. They will express their knowledge by participating in gamified activities, scavenger hunts, virtual field trips, hands-on lessons, and graphic organization. Awardees will be expected to recruit different students for the fall and spring sessions.

Astronaut Candidate (DoK 2)

Astronaut Candidate is a challenge where students will apply knowledge by designing, creating, and showcasing a model of a lunar base camp to support two astronauts living and working on the lunar surface for two weeks in the lunar South Pole region. Awardees will be expected to recruit different students for the fall and spring sessions.

Astronaut (DoK 3)

Astronaut is a challenge where students investigate the lunar South Pole region and justify a choice for a landing site in a debate competition. Participants will attend live virtual connections to hear from NASA subject matter experts to learn about NASA Artemis missions and lunar landings sites. These events will provide students the opportunity to ask questions and gather information to formulate their debate arguments.

Registered teams will compete against other registered teams. Debate teams will register based on grade level, middle school (grades 5-8) or high school (grades 9-12). The full program will include a series of practice debates, qualifying rounds and a championship debate tournament that will take place at the virtual culminating event. The top four teams in each grade band will meet to determine the winner for their respective grade level. The teams will debate in a pool play format to determine an overall winner. The debate tournament is a yearlong commitment beginning in the fall and culminating in the spring.

Each team will have a minimum of two and maximum of four students speaking at each debate round. There is no limit to the number of student participants per organization and teams can select different students to participate in each debate round. Non-speaking team members are encouraged to contribute through real-time information gathering and fact-checking of the opposing team.

Mission Commander (DoK 4)

Mission Commander is a coding activity that is part of NASA's App Development Challenge (ADC) where teams use provided data to visualize communication links surrounding the Moon. Registered teams will compete against other registered teams. The ADC is a yearlong commitment beginning in the fall and culminating in the spring.

The coding challenge will enable student teams to utilize development tools to solve a real-world challenge relevant to mission planning and exploration activities. This rigorous challenge will require educator and facilitator knowledge of coding platforms and computer science. Alternatively, a team may seek out a community mentor with this expertise for guidance.

AWARDEE REQUIREMENTS AND EXPECTATIONS

REACHING THE UNDERREPRESENTED AND UNDERSERVED

The terms *underserved* and *underrepresented* are often interchanged, particularly as they relate to the sciences and engineering disciplines. The term *underrepresented* in science and engineering refers to a minority group whose numbers constitute a disproportionately smaller percentages of employed scientists and engineers than they do of the U.S. population. The term *minority* refers to American Indian, Alaska Native, Black (not of Hispanic origin), Hispanic (including persons of Mexican, Puerto Rican, Cuban, and Central or South American origin), Pacific Islander or other ethnic groups underrepresented in science and engineering. In the STEM arena, *underserved* typically has referred to women and persons with disabilities.

Applicants will be evaluated, in part, based on their ability to reach student populations historically underserved and/or underrepresented in STEM, including students in low income communities, students of color, females, students living in rural communities, and students with special educational needs. The ability to scale efficiently and reach a broader community of educators and students is a primary objective of this solicitation.

TARGET PARTICIPANT NUMBERS

The tables below represent a recommended minimum expectation of student participation in the fall, spring and yearlong sessions by DoK Level and mission-focus area to reach the minimum goal of 1,800 students per awardee. Applications will be scored, in part, by the applicant's ability to meet these minimum standards. However, applicants will receive higher scores if they can exceed these minimums. DoK levels 3 and 4 of the Moon strand are targeting approximately 6 teams from each awardee (3 middle school and 3 high school teams).

FALL 2021 (October - December) Student Participation by Strand and DoK Level

	Aeronaut-X	Earth	Moon	Solar System	Subtotal
DoK 1			150+ students		150+ students
DoK 2			150+ students		150+ students
Subtotal			300+ students		300+ students

SPRING 2022 (January - April) Student Participation by Strand and DoK Level

	Aeronaut-X	Earth	Moon	Solar System	Subtotal
DoK 1	150+ students	150+ students	150+ students	150+ students	600+ students
DoK 2	150+ students	150+ students	150+ students	150+ students	600+ students
Subtotal	300+ students	300+ students	300+ students	300+ students	1,200+ students

YEARLONG (October 2021 - April 2022) Student Participation by Strand and DoK Level

	Aeronaut-X	Earth	Moon	Solar System	Subtotal
DoK 3			150+ students		150+ students
DoK 4			150+ students		150+ students
Subtotal			300+ students		300+ students

STUDENT TOTALS (Fall, Spring and Yearlong)

	Aeronaut-X	Earth	Moon	Solar System	Total Students
Total Students	300+ students	300+ students	900+ students	300+ students	1,800+ students

Applicants are expected to identify, recruit and retain a minimum of 1,800 students across grade bands, mission-focus areas, and DoK levels in the fall, spring and yearlong sessions.

MONITORING AND EVALUATION REQUIREMENTS

Data are a critical component to ensure that Paragon TEC and NASA evaluate this pilot program's effectiveness at achieving the stated objectives.

Awardees will be asked to provide metrics through a reporting template regarding student and educator participation on a monthly basis. Specifically, awardees will be asked to provide the following data by grade level and DoK level/mission-focus area:

- Number of students who participated in some portion of NASA SPARX;
- Number of students who completed at least 50% of a NASA SPARX session;
- Number of educators or facilitators who worked directly with students for some portion of NASA SPARX;
- Percentage of students identifying as Female;
- Percentage of students identifying as American Indian or Alaska Native;
- Percentage of students identifying as Asian;
- Percentage of students identifying as Black or African-American;
- Percentage of students identifying as Hispanic or Latinx;
- Percentage of students identifying as Native Hawaiian or Other Pacific Islander;
- Percentage of students identifying as Two or More Races;
- Percentage of students considered economically disadvantaged (i.e., eligible for free or reduced price meals under the National School Lunch Program);
- Percentage of students eligible for services under the Individuals with Disabilities Education Act (IDEA).

Additional metrics may be incorporated into the reporting template to support the evaluation of the pilot program.

All awardees must provide a final closeout report. A closeout report template will be provided to awarded institutions. The final data report must include the following:

- A narrative of the implementation of the activities with the students;
- Student and facilitator participation data (aggregate and anonymized), including:
 - Number of students (by each grade level);
 - Number of educators/facilitators (certified teachers, pre-service teachers, informal educators); and
 - Demographic data (gender, ethnicity, and race);
- Model of implementation (i.e. in-school program, after-school program, weekend program or other model);
- When the program took place (every morning, half-days on Saturday, etc.);
- What DoK levels and mission-focused activities were implemented;
- Detailed description of the data collection process;
- Comprehensive signed budget summary;
- Best practices, lessons learned, descriptions of challenges and successes, suggestions to NASA and Paragon TEC for additional support for mitigating those challenges;
- Stories and images of participants (sites are required to obtain and submit signed media release forms for all people whose likenesses are featured in a submitted photo); and
- Any additional third-party partnerships and/or collaborations pertaining to the implementation of NASA SPARX.

Awarded institutions and organizations will be asked to participate in one or more of the following evaluation activities to help improve NASA SPARX Challenges and Competitions. By applying, institutions and organizations agree to participate in the following:

- Award kickoff meeting evaluation overview;
- Midpoint and end of session focus groups for educators/facilitators;
- Lessons learned meeting; and
- Student and/or educator participant surveys.

AWARD KICKOFF MEETING

Applicants will identify at least two representatives to attend a virtual award kickoff meeting. Awardees must inform Paragon TEC of the selected representatives from the institution upon notification and acceptance of their award. The award kickoff meeting will include informational sessions about each of the DoK levels and mission-focus areas, evaluation requirements, and reporting expectations. Some content, in the form of documents or instructional videos, may be provided for awardees to review in advance of meeting attendance.

PROPOSAL PROCESS

APPLICATION INSTRUCTIONS

All applications will be completed online. Applications may not be revised after submission, and proposers are encouraged to prepare all responses prior to online submission. Applications will include the following:

- A short description of the organization and detailed contact information for two points of contact and the institution;
- A forecast of student reach including targets for underserved and underrepresented groups;
- A geographical breakdown of student reach;
- A forecast of educators and facilitators to be recruited to support the program;
- A summary of the program implementation including selected DoK levels and mission-focus area strands;
- A summary of the methodology to be used to meet data collection requirements; and
- Affirmation that eligibility requirements are met and the application is complete and accurate.

The application must be completed in one session--**application progress cannot be saved**. A list of the application questions for reference is available in [Appendix A – Solicitation Application Questions](#). Applicants are encouraged to complete their application offline before inputting their data into the online submission form. Only applications submitted online will be accepted.

All solicitation materials can be found at: <https://paragon-tec.com/funding-opportunities/>.

Submitting Your Application

All applications are to be submitted through the online application form, which is located at: <https://forms.gle/CNtbwM1rU3y8ySTW8>. Submissions are due August 15, 2021, 11:59 p.m. EDT.

PROPOSAL EVALUATION AND REVIEW PROCESS

Applicant proposals must, at a minimum:

- Serve underrepresented and/or underserved students in grades K-12;
- Articulate a plan to recruit and retain educators and students to participate in the NASA SPARX Challenges and Competitions across grade levels, and ensure participation at all DoK levels;
- Incorporate all four NASA mission-focus areas into the design of the program;
- Outline a strategy using evidence-based approaches to ensure data is collected in a timely, accurate and comprehensive way detailing the reach into underserved and underrepresented communities;
- Achieve regional, multi-state, or national scalability; and
- Reach a minimum of 1,800 students across all DoK levels and all mission-focus areas.

Competitive Review Process

Funding will be awarded through a competitive application review process. Paragon TEC may elect to make full or partial awards based on proposals received. Paragon TEC reserves the right to award up to six applicants.

To ensure the program serves diverse communities nationwide, it is the intent of this solicitation to select three partners serving students in the western United States and three partners serving students in the eastern United States representing urban, suburban and rural communities. Paragon TEC reserves the right to consider geographic representation as a selection criteria to meet this goal.

Scoring Proposals

Complete applications will be reviewed and evaluated by a panel of experts from Paragon TEC using the rubric outlined in [Appendix B – Solicitation Rubric and Scoring](#).

Selection of up to six applicants will be determined by the highest score on the rubric. In the case of a tie, Paragon TEC may request additional information beyond that which is included in the

original application of all tying organizations; non-tying organizations are not eligible for increased score based on tie-breaking considerations. If any potential awardee declines Paragon TEC's offer, the next highest scoring applicant will be considered.

Quantitative metrics for evaluation include:

- # of students reached;
- # of educators committed;
- % of underserved/underrepresented students reached;
- # of states and/or communities reached (i.e. multi-state); and
- Efficient use of funding.

Qualitative metrics for evaluation include:

- A detailed and innovative approach to program implementation, recruiting and retention of educators and students;
- Experience and/or expertise in managing student debates or debate competitions;
- Experience and/or expertise in managing computer science and coding activities;
- A detailed methodology for data collection that meets requirements; and
- Prior engagement with NASA resources or relevant experience.

Proposals will first be evaluated to determine if they meet minimum eligibility requirements. Proposals that do not meet the minimum requirements will not be scored. A follow-up email notification will be sent to both selected and non-selected proposers. Awardees will be notified by August 27, 2021, and implementation will begin October 1, 2021.

AWARD DISTRIBUTION

Awarded institutions will receive funding from Paragon TEC to supplement costs of materials and supplies to implement the NASA SPARX challenges and competitions. Initial funding provided will be 75 percent of the total award approximately one week after the completion of the award kickoff meeting in September. The remaining 25 percent will be provided within 21 days following completion of all evaluation activities and successful submission of final reporting requirements.

TECHNICAL ASSISTANCE AND SUPPORT

Paragon TEC will provide technical assistance and support to awardees based on their unique needs. Technical assistance may include:

- Help desk support during the hours of 9 a.m. ET to 4 p.m. ET; and
- Implementation support from Paragon TEC via email, phone, or video calls.

If you have questions about Paragon TEC's NASA SPARX Challenges and Competitions solicitation including questions about the application process, please contact:

Paragon TEC Partnership Development Team

partnerships@paragon-tec.com

ADDITIONAL RESOURCES

The following links are to resources that may help inform the applicant prior to completing an application submission.

- Difference between Webb’s Depth of Knowledge and Bloom’s Taxonomy
<https://www.synergiseducation.com/blooms-taxonomy-and-webbs-depth-of-knowledge/>
- NASA Next Gen STEM Website
<https://www.nasa.gov/stem/nextgenstem/index.html>
- National Science Foundation Report on “Women, Minorities, and Persons with Disabilities in Science and Engineering”
<https://nces.nsf.gov/pubs/nsf21321/report>

REFERENCES

U.S. Department of Education (2017). Office of Elementary and Secondary Education: Science, Technology, Engineering, and Math (STEM). Retrieved from <https://oese.ed.gov/stem/>

U.S. Census Bureau (2019). QuickFacts: United States. Retrieved from <https://www.census.gov/quickfacts/fact/table/US/PST045219>

Webb, N. L. (1997). *Criteria for alignment of expectations and assessments in mathematics and science education. (NISE Research Monograph No. 6)*. Madison: University of Wisconsin-Madison, National Institute for Science Education. Washington, DC: Council of Chief State School Officers. <https://eric.ed.gov/?id=ED414305>

Webb, N. L. (1999). *Alignment of science and mathematics standards and assessments in four states. (NISE Research Monograph No. 18)*. Madison: University of Wisconsin-Madison, National Institute for Science Education. Washington, DC: Council of Chief State School Officers. <https://eric.ed.gov/?id=ED440852>

APPENDIX A – SOLICITATION APPLICATION QUESTIONS

Section 1 includes contact information for two representatives from the applying institution or organization. Secondary point of contact may also represent a partnering organization if identified in the proposal. The questions include name, phone number, and email address. Please use official business contact information only.

Section 2 includes information about the institution or organization applying. The questions include name, address, website address, type of institution, and geographic reach.

Section 3 includes projected demographic data based on historical institutional data. The questions include percentage of students identifying with different demographic categories.

Section 4 includes details about the proposer's implementation plan. The questions include identifying an implementation model (in-school, out of school, in person, virtual, hybrid), anticipated numbers of participants, grade level of participants, strategies for recruiting educators and students, and experience with implementing specific content types. There is an additional question requesting a description of the applying institution or organization to provide more details about the program or partnerships that are not captured elsewhere.

Section 5 includes data collection and evaluation questions. The questions include a description of the applicant's proposed method for meeting data collection requirements.

Section 6 seeks additional information including the proposed budget, confirmation of requirements and expectations, and prior NASA experience.

To review the full application form, please download the Application Form PDF at: <https://paragon-tec.com/sparx-appform.pdf>.

A budget template to be used as a guide to submit your proposed budget can be found online at: <https://paragon-tec.com/sparx-budget.doc>.

All applications must be submitted through the online application form, which is located at: <https://forms.gle/CNtbwM1rU3y8ySTW8>. Submissions are due August 15, 2021, 11:59 p.m. EDT

APPENDIX B – SOLICITATION RUBRIC AND SCORING

Applications will be scored according to a rubric that includes both qualitative and quantitative assessments. **There are 60 potential points possible.** The following is a high-level overview of the scoring rubric.

- **(Qs 1-8) General Institution Information section**
 - UNGRADED but required.
- **(Qs 9-15) Institution or Organization Information section part 1**
 - UNGRADED but required. May be used to ensure diversity in organization types that are awarded.
- **(Qs 16-19) Institution or Organization Information section part 2 [Max 20 points]**
 - Broadly speaking, Paragon TEC is seeking organizations with the widest geographic reach and with a dedicated emphasis on serving those underrepresented and underserved in STEM.
- **(Qs 20-29) NASA SPARX Implementation section [Max 28 points]**
 - Broadly speaking, Paragon TEC is seeking organizations with the largest student audience and the lowest student-to-educator ratios. [Max 10 points]
 - Paragon TEC is interested in serving students across multiple grade bands. [Max 4 points]
 - Successful applicants will have clear plans for recruiting, supporting, and retaining both educators and students. [Max 10 points]
 - Successful applicants will have staff experienced with both debate competitions and computer science. [Max 4 points]
- **(Qs 30-31) Data Collection and Evaluation section [Max 5 points]**
 - Successful applicants will have a clear plan for gathering, organizing, and reporting data to Paragon TEC with an emphasis on underserved/underrepresented populations. [Max 5 points]
- **(Qs 32-36) Additional Information section [Max 7 points]**
 - Paragon TEC will give preference to applicants who have successfully worked with NASA in the past, but will not award applicants who are currently receiving NASA funding [Max 3 points]
 - Successful applicants will have a detailed and reasonable budget proposal that highlights an innovative approach. Paragon TEC is particularly interested in organizations that have matching funding from other sources [Max 4 points]
 - Applicants must agree to all of the requirements to be eligible for award.

APPENDIX C – TECHNICAL NARRATIVE

In 2018, NASA’s Office of STEM Engagement (OSTEM) launched the Next Gen STEM (NGS) project which focuses on investments in K-12 formal and informal education communities, with an expanded ability to provide rich, comprehensive STEM engagement. NGS play a critical role in meeting the following strategic goals:

1. Achieve scalability and efficient distribution of NASA content through channels to educators nationwide, including both urban and rural geographies;
2. Create and deliver innovative opportunities and learning experiences beyond current NASA capabilities; and
3. Extend NASA content and experiential learning opportunities to historically underserved and underrepresented communities.

NASA OSTEM STRATEGIC PLAN

The NASA 2018 Strategic Plan establishes the agency’s vision and mission, outlining strategic goals through 2022. These goals include extending human presence deeper into space, launching a campaign to the Moon for sustainable long-term exploration and utilization, and becoming a catalyst for economic growth.

The 2018 strategy includes a focus on the development of STEM disciplines along with the engagement of academic institutions and students in accomplishing NASA’s vision and mission. NASA contributes to national efforts for achieving excellence in STEM education through a comprehensive education portfolio implemented by its Office of STEM Engagement (OSTEM), mission directorates, and the field Centers located across the country. NASA will continue its tradition of investing in and supporting U.S. education programs and educators who play a key role in preparing, inspiring, exciting, encouraging, and nurturing the young minds of today who will manage and lead the nation’s laboratories and research centers of tomorrow.

NASA’s OSTEM strives to improve STEM education opportunities and to inspire, engage, educate, and employ the next-generation of explorers and innovators by offering experiential activities for students and educators, both inside and outside formal K-16 education systems. STEM Engagement activities are designed to increase students’ interest and involvement in STEM, improve their ability to participate in STEM studies and careers, and enhance their understanding of the value of STEM in their lives. This solicitation is aligned with broader NASA OSTEM Goals and Objectives.

RELEVANT NASA OSTEM GOALS AND OBJECTIVES

The NASA Strategy for STEM Engagement provides the context for STEM engagement within the agency's strategic plan and describes the cross-cutting design principles that are foundational to this work. This strategy, developed and adopted by the STEM Engagement Council, serves as the framework for the agency to provide immediate benefits to students, educators, and educational institutions, and help build the next generation of explorers with the technical skills needed to continue pursuing NASA's mission.

The following goals and objectives are aligned with the goals and objectives of this solicitation:

Strategic Goal 1.0: Create unique opportunities for students to contribute to NASA's work in exploration and discovery

Objective 1.2: Create structured and widely-accessible experiential learning opportunities for students to engage with NASA's experts and help solve problems that are critical to NASA's mission

Strategic Goal 2.0: Build a diverse future STEM workforce by engaging students in authentic learning experiences with NASA's people, content and facilities

Objective 2.1: Develop and deploy a continuum of STEM learning opportunities that cultivates students in pursuing STEM careers, and fosters interests in aerospace fields

Objective 2.2: Enable students, including those from underrepresented and underserved communities, to explore and pursue STEM pathways through authentic learning experiences and research opportunities with NASA's people and work

Strategic Goal 3.0: Attract students to STEM through learning opportunities that spark interest and provide connections to NASA's mission and work

Objective 3.1: Attract a broad and diverse set of students to STEM through targeted opportunities and readily available NASA STEM engagement resources and content

Objective 3.2: Foster student exposure to STEM careers through direct and virtual experiences with NASA's people and work