



MICRO-G NExT

Neutral Buoyancy Experiment Design Teams

Micro-g NExT FAQs

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Lessons Learned from Former Micro-g NExT Participants

Want to know what advice past participants would give to students thinking about taking the Micro-g NExT journey? Click the links below to view video of past participants sharing their advice from a student's perspective. The topics include how to collaborate with teams, the importance of a timeline, how to build a successful team, and the impact Micro-g NExT can have on your future. These lessons learned from previous participants will help make your upcoming journey with Micro-g NExT more successful.

- How are teams structured? [Link to Video](#)
- How do teams successfully manage deadlines? [Link to Video](#)
- What is the makeup of a successful team? [Link to Video](#)
- What can one expect to learn during Micro-g NExT? [Link to Video](#)
- How can Micro-g NExT help in future career success? [Link to Video](#)

FAQs: General

1. How does my team's design potentially benefit space exploration?

NASA is currently working on systems to take humans beyond Low Earth Orbit to explore the solar system. Some of the destinations of interest are the Moon and Mars. As part of NASA's exploration objectives, new tools and procedures are necessary to prepare for and carry out the upcoming missions.

2. What expenses does NASA cover?

The selection of a team for this opportunity does not include a monetary award to your institution. NASA assumes responsibility for costs involved with prototype testing in the NBL. Each team is responsible for all other costs including travel to Houston and cost of building the prototype.

3. With whom will my team interface with NASA?

Your team will have multiple interfaces at NASA, each of which serve a different function. Your primary interface will be the Micro-g NExT Coordinators.

4. How much time should I anticipate spending on this project?

Time requirements will vary from team to team. Expect to spend a large portion of your time on design, creation, and outreach. If your team is struggling with time management, please work with your faculty advisor to set a feasible timeline. The workload of this project is comparable to that of a 4-credit hour course.

5. How many teams will NASA select to test their prototypes in the NBL?

The number of teams is not predetermined but rather based on the quality of submitted proposals.

6. Can I submit a design for more than one tool?

Each team may submit a proposal for only one of the Micro-g NExT challenges.

7. Can more than one proposal be submitted from the same school?

Yes, more than one proposal can be submitted from the same school. However, students may only belong to a single team.

8. If a school submits multiple proposals, does each proposal need a different outreach section?

Yes, each proposal will need its own outreach section.

9. Do we need a signature from the Department Head or any other management individual from our school before submitting the Letter of Intent and/or the Project Proposal?

You do not need a letter of endorsement for the Letter of Intent, but it is a requirement for your team's proposal.

10. Does a prototype need to be submitted with the proposal?

A prototype is not required to be submitted with the proposal. However, any prototyping you do will add to the quality of your proposal.

11. If selected, what is the first step?

Your team will be required to attend a 1-hour orientation session with the Micro-g NExT coordinators. It is mandatory that all team members and faculty advisors attend this virtual session.

12. Can teams be comprised of students from multiple schools?

Absolutely! We encourage collaboration and interdisciplinary teams.

13. Can returning teams participate?

Returning teams may participate; however, teams may only have 2 returning members.

14. Do members who have submitted a proposal, but have not been selected constitute a returning member?

No, the requirement only refers to teams that have previously participated on a team that advanced to Phase II of Micro-g NExT and attended the prototype test week.

15. Are BS/MS students who have yet to be immersed in graduate courses allowed to compete in this project?

If your academic status is listed as an undergraduate student when we verify with your college/university, you are eligible to participate as a student.

16. Can I participate in Micro-g NExT if I have a green card/am a Legal Permanent Resident or DACA student?

Micro-g NExT is currently available to U.S. citizens and Legal Permanent Residents enrolled in U.S. institutions of higher learning.

17. My choice for faculty advisor is not a U.S. citizen. Are they still able to work with my team?

Yes, they can still act as your advisor. However, they will be unable to travel to Houston for the test week. **Any person participating in the Test Week in Houston must be a U.S. citizen or Legal Permanent Resident.**

18. Where can I find information about the Neutral Buoyancy Laboratory (NBL)?

Information about the NBL can be found at the following link:

https://www.nasa.gov/centers/johnson/pdf/167748main_FS_NBL508c.pdf

19. Are there hardware requirements and/or standards my team should be aware of before testing in the NBL?

Requirements for hardware that will be tested in the Neutral Buoyancy Laboratory (NBL) can be accessed in the NBL Engineering and Safety Requirements document.

20. Do I get to dive with my team's prototype during testing in the NBL?

Professional NBL divers will test the tools and students will direct the divers from the Test Conductor Room of the NBL facility.

21. Who is responsible for writing the procedures that will be used to conduct test in the NBL?

Your team is responsible for drafting the diver procedures and coordinating with the assigned Ops Lead to finalize the procedures.

22. What is considered STEM engagement?

STEM engagement may consist of a presentation to a school group, a symposium, or other similar event. You may also incorporate a social media plan in your outreach.

23. When will we hold the STEM engagement component?

Your STEM engagement component can occur prior to test week, but as some outreach components will include testing results, some outreach could occur after your team's test week.

24. The STEM engagement portion of my project involves development of K-12 curriculum for classroom use. Are there any suggested components I need to incorporate?

The following websites might be useful when looking to incorporate NASA missions into the curriculum:

- [For Educators - NASA](#)
- [Learning Resources - NASA](#)

25. How should STEM engagement be documented in the proposal?

Include a description of activities you plan to carry out. The description should include the purpose of the activity, the intended audience, the expected number of participants, and the perceived impact of the activity. It helps to have a letter of support from organizations you plan to work with in your outreach efforts. It is advised that you begin making connections now.

26. Can we coordinate social media outputs about the project with Micro-g NExT?

Absolutely. This can be coordinated with the Micro-g NExT coordinator. We encourage you to use our hashtag #MicrogNExT.

27. Is selection announcement also based on our Project Planning document?

No, it is mainly based on the proposal submission.

28. Is there a difference between the press/social media plan? What are the objectives?

The social media plan refers to how you're getting the information out about your team and what you are doing. The press plan refers to how you are going to communicate to the press.

29. Does the outreach need to be related to the tool?

No, it does not need to be directly aligned to your tool or to the challenge. It can be anything in STEM, aerospace-related, NASA related, etc.

30. Are we required to provide specific dates and times for all our STEM engagement lessons? Are we able to add additional STEM engagement lessons after the proposal is submitted? Finally, is there any due date for STEM engagement lessons?

When submitting your STEM engagement plan it is beneficial to have letters of support from the groups you are going to partner with, however it is understood that plans may change. The final STEM engagement report will be submitted along with the final technical report roughly a month after test week.

FAQs: Technical

Please visit the [EVA Reference Website](#). It provides a reference you can use when considering your design. You will only be judged on your ability to meet the requirements outlined in the challenges. You are not required to meet the requirements outlined in the website.

1. Who would own the intellectual property rights?

NASA hopes to potentially utilize some of the ideas that your team puts forward in a future space mission. Therefore, we ask that teams complete a “Statement of Rights” document. See the Proposal Guidelines for specifics regarding this topic.

2. Some requirements are vague. What should I do in this case?

Some requirements are purposely vague. We want you to do the research and provide the rationale for why you designed your device the way you did.

3. Can you combine the functions of multiple tools together to save cargo space?

That’s a great thought and an important consideration for space tool development. For the purpose of this activity, we ask you select only one (**1**) challenge.

4. Can we have detachable parts on the prototypes?

Yes. You can have multiple pieces of hardware to accomplish the challenge. All pieces together should fit within the given dimensions.

5. May we 3D print parts of the tool?

Yes. Though you’ll want to consider the loads that your tool will encounter and ensure that the plastics used in the 3D printer can handle those loads.

6. Will we have to make a waterproof version of our tool?

You will have to make a version of your tool that operates in the NBL. We will work with you to ensure you are using approved materials.

7. Does the prototype have to be built on a 1:1 scale, or can it be smaller?

The simulation in the NBL will be full-scale, 1:1. However, doing scale prototypes during the proposal phase is recommended to show the validity of your design.

8. What will be the depth of operation in the NBL?

Assume a depth of 40ft. That is the maximum depth of the NBL.

9. Do the prototype materials need to be NBL and Space approved?

For the purpose of the proposal, the minimum requirement is to describe the materials you would use in the NBL.

10. What are the temperatures our materials need to be able to withstand?

The actual testing will occur in the NBL which is about 85°F. So, for this effort of developing a prototype, temperature will not be a major factor.

11. What is the size of an EVA glove?

See the [EVA Reference Website](#) for glove dimensions. You can also use a ski glove as a reference. It is approximately the same thickness as an EVA glove. Remember that when a space

suit glove is pressurized its nominal position will be “hand open” and the astronaut needs to expend energy to close their hand.

12. Will tools need to be able to be used with either hand?

This is not a requirement, but NASA does like tools that can be used by both left and right-handed astronauts.

13. Are we able to use magnets for any part of the challenges, just as a small component, not as a whole?

Yes, magnets are okay in that capacity.

14. How often can the teams ask for technical clarifications? Will all technical clarifications be posted for all teams to see?

All questions and their answers will be continuously posted in this FAQ document. Check this document regularly. Ask as many questions as you’d like, we’ll get to them as soon as we can.

15. What kind of CAD program is best for all of these? SolidWorks or AutoCAD?

You can use any CAD program you’d like, or none. A 3D model is not required, though it is recommended as it is easier to understand a design that way.

16. Can we have more than two parts as detachments?

Yes.

17. If we have something on our design that fits the requirements, but upon using it, that part may stretch outside of the dimensions given, is that allowed? Or does everything have to stick within the dimensions you gave us?

The dimensional requirement is a stowage requirement. If your tool doesn’t fit into that box when stowed, consider making your device in multiple pieces. Also, not meeting one of the requirements does not disqualify you. You just won’t get full credit for meeting that requirement.

18. Can our design deviate slightly from proposal drawings to actual day of testing?

Yes. As with all proposals, there may be slight modifications. However, all changes will need to be approved.

19. Can we adapt technology used in other industries for our design?

Absolutely!

20. What is considered a sharp edge, and how can they be mitigated?

To avoid sharp edges, the minimum radii on exposed edges should be 0.04” or larger.

- This is not a hard requirement, but it is a good idea to include as part of the design. If the hardware passes the sharp edge inspection at the NBL, it will be fine. This inspection involves a person gently running their hands over the hardware and identifying edges that need to be filed down or covered.
- **Please note that exposed threads (on screws, bolts, etc.) are considered sharp edges.** I recommend choosing fastener lengths such that they are flush with your device/any nuts. Any unavoidable exposed threads should be covered with RTV silicone, which comes as a liquid in a tube and cures at room temperature into a soft silicone.

FAQS: NASA STEM Gateway

1. Does every member of the team need to submit the proposal?

Only one member of the team (preferably the team lead) will submit the proposal on behalf of the team. During this process they will add all team members and faculty advisor by entering their name and email address.

2. I have already created a STEM Gateway profile for other engagement openings, do I need to create a new profile?

No, if you are using the same email address attached to your existing profile you will receive the notification of being added to the team without needing to set up an additional profile.

3. How do we add team members?

During the application process the team lead will be prompted to add team members. You will do this by entering each team member's name and email address. Be sure to check with each team member that you are using the correct email address. You will need to click the send invites button in order to have the invitations sent.

4. Do we have to include our faculty advisor as team member?

Yes, all team members and faculty advisors must be added to your team roster.

5. If we encounter technical issues, who do we contact?

Technical issues with STEM Gateway can be sent to hq-nasa-stem-gateway@nasa.gov