

Challenge 6: Growing Beyond Earth®

YOUR CHALLENGE:

As NASA looks toward a long-term human presence beyond Earth's orbit, there are specific science, technology, engineering, and math (STEM) challenges related to food production in space. Established in 2015 as a partnership between Fairchild Tropical Botanic Garden and NASA's Exploration Research and Technology Programs, Growing Beyond Earth® enables student community scientists to actively contribute data toward NASA mission planning.

New GBE Schools will conduct the following experiment:

- **Novel Crops** – Research Protocols to be shared during mandatory teacher workshop

Returning GBE schools will choose on of the following experiments:

- **Novel Crops**
- **Neighboring Effect**
- **Water Stress**
- **Fruiting Crops**
- **Fertilizer Placement**

POINT SYSTEM

Maximum Points	75 pts for Trial 1 data
	75 pts for Trial 2 proposal
	75 pts for Trial 2 data
	75 pts for submitting a presentation and optionally presenting at the Growing Beyond Earth® Symposium
Submissions per high school	1

**You must register with the GBE program
by August 29, 2025 to participate in this Challenge**



MANDATORY Teacher Workshop (choose one):

Teachers NEW to GBE:

- Virtual Workshop: September 12, 2025
- In-person Workshop: September 27, 2025 @ Fairchild

RETURNING GBE Teachers:

- Virtual Workshop: September 19, 2025
- In-person Workshop: September 27, 2025 @ Fairchild

IMPORTANT DATES:

Trial 1 Data Due: November 21, 2025 by 5pm

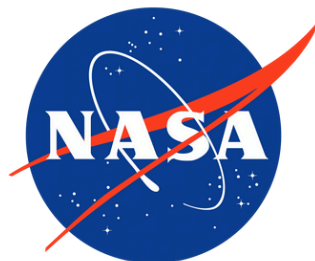
Trial 2 Proposal Due: December 12, 2025 by 5pm

Trial 2 Data Due: March 21, 2026 by 5pm

Trial 2 Research Presentation Due: April 2, 2026 by 5pm

Research Symposium: Saturday, April 11, 2026

Participants per submission: Student Group



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✓	SUBMISSION REQUIREMENTS to earn Fairchild Challenge points:
	Teachers must register to attend a mandatory workshop led by NASA and GBE facilitators.
	Trial 1 + 2 data sheets. – Submitted to GBE portal
	Proposal <ul style="list-style-type: none"> • Student designed, original research project informed by Trial data. • Proposal utilizes the <u>provided template</u> with all sections completed. • Proposal includes a bibliography citing 3 sources, MLA or APA format.
	Presentation powerpoint of Trial 2 results
	OPTIONAL student presentation at GBE Symposium on April 11, 2026
	One set of Fairchild Challenge points earned per high school.

For more detailed information and resources,
please visit the **High School Challenge 6 webpage**.



You can also check out
the **Growing Beyond Earth® website** here.



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Prior Knowledge:

To be successful, students should be familiar with these concepts:

- Best methods to effectively conduct research from reliable resources
- Understand the scientific method and the process of developing a hypothesis

Standards/Learning Targets:

Subject	Strand	Standard
Science	The Practice of Science	SC.912.N.1.3 Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.
		SC.912.N.1.1 Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following: <ol style="list-style-type: none"> 1. Pose questions about the natural world, 2. Conduct systematic observations, 3. Examine books and other sources of information to see what is already known, 4. Review what is known in light of empirical evidence, 5. Plan investigations, 6. Use tools to gather, analyze, and interpret data 7. Pose answers, explanations, or descriptions of events, 8. Generate explanations that explicate or describe natural phenomena (inferences), 9. Use appropriate evidence and reasoning to justify these explanations to others, 10. Communicate results of scientific investigations, and 11. Evaluate the merits of the explanations produced by others.

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Standards/Learning Targets Continued:

Subject	Strand	Standard
Computer Science - Computer Practices and Programming	Data Analysis	SC.912.CS-CP.1.2 Perform advanced searches to locate information and/or design a data-collection approach to gather original data (e.g., qualitative interviews, surveys, prototypes, and simulations).
		SC.912.CS-CP.1.3 Analyze and manipulate data collected by a variety of data collection techniques to support a hypothesis.
	Communication and Collaboration	SC.912.CS-CC.1.5 Communicate and publish key ideas and details to a variety of audiences using digital tools and media-rich resources.
World Languages	Presentational Speaking	WL.K12.AL.4.4 Communicate ideas on a variety of topics with accuracy, clarity, and precision.

Learning Goals/Objectives:

By the end of this Challenge, students will be able to:

Design an experiment addressing the challenges related to growing plants in space

Collect quantitative and qualitative data consistently

Analyze and present data graphically

Communicate findings to the scientific community

Differentiation:

We strive to be inclusive of all learners. Please contact us at challenge@fairchildgarden.org if you have questions about accommodations specific to your students' needs.

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