Diverse Audiences with Diverse Needs - Focus on Neurodiversity

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Today’s Presenters

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N3 Program Goals, 2021-2026

Providing a pathway to NASA participation and STEM employment for neurodiverse learners, with a focus on those on the autism spectrum.

- Enabling STEM education for a segment of the population that is significantly underserved by co-redeveloping existing NASA resources with autistic learners.
- Improving scientific literacy for this underserved population by providing authentic NASA experiences.
- Providing internships, mentored by NASA Subject Matter Experts, to selected neurodiverse learners.
What does it mean to “co-design”
Interested in Participatory Co-Design?

- Autistic people are not usually involved in developing support programs despite evidence that participatory approaches improve their effectiveness.

- Making a program participatory means that stakeholders (i.e. autistic people) are meaningfully involved in developing, enacting, and disseminating research initiatives, programs, and activities.

- Participatory approaches are key to be sure that programs align with the needs of the people they intend to serve. \(^5\), \(^6\)

\(^5\) Nicolaidis et al., 2013; \(^6\) Pellicano et al., 2014
What have we learned so far?

- **Astronomy from Home**
  - Students and teachers gave critical feedback about the broader context of our AfH curriculum. While activities were fun and engaging, more background information was needed to motivate students and provide a contextual frame.
  - All participants emphasized the need for graphics, diagrams, images, videos, and other interactive methods for teaching these materials.

- **Rocketry/Rising Data**
  - Similar concerns arose when redeveloping this curriculum - namely the need for an improved visual guide and step-by-step checklists to assist with completing this complex project.
Astronomy Example

EXOPLANET EXPLORATION
Planets Beyond Our Solar System

The Search For Life

MENU Are We Alone?
N3 Rocket Example

Helping-Hands Tools
Hold Electronics Board for Ease of Soldering

Checklists Support Success

A. Building the Rocket
A.1 Assemble the engine mount
A.2 Prepare the fins
A.3 Insert engine mount in main tube
A.4 Attach the fins
A.5 Attach the launch lug
A.6 Shock cord assembly
A.7 Nose cone fit and disk insertion

Personalized Rockets Facilitates Ownership
Tips for Supporting Autistic Learners

- Provide a visual schedule
- Prime students for what’s to come so they understand the context and process for their learning
- Embed interests
- Establish clear expectations
- Provide supportive visuals and/or other reference materials
Context: Our Sun as an active star

Hands on activities:
- Sunspotter* activities to view sunspots prior to eclipses
- Safe solar viewing prior to eclipses
- Positions of the moon and sun in the sky

Content
- Solar cycle
- Sun’s layers and atmosphere
- Effect on Earth’s technologies
- Solar Eclipses

Eclipse activities
- Sunspotter used as partial solar eclipse viewing device
- Pinhole cameras
- Activities designed for those on the path of totality

*Modified from https://www.exploratorium.edu/eclipse/video/how-build-sun-viewer
Activities will take place in 2023 and 2024
- California Partner Schools
- New York Hall of Science
- At least one location under the path of totality in 2024

Watch for activity releases on the N3 Website

https://n3.sonoma.edu
Questions?

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