National Science Foundation
Advancing Informal STEM Learning

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EDU/DRL
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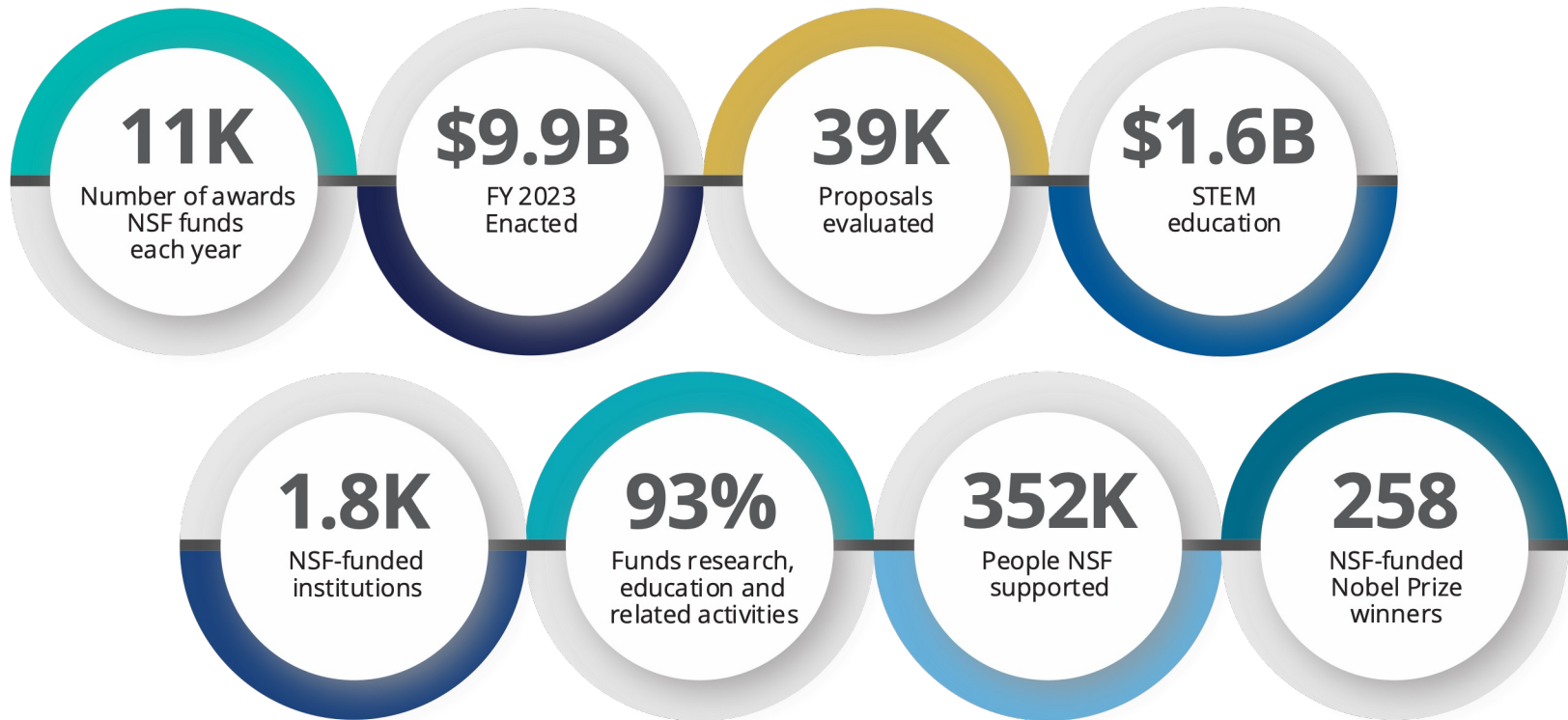
NSF Mission

"to promote the progress of science; to advance the national health, prosperity, and welfare; [and] to secure the national defense"

National Science Foundation
Directorate for STEM Education (EDU)

Preparing a diverse STEM workforce and a well-informed citizenry

NSF By the Numbers

11K
Number of awards NSF funds each year

$9.9B
FY 2023 Enacted

39K
Proposals evaluated

$1.6B
STEM education

1.8K
NSF-funded institutions

93%
Funds research, education and related activities

352K
People NSF supported

258
NSF-funded Nobel Prize winners

Advancing Informal STEM Learning
(AISL) Solicitation NSF #22-626

Deadline JANUARY 10, 2024, *5pm local time of the submitting institution*

https://www.nsf.gov/pubs/2022/nsf22626/nsf22626.htm

AISL Program

❖**Advancing** – Projects that advance the field by addressing questions important to learners and informal STEM practitioners using innovative approaches and research.

❖**Informal** – Learning that is self-directed and lifelong that occurs outside formal schooling systems and school or degree-related outcomes.

❖**STEM** – Science, technology, engineering and math—including the social, behavioral, and economic sciences, emerging areas, interdisciplinary learning, and STEM learning positioned within meaningful personal, cultural, or societal frameworks.

❖**Learning** – Expansive learning outcomes, including: Awareness, knowledge or use of STEM concepts, skills, and processes; Engagement or interest in multiple ways of knowing STEM and STEM careers; STEM identity and belonging; Discerning among evidence, opinion, misinformation, and disinformation; and Enacting behaviors and agency around STEM and related societal issues.

Informal STEM Learning

Includes (but is not limited to):

- Exhibitions and programs
- Science communication and Public Engagement with Science
- Traditional and intergenerational knowledge sharing
- Community and participatory science
- Radio, television, film, media programs/series, or podcasts
- Do-It-Yourself (DIY) or maker initiatives
- Public Participation in Scientific Research (PPSR)
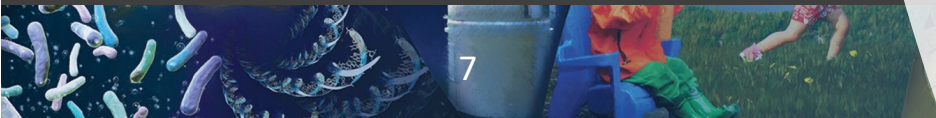- Digital experiences

That take place in (among others):

- Museum-type settings (e.g., aquariums, botanic gardens,, planetariums, zoos)
- Nature centers, parks
- Grocery stores and airports
- Libraries
- Homes
- Community centers

Advancing the Knowledge Base in ISL

Research and evaluation may be used in service of advancing the knowledge base.
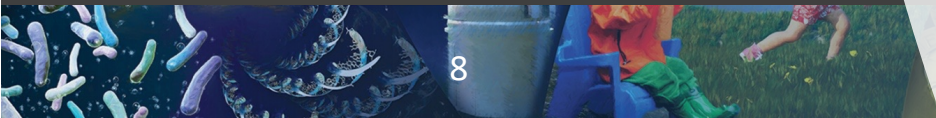
Informalscience.org

Equity & Belonging

throughout the proposed work

Throughout the proposed work … e.g., framework, design, budget, team composition, management, evaluation, & communication

- Demonstrate a **well-rounded understanding** of the focal people in their communities, public and professional

- Articulate specific plans or approaches for **integrating that understanding**

- Be equity-oriented in design, work, and collaborations to ensure work is done **by** and **with** people

- Include the team's processes for recognizing and working through potential inequities to **hold the team accountable**

https://www.code-crafters.org/video/CodeCrafters%20STEM4All2021.mp4

www.code-crafters.org

STEM
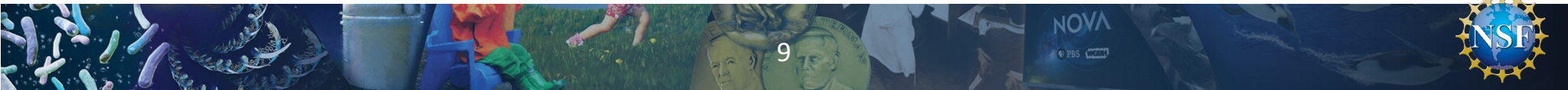A**M**BASSADOR
PROGRAM
BRIDGING SCIENCE & SOCIETY

Figure 1. STEMAP engagement process.

STEMAP.org; Weber et al., 2021

- Supporting Scientists' Engagement with Public Audiences

- Studied the scaling of a program to train scientists engaged with older adults living in residential senior centers, among over 45 other venues

- Outlined a five-step process in which scientists can personalize science engagement for a specific community or group (e.g., large-print materials and surveys)

Engagement Survey

Instructions: For each item, fill in the corresponding bubble that best matches what you think and feel about the activity you just completed.

During this activity...	Agree strongly	Agree	Disagree	Disagree strongly
I thought the activity was exciting	○	○	○	○
I enjoyed the activity	○	○	○	○
It was easy to stay focused	○	○	○	○
I was curious to find out what might happen next	○	○	○	○
I was fascinated	○	○	○	○
I was intrigued	○	○	○	○
I felt mentally stimulated	○	○	○	○
I paid attention most of the time	○	○	○	○
I found myself wanting to learn more	○	○	○	○

- Developed new survey methods to measure participation, engagement and advocacy in older adults (50+).

- Collaboration between Berkeley researchers, Osher Lifelong Learning Institute, and Fung Fellowship undergraduate students—the majority of whom are from backgrounds underrepresented in engineering.

- The informal science learning activity was an intergenerational collaborative engineering design activity developing engineering solutions (e.g., apps for phones) to gait disturbances in neurodegenerative disease.
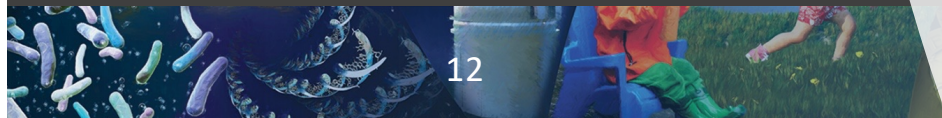
https://lawrencehallofscience.org/research/current-projects/investigating-measurement-of-stem-engagement-and-advocacy-in-older-adults/

NSF

Q & A

THANK YOU

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