Nanoscale Informal Science Education Network (0940143)
Multi-Site Public Engagement with Science – Synthetic Biology (1421179)
ChemAttitudes: Using Design-Based Research to Develop and Disseminate Strategies and Materials to Support Chemistry Interest, Relevance, and Self-Efficacy (1612482)

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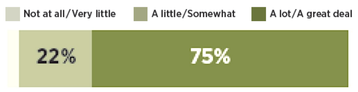
Nanoscale Informal Science Education Network
now the
National Informal STEM Education Network

Funded by NSF from October 2005 through February 2017 to raise public awareness, understanding, and engagement with nanoscale science, engineering, and technology through the creation of a national network of informal science education organizations and university-based nanoscale research organizations.

NISE Net helped educators and scientists communicate with the public about science

To what extent has NISE Net helped you communicate ANY science, technology, engineering, and math with the public? (n=274)

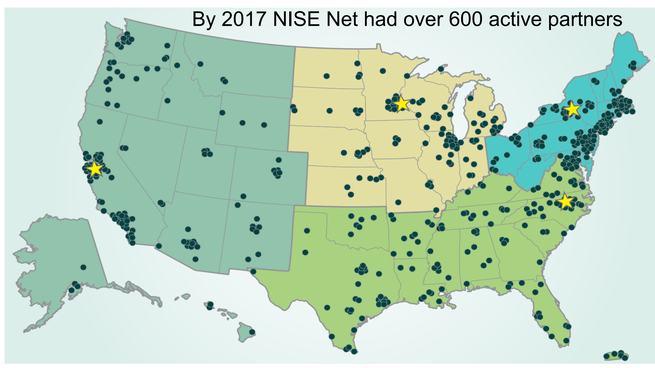


NISE Net introduced science and society concepts and practices to its community of educators and researchers

NISE Net work led to spin-off projects in synthetic biology and chemistry:

- Nanotechnology & Society and Science Communication work led to a project to create conversations between scientists and publics that both value and learn from.
- NanoDays kit development and research and evaluation on nano interest and perception of relevance led to a project to explore strategies for stimulating interest, sense of relevance, and feelings of self-efficacy.

By 2017 NISE Net had over 600 active partners



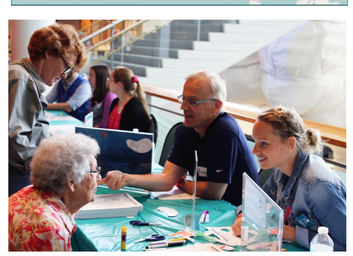
Building with Biology
Creating conversations between scientists and publics that both value and learn from

Public engagement with science (PES) refers to activities, events, or interactions characterized by mutual learning – not one-way transmission from experts to publics – among people of varied backgrounds, scientific expertise, and life experiences, who can articulate and discuss their perspectives, ideas, knowledge, and values.

Participation in Building with Biology increased scientists':

- confidence and skills in engaging publics in science
- knowledge of public's values and experiences related to synthetic biology
  (220 scientists or science students completed a post-event survey.)

"I've definitely seen more of the scientific community, especially within synthetic biology, really adopt conversations around engagement….(and) people who weren't even versed in what engagement was, or the idea of having dialogues, become champions of that concept. It's really exciting to see and it's become institutionalized…a large influence from this project."



Events were held at ~200 sites nationwide using hands-on activities to stimulate multi-directional conversations. About 40 sites also implemented more in-depth dialogue programs. A supplement is supporting development of a forum on human gene editing to be tested at 20 sites in 2018.

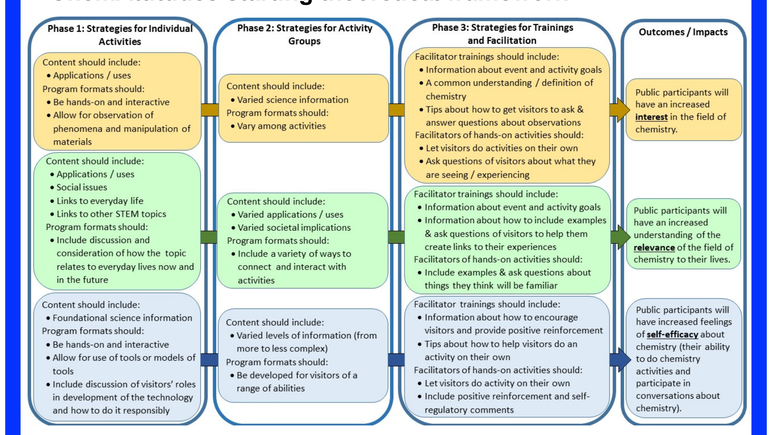
ChemAttitudes
Design-Based Research to Develop and Disseminate Strategies and Materials to Support Chemistry Interest, Relevance, and Self-Efficacy

Design-based research project formatively evolves educational activities and the theoretical framework upon which they are based simultaneously through iterative testing and revision.

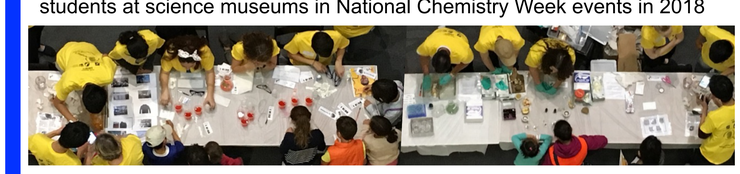
A 2015 Royal Society of Chemistry report, *Public attitudes to chemistry* found that a large segment of the population:

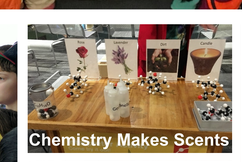
- has low interest in chemistry
- finds chemistry difficult to learn about and discuss
- feels chemistry lacks relevance to their own lives and to the real world in general

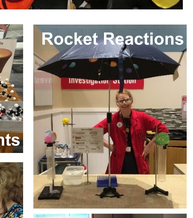
ChemAttitudes starting theoretical framework

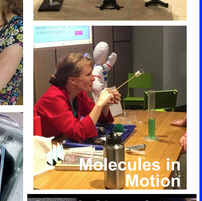


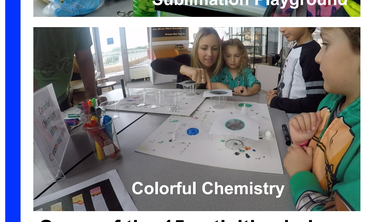
Hands on activities are being designed for use by chemists and chemistry students at science museums in National Chemistry Week events in 2018

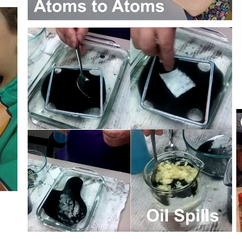












Some of the 15 activities being tested in phase 1 of the project