

Stanford University Office of Science Outreach

Menu of Outreach Activities



The Office of Science Outreach (OSO) serves Stanford faculty by assisting them in creating outreach project ideas and proposals to address NSF's Broader Impacts criterion. We identify potential community and campus partners to work with, and facilitate information and resource sharing among all of the University's science outreach programs.

In addition, the OSO directs several programs in which Stanford faculty and their students can participate.

We hope this menu will stimulate your thinking about outreach activities to meet the Broader Impacts requirements of NSF and other funders and spur you to action!



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This menu can be found online (with active links to many examples) at oso.stanford.edu/resources/faculty.

Outreach Ideas for K-12 Students & Teachers

Resources*

<p>Host a high school student in a summer internship in your lab. You can tap into the RISE Summer Internship Program, or participate in programs sponsored by the Schools of Medicine or Earth Sciences. There is often stipend funding available for summer internships. Or host a student intern during the school year. School-year interns receive high school credit and do not expect to be paid. You can also host high school interns outside of Stanford's formal programs; the OSO has a checklist and sample documents for hosting minors in your lab.</p>	2
<p>Host a high school science teacher in a summer research fellowship. The OSO operates a program you can tap into and may have funds for stipends or can help you obtain an RET Supplement from NSF. This is an excellent opportunity to collaborate with teachers in creating materials for classroom use that are informed by your research.</p>	2
<p>Create materials for use in a K-12 classroom – a lesson or series of learning modules, a video, a virtual lab, computer simulation or.... The OSO will help conduct a needs assessment to ensure the resources will be useful to students and can be widely disseminated.</p>	3
<p>Partner with the Graduate School of Education's Center for the Support of Excellence in Teaching (CSET) to create professional development workshops for teachers.</p>	3
<p>Serve as a judge for a local or regional Science Fair and invite your grad students to participate. Or sponsor a science competition at Stanford for local students built around a challenge project related to your field of research. Alternatively, sponsor a science club - including science fair projects -for students in a local school. This might entail sending your graduate students to the school one day a week for a quarter. The OSO can help you identify a school with students historically under-represented in STEM and provide guidance to the graduate students in working with K-12 students.</p>	1
<p>Host a Career Day on campus for girls or students under-represented in STEM, including presentations by faculty and graduate students about careers related to your field of research. Or offer a lab tour or "shadow" program where high school students spend a day on campus with you and your research group, including attending classes, visiting labs, seeing a dorm room, etc.</p>	2
<p>Create a new online curriculum module related to your research area with the help of Stanford Online or partner with the Stanford Precollegiate Studies or C-K12, an educational nonprofit that helps teachers create their own Flexbooks using open resource content.</p>	3

*Resources Key: **1** = low cost/time **3** = high cost/time

Cool Faculty Ideas/Activities

Microdocs: The Short Attention Span Science Theater on Ecological Sustainability

Marine Biologist Steve Palumbi created a series of 2-4 minute **micro-documentaries** about sustainability, featuring coral reefs from around the world. His lab then developed a website that provides additional resources for teachers and students, built around the videos.



LABSci Curriculum Modules for Impaired or Hospitalized Students

LABSci is a partnership between Dr. Andrew Spakowitz's research group in Chemical Engineering and the Lucile Packard Children's Hospital School. They've developed a series of low-impact experiments that are suitable for students with impaired mobility and difficulty performing experiments due to hospitalization or medical treatments.



Outreach Ideas for Undergrads or Grad Students

<p>Encourage your graduate students to participate in existing K-12 outreach activities already organized on campus. Science Bus ■ ESP/Splash! ■ Haas Science in Service ■ Henry's Place ■ Optical Society of America ■ Society of Women Engineers ■ Inspiring Future Scientists in Chemistry</p>	Resources* 1
<p>Host an undergraduate in a Research Experience for Undergraduates (REU) program. Students can come from Stanford or other colleges, especially community colleges or minority-serving institutions. All NSF PIs are eligible to apply for REU supplements and OSO staff will assist with your application. Click for a sample of REU programs for non-Stanford students. You can also do this informally, using the OSO's checklist and sample documents.</p>	2
<p>Encourage your graduate students (or volunteer yourself) to work with K-12 students on a regular basis by partnering with local nonprofits such as Science Buddies or Science is Elementary. Or encourage them to tap into one-day off campus events such as Expanding Your Horizons or Sally Ride Science Festival. Or support them to teach a one-day class for ESP/Splash!</p>	1
<p>Encourage your graduate students (or volunteer yourself) to serve as online mentors to high school students preparing for a science fair, for example by partnering with a nonprofit like A Schmal Science Workshop. Or consider allowing science fair participants to use your lab equipment.</p>	1
<p>Encourage your graduate students to enroll in a course or workshop on communicating science to a lay audience. The VPGE office offers a variety of communications courses.</p>	1
<p>Encourage your students to get involved with the d.school's K-12 Lab Network and help build spaces, courses, and partnerships to bring design thinking to young people.</p>	2
<p>Encourage your undergraduate and graduate students to get involved with the student chapters of their professional societies. Many at Stanford do K-12 outreach (e.g., Stanford Optical Society, Society of Women Engineers, Stanford Polymer Collective, etc.)</p>	1
<p>Encourage your students to volunteer at a science museum. The Exploratorium, Tech Museum of Innovation, California Academy of Sciences, Chabot Observatory & Science Center, or smaller venues like the Palo Alto Junior Museum, Coyote Point Museum or Museum of Aviation need docents, interpretive guides, instructional assistants, and more. See Stanford at the Tech as an example.</p>	1

**Broader Impacts Outcomes could include....

- Full participation of women, persons with disabilities, and underrepresented minorities in STEM
- Improved STEM education and educator development at any level
- Increased public scientific literacy and public engagement with STEM
- improved well-being of individuals in society
- Development of a diverse, globally competitive STEM workforce
- Increased partnerships between academia, industry, and others
- Improved national security
- Increased economic competitiveness of the U.S.
- Enhanced infrastructure for research and education



Ideas for Communicating Science to the General Public

Resources*

Help develop exhibits for a science museum such as the Exploratorium, Tech Museum of Innovation, Lawrence Hall of Science, Chabot Observatory and Science Center, or smaller venues like the Palo Alto Junior Museum, Coyote Point Museum or the Museum of Aviation.	③
Create a Stanford Continuing Studies course to explain the nature of your research and its societal implications.	③
Tap into a “science day” (and involve your students) to provide lectures, demos and hands-on activities for the community. Examples include the Bay Area Science Festival and Wonderfest .	②
Create a web site for people to interact with or learn more about your field. Examples include Steve Palumbi’s Microdocs: The Short Attention Span Science Theater on Ecological Sustainability , Deborah Gordon’s Citizen Science Project on Investigating Any Colonies , and Vijay Pande’s Folding@Home .	③
Present a lecture about your field of research to a lay audience. Stanford hosts many lecture series you can tap into, including the SLAC Public Lecture Series, Frontiers in Interdisciplinary Biosciences, and Continuing Studies Public Programs. Or check out a local Café Scientifique .	②

*See previous page for Resources Key

Need More Ideas???

Stanford faculty can also achieve a **broader impact** in many other rigorous, meaningful and innovative ways. Some examples to get you started:

- Serve on a board or advisory committee of a science center, K-12 school district or educational nonprofit.
- Mentor junior faculty or post-doctoral researchers, especially women and other under-represented groups.
- Develop new (or enrich your current) undergraduate or graduate courses in creative ways.
- Help your school or department recruit under-represented graduate students.
- Develop partnerships with industry to identify internship opportunities for your students, co-develop or share instrumentation, software or research methodologies.
- Write scholarly articles that go beyond routine publication of research results.
- Write articles or books for the general public that help synthesize information in your field of research.
- Assist journalists to understand and write about your research.
- Serve as a policy advisor for local, state, or national governmental agency.
- Collaborate with other higher education institutions that serve predominantly under-represented students.
- Help initiate or provide mentoring for a student chapter of a professional society.