

# 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 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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Stanford University | Office of Science Outreach

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

# Outreach Ideas for K-12 Students & Teachers

Resources\*

<p><b>Host a high school student in a summer internship in your lab.</b> You can tap into the <a href="#">RISE Summer Internship Program</a>, or participate in one of the other formal HS internship <a href="#">programs</a> on campus. You can host a HS student intern part-time during the school year or outside of Stanford's formal programs; there are Guidelines and a Checklist for hosting minors in your lab available at the <a href="#">OSO Faculty Resources</a> page.</p>	<b>2</b>
<p><b>Host a high school science teacher</b> in the <a href="#">Stanford Summer Research Program for Teachers</a>. The OSO handles all the logistics and may have funds for stipends or can help you obtain an NSF RET Supplement. This is an excellent opportunity to collaborate with teachers in creating materials for classroom use that are informed by your research.</p>	<b>2</b>
<p><b>Create materials for use in a K-12 classroom</b> – 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>	<b>3</b>
<p><b>Partner with the Graduate School of Education's Center for the Support of Excellence in Teaching (CSET)</b> to create a professional development workshop for teachers.</p>	<b>3</b>
<p><b>Serve as a judge for a local or regional Science Fair</b> and invite your grad students to participate.</p>	<b>1</b>
<p><b>Participate in a Career Day</b> at a local high school.</p>	<b>1</b>
<p><b>Create a new online curriculum module</b> related to your research area with the help of <a href="#">CTL</a> or partner with <a href="#">Stanford Precollegiate Studies</a> to create a new course for K-12 students.</p>	<b>3</b>
<p><b>Create a field trip program to your lab for visiting K-12 students.</b> Examples include the Collaborative Haptics &amp; Robotics in Medicine (<a href="#">CHARM</a>) Lab and <a href="#">Stanford's Clinical Anatomy Lab</a> Tours.</p>	<b>3</b>
<p><b>Create a Citizen Science project to engage K-12 students or the public in your research.</b> Examples include <a href="#">Ant Colony Search</a> and <a href="#">Abuzz: Citizen-Based Mosquito Monitoring System</a>.</p>	<b>3</b>
<p><b>Create a workshop for K-12 teachers.</b> Examples: <a href="#">Intrologic Teacher Training</a> and <a href="#">Nanoscience Summer Institute for Middle School Teachers</a>.</p>	<b>2</b>

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

## Cool Faculty Ideas/Activities

### shoMe

Professor George Hilley in Geological Sciences developed [shoMe](#) to let anyone create and share virtual journeys through the real world. Tour landmarks, make scavenger hunts, or take a field trip via a [mobile app](#) or a [web-based platform](#).



### 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

Resources\*

Encourage your graduate students to participate in <a href="#">existing K-12 outreach activities</a> already organized on campus. Examples: Girls Teaching Girls to Code ■ Science Penpals ■ SEEDS ■ Future Advancers of Science and Technology ■ Inspiring Future Scientists in Chemistry	①
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. Check out a <a href="#">list of REU programs</a> for non-Stanford students. You can also do this informally, using the Guidelines and Checklist available at the <a href="#">OSO Faculty Resources</a> page.	②
Encourage your graduate students (or volunteer yourself) to work with K-12 students on a regular basis by partnering with local nonprofits such as <a href="#">Science Buddies</a> or <a href="#">Science is Elementary</a> . Or encourage them to tap into one-day off campus events such as <a href="#">Science Teaching Through Art (STaR)</a> . Or support them to teach a one-day class on campus for <a href="#">ESP/Splash!</a>	①
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 href="#">Schmahl Science Workshop</a> . Or consider allowing science fair participants to use your lab equipment.	①
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 <a href="#">courses</a> .	①
Encourage your students to get involved with the <a href="#">d.school's K-12 Lab Network</a> and help build spaces, courses, and partnerships to bring design thinking to young people.	②
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., <a href="#">Stanford Optical Society</a> , <a href="#">Society of Women Engineers</a> , <a href="#">Materials Research Society</a> ).	①
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 <a href="#">Stanford at the Tech</a> as an example.	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, Chabot Observatory and Science Center, or smaller venues like the Palo Alto Junior Museum, Coyote Point Museum or the Museum of Aviation. This requires a lot of coordination and lead time.	3
Create a Stanford <a href="#">Continuing Studies</a> course to explain the nature of your research and its societal implications. Courses can be one quarter or short courses.	3
Tap into a “science day” (and involve your students) to provide lectures, demos and hands-on activities for the community. Examples include the <a href="#">Bay Area Science Festival</a> , <a href="#">Wonderfest</a> and the <a href="#">Bay Area Maker Faire</a> .	2
Create a web site for people to interact with or learn more about your field. Examples: Steve Palumbi’s <a href="#">Microdocs: Short Science Video on Ecological Sustainability</a> and Ali Mani’s <a href="#">Water Desalination by Electrodialysis</a> simulation applet.	3
Present a lecture about your field of research to a lay audience. Stanford hosts many lecture series you can tap into, including the <a href="#">SLAC Public Lecture Series</a> , <a href="#">Bio-X Frontiers in Interdisciplinary Biosciences Seminar Series</a> , and the <a href="#">LASERs (Leonardo Art Science Evening Rendezvous)</a> . Or check out a local <a href="#">Café Scientifique</a> .	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.