Museum of Science

NISE network
NANOSCALE INFORMAL SCIENCE EDUCATION

SCIENCE COMMUNICATION WORKSHOP
Research Experience for Undergraduates

Developed by the Strategic Projects Group at the Museum of Science.
REU SCW guide and materials freely available from the NISE Network.
http://www.nisenet.org/catalog/tools_guides/REU_Science_Communication_Workshop
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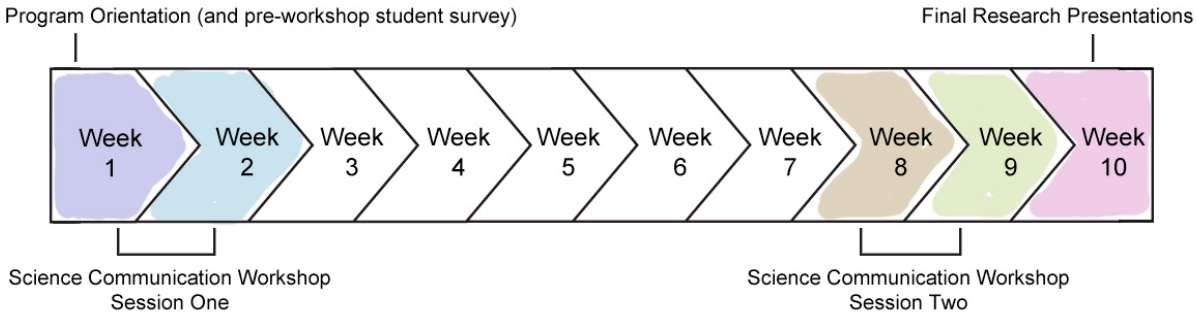
BASICS: This is a two-session workshop targeted to undergraduate students participating in university-based research programs such as NSF Research Experience for Undergraduates (REU) program, which typically occur during the summer months. University faculty and science museum staff integrate the sessions into the 10-12 week research program to enhance the students' science communication skills, with an emphasis on professional oral, powerpoint, and poster presentations. Each session takes a half-day, but can be shortened.

GOALS:

- Help students gain greater appreciation for the importance of science communication skills to successful careers in science and engineering.
- Assist faculty in preparing students for successful graduate school level work and for careers in scientific and technical fields.
- Guide students in developing effective science communication skills for professional and non-professional audiences.
- Guide students in developing habits of inquiry and exploration into the broader social, ethical, and economic aspects of their research.
- Provide students with communication tools to help integrate their life in science with other aspects of their lives.

STRUCTURE:

Workshop Scheduling within a Ten-Week REU Program



Session One provides an introduction to the importance of communication skills in science and to achieving understanding of the larger context and meaning surrounding individual research

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projects. Students practice basic communication skills and techniques for introducing their research and describing its context and meaning in simple terms that can be understood by non-scientists. They are given guidance for developing the oral slide (or poster) presentations they will later deliver on their research. They also learn techniques of providing supportive and constructive feedback to each other. Students come to Session Two prepared to deliver the first 5-10 minutes of their final research presentation in small groups, and to receive support, feedback, and further guidance. Session Two is scheduled to occur a week to ten days before the students are to deliver their final research presentation in a higher stakes setting.

CONTENT AREAS: Contextualizing research within its goals and societal implications; engaging different types of audiences; engaging multi-disciplinary audiences; oral and graphic presentation skills; slide and poster preparation skills; constructive feedback skills.

STRATEGIES: Discussion; skits; role-play; practice in small groups; reflection and feedback; writing and presentation assignments.

TARGET AUDIENCE: Undergraduate research program participants.

RECRUITMENT: Once the research program faculty decide to incorporate the Science Communication Workshop into their program, they require all the students to participate. The university either contracts with the Museum for the Science Communication Workshop, or the cost is included in an education outreach sub-award from a research center.

COMMITMENT: Students attend both workshops and complete the assignments (which coincide with the program's overall assignments).

FACILITATORS: Museum staff with knowledge of professional science communication practices and excellent workshop facilitation skills; aided by faculty coached in the process serving as small-group facilitators.

PUBLIC ENGAGEMENT PLATFORMS: The REU SCW focuses on preparing undergraduates for the professional graduate studies in science and engineering, but it also guides them in finding ways to share their interest and work in science with other people in their lives.

EVALUATION FINDINGS: The Donahue Institute for Research and Evaluation has conducted evaluation studies of the REU SCW workshop over more than six iterations. These include workshops conducted by the Museum of Science Strategic Projects Group in collaboration with faculty at Harvard University, Northeastern University, the University of Massachusetts-Lowell, and the University of New Hampshire. In 2010 Donahue also conducted an evaluation of a dissemination version of the workshop implemented at the University of Wisconsin-Madison. The findings show that the Science Communication Workshops are rated highly by students and faculty alike; they typically rate the highest among professional development sessions attended by the students. Faculty note a marked improvement in poster and slide presentations. The 2009 evaluation study is posted at:
http://www.nisenet.org/catalog/evaluation/research_experience_undergraduates_reu_science_communication_workshops, and the following papers have been published:

Alpert, C.L., Levine, E., Barry, C., Isaacs, J., Fiorentino, A., Hollar, K., Thate, K., "Tackling Science Communication with REU Students: A Formative Evaluation of a Collaborative Approach," *Mater. Education,* eds. M. Marinho Patterson, D. Dunham, E. Marshall, J. Nucci (*Mater. Res. Soc. Symp. Proc.* **1234**), PP04-12. 2009. DOI: 10.1557/PROC-1233-PP04-12.

Alpert, C.L., Isaacs, J., Barry, C. Miller, G., Busnaina, A., "Nano's Big Bang: Transforming Engineering Education and Outreach," *Proc. ASEE Annual Conf. & Expo*, June 2005.