

# What is Public Engagement?

Public engagement with science describes intentional, meaningful interactions that provide opportunities for mutual learning between scientists and members of the public. Museums in particular are trusted<sup>1</sup> sites for many audiences, so may provide a suitable venue for public engagement with science activities.

Goals for public engagement with science within informal science education often include mutual learning (scientist and public), civic engagement skills and empowerment, increased awareness of the cultural relevance of science, and recognition of the importance of multiple perspectives and domains of knowledge.<sup>2</sup> Mutual learning refers not just to the acquisition of knowledge, but also to increased familiarity with a breadth of perspectives, frames, and worldviews. Many informal science educators or institutions may also have educational learning goals for the activities.

## Why It Is Needed

Because science is prevalent in all facets of our lives, the science-society relationship is complex, and there are many ways to approach it. The relationship can be constructive, tension-filled, or everything in between. Interaction between interested stakeholders is critical to finding common ground on scientific issues affecting society (see Synbio Audience Research). In the case of synthetic biology, we can observe both a relative lack of awareness of the technology and its applications, as well as rather distinct views of the ways in which the technology should be regulated, applied, or

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<sup>1</sup> "Trust: Are We Trusted?" Museum Audience Insight, 25 Nov. 2008. Web. 29 May 2015.

<[http://reachadvisors.typepad.com/museum\\_audience\\_insight/2008/11/trust-are-we-trusted.html](http://reachadvisors.typepad.com/museum_audience_insight/2008/11/trust-are-we-trusted.html)>

<sup>2</sup> Bonney, R., et al. Public Participation in Scientific Research: Defining the Field and Assessing Its Potential for Informal Science Education. A CAISE Inquiry Group Report. Washington, D.C.: Center for Advancement of Informal Science Education (CAISE) (2009).

otherwise approached.<sup>3</sup> Public engagement – rather than public understanding – provides a constructive platform for public views to be combined with scientific expertise in decision-making contexts.

## From Public Understanding...

The traditional approach to the science-society relationship — particularly when tension exists — has been to try to increase public understanding of scientific discoveries and theories. However, many members of the public already understand basic scientific facts and concepts,<sup>4</sup> yet they may disagree or be uncomfortable with the presumed implications.<sup>5</sup> Thus education alone may be insufficient.

## To Public Engagement...

In the public engagement approach, scientists and the public discuss the benefits and risks of science and technology.<sup>6</sup> In doing so, questions and concerns can be better understood and addressed. Scientists can also expand the reach of their work, and make it more relevant to society.

The public engagement approach often uses and builds on public understanding efforts, while moving toward more comprehensive and interactive opportunities for dialogue and exchange. Through engagement, scientists and the public<sup>7</sup> participate in discussions about the benefits and risks of the science and technology impacting our daily lives. In doing so, questions and concerns can be better understood and addressed. Further, involving a wide range of interested stakeholders can connect seemingly unrelated viewpoints, with potentially far-reaching effects.

In addition, a growing body of work suggests scientists themselves benefit from engaging with the public. Scientists can discover ways to make their work more relevant to society if they engage in two-directional dialogues

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<sup>3</sup> Pauwels, Eleonore. "Review of Quantitative and Qualitative Studies on U.S. Public Perceptions of Synthetic Biology." *Systems and Synthetic Biology* 3.1-4 (2009): 37–46. PMC. Web. 29 May 2015.

<sup>4</sup> National Science Board. *Science and Engineering Indicators*. Arlington VA: National Science Foundation (2014) (NSB 14-01).

<sup>5</sup> Kahan, Dan M. et al., "The Tragedy of the Risk-Perception Commons: Culture Conflict, Rationality Conflict, and Climate Change." Temple University Legal Studies Research Paper No. 2011-26; Cultural Cognition Project Working Paper No. 89; Yale Law & Economics Research Paper No. 435; Yale Law School, Public Law Working Paper No. 230 (2011).

<sup>6</sup> Scheufele, D. Communicating Science in Social Settings. *PNAS*. 110 (2013): 14040-14047.

<sup>7</sup> "Engaging the Public: Scientist Involvement." AAAS Center for Public Engagement with Science & Technology. Web. 29 May 2015. <<http://www.aaas.org/pes/engaging-public-scientist-involvement> >

with the public (which may also help to meet grant requirements, such as the National Science Foundation's "broader impacts" requirement<sup>8</sup>).

The Building with Biology project leverages the public engagement model to create conversations in science museums among scientists, engineers, and public audiences.

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<sup>8</sup> March, Peter. "Broader Impacts Review Criterion." NSF. Web. 29 May 2015.  
<<http://www.nsf.gov/pubs/2007/nsf07046/nsf07046.jsp>>