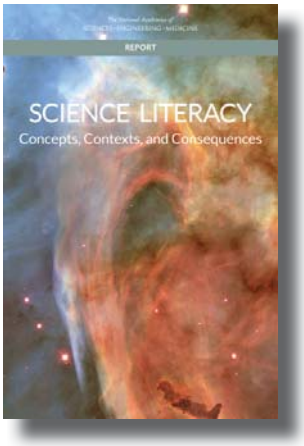
# Science Literacy and Science Communication: Highlights from Two Reports

April 2017

Two reports from the National Academies of Sciences, Engineering, and Medicine— *Science Literacy: Concepts, Contexts, and Consequences* (2016) and *Communicating Science Effectively: A Research Agenda* (2017)— examine how people gain, use, and respond to scientific information. Both reports highlight the complexity of how people process the scientific information they receive, and both cast doubt on the common assumption that if people are simply given more information about science, they will alter their beliefs and actions to reflect that information. The reports also highlight the need for further research in these areas.




## *SCIENCE LITERACY: CONCEPTS, CONTEXTS, AND CONSEQUENCES*

This report examines science literacy in the United States at societal, community, and individual levels. Among its key conclusions:

**On current measures of science knowledge, U.S. adults perform comparably to adults in other economically developed countries.**

**While science literacy has historically focused on individual competence, communities can also develop and use science literacy to achieve their goals.** Science literacy can be built and applied collectively, when community members with different levels and types of expertise work in concert to address questions about health, the environment, and social policies.

**Studies using measures of science knowledge observe a small, positive relationship between science literacy and attitudes toward and support for science in general.** However, the relationship is not strong, and available research does not support the claim that increasing science literacy will lead to appreciably greater support for science in general.

**An individual's attitude toward science in general does not always predict his or her attitude toward a specific scientific topic** (for example, genetic engineering or vaccines). Some specific science issues evoke reactions based more strongly on worldviews than on knowledge of the science alone.

**Commonly used survey-based measures of science literacy, along with other measures of scientific knowledge, are only weakly correlated with action and behavior across a variety of contexts.** These weak relationships between knowledge, attitudes, and behaviors suggest that efforts to simply promote knowledge and understanding to change behavior or attitudes may have limited results. Efforts should focus on increasing knowledge while also removing impediments to actions and lowering the literacy demands of particular situations.

**Further research on science literacy is needed.** In conducting this research, the scientific community and other stakeholders should continue to expand conceptions of science literacy to encompass an understanding of how social structures, such as education systems or local resources, might support or constrain an individual's science literacy, as well as an understanding that societies and communities can demonstrate science literacy.

A PDF of the report can be downloaded free of charge from the National Academies Press at https://www.nap.edu/catalog/23595.

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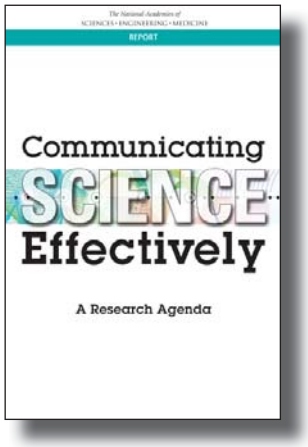


## *COMMUNICATING SCIENCE EFFECTIVELY: A RESEARCH AGENDA*

This report offers some insights into effective science communicating and a research agenda that can inform efforts to communicate about science more effectively, particularly when issues are contentious. Among the report's main findings and recommendations:

**Science communicators need to move beyond the "deficit model" of communication,** which holds that if science communicators simply increase people's knowledge of the relevant science, people would make choices more consistent with the evidence. Research shows that many audiences may already understand generally the information scientists are presenting, but for diverse reasons do not agree with or act consistently with that science. People rarely make decisions based only on scientific information; they also consider their own goals and needs, knowledge and skills, values and beliefs. Science communication can be more effective when it aims to help people understand the science relevant to a decision, while recognizing that other factors will also affect their decisions.

**When science is involved in public controversy, the already-complex task of communicating about science becomes even more so.** Science-related controversies typically involve conflicts over beliefs, values, and interests that are central to the debate, rather than simply a need for knowledge from science. For those reasons, across different science-related controversies, from GMOs to climate change, people who are demonstrably knowledgeable about the science may have opposite perceptions of or expressed support for the science. Scientists should engage with the public and seek common ground where possible.

**Far more research is needed to assess various approaches for communicating science.** For example, research is needed to:

- find more effective ways to communicate about scientific consensus and scientific uncertainty
- find more effective ways to communicate about science in the context of public controversy
- understand better how people's mental shortcuts and social networks affect how they process the scientific information they hear
- find more effective ways to ensure that accurate information about science can be heard in a competitive online media environment

Researchers and practitioners of science should enter into partnerships to test hypotheses and to translate what is learned through research into practice.

A PDF of the report can be downloaded free of charge from the National Academies Press at https://www.nap.edu/catalog/23674.

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