THE ASPEN INSTITUTE
Citizenship & American Identity
program

Science & Civics: A Guide for Collaborative Action by Science & Civics Meeting Participants

INTRODUCTION

Today, it is necessary and urgent to defend the vital role of science in a healthy civic life. This report begins with the premise that there is a gap in both civic literacy and scientific literacy in the United States. The Aspen Institute's Citizenship and American Identity Program (CAI) believes that these two trends are connected – and that addressing them together is vital to cultivating a citizenry capable of informed self-government. Through the Science & Civics Initiative, CAI aims to help scientists become more powerful citizens and enable citizens to make sense of the world and its complex problems more like scientists. The goal of this report is to outline a path of collaborative action for both civic groups and scientists.

BACKGROUND ON SCIENCE & CIVICS INITIATIVE

The goal of CAI's Science & Civics initiative is to ensure scientific literacy is interwoven with civic and cultural literacy – in both directions. The Science & Civics initiative is part of a larger effort by CAI called What Every American Should Know (WEASK), a project that grew out of an essay by executive director Eric Liu. WEASK was created to explore how, in an age of increasing diversity and widening inequality, this country can cultivate a sense of shared destiny and common civic purpose.

For the first phase of the Science & Civics initiative, CAI invited leading practitioners and communicators of civics and science to join a closed-door convening on November 15, 2016. Participants explored best practices and recommendations to cultivate more citizens-as-scientists and more scientists-as-citizens. This report summarizes the learning and key insights that emerged from this meeting.

Eric Liu, executive director of CAI, and Caroline Hopper, CAI program associate, represented the program at this meeting, and hosted the following attendees:

Dr. Kevin Desouza, ASU Foundation professor in the School of Public Affairs at Arizona State University, nonresident senior fellow, Brookings Institution

Shannon Dosemagen, executive director of Public Lab

Dr. John Falk, Sea Grant professor of free choice learning at Oregon State University

Leetha Filderman, president and COO of PopTech

Ira Flatow, host and executive producer of Science Friday

Dr. Cary Funk, associate director of research on science and society at Pew Research Center

Thomas Kalil, deputy director for policy for the White House Office of Science and Technology Policy

Dr. Leandris Liburd, associate director for minority health and health equity at the Center for Disease Control and Prevention

Dr. Dietram Scheufele, John E. Ross chair in science communication in the Department of Life Sciences Communication at the University of Wisconsin–Madison

Brooke Smith, former executive director of Compass

HOW CIVIC AND SCIENTIFIC LITERACY INTERSECT

The public's understanding of science and scientists' understanding of civics matter more today than ever before. Consider the Flint water crisis, the Dakota Access Pipeline debate, and conversations about climate change. Add recent policy debates on topics like Zika intervention strategies, genetic testing, and driverless cars, and the civic dimension of science becomes clear and urgent. Scientific issues already impact contemporary life in meaningful ways, and today's decisions will affect our future dramatically.

Furthermore, in an increasingly "post-fact" era, science denial and the twisting of scientific norms are becoming all too common. This creates unprecedented challenges for both the public and the scientific community. Leading politicians, including the current president, have cast doubt upon the reality of climate change and its correlation to human activity, despite evidence-based science proving otherwise. The challenge is to counter these trends by providing the tools and support for increased communication and collaboration among scientific experts and civic actors.

Scientists can learn from active citizens, just as citizens can learn from scientists. Citizens can help scientists to understand the needs and fears of communities, how to communicate their practical knowledge as it relates to those lived experiences, and how to do so in a way that can create practical, positive change. Scientists can teach citizens to activate their imagination, to push frontiers, and to co-create in order to problem-solve.

BEST PRACTICES

Implementing certain best practices is vital to successfully increasing communication and collaboration between scientists and civic groups. The following practices are recommended by the Science & Civics meeting participants.

Citizens must take ownership of the challenge to defend evidence-based science.

In order to achieve effective solutions to science-related societal challenges, citizens must be able to connect the dots between scientific evidence and policy framework. The recent politicization of science has distracted citizens from activating this skill, yet it is because of the politicization of science that this skill is so important. As Eric Liu points out, citizens must sustain some notion that there is scientific truth, that science matters, and that it is must not be the malleable product of the people in power. Cary Funk points out that when the public interacts with science, they are seeing only the pieces that raise civic and policy issues. Therefore, citizens must act as advocates for the experts promoting evidence-based science. It is important that the general public actively support evidence-based scientific knowledge as truth, and that they use that evidence to inform their actions when approaching science-related societal issues.

For example, grassroots campaigns to ban hydraulic fracturing (or natural gas fracking) have sprouted in small towns around the country. These citizen groups, concerned about water safety and supported by

evidence-based science, have successfully banned fracking or at least landed fracking bans on ballots despite millions of corporate dollars being poured into misleading pro-fracking campaigns.

Scientific relevance can motivate citizen action.

Ira Flatow says that the general public loves science, but does not necessarily understand its relevance in their own lives. He adds that when scientific evidence is discussed, it should be coupled with explanations of why the evidence is important for individual and community welfare.

This is not currently the case. Dietram Scheufele explains that when communities do not see the relevance and necessity of science, there is a lack of excitement about that science, which leads to a lack of engagement. Levels of civic participation are low, he says, and have steadily decreased since the 1960s despite every piece of data suggesting that they should have gone up[i]. An antidote to this trend is better framing. Science should not only be shared as "exciting information that is pushing frontiers," but also as "exciting information that is pushing frontiers that matter to you." For example, when it comes to the topic of automation, a citizen ought to know more than just what tasks can be automated. The citizen should understand the potential harm and benefits – the ways in which automation could make life easier, by leading to greater efficiency, or harder, by replacing job opportunities with robots.

Leandris Liburd makes the important point that this effort is also directly related to equity. Increasing participation around science-related issues is especially critical when it comes to the most vulnerable, often minority, communities. Communities that are organized around issues that affect them often fare better than those that aren't. If vulnerable communities are not encouraged to participate in these initiatives, disparities related to these issues will widen.

Kevin Desouza notes that efforts should be focused on customizing scientific communication. Too often, science is communicated to communities without sufficient customization and packaging. As a result, communities are challenged to "plug-n-play" scientific discoveries and knowledge into their daily operations. Efforts need to be taken to make the process of engaging with science seamless and embedded into the daily lives and activities of individuals and communities.

Improved community engagement requires scientists to break professional patterns.

As scientists engage with communities more deeply, the scientific evidence should be injected into ongoing community conversations, keeping community interest, needs, and values at the center of all efforts.

Historically, the culture of science has rewarded lab-based work and does not enable scientists' interaction with communities. Shannon Dosemagen points out that there is dangerous disconnect between scientists studying certain issues and people with lived and learned experiences with those issues. Brooke Smith, executive director of Compass, argues that in recent decades, scientists' interest in engaging with communities has grown, but science institutions do not yet support this desire.

Before scientists can discuss their expertise with communities they must first understand the needs and realities of those communities. This task requires deep listening, a skill that scientists do not regularly practice. According to Leetha Filderman, a tremendous deficiency is the lack of expectation-setting for scientists as civic catalysts and communicators of their work. This is not built into scientific training programs. If scientists are to be successful deep listeners, they must be adequately trained and prepared. They must also be supported to build time into their work cycle for community engagement.

Leandris Liburd explains that deep listening allows scientists to better understand how they can apply their knowledge in a way that will work for the community at hand. Scientists should be open to the

reality that their assumptions about the community may be wrong. She points out that part of this process is acknowledging "indigenous knowledge" and other epistemologies, or ways of knowing that exist in the community. This is a hard ask of scientists, given the centrality of methodology and the "scientific method" in defining what constitutes science and the rigorous production of facts. Encouraging these kinds of conversations between scientists and citizens, however, can foster greater mutual respect and collaboration.

Liburd also flags the importance of assuring the community that the goal of science and the scientific inquiry is to do no harm. This helps to dismantle the historical legacy of mistrust of medical research and experimentation experienced by some population groups in the US. She explains that there are power dynamics between researchers and the researched, and researchers and the community. The characterization of scientists as highly educated and affiliated with elite institutions (like universities, private research firms, and government agencies) sets up an unequal social relationship with some communities. Recognizing how scientists might be viewed and being intentional about creating equity in the scientist-citizen relationship is important.

After deep listening, scientists should communicate their knowledge in a way that is sensitive to community needs, and applicable to that community. Delivering scientific findings to communities has been a common problem. Cary Funk points out that innovation is at the heart of science. When the public hears about new scientific ideas, those concepts often bring change. This raises mixed feelings, and makes it even more important that the scientific knowledge is engaged and discussed in thoughtful and effective ways.

Brooke Smith says that most scientists practice the ineffective "deficit model" of communication, which assumes that the obstacle to community understanding is simply that people don't have the facts. Once they do, the model goes, they'll gain understanding of the scientific topic. Unidirectional communication from scientists to people does not work, Smith says. Scientists must engage in discussions around the information they would like to share.

This requires that scientists return to the basic idea of proper framing and present science not only as evidence-based facts but also as relevant facts. Thomas Kalil recommends focusing these efforts around specific science-related societal issues and within specific communities for the most effective outcomes. John Falk recommends broadening discourse beyond the disciplinary frame of science, starting with the framework of the problem. Delivering information within this framework allows the communicator to trigger people's self-interest and is a more effective entry point for the conversation.

Falk adds that effectively communicating science to communities requires creative and diverse forms of engagement. Scientists should look beyond schools as vehicles for communication and turn to after-school programs, workplaces, museums, interest groups, and other sectors. Ira Flatow says that the entertainment industry offers great opportunity to teach not just science, but also why science matters. He suggests that scientists be trained in the art of communicating with the media as part of any graduate degree program and that they learn and practice effective communication techniques for conveying their ideas to print, social, audio, and video platforms.

Science can catalyze and popularize changed notions of self-interest.

While self-interest and self-relevance are powerful motivators for the public to engage with science-related issues, some of these issues become even more important when considering their collective benefit. Cary Funk uses clean air as an example. She says that people who support clean air span all sectors and partisan lines. The topic of clean air connects scientific ideas to real life experiences. It is indeed in one's self-interest to join the collective effort towards clean air. In this way, science-related issues are opportunities to find common ground.

Similarly, Dietram Scheufele says that scientific issues are never solely scientific in nature. These issues touch on many topics, and understanding what angles to highlight is key to garnering community support. Thomas Kalil uses the example that some actors are interested in clean energy not because of environmental concerns but because of economic incentives.

To reach communities, humanize scientists.

As Leetha Filderman explains, because of the culture of science and other factors, when scientists do find opportunities to engage with communities they are often unable to communicate their work outside of their own lab or area of expertise. This is particularly true for early-career scientists. Brooke Smith adds that in instances that scientists do make these attempts, they can be unidirectional using the deficit model, and this can be harmful. The lack of communication across sectors leads to dangerous information fragmentation. Skill-building should be incorporated into scientific education, but also additional infrastructure should be built to train scientists in these efforts. Kevin Desouza says that at the heart of these efforts is the need to humanize scientists, which means giving scientists opportunities to share their struggles, failures, and missteps during the knowledge discovery process. Too often, we only hear about the success stories.

Citizens deserve better opportunities to engage with science.

Modern "citizen science" efforts offer a wide array of venues for citizen engagement with science. Kevin Desouza expresses concern, however, about efforts that are focused on crowdsourcing data collection. He says that these efforts are not effective modes to engage the public around science, and that citizens need opportunities to engage beyond just data collection. We need to develop more robust platforms that engage citizens into all facets of scientific discovery from problem definition and modeling to data collection, analysis, and even communication of results. We have yet to leverage the potential of crowdsourcing when it comes to building truly collaborative, open, and participatory scientific platforms.

Shannon Dosemagen adds that researchers benefit from citizen efforts, but do not always share data or their process with these citizens. This leads to mistrust and further disconnect between citizens and scientists.

Scientists can be civic catalysts, setting in motion a positive convection cycle.

In order to successfully address science-related societal issues, scientists must work with and learn from the public. First of all, Brooke Smith says, scientists should not only do research, but do relevant research then get out and share it. Broad public engagement is required for scientists to figure out what citizens need to know. The public can also help scientists to navigate power and determine who to talk to about their knowledge. As Eric Liu says, to be a real scientist is to be at least partially literate in power. Scientists must understand how to discern and engage with institutions and other structures of power in order to share their evidence in the most productive and effective way. Furthermore, scientists should bring the concept of democracy to scientific institutions themselves. According to Brooke Smith, scientific institutions currently contribute to inequities, particularly around race and power. She says that efforts to decolonize research and science are underway and should be considered by such institutions.

The public too must look to scientists. When citizens are able to engage with science, they not only learn about the science itself, but also about how to think like scientists and why this matters when solving problems. For example, scientists are able to activate imagination around solving problems and should teach citizens how to do this and how to not accept the status quo. Scientists are also able to co-create and they should teach citizens how to do this when it comes to solving problems.

In this way, John Falk says, science should be used as a tool for stronger citizenship. Scientists have the potential to become civic catalysts, and Leetha Filderman points out that those skills should be taught. That is a step further than scientists as listeners, communicators, and engagers. When scientists act as civic catalysts, it sets in motion a positive convection cycle – people know how to ask questions like scientists. Scientists can learn from citizens about local knowledge and understand the changes that are happening in their own communities. When scientists and communities are connected in this exchange, problems are solved more effectively and progress is made.

TEMPLATE FOR ACTION

The recommendations in this report are intended to increase communication and collaboration between scientists and citizens, promoting mutual learning. We believe it is vital for citizens to be more scientifically literate and scientists to be more civically literate. And we believe the best way to do that is to focus on place: to ground this work in the real issues of a real community. In short, think scientifically and act locally.

When launching these efforts, we suggest that both scientific and civic practitioners consider the following checklist for guidance:

- **Create space for dialogue.** There is an urgent need to affirm and champion the role of science in society and to call for evidence-based policies. When possible, those scientists and civic practitioners who are committed to using science as a civic catalyst, committed to training and amplifying the scientists for such, or committed to making science accessible to the public should convene. It is best if these convenings can be open to the public. Local actors from a wide range of sectors should be invited to participate. Action is born from these conversations.
- **Focus your issue area.** Efforts to organize communities around science-related societal issues should be focused on specific topics. Both scientists and civic activists should first examine existing organizing efforts and determine how science can support them.
- **Be clear on what you want to achieve.** Is the goal to build consensus around solutions for policy problems that are based on the best available science? If yes, then communication efforts would likely focus on different evidence than if the goal is simply to increase understanding of an issue among the population more broadly.
- **Determine your target community.** The most effective efforts are place-based. Consider which community you will work with to organize around your specific topic. Equity in relationships is important. Both scientific and civic practitioners should carefully consider who is willing to invite these efforts into their community.
- **Understand community needs and values.** The most effective form of messaging will appeal directly to these needs and values. Any outsiders coming in to a community, particularly scientists, should conduct deep listening in the community before actively engaging. Civic practitioners should work with scientists to facilitate this listening.
- **Share and discuss knowledge thoughtfully.** Scientists' engagement should be informed by their deep listening. When communicating scientific evidence, that knowledge should be presented in a way that is relevant to the community's needs and values. Civic practitioners should work with scientists to inject their evidence-based knowledge into ongoing community conversations, and this evidence should be presented in terms of the problem framework rather than a scientific evidence-driven conversation. Communicate clearly. Avoid jargon or highly scientific language that might alienate the community.

- **Organize.** Civic practitioners should help scientists to understand how to engage with ongoing community organizing efforts around scientific issues, which can help to establish common ground across many separate groups.
- **Scale.** Scientists should work with organizers and key community members to implement "train the trainer" systems that can easily be scaled. There is great need for the scaling of this work.

CAI plans to pilot the process outlined in this report in at least two communities facing specific science-related societal issues. We encourage others to implement these processes as well, and we welcome reflections, feedback, and stories from your community.

five separate energy-focused forums each summer that examine different aspects of the energy world: the power sector, global oil and gas, clean energy innovation, nuclear energy, and shale production and governance. The goal of all these convenings is the same - to encourage candor and the free exchange of ideas about our energy economy and the future. Change is perhaps the only real constant in the energy world, and we look forward to discussing the changes that occur over the next year at our 2017 forums.

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i Scheufele, D. A. (2001). Democracy for some? How political talk both informs and polarizes the electorate. In R. P. Hart & D. Shaw (Eds.), Communication and U.S. elections: New agendas (pp. 19-32). Lanham, MD: Rowman and Littlefield Publishers.

The **Citizenship & American Identity** program focuses on the challenge of sustaining strong citizenship in America and coherent national identity in an age of demographic flux and severe inequality.

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