INCLUSIVE SCIENCE COMMUNICATION STARTER KIT

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This report summarizes responses from focus groups conducted during the 2019 Inclusive SciComm Symposium and survey responses collected from Symposium attendees before and after their participation in the event. Quotes used herein came directly from Symposium surveys and focus groups or represent paraphrased composites of multiple comments received from symposium attendees.

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What is science communication?

If you ask five people to define science communication, you're likely to get five different answers. Here, we define science communication as any information exchange that engages audiences in learning, conversations, or activities related to STEMM – science, technology, engineering, math, or medicine.

Regardless of the definition, science communication happens in a wide range of situations and contexts, from the one-way dissemination of scientific information (for example, in lectures, mass media or written materials), to ephemeral interactions in museums, parks or social media settings, to relationship-based exchanges in settings like classrooms, community organizing and community-based research.

Like other types of learning, all of these information exchanges build on existing knowledge and are context dependent. (1) In any situation, effective science communication begins with clear and measurable goals. (2)

Why do I need a "starter kit" for inclusive science communication?

Many people have never heard of "inclusive science communication" before, or, if they have, they may not have a clear sense of how it relates to their work.

This Starter Kit is intended to help anyone who communicates with others about STEMM do so in ways that
1) seek and value a wide variety of perspectives,
2) recognize how a person's multiple identities might affect their relationships with STEMM, and
3) yield equitable outcomes that build and sustain trust.

Sound like a lot? It is! But we all have to start somewhere. This starter kit is just that, a way to get acquainted with this challenging, rewarding, and essential work.

How is inclusive science communication different?

Inclusive science communication (ISC) departs from traditional science communication practices by prioritizing inclusion, equity, and intersectionality as both central parts of the process and as desired outcomes.

By placing these values and the perspectives of marginalized groups at the center of science communication, ISC combats prevailing racist, gendered, ableist, heteronormative, and otherwise discriminatory STEMM frameworks and advances forms of engagement, participation and communication that build on the multiple overlapping facets of one's identity and celebrate diverse ways of knowing. (3)

What are the goals of inclusive science communication?

People and organizations who practice inclusive science communication aim to

- acknowledge how historical and present oppressions and inequities affect public perceptions about and participation in STEMM,
- reflect on how their own biases influence the design and implementation of their work,
- increase public participation and sense of belonging in STEMM fields,
- foster collaborations that better serve communities' priorities and
- enhance the quality and scope of research projects. (4)

The key traits
of inclusive science communication

Three key traits describe the ways that ISC is practiced: **intentionality**, **reciprocity**, and **reflexivity**. (5) Each of these three key traits is closely linked to the others, and they all work together to achieve the goal of equitable communication. (6)

What do these terms mean in the context of science communication?

Intentionality refers to the communicator's thoughtful, purposeful consideration of their goals, audiences, and processes to both represent and support diverse social identities. For example, an after school program leader might use a more inclusive definition for what constitutes scientific knowledge to incorporate Indigenous ways of knowing as well as Western approaches. A YouTube creator might rethink the language and imagery they use and prioritize the use of high quality captions or sign language interpretation in their videos. A librarian might take greater care to understand and integrate the lived experiences of community members in their programming.

Reciprocity means that the relationships between audiences and communicators are equitable (providing each party with what they need to succeed) and recognizes what the audience or community brings to the conversation (their *assets*), rather than what they may lack (for example, a specialized degree). Reciprocal communication works most effectively when there are co-created benefits for the communicator and the people they wish to engage. For example, a journalist covering climate change adaptation might show reciprocity by highlighting community-led solutions instead of presenting community members as victims. A researcher might seek out local community partners to help shape, guide, and adapt their study questions and methods.

Reflexivity refers to the ways that one reflects, thoughtfully and systematically, on their communication practices and outcomes. Reflexive communication or engagement allows for adaptation as needed. For example, an exhibit designer may reflect on their portrayal of a particular important scientific milestone and realize that the history was one-sided, showing only the researchers' point of view instead of the perspectives of communities who informed or were affected by the research.

Who practices inclusive science communication?

ISC can happen across a wide range of sectors, disciplines and settings. Some people study ISC, some practice it, and a growing number of people do both. Many people, in fact, may not view themselves as doing ISC even though they regularly practice its key traits.

Inclusive science communication practitioners may include, but are certainly not limited to:

Artists and designers
Community elders and leaders
Community organizers
Cooperative Extension staff and volunteers
Educators (K-12, post-secondary, after school programs)
Government agency staff
Librarians
Media professionals (journalists, podcasters, YouTubers, filmmakers)
Medical professionals
Museum staff and volunteers/docents
Public information and press officers
Scientists, technologists, engineers, mathematicians

What happens when science communication isn't inclusive?

Here's what some respondents told us* about their experiences.

"I had, to a certain extent, internalized that STEM might not be for me because, despite my sincere interest, I did not see people like me inhabiting the space."

"The question is: how can we make all of these efforts, public engagement and community engagement, be sustainable and not just interventions for a few years?"

"The people crafting the messages are not representative of the people receiving those messages."

"The project happens, the people go away, and then the people in the community say, 'yeah, they came to exploit us again and they're gone.'"

*Respondent comments are quotes and paraphrased summaries from focus groups and surveys conducted before, during, and after the 2019 Inclusive SciComm Symposium.

Inclusive science communication techniques and strategies

Centering inclusion, equity and identity is essential to inclusive science communication.

People working to engage diverse audiences in conversations about STEMM topics and to broaden participation in STEMM fields must acknowledge the historical, social and political inequities that underrepresented and marginalized populations experience. By centering the core values and key traits of ISC we can amplify diverse perspectives, identify creative approaches to societal problems, and contribute to social justice.

So, how do I apply the core values and key traits of ISC?

▶ **Engage with different ways of knowing and learning.**
In the United States, science is typically considered through a Western or European-centric lens. By integrating bodies of knowledge and expertise from different cultural perspectives and frameworks you can offer diverse approaches to learning. (7)

"We partner with a literacy group to combine poetry and spoken word as part of teens' out of school experiences with science. We have a puppet group meet with animal care staff and tell stories of conservation using puppets."

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"Science communication is inherently cultural. Everyone doesn't see or practice science as this linear thing, from question to answer. Different cultural relationships with the natural world, for example, make space for entirely different ways of telling stories about and connecting with scientific inquiry."

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▶ **Decenter yourself.**
Individuals and communities are best positioned to know their own priorities, interests, and challenges. Exercise humility when listening to others' insights.

"This is so important, but we just weren't sure where to begin! I was afraid to mess up. Our team decided to start with dedicated, monthly discussions about how we could make our community programs more welcoming.

We realized that we had been making a lot of assumptions about who 'the community' was, and that we needed to do more work to understand their interests instead of ours."

▶ **Understand your own, and your organization's, historical, cultural, and political contexts and the contexts of those you wish to communicate with.**
We all bring our history with us through life, and awareness of these contexts may illuminate why different people interpret information or messengers differently. (7)

"I did an exercise with my students that I learned [at the Inclusive SciComm Symposium], thinking about privilege and who has advantages and disadvantages.

They responded really positively, saying 'I never considered that some of my classmates had to deal with some of those issues.' It was something they were kind of uncomfortable with at first, but then it turned around. They were really positive about it because they learned more about their fellow classmates, in ways they had not imagined."

▶ **Watch your language.**
Consider how your language may exclude or oppress those with differing ability, race or ethnicity, sexual orientation, gender, age, occupation, education, language, religion, or experience level. Also, think about the specific languages you're using, and not using, in your communication. English-only science communication is inherently limited in its reach, as are videos without accurate captions. (8)

▶ **Reflect on power dynamics.**
Many studies have shown that one's perceived identities–especially identities related to gender, race, or disability that are often assumed by others based on our appearance–allow some individuals to wield more social power than others. (9) An imbalanced power dynamic can result in those with less power being reluctant or unable to share their perspectives. (10) If the power dynamic is shifted in your favor, look for opportunities to "pass the mic" so that others feel comfortable about contributing. Not all spaces are safe for everyone to participate. Take time to reflect on how power dynamics might affect participation in the space before asking others to engage. Specifically, consider how your words, actions, and even the space you take up in the room may cause others to feel resistant or unsafe. Conversely, if you are resistant to engage in certain discussions, reflect on why you are feeling that way and, then, how your silence might affect the conversation.

"It's really challenging to know when it's appropriate to use my position of privilege to bring up an issue versus stepping back. Will I do more harm by speaking up, or am I not doing enough?

I've found it helpful to have a sort of network of friends and colleagues who I can talk with about these concerns. Talking through my intentions and assumptions with someone else who has a totally different perspective has helped me see how I might approach these situations."

▶ **Don't perpetuate exclusive or inequitable practices.**
This may seem obvious, but research has shown that science communication often repeats stereotypes and misconceptions. (11) It's important to be aware of these pitfalls so you don't unintentionally reproduce them in your own work. This point also relates to the previous example of highlighting people's unique strengths (assets) based on their own lived experiences. (12)

▶ **View this work as a marathon, not a sprint.**
ISC, especially approaches that focus on true engagement and relationships, requires time. You may not be able to apply every promising practice outlined in this ISC Starter Kit at once. We encourage you to take on the pieces that you can. Over time, as you develop your skills, competencies, relationships, and confidence, experiment with additional strategies and techniques. This is a lifelong process.

"I realized that we were putting the cart before the horse. Now we're convening working groups to discuss inclusive approaches to our work before we begin a project."

"We act as accountability partners for each other. We call each other out, when needed, if one of us is repeating harmful patterns."

"I am at peace with not feeling like an expert. Understanding and applying good practice isn't something you achieve, it's something you constantly strive for."

Inclusive science communication techniques and strategies

Dialogue across difference is an effective way to break down social barriers and build understanding.
Conversations about potentially uncomfortable topics such as privilege, power, or marginalization are inherently difficult to begin and sustain, though the reasons for this difficulty may vary depending on your own position and identities. Race, ethnicity, class, gender, ability, sexual orientation, among other topics, often arise in these discussions. People in more marginalized positions, for example, may fear that their concerns will not be heard or appreciated. People with more power or influence, on the other hand, may struggle to perceive their own privilege.

In science communication settings, these conversations might include talking about sense of belonging in STEMM spaces, how intersectional identities affect a visitor's response to a science festival exhibit, or how to equitably engage marginalized communities in environmental planning efforts.

Discussions about social and political inequities require "brave spaces" in which participants confront and interrogate their discomfort through respectful and honest conversations. (13) Given the stakes of these difficult conversations across difference, it can be intimidating to initiate them. Nonetheless, engaging in difficult conversations about the intersections of STEMM, culture, history, and society is essential to the goal of welcoming and engaging all people in science.

So, what are the steps and actions for successful dialogue across difference?

Set expectations and desired outcomes.
Controversy and disagreement are natural elements of difficult conversations. Some planning is important to help you prepare for this part of the process.

…**Develop a plan.** What are your goals for the discussion? What are the audience or partner goals? How would you define success? How will you ensure the discussion stays true to the norms and agreements you have established?

"We are very explicit about agreements, aspirations and conditions in dialogues. People can hold each other to what we agreed upon. Aspirations are more internally driven, things that we hope and aspire to in our dialogues. And conditions are the things that facilitators keep us accountable for."

More about setting expectations and desired outcomes

…**Set realistic expectations** for the group by establishing clear, co-created guidelines for how to manage the discussion when tensions inevitably arise.

…**Don't bite off more than you can chew** for the allotted time.

…**Define and then remind yourself of the difference between civil disagreements and true altercations.** If you feel attacked, take a step back and reflect on whether or not you are simply being confronted with a dissenting perspective. As a facilitator, help the group return to the goals and outcomes if the conversation becomes heated.

"Facilitators are often described as neutral, but we refer to them as multi-partial, which means they care the same amount about each person in the room."

Encourage and support self-identification. Ask or observe which terms individuals use to describe themselves, and then use those terms, too. Respecting others' identities lays the groundwork for a trusting relationship and more open dialogue. Every person is at a different stage with regard to their own identities. For example, while some people may be happy to share their pronouns, others may not. Similarly, a person with a chronic illness may or may not identify as disabled. Identity is a complex and fluid concept, potentially changing for an individual throughout their life. Make space for everyone to participate as authentically and safely as possible.

"I came here from Puerto Rico and all these people are telling me who I am, and I'm like, am I supposed to thank you?

I had a faculty member ask me, like, how does it feel to be a woman of color? And I'm like, who are you? What's going on here? I lack certain privilege but might have other privilege. For many years I was told 'you are a woman of color here in the U.S.' and I didn't know what the phrase meant. I didn't grow up as a 'person of color.' I didn't experience that racial profiling growing up, so I want to respect those who have and at the same time tell them I don't have your experience.

I have different experience, but now we're in this together and how do we push back?"

a little more about working toward successful dialogue across difference..

Prioritize active listening over speaking.
If you are dominating the conversation or thinking of how you want to respond while another person is talking, then you are not truly listening and absorbing their perspective. Active listening requires the listener to analyze and reflect on the speaker's comments.

"When I first started leading these discussions, I talked way too much. I learned that listening was the key to success, but I had to learn how to listen. It turns out that listening can yield a lot more information than you might expect."

Ask questions instead of making assumptions.
The more you learn about another person, the better you will be able to understand the experiences and values that shape their worldview (and your own!), and identify areas of shared understanding as well as difference.

"We wrap these dialogues around socially relevant science topics. Before we discuss science, we create structured dialogue where there is an opportunity for a shared experience, to humanize the conversation. This builds understanding and wonder about not only the science but also about each other. The dialogues provide broader context that allow us to explore science through the lens of history and systemic oppression."

Practice self-awareness.
Think about how your presence and identities may shape, limit, or extend a conversation. Can you anticipate which topics will evoke your most challenging emotions and how you can navigate those responses? Can you predict your impact on other people in the room at a given moment?

Embrace the discomfort.
Dialogue across difference can feel awkward, but that discomfort is part of the process. Each of us experiences this type of conversation in different ways and with different stakes. For example, when we say or do something that offends another person, the choice to apologize and ask for guidance, if needed, is a small but important act. Making mistakes is key to learning and connecting across difference.

Hold yourself accountable.
When you inevitably say or do something with which another person takes issue, acknowledge how you have made the person feel. Remember that impact is more important, ultimately, than intention. Owning up to your impact builds trust. Denying impact erodes trust.

Normalize emotional responses.
There is significant emotional energy involved in dialogue across difference. Recognize that emotions are part of the process and learn to use emotional tensions as learning moments.

"I didn't have just one feeling, but many. I felt a lack of belonging, like I didn't belong anywhere. But it's also fear and anger."

Be courageous enough to start the conversation. Dialogue across difference is truly a life's work and a practice from which we all benefit. Meaningful dialogue across difference requires the willingness to take the first step. Start from where you are with courage and the conviction that you are on a learning journey. There is an element of risk involved with taking that first step, but there may be greater risk if you wait until you feel you can seamlessly manage all the possible outcomes.

"Oftentimes I'm in rooms where people are like, 'we understand that we can do better but we don't have time.' Hearing that multiple times in one year when you're working with the same people over and over, that's painful, you know?"

How can I learn more about practicing dialogue across difference and inclusive science communication?

Inclusive science communication is an emerging movement, which means that the practices are constantly evolving and resources are increasingly available. That said, ISC builds on decades of work in different fields, from formal education to psychology to community organizing, and generations of knowledge from Indigenous cultures. Seek out resources from across these fields and knowledges to build your proficiency as an inclusive science communicator.

Many of the available techniques and resources on dialogue across difference relate to discussions about race, but they can be useful across a spectrum of discussions on difference. The list of resources in this Starter Kit is not exhaustive but will help you build a foundation.

Visit **https://inclusivescicomm.org** to submit your own resources and questions!

Inclusive SciComm Starter Kit Resources

Research*

[Inclusive Science Outreach at Rockefeller University](#)
A collection of science communication case studies, tools, and resources organized into bite-sized articles.
Rating: Beginner

[The impact of the British Science Association's community engagement programmes](#)
A report summarizing the BSA's efforts to support community groups.
Rating: Beginner

[University of Michigan Program on Intergroup Relations (IGR)](#)
A program that promotes social justice through education and research. This link is to IGR's Research & Publications page.
Rating: Intermediate

[Dialogue Across Difference: Practice, Theory and Research on Intergroup Dialogue](#)
A rich suite of resources from research in educational settings.
Rating: Intermediate/Advanced

[Center for Advancing Informal Science Education](#)
"A collection of projects, research, and evaluation resources to support the informal STEM education community."
Rating: Beginner/Intermediate/Advanced

[STEM Teaching Tools](#)
A collection of usable tools to support STEM teaching, leveraging knowledge from practice and research.
Rating: Beginner/Intermediate/Advanced

[Inclusive Science Communication in Theory and Practice](#)
A special topic of the journal Frontiers in Communication dedicated to ISC research.
Rating: Beginner/Intermediate/Advanced

*See more research resources in the references list!

Read

[Disability Visibility Project](#)
"An online community dedicated to creating, sharing, and amplifying disability media and culture."
Rating: Beginner/Intermediate/Advanced

Read (continued)

Diversity Toolkit: A Guide to Discussing Identity, Power and Privilege
Features definitions and activities for leading discussions across difference, including tips for facilitators.
Rating: Beginner

LARA (Listen, Affirm, Respond, Ask Questions) Method for Managing Tense Talks
A framework for having respectful and productive conversations about differences.
Rating: Beginner

Communication for Equity in the Service of Patient Experience: Health Justice and the COVID-19 Pandemic
An article on communication across cultures related to the clinician-patient relationship
Rating: Beginner

Diverse Voices in Science Journalism
This series "aims to examine the experiences, expertise, and perspectives of science journalists from communities that are underrepresented in science journalism."
Rating: Beginner

Social Identities and Systems of Oppression
A primer on how social identities intersect with power and oppression, including reflection exercises.
Rating: Beginner

Sister Stem
A media platform and online community developed to create a more expansive conversation about STEM.
Rating: Intermediate

(En)gauging Self: Toward a practical framework for race talk
Recommendations for educators on how to facilitate dialogue about race and racism.
Rating: Intermediate

From Safe Spaces to Brave Spaces
A way to frame dialogue around diversity and social justice.
Rating: Intermediate

Watch

3 Steps To Having Difficult - But Necessary - Conversations
This TED Talk explains how to overcome feelings of discomfort to address "the elephant in the room" and other conflicts.
Rating: Beginner

Watch (continued)

Identity, The Story of Me
This TED Talk describes Kelli McLoud-Schingen's journey to understanding her various identities.
Rating: Beginner

The Equity Compass
Describes the key dimensions of equitable work and how the Equity Compass can be used to determine the degree to which your practices advance equity.
Rating: Beginner/Intermediate

Listen

The "I Statements" podcast from Cornell University's Intergroup Dialogue Project
In each episode, people with different identities come together to share their own beliefs, experiences, and perspectives, demonstrating the power and possibility inherent in communicating across differences.
Rating: Beginner

Intersection Podcast
"New Republic editor Jamil Smith explores how race, gender, and all the ways we identify ourselves and one another intersect."
Rating: Beginner

About Race Podcast
Conversations about how people view, discuss, and practice race, privilege, culture, and more.
Rating: Beginner

Disability Visibility Podcast
"Conversations on politics, culture, and media with disabled people." See the podcast resource guide, with full transcripts and related links, here.
Rating: Beginner

Practice

SPARQtools Digital Toolkits
Short activities that prompt analysis of one's own communication and beliefs.
Rating: Beginner

Broadening Perspectives on Broadening Participation Toolkit
Modules for training staff and other professionals on inclusive science communication practices.
Rating: Beginner

Practice (continued)

Active Listening
A short exercise to "connect with a partner through empathy and understanding."
Rating: Beginner

ASDC Inclusion Wheel
A tool to guide strategic discussions and reflection for science center practitioners.
Rating: Beginner/Intermediate

Justice Map - Visualize race and income data for your community
Use this tool to consider how physical and geographic contexts influence patterns of systemic inequity.
Rating: Beginner

Learning to Talk/Talking to Learn: Teaching Critical Dialogue
This paper details four steps for teaching dialogue across difference (or critical dialogue), including common stumbling blocks and guided practice.
Rating: Beginner

Guidelines for Discussing Difficult or High-Stakes Topics
Sample guidelines for difficult dialogues and a strategy for planning the discussion. While developed for classroom settings, these tips have broad applicability.
Rating: Beginner/Intermediate

Feedback Labs
Tools and resources to help non-profits, government agencies, and philanthropy take more intentional, reciprocal, and reflective approaches to gathering feedback from their constituencies.
Rating: Beginner/Intermediate

Learning for Justice
Resources for educators related to facilitating discussions about justice, creating brave spaces that respect diverse and intersectional identities, and building strong relationships.
Rating: Beginner/Intermediate

What are Core Equitable Practices in informal STEM learning?
Defines core equitable practices and provides examples of these practices in informal STEM learning settings.
Rating: Beginner/Intermediate

Do No Harm Guide: Applying Equity Awareness in Data Visualization
A helpful resource to help anyone who communicates data view their work through an equity lens.
Rating: Beginner/Intermediate

Practice (continued)

Liberating Structures

A series of guided activities designed to foster open discussion and collaboration.
 Rating: Intermediate

Build Vocabulary

A Progressive's Style Guide

A primer designed to "harness language in support of intersectionality and cross-sector power building."
Rating: Beginner

Diversity Style Guides for Journalists

A collection of recommendations on journalistic language from various associations.
Rating: Beginner

Disability Language Style Guide

From the National Center on Disability & Journalism. Available in English and Spanish.
Rating: Beginner

Glossary of Terms for Diversity, Equity, and Inclusion

Vocabulary that is commonly used in discussions about social justice.
Rating: Beginner

Pronouns and why they matter

An illustrated guide to incorporating pronoun-inclusive behavior in your daily life.
Rating: Beginner

The Language of Gender

From Gender Spectrum. "The vocabulary of gender continues to evolve and there is not universal agreement about the definitions of many terms. Nonetheless, here is some working language and examples of frequently used (and misused) terms."
Rating: Beginner

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