

# Putting DEIA Ideas into Action in NASA Citizen Science Projects

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Perhaps your interest in citizen science stems from a desire to make science more accessible to everyone, including underserved communities. You are not alone in having this goal. NASA is [fully committed to Diversity, Equity, Inclusion, and Accessibility \(DEIA\)](#). In 2020 inclusion became the fifth of NASA's core values, joining safety, excellence, teamwork, and integrity.

Of course, there is no magic wand that will cure the world of racism, ableism, sexism, etc. We all must examine our own internal biases, unlearn old ways of thinking and behaving and take time to make changes. Here are a few best practices that can help you accelerate your mission to make the world better through citizen science. We'll start with some general tips, then cover some more specific project management and website design tips, then offer a few "don't"s and a resource list.

## General Tips

- Educate yourself on issues of diversity, equity, inclusion, access, and justice. There are many ways to learn: reading books, taking professional training opportunities, following scientists from underserved communities on social media. We have included a list of additional resources at the end of this document.
- Consider your words. The American Psychological Association's [Inclusive Language Guidelines](#) is an excellent resource for inclusive language. You'll find definitions for many relevant terms in these guidelines, as well as suggested language to help you avoid common terms that may be unintentionally excluding others as you build bridges to new communities.
- Educate yourself on the historical context of how people at your institution/scientific field have related to the community you aim to serve. For example, some communities may have a history of good or bad relations with scientists, which you will want to be aware of as you forge relationships.
- Exercise the [ten simple rules for building an antiracist lab](#), by Chaudhary and Berhe (PLOS Computational Biology, 2020). The rules are also included at the end of this document. Note that BIPOC (pronounced "bye-pock") stands for Black, Indigenous, and people of color.
- Collaborate with NASA's [Science Activation teams](#) to reach new diverse audiences. These teams are funded by NASA to [broaden participation in NASA science](#). They have

the educators, specialists, and relationships needed to engage underserved communities—and they are often looking for Subject Matter Experts (SMEs) like you to help with this process. For an example of the work of these teams, check out the tips for great astronomy events in the resource list below.

- Remember the principle, “Nothing about us without us.” If you are working with people from an underrepresented group, co-create with them. Include members from this group as equal partners; include them on your funding proposals, publications and other scientific products.
- If you are working with an Indigenous group, respect that group’s data sovereignty. That means the right of an Indigenous group to govern the collection, ownership, and application of its own data. It derives from tribes’ inherent right to govern their peoples, lands, and resources.
- Make a DEIA plan. Start small and make incremental changes to further inclusion. Establish a few goals that you can integrate into your activities and decide how you will solicit feedback on the work from your team and the communities you are collaborating with.
- Listen and be humble.

## Project Management Tips

- Share a Code of Conduct with your volunteers to explicitly articulate both welcome and unwelcome behavior/ interactions in your citizen science project, as well as consequences for violating it. Explain how codes of conduct help set expectations and a shared understanding for the values of the project. Share this on your project pages and reference it in your interactions with your science team and volunteers, updating it as appropriate. Here are some examples:
  - American Astronomical Society [Code of Ethics](#)
  - NASA Open Source Science [Code of Conduct](#)
  - NASA Cit Sci Leaders Series [Code of Conduct](#)
- Create spaces for people to get to know one another. These can include online forums, group video calls with scientists and volunteers, a Slack channel, a Facebook group, etc. If you can create a collegial community of scientists and volunteers, not only will everyone accomplish more science, they will also experience the pleasure of working in a diverse group of colleagues. Make these spaces safer by:
  - Reminding the group of your Code of Conduct
  - Allowing volunteers to decide how, what, and when to share information about themselves
  - Keeping interactions visible and public and participating in them yourself so that you can help maintain a positive and welcoming atmosphere.
- If you hold scheduled events for citizen scientists, schedule them when the people you are hoping will attend can do so. Try a variety of times and days to accommodate work, school, family schedules and time zones. If you can, record the events and post them

online for people who can't attend live. Share the slides or documents you are discussing—and notes on the event—with your participants so they can run them through translation tools. Power Point can now do live [closed captioning](#), a handy tool for communicating better with non-English speakers.

- If you are scheduling in-person meetings or events, make sure the space is physically accessible. Provide an accessibility statement for all events (virtual, hybrid, and in-person), and a point-of-contact for accommodation requests. If you are recording an event and posting online, make sure captions are available. Refer to [NASA's Checklist for Planning Accessible Meetings and Events](#) for more information.
- Direct your volunteers to science career opportunities! A little nudge from a real scientist can go a long way toward inspiring a lifetime change for someone who might not have considered pursuing science. Younger volunteers may be interested in [NASA Internships](#). A more exhaustive list of NASA career opportunities can be found [here](#). Encourage them to mention their citizen science work on their applications!
- If you make a mistake: apologize sincerely. Building diversity, equity, inclusion, and accessibility means building relationships, and building relationships with any new person or community means taking risks. These relationships may be within your team, or the communities you are engaging with. If you do make a mistake while you're working to build these bridges, this [Anatomy of an Apology](#) guide will help you make amends and repair.

## Website Design Tips

- Explain your science in multiple ways using different kinds of media, like text, pictures and video. Repeat the most important ideas with different words. Delivering the same message in different ways will help you reach people with a variety of abilities. Moreover, research indicates that these efforts to serve a more diverse audience serve everyone ([Learning Through Citizen Science](#), NASEM, 2018).
- Translate your website and social media posts into as many languages as you can manage. Consider engaging (and compensating) current volunteers to do this work, keeping in mind that you'll likely need a scientist on your team who speaks that language to check their work. Remind people about free translation tools, like the Google Chrome browser's translation function. If you have a new website or opportunity that is already in Spanish or is otherwise of interest to a Latinx or Hispanic audience, contact Pedro Cota at NASA HQ ([pedro.a.cota@nasa.gov](mailto:pedro.a.cota@nasa.gov)) to help spread the word.
- Use [plain language](#) on your website and avoid using jargon and acronyms. When you must use an acronym or some jargon, be sure to define it and define the words in the acronym.
- Make project websites and tools easily accessible to smartphones. More people have smartphones than laptop computers with strong internet connections. If some of your project tasks must be completed outdoors, it will further help your users if you set up a mobile app that enables participation without a Wi-Fi or cell phone signal. If you are

building new digital tools, make sure to build in plans for accessibility testing and development.

- Does your project already have a diverse team? Ask your team if you can show pictures of your whole team on your website. People are more likely to join groups with members who look like them.
- Share - in words, images, video clips, etc. - all the reasons that someone might want to volunteer with your project. Different volunteers are motivated for different reasons, so you may attract more diverse volunteers if you spell out multiple kinds of benefits on your website. Some may be inspired by the opportunity to meet new people. Others may want to know their time and contributions will benefit society or leave a lasting mark. For example, it may be obvious to you that studying the ionosphere can help us protect the power grid from solar flares, but that benefit may not be obvious to your potential volunteers.
- Using the term “citizen science” on your website may dissuade some participants. It may help to point out explicitly that participation in your project does not require citizenship in any country. It may also help to refer to your project by other keywords, if they are appropriate: amateur science, volunteer science, etc.

## A Few Don'ts

- Don't single out individual members of minority groups to help you with your DEIA goals. Do not ask someone from an underserved community to tell you what works for “people like them.” If a special opportunity comes up for members of underrepresented communities (or you create such an opportunity!) ask ALL your volunteers at once if anyone is interested. If a member of an underserved community feels like stepping forward, they will. It is often better to seek help from a professional who works in this area, like someone in the NASA [Office of Diversity and Equal Opportunity](#).
- Don't pressure anyone to get involved in your project. Remember that not everyone has the time/resources to volunteer for a citizen science project—and if they don't, it can be insulting to suggest that they should. Instead, focus your efforts on making your project as inviting as possible, and as rewarding as possible for the volunteers who do participate.
- Don't be a “helicopter scientist” who flies in, enlists help from an underrepresented community, and then disappears. Share the outcome of your research with the people who helped do it – using plain, accessible language - and say “thank you.” Build a lasting relationship by including members of the communities you serve in the next part of your process—writing papers, applying for more funding, disseminating results, etc.
- Don't feel like your project needs to be everything to every community. If you have built relationships with one underserved community, feel free to focus on that one community.
- Don't be defensive when you are given feedback on ways to improve DEIA. Learning to get along better with our fellow humans is a lifetime journey for every single person on

Earth—even for scientists. There will always be more to learn, more to un-learn, and more to work on.

- Don't expect to get credit for your efforts to improve DEIA; we do it because it's the right thing to do.

## More Resources

- [Project Implicit](#) helps you discover what biases you may have as work with different people.
- Now what can we do about those biases? This [Harvard Business Review Podcast](#) can help.
- [Section 508](#) of the Rehabilitation Act.
- [Contrast Checker](#), a tool for checking the readability of your website. Aim for contrasts > 4:5:1.
- [Inclusive Science Communication Starter Kit](#) A report from the 2019 Inclusive SciComm Symposium.
- [ShutDownSTEM](#)
- Harvard University [Anti-Racism Resources](#)
- Five [tips for great astronomy events](#) created by the Night Sky Network. While the videos are designed for educators leading programs with Girl Scouts, their advice and content is readily applicable to citizen science.
- The Natural History Museum of Los Angeles' [Equitable Partnerships Framework](#)
- Keynote by Kaare Erickson: [Why It's So Hard to Solicit Buy-In from Arctic Communities in Arctic Research](#)
- TEK Talk by Phil Wight: [Knowledge, Nature, and the Infrastructures of Colonialism in Alaska](#)
- [Differing Abilities in STEM](#) - March 25, 2021 seminar featuring Dr. Temple Grandin and other experts discussing how to create inclusive STEM environments so that students of all abilities can be successful.

## Ten Simple Rules for Building an Antiracist Lab

From Chaudhary and Berhe 2020

1. Lead informed discussions about antiracism in your lab regularly
2. Address racism in your lab and field safety guidelines
3. Publish papers and write grants with BIPOC colleagues
4. Evaluate your lab's mentoring practices
5. Amplify voices of BIPOC scientists in your field
6. Support BIPOC in their efforts to organize
7. Intentionally recruit BIPOC students and staff
8. Adopt a dynamic research agenda
9. Advocate for racially diverse leadership in science
10. Hold the powerful accountable and don't expect gratitude