The Library & Community Guide to Citizen Science

Understanding, planning and sustaining ongoing engagement in citizen science at your library or community-based organization

December 2020

scistarter
Science we can do together.

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Libraries are quickly becoming hubs for citizen science. Your library may already be involved in citizen science programming. If so, bravo! For countless others, citizen science is still a bit of a mystery. We created this guide to help you navigate the rapidly changing landscape, access resources, learn about projects and programs and explore a myriad of opportunities to support your plans to bring citizen science to your library or community-based organization (CBO).

We hope this guide will help you:

- Learn more about citizen science and connections with libraries and community-based organizations.
- Discover STEM-related issues of interest or concern to your communities.
- Connect existing programs and communities to projects on **SciStarter.org**.
- Access resources to help broaden awareness and increase diverse engagement with citizen science projects.
- Connect with projects, instruments, subject matter experts and diverse communities to activate and sustain engagement in citizen science.
- Plan Citizen Science Month events in April and other in-person, virtual and hybrid events throughout the year.
- Support facilitators (community leaders, educators, volunteers, staff, etc.) in introducing citizen science through your library.

CONTENTS

This guide can be downloaded from
SciStarter.org/Library-Resources

We'll update this guide periodically. Email **info@SciStarter.org** to share your citizen science resources or suggest edits to this guide.

Some URLs in this guide are case-sensitive.

QUICK-START GUIDE

Get started with citizen science

CITIZEN SCIENCE IS:

- A way for anyone, anywhere to engage in science, from monitoring water quality, tracking wildlife and insect species, analyzing and classifying images of galaxies and so much more.
- A growing trend for fun, scientific engagement that libraries and community organizations won't want to miss.
- Accessible to people regardless of background, interests, skills or location.
- A perfect addition to existing library programs, community-based organization activities, event calendars, inclusive options for seniors/adults/teens/families and more.
- Free and easily accessible through **SciStarter.org**, featuring thousands of searchable projects.
- An opportunity for collaborations between libraries and community organizations to leverage resources and increase engagement in authentic scientific research.
- And a way to help people address local concerns that can inform decision-making and improve related policies.

TUTORIAL: Introduction to Citizen Science

This interactive, self-guided, online tutorial introduces the who, what, how and why of citizen science. Allow approximately 30 minutes to complete the tutorial and engage in one project. Offered in English and Spanish at **SciStarter.org/Library-Resources.**

LEARN MORE

Watch videos, including "What is Citizen Science?" and a series of "How Tos": **SciStarter.org/Citizen-Science-Videos**

Explore citizen science programming and kit resources for libraries: **SciStarter.org/Library-Resources**

Sample citizen science project kits designed for use by libraries and other community organizations: **SciStarter.org/Library-Kits**

Embed the Project Finder on your organization's website to help people discover and join projects: **SciStarter.org/Widget**

Share citizen science projects and resources for educators and learners: **SciStarter.org/Education**

Engage with citizen science resources and find best practices for academic libraries and higher education: **libguides.asu.edu/citizenscience**

Join the growing network of citizen science libraries and community-based organizations (CBOs) by signing up for our mailing list: **CitizenScienceMonth.org/MailingList**

Discover Citizen Science Month resources and add an event: **CitizenScienceMonth.org**

Read citizen science articles: **blog.SciStarter.org**

Stay current on the field of citizen science: **CitizenScience.org**

SECTION 1:

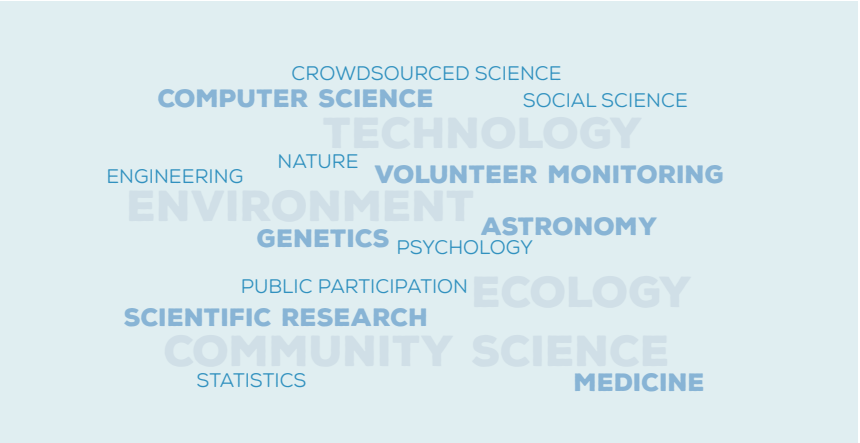
CITIZEN SCIENCE OVERVIEW

Learn about citizen science and how it can help your community

Science is our most reliable system of gaining new knowledge and citizen science is the public involvement in the inquiry and discovery of new scientific knowledge. A citizen science project can involve between one person and millions of people collaborating toward a common goal. Typically, public involvement centers around data collection, analysis or reporting.

Bruce Lewenstein of Cornell University's Communication and S&TS departments describes three possible definitions:

- The participation of nonscientists in the process of gathering data according to specific scientific protocols and in the process of using and interpreting that data.
- The engagement of nonscientists in true decision-making about policy issues that have technical or scientific components.
- The engagement of research scientists in the democratic and policy process.



WHAT'S IN A NAME?

Citizen science is the most widely used term to describe this process of public involvement with scientific research. Here's how the National Academies explains the global use of the term: "The committee uses the term citizen science because that is the term most commonly used within the scientific and science education communities to describe these activities. We recognize that the term 'citizen,' particularly in the United States, connects to a contentious immigration debate about who is eligible to participate in civic life, including science and education. While other terms can be used to describe citizen science, such as community science, public participation in scientific research, participatory action research and community-based participatory research, none of them is as complete or widely used as citizen science. The committee uses citizen science despite its associated tensions."

bit.ly/NationalAcademiesCitizenScience

Bottom line: We are citizens of the world and citizen science is serious science. If it were up to us, we'd just call this "science"!

WHO CAN BE A CITIZEN SCIENTIST?

A citizen scientist can be anyone who voluntarily and actively engages in scientific research, typically in formal or informal collaboration with professional scientists. Citizen scientists can be online gamers, retirees, environmental justice advocates, naturalists, technologists, fishermen, farmers, ham radio operators, stargazers, birders, weather watchers, students and teachers, scouts, doctors, parents, children, corporate volunteers, undergraduate students and even current and former NFL and NBA cheerleaders in science professions (**ScienceCheerleaders.org**) who train and engage thousands of nontraditional audiences in citizen science. Citizen scientists share and follow protocols to advance scientific knowledge.

CHARACTERISTICS

Citizen science is commonly supported by government agencies, universities, nonprofit organizations, industry and start-ups. Citizen science advances research in a wide range of disciplines, such as public health, environmental health, astronomy, computer science, engineering, genetics, medicine, psychology, social science, statistics, emerging technologies and more.

These research collaborations can be concentrated or massive. They range in scale from local, regional, national and even global levels. Project timelines may last one minute or an hour, one day, one year or decades, require one-time participation or seek ongoing engagement.

Four common features of citizen science include the following:

1. Anyone can participate.
2. Participants and professional scientists use the same process—or protocols—to make observations and collect, share and analyze data so the data can be trusted and used.
3. Data can help scientists and participants advance research and support decision-making.
4. Everyday people, as well as scientists, have access to and can use the data.

With such a wide range of project support, disciplines, scales and timelines, the objective remains the same: Citizen science can lead to discoveries an individual could never achieve alone.

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BENEFITS

Citizen science bridges gaps by harnessing the power of diverse people motivated by curiosity, a desire to advance research or a concern about local or global issues, then connecting them to projects that benefit from their energy and dedication.

Citizen science accelerates research. In the past, collecting large samples of data for research was the most challenging task of any initiative. However, with today's interconnected world and low-cost instruments (including cell phones loaded with sensors), millions of people from around the globe can remotely contribute to a study and provide or analyze data with researchers.

Citizen science empowers the public. Increased public participation in scientific research supports engagement/contributions of underrepresented individuals and communities in the scientific enterprise. Citizen science enables people to actively learn more about the world around them and address issues they are curious and concerned about.

COMMUNITY PARTNERSHIPS

The mission of citizen science aligns with public libraries and many community organizations as we collectively strive to ensure equitable access to information, increase knowledge, create participatory lifelong learning experiences and build and support diverse communities. Watch this video to learn how libraries can be activated as hubs for citizen science. **bit.ly/LibraryHowTo**

Connecting your library or community-based organization to citizen science:

Join the growing **Citizen Science Library Network Listserv** to participate in discussions, share ideas, find resources and connections at CitizenScienceMonth.org/MailingList.

Ask your State Library or State Library Association if they offer **grants to support citizen science programs** or kits in your library. They can also help connect you with nearby librarians already participating in citizen science.

Contact your **regional Network of the National Library of Medicine** office to learn about grants and citizen science programs at nnlm.gov/regions.

Use the free online **"Introduction to Citizen Science"** tutorial (in English and Spanish) to learn more about citizen science at SciStarter.org/Library-Resources.

Discover **thousands of citizen science projects** and events at SciStarter.org and invite patrons to get involved together or independently.

Find field-tested, **"gold star" citizen science** projects at SciStarter.org/Affiliates.

Consider hosting an event! Login to SciStarter and click "Contact Project Scientist" from any project page to invite the project scientist to a Zoom meetup to talk about the project, how to participate and answer other questions.

Find other libraries and community organizations using citizen science kits at SciStarter.org/library.

Academic librarians can find a suite of resources at libguides.asu.edu/citizenscience/acadlib.

Access customizable resources and programming ideas at SciStarter.org/Library-Resources.

Find resources to guide **Integrity, Diversity and Equity** approaches via the IDE Working Group of the Citizen Science Association at citizenscience.org/get-involved/working-groups/#IDE.

Find STEM resources for libraries at STARnetLibraries.org.

Find additional resources in Section 6 of this guide!

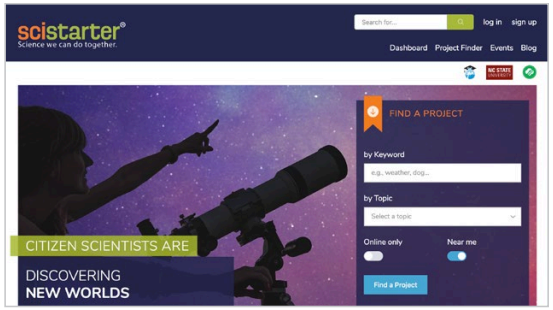
SECTION 2:

USING SCISTARTER

Connect to projects, instruments, subject matter experts and more

ABOUT SCISTARTER

SciStarter is a globally acclaimed, online citizen science hub where more than 3,000 projects, events and tools have been registered by individual project leaders or imported through partnerships with federal governments, NGOs and universities. As a research affiliate of ASU and a popular citizen science portal, SciStarter hosts an active community of over 100,000 registered citizen scientists and millions of additional site visitors.



Hundreds of citizen science projects use SciStarter's National Science Foundation–supported APIs to help citizen scientists earn credit for their participation in their SciStarter dashboard, across projects and platforms. These features enable SciStarter's partners (libraries, schools, museums, Girl Scouts and more) to catalyze customized citizen science pathways and track and support the progress of their communities through SciStarter.

SciStarter organizes information about projects, events and tools, sharing the combined offerings through digital tools, such as embeddable Project Finder widgets used by media partners (including PBS and Discover), libraries, museums and other organizations like the National Science Teachers Association. SciStarter works with the Girl Scouts of the USA, National Geographic, school districts, colleges and universities and other organizations to connect them to citizen science. The projects and events on **SciStarter.org** represent a wide array of topics and research programs that diverse participants can engage in anywhere, anytime, just once or on an ongoing basis.

USING SCISTARTER TO CONNECT TO CITIZEN SCIENCE

SciStarter connects communities with projects, tools and resources to successfully engage in citizen science research, often supporting libraries and community-based organizations. Librarian feedback has shown SciStarter to be a user-friendly tool that helps community members participate in amazing research projects locally and globally. SciStarter makes it easy to choose interesting projects at the desired level of involvement. By becoming familiar with SciStarter and its resources, we can help you find citizen science projects appropriate for your community (virtually and in person), plus ideas and resources for Citizen Science Month and beyond.

As you review projects on SciStarter, consider the ways you can introduce these experiences and resources to your community:

- Invite local subject matter experts (including citizen scientists) to talk about topics related to projects.
- Leverage your existing programs and partners, connecting them to projects and events at your local library, community meeting place or at home.
- Make your library or community center a hub for citizen science by hosting large-scale programs, encouraging informal citizen science connections and providing citizen science kits.

EXPLORE THE SCISTARTER PORTAL

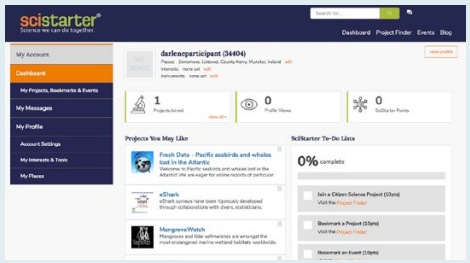
Step 1: Watch *Get Started in Citizen Science.* This video gives a quick introduction to citizen science. **bit.ly/WhatIsCitizenScience**

Step 2: Sign up for a SciStarter account to experience the citizen science hub firsthand. This is the best way to find relevant projects near you, bookmark projects to try later and track your contributions to various projects. **SciStarter.org/Login**

Go to **SciStarter.org** and click the "Sign Up" link on the upper right section of any page. You'll enter your email address so SciStarter and project leaders can reach you if needed. (Don't worry, SciStarter won't ever sell your information.) You can also click the Visit or Join button on any project page under the project picture, select the "Join SciStarter" option, sign up and you'll be redirected to the project's page.

In some instances, you will also need to sign up on the individual project's webpage. In other cases, your SciStarter account can be used to sign up or sign in to other projects.

Although you do not need a SciStarter account to discover or participate in projects and events, an account allows registered users to:

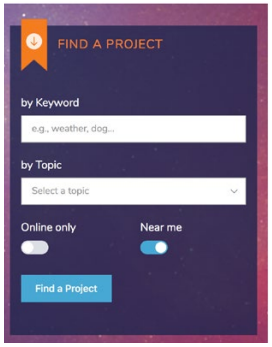


- Find recommended projects in your SciStarter dashboard that match your location.
- Easily send messages or questions to project scientists.
- Bookmark any interesting project and join many others using a "one-click" process.
- Complete your profile page to ensure you are matched with the best projects aligned with your interests and goals.
- Track your contributions to projects.
- Help scientists find you when and where they need you the most!

Step 3: It's time to find a project! While logged in, use the Find a Project search on the homepage to quickly find projects that match a topic of interest. Use the Project Finder link to do an advanced search with specific parameters. For example, the Project Finder can connect you with projects based on an age group or that partner well with a hike or visiting the beach.

Search by Location:

Use the "Near me" toggle on the homepage Project Finder box or enter your location on the Project Finder page. This will prioritize local projects on the search results page that may be particularly relevant to your community. There are often additional connections and programming opportunities to discover by reaching out to the local project leader and citizen scientists.



Search by Topic:

An easy way to find citizen science projects that align with topics of interest is to click on the Topics field, where you'll find many types of research projects currently being conducted on popular science subjects. Select as many topics as you'd like, such as Health & Medicine, Nature & Outdoors and Astronomy & Space.

Search by Activity:

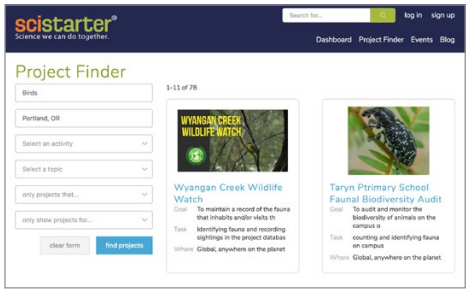
Click the Activity field to search for projects that suit your community. There are projects that can be done indoors or outdoors, while hiking, with a smartphone app, in less than 15 minutes, etc. Select as many activities as desired.

Search by Age Group:

This advanced search feature is especially useful to find projects suitable for kids, families, adults, college/graduate students. Select as many age groups as desired.

Additional Search Tips:

Dozens of projects on SciStarter use affiliate tools made possible by support from the National Science Foundation. These tools enable SciStarter members to track their interests in and contributions to citizen science across projects and platforms. SciStarter affiliate projects are included in curated programs offered to schools, universities, the Girl Scouts of the USA, media partners and more. They are also ideal for libraries and many community-based organizations. Find them at **SciStarter.org/Affiliates**. You can also make a list of affiliate projects to assess the collective impact of your programs via the number and frequency of contributions to affiliate projects at **bit.ly/MakeASciStarterList**.



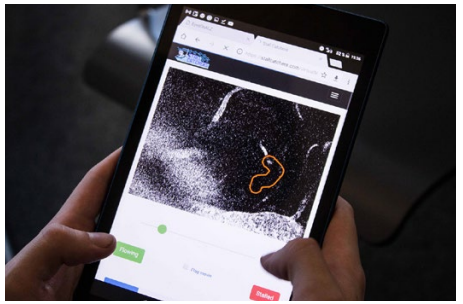
Step 4: Engage in citizen science yourself! By experiencing citizen science firsthand, you'll know what your community can expect and the types of questions that might be asked while exploring SciStarter. Plus, it's fun!

INTRODUCTORY PROJECTS

The following projects are included here to illustrate the breadth of topics and experiences offered. You'll find them using the Search box on the homepage.

NASA GLOBE Observer – GLOBE Observer invites you to make environmental observations that complement NASA satellite observations to help scientists studying Earth and the global environment. All you need is a smartphone or tablet to start ground-truthing satellite data. **SciStarter.org/NASA**

Stall Catchers – The Stall Catchers project is designed by researchers at Cornell University to advance Alzheimer's solutions. This project focuses on one aspect of the disease: reduced blood flow in the brain.



This symptom of Alzheimer's has been known for years, but until now, nobody knew why reduced blood flow happens in the brain. Researchers are now finding a connection between blood flow and memory. We need your help for researchers to understand this relationship further.

You can help by playing a simple game: view short videos from the brains of mice and "catch" stalls. We will teach you how to score blood vessels as "flowing" or "stalled." Even the most powerful computer technologies can't do this accurately enough yet, but your keen eyes can help us process decades worth of data.

Your participation can help us fully understand how stalls are contributing to Alzheimer's and discover potential treatment targets. **SciStarter.org/NLM**

ISeeChange – The ISeeChange project is a global community that documents local changes in environment, weather and climate. Each post is synced with weather and climate data, which is broadcast to the community to investigate bigger-picture climate trends. Community members use this information to track climate changes over time and how this impacts daily life.

You can use the app or the project website to submit your observations. You have the ability to personalize, measure and track your local climate change impacts. This information helps local partners apply community insights to local resilience planning, ADA and infrastructure design.

Help us learn more about how weather and climate impacts your community and environment! **SciStarter.org/NLM**

Affiliate Projects – Over a hundred projects offer SciStarter's National Science Foundation–supported free tools. This includes Participant API, which allows participants to track the number and frequency of contributions in their SciStarter dashboards. Additionally, project leaders are able to learn more about their community by discovering what other projects are being bookmarked or joined. Educators, library staff and others can track community participation with a SciStarter list.

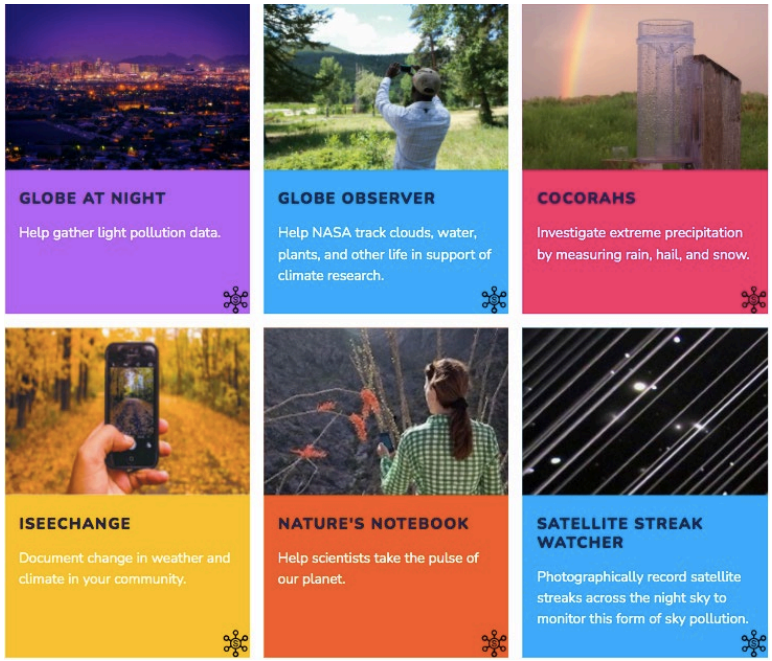
Affiliate projects can be found through the SciStarter Project Finder advanced search at **SciStarter.org/Affiliates**.

Education Projects:

Find projects listed by grade level with step-by-step instructions and links to teacher resources at **SciStarter.org/Education**.

Learn More:

Watch and share these "how to" videos, provided by project leaders, as well as videos from different citizen science events at **SciStarter.org/Citizen-Science-Videos**.



SciStarter affiliate projects featured on SciStarter.org/Affiliates allow participants to track the number and frequency of their contributions to different projects in their SciStarter dashboard.

SECTION 3:

CONNECTING YOUR COMMUNITY TO CITIZEN SCIENCE

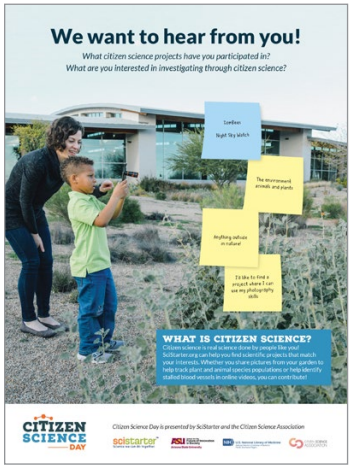
Discover interest areas within your community, access resources and develop partnerships

There are so many ways to bring citizen science to your library or community organization! This section will help you collaborate with your community to find the right topics and projects, connect with scientists and subject matter experts, find local citizen scientists who can share their experiences and help engage and support ongoing participation.

COLLABORATE

There are thousands of citizen science projects spanning all types of topics. Create opportunities for community members to provide feedback on what they are interested in or concerned about—issues that can be addressed through citizen science.

Host a community dialogue. STAR_Net produced a Community Dialogue Guide (**bit.ly/CommunityDialogueSTARNET**) to "Strengthen librarians' roles in establishing a STEM Learning Environment; Identify under-represented community groups; Identify possible collaborations and partnerships within the community; Contribute to developing a flexible *Community Dialogue* framework that all libraries can use." This guide can be adapted to meet the needs of many types of community organizations.



Download, print and display interactive posters and fliers to generate thinking around the topic of citizen science. Have sticky notes and pencils nearby so community members can share information about topics they are interested in or concerned about. Download these and other free materials at **SciStarter.org/library-resources** (please scroll down to the bottom of the page).

Consider best practices to be attentive to Integrity, Diversity and Equity by accessing resources from the Citizen Science Association's IDE working group. **citizenscience.org/get-involved/working-groups/#IDE**

FIND THE RIGHT PROJECT

Now that your library or organization has identified topics, it's time to focus on the right project(s). Consider embedding the SciStarter Project Finder on your library or organization's website and computers (**SciStarter.org/widget**). This makes it easy for people to discover and try out projects.

Refer to **Section 2** to use SciStarter to find projects that align with the right topic, location, age group and other criteria. Other ways you can find citizen science projects include searching the internet, talking to formal and informal science providers such as park rangers and researchers at colleges/universities or museums, talking to your state agencies and/or connecting with other librarians or community organizers in your state.

Here are some questions to consider as you narrow down your project choices:

- Does the project need data from your location?
- Are specialized instruments required (sensors, rain gauges, etc.) and, if so, can the project leader provide those instruments? Should they be installed on the grounds of your library or community center, hosted within the facility and/or can they be loaned out?

- What technological interface is used by the project and can people who do not own smartphones participate? Is Wi-Fi required? Would this project be ideal for an in-person event to do together?
- Will the project leader be available to talk about the project, either in person or virtually?
- What additional resources can be provided to help improve the participants' experience (books, constellation guides, reference manuals, etc.)?
- How will participants see their data and understand how the data is being used?

CONNECT WITH SCIENTISTS AND EXPERTS

Next, find local project leaders, citizen scientists or related subject matter experts to invite to your library or community meeting place (in person or virtually).

Typically, members of the scientific community engaged in citizen science will be eager to talk about their work and your community can be an excellent outreach venue for them. Who might be interested in giving related talks, activating a citizen science project, leading a bioblitz or demonstrating a project they lead or participate in? There are many ways to find them:

- Sign in to SciStarter, select the option to find local projects, choose a project and click "Message Project" to email the project leader. Inquire if he or she is available to come talk with your community about the project and/or to participate in discussions virtually.
- If you've added a project or event to SciStarter, use the "People Finder" to discover and connect with citizen scientists and project leaders near you. It's as simple as placing a circle on a digital map and sending an email to everyone located in that circle. **SciStarter.org/people-finder**
- Reach out to your local college, museum or nearby state and national parks to find experts to talk about their citizen science research. You may want to start simply by Googling "citizen science" and the name of the college or museum.
- Use social media to find networks of people who can help you: "Our organization in Philadelphia, PA, would like to engage people in [x project]. Does anyone know a local [related type of scientist] who can help with training or who can talk more about [subject]?" Tag @SciStarter on Facebook, Twitter, Instagram and LinkedIn and use the hashtags #CitSciMonth, #CitizenScience or #CitSci.

Citizen scientists are all around you

You'll likely find someone interested in talking about their experiences and/or leading citizen science activities or events. These individuals can be found in the following and other groups:

- Library administration and colleagues
- Researchers (university, museums, etc.)
- Student groups/clubs (e.g., Girl/Boy Scouts)
- Cooperative extensions (e.g., 4-H)
- Schools/teachers/education faculty and students
- Churches
- Naturalist communities
- Stargazing communities
- Weather watchers
- Ham radio operators
- Bird-watching groups
- Gardening groups

- Do any staff members or community members already participate in citizen science or know someone who does? Do they have specialized knowledge or interests related to the wide variety of citizen science projects? Leverage your personal network.

DEVELOP PARTNERSHIPS

Partnerships between librarians and/or community organizations with citizen scientists can broaden perspectives, engage new and diverse audiences and result in mutually beneficial outcomes. Public libraries and many other organizations act as anchors within their communities, connecting the people they serve with experiences and resources valuable to their daily lives. At its most basic level, a partnership is formed by two or more people who share a common vision or goal. The success of a durable community-citizen science partnership is based on shared values.

Characteristics of sustainable partnerships

It's a win-win for everyone involved.

Mutual trust, understanding and respect allow individuals and organizations to take risks, express intellectual curiosity, experiment and share lessons learned.

Each organization contributes staff, time and financial or in-kind resources to the partnership. Communities "convene" while researchers "enlighten," and both "catalyze" action.

Others join the effort, enhance or adopt resources and provide input on future steps.

The value of shared accomplishments is greater than what each partner would have achieved alone.

A good way to begin building partnerships together is to start with a defined activity, project or event, such as hosting an event for Citizen Science Month, which is April every year. Team members play to their strengths while learning from each other by sharing in key roles and responsibilities, such as creating a joint message on the value of citizen science; marketing and communicating the event; developing activities and presentations that will be highlighted on the day; making sure there are enough resources, volunteers and presenters to make the day an engaging and successful one; and building opportunities for ongoing, broader and deeper engagement in citizen science.

What type of partnership do you want to create and what can you bring to the partnership? The following list describes some characteristics to consider.

DEFINE AND MEASURE SUCCESS

How will you know if your partnerships with citizen scientists or researchers are successful for your community? Here are some general ways to view success:

Meaningful connections are made. Your partnership with citizen science connects your community with ideas and experiences that are engaging and meaningful.

Relevant issues are addressed. The activities conducted through the partnership reflect diverse community needs and interests in intentional ways.

Momentum builds. The community can see tangible results of the partnership's initial endeavors, and that enthusiasm builds momentum. You and your partners have new opportunities to deepen collaborations, welcome new and diverse partners and accomplish shared goals.

CHECK IT OUT! CITIZEN SCIENCE KIT PROGRAM

Providing everything a citizen scientist needs to get started

Thanks to support from the Institute for Museum and Library Services, the School for the Future of Innovation in Society at Arizona State University and SciStarter have partnered to help libraries connect communities to citizen science. As a result, citizen science kits are now available for loan through a growing number of libraries. The team is collaborating with national partners to expand access to these and other kits through 2023.

As part of the pilot project, Maricopa County District Libraries (AZ) moved the kits into circulation and regularly invite local subject matter experts to speak about related topics including stargazing, bees and bioblitzes. The libraries hosted webinars, produced "how to" videos and organized monthly Citizen Science Meetups. Find summative evaluations at **SciStarter.org/Library-Resources**.

WHAT IS A CITIZEN SCIENCE KIT?

A citizen science kit is a small box that contains everything you need for a specific citizen science project. Each kit includes a printed activity guide, helpful tips and any specialized tools or materials you need to complete the project. Designed to be easy to replicate and work with existing library circulation systems, these kits are a perfect way to help anyone get started.

CHECK IT OUT!
CITIZEN SCIENCE
AT YOUR LIBRARY

Developed by Arizona State University and SciStarter, with support from the Institute for Museum and Library Services, Citizen Science Kits are available to check out at libraries!

SciStarter.org/Library-Kits

KIT DESCRIPTIONS

MEASURING LIGHT IN THE NIGHT

Help gather light pollution data. Globe at Night is a citizen science project to measure and monitor light pollution. Learn how to use a Sky Quality Meter to measure light pollution and share your data on the Globe at Night website. Hundreds of thousands of people from 115 countries have already added data to help scientists study the impacts of light pollution on energy consumption, ecology, and human health.
SciStarter.org/Library-kits/measuring-light-in-the-night

EXPLORING BIODIVERSITY

Document and identify plants and animals around you. Record and share images of biodiversity and learn about the natural world. Use the clip-on lenses provided in your kit with projects and apps, including iNaturalist, and join a community of naturalists who share observations of nature, collaboratively identify species, and share data with scientists.
SciStarter.org/Library-kits/exploring-biodiversity

ZOMBEE HUNTING

Is the Zombie Fly attacking bees in your neighborhood? Honey bees are being infected by the Zombie Fly, which lays eggs in bees, causing them to behave like moths! The infected bees leave their hives at night in search of lights, where they get stranded and die. The Zombee Watch project needs your help to hang a light trap to attract bees, then safely record and report where the Zombie Fly is infecting and killing bees.
SciStarter.org/Library-kits/zombee-hunting

MONITORING AIR QUALITY

Curious about the air quality around you? Learn how to use an AirBeam sensor to capture real-time measurements. Air pollution is a worldwide problem that poses many risks to human health. Data collected from this citizen science project is uploaded to an online map that anyone can access.
SciStarter.org/Library-kits/monitoring-air-quality-kit

STREAM MAPPING

Use wet/dry mapping to help chart streams near you. Stream mapping, or wet/dry mapping, builds a map of Arizona streams to help tell us about when they are flowing and when they are dry. Learn how to collect location and temperature data of streams in Arizona and report your findings. This water quality kit helps you collect important data from streams to help scientists at Arizona Department of Environmental Quality better discover and analyze water quality issues at the source.
SciStarter.org/Library-kits/Stream-Mapping

OBSERVING POLLINATORS

Identify and count pollinators as they visit flowering plants. You can gather observations of pollinators visiting any flowering plant. Make as many observations as you

want while flowers are blooming. It's that easy! Your participation can help scientists understand pollinator health and keep our wildlife communities vibrant.
SciStarter.org/Library-kits/observing-pollinators

BUILD YOUR OWN KITS!

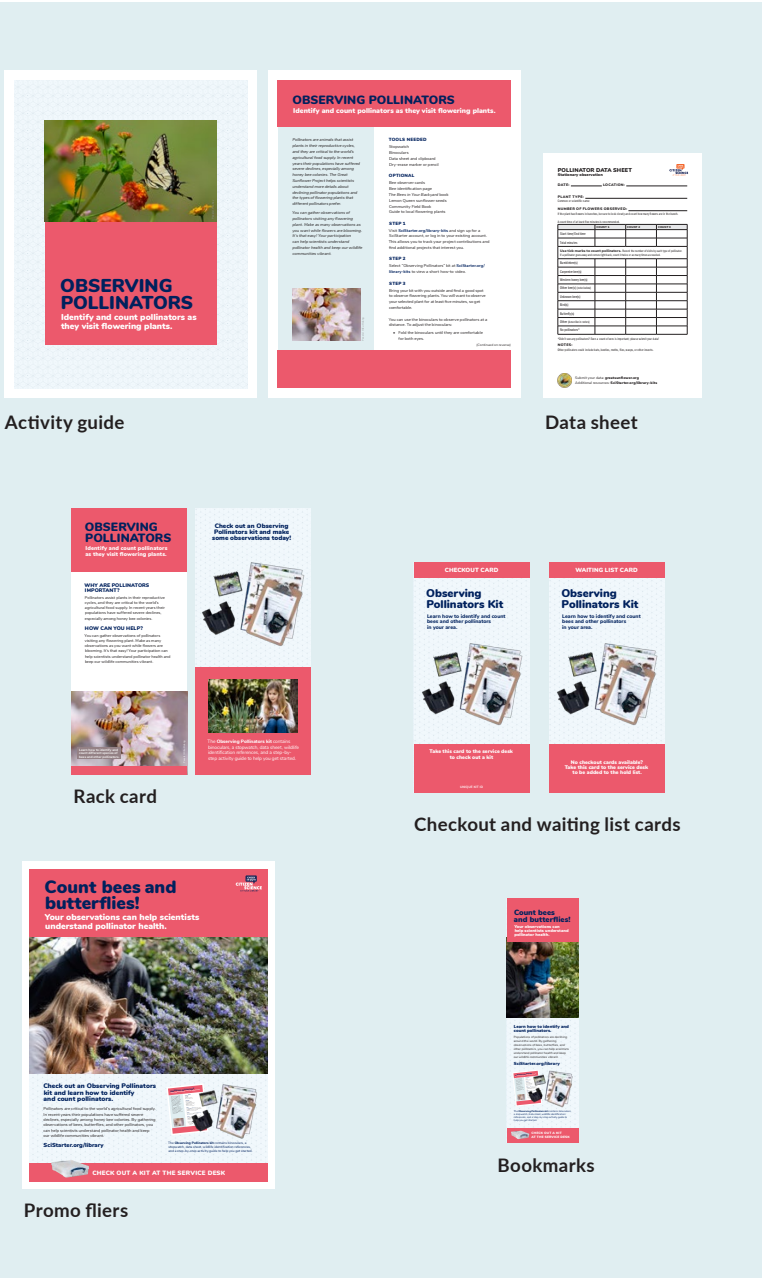
Ready to build your own kit? Downloadable PDFs of the activity guides, supply lists for any tools or materials you need to purchase and tips for assembling the boxes are available for each of the kits listed above. These free resources are available to anyone who would like to create a set of kits at their library or community organization.
SciStarter.org/Library-resources

USE AND PROMOTE YOUR KITS

An accompanying suite of materials for each kit has been developed to help promote use and facilitate circulation:

- Rack cards
- Checkout cards
- Waiting list cards
- Promo Fliers
- Bookmarks
- Borrowing Agreements

Download kit materials at SciStarter.org/Library-resources.

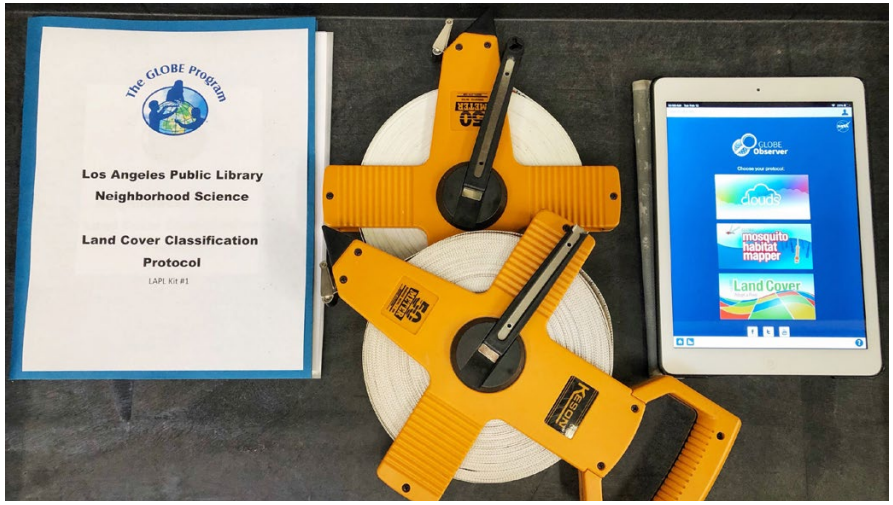


PARTNERSHIP HIGHLIGHT:

Neighborhood Science Kits

Los Angeles Public Library (LAPL) collaborates with Globe Learning and Observations to Benefit the Environment (GLOBE) Program to host pilot programs.

Vivienne Byrd



Diane Olivo-Posner

The Los Angeles Public Library (LAPL) has collaborated with the Global Learning and Observations to Benefit the Environment (GLOBE) Program to train a group of LAPL librarians to host hands-on Neighborhood Science pilot programs at 13 of the 73 libraries in the city of Los Angeles. These programs are designed to enhance participants' environmental and data literacy and promote community engagement.

Meeting monthly, participants learn about the science behind the environmental issues in their communities, use the citizen science tools and methods to collect and interpret data and work collaboratively to formulate solutions. Currently, LAPL's Neighborhood Science kits are developed for in-house programming purposes only and are not loaned out to the public. Each kit contains the GLOBE instructional guide and tools used for investigation and data collection that invite feedback from participants as well as the librarians.

The feedback received from the pilot programs will be used to help LAPL develop circulating kits that will be made available to the Neighborhood Science program attendees to use at home or throughout Los Angeles. The kits will be available for checkout during phase two of the pilot.

Additionally, in 2020, different branches of the LAPL produced high-quality citizen science online programming, including virtual storytimes, kit demos and Q&As with project scientists. Find two examples of these events produced in partnership with LAPL at **SciStarter.org/NLM**.

PARTNERSHIP HIGHLIGHT:

Maricopa County (AZ) Library District Spotlight

Maricopa County hosts weekly Citizen Science Meetups and a suite of creative programs.

"The Maricopa County Library District is offering virtual programs for our customers using resources from SciStarter.org. Our goal is to connect our customers, of all ages, with opportunities to engage with citizen science projects. We're offering programs on a wide variety of topics to let our communities know that there are so many diverse areas of science that they can explore. Successful programs have included demonstrating the use of iNaturalist to help document environmental diversity and offering a countywide bioblitz for customers to join through April of 2021. We have demonstrated how to make a Sourdough Starter, collect data as bacteria and yeast begin the fermentation process and then we follow up with a sourdough bread baking program. Most recently, we have taught our community to observe clouds and contribute cloud data for climate scientists using the Globe Observer app.

My advice for libraries interested in offering citizen science programming, virtually or in person, is to reach out to the SciStarter team. There are unlimited programming opportunities and the experts at SciStarter are always there to help."

Jennifer Gallagher, Adult Services Supervisor

PARTNERSHIP HIGHLIGHT:

The National Library of Medicine (NLM)

The National Library of Medicine supports and provides resources for citizen science.

MedlinePlus: **medlineplus.gov**

MedlinePlus Genetics: **medlineplus.gov/genetics**

NNLM Crowdsourcing and Citizen Science: **nnlm.gov/national/guides/ccs**

ChemIDplus: **chem.nlm.nih.gov**

The Network of the National Library of Medicine (NNLM), a program of the National Library of Medicine (NLM), supports SciStarter and Arizona State University as facilitators and knowledge brokers to help make citizen science accessible to libraries and community-based organizations. The organizations collaborate on Citizen Science Month and an ongoing series of virtual, in-person (per National Institutes of Health [NIH] approval) and hybrid events to increase awareness of citizen science in communities across the nation, and help individuals explore the impact of their environment on health.

Through citizen science and crowdsourcing, NNLM can engage and empower communities to access information about their health and wellness while simultaneously accelerating biomedical science, technology and innovation. Community participation in the research process builds trust between NNLM and the communities they serve. NNLM, in partnership with the NIH All of Us Research Program (**joinallofus.org/nlm**), highlights citizen science as a means to increase the involvement of people living in the U.S. in scientific research, reducing some of the barriers between health researchers, research and the public.

Collaborations between communities and researchers build capacity to identify and address community-based needs and meet research goals. The partnership aims to foster better understanding of individual health data and its uses in this increasingly data-driven world. NLM provides access to a variety of resources on the topics of general health and wellness, environmental health and genetics that can support citizen science outreach efforts in your community. Locate your NNLM Regional Medical Library (**nnlm.gov/regions**) to learn more.

PARTNERSHIP HIGHLIGHT:

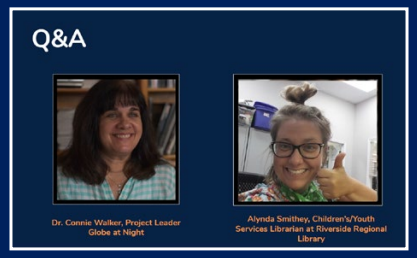
Summer Reading Program

Summer Reading Meets Citizen Science

Summer reading programs offer a variety of library events and activities designed to encourage school children to read during summer vacation, use the library and develop the habit of reading. The Riverside Regional Library in Missouri was one of many libraries prepared to engage in the American Library Association's long-running national summer reading program. They chose to partner with their local International Dark-Sky Chapter to support astronomy-based citizen science research. However, unexpected public library closures due to COVID-19 made it challenging for libraries to organize planned programs and events.

With the support of the Network of the National Library of Medicine (NNLM), Dr. Connie Walker (the Globe at Night project scientist), SciStarter and the International Dark-Sky Association, the Riverside Regional Library was able to transition programming to a virtual program. The Riverside Regional Library, in collaboration with the Missouri Chapter of the International Dark-Sky Association and SciStarter, used a video conferencing platform to introduce the community to citizen science through the Globe at Night project, which measures light pollution.

Project scientist Dr. Connie Walker was interviewed about her personal journey to a science career and the research project she oversees. Missouri International Dark-Sky Chapter President Don Ficken discussed the important role of libraries in educating communities about light pollution and its influence on health and ecology. Attendees learned how to participate in Globe at Night and engaged in two-way dialogue, posing their own questions to panelists on Zoom.



View the Riverside Regional Library virtual event and consider using it for your own programming.
SciStarter.org/NLM

Read about how this event helped jumpstart a citizen science kit program, as covered in the local Missouri news.
bit.ly/MissouriLibrary

OPPORTUNITIES FOR THE ACADEMIC LIBRARY

Different opportunities present themselves within the academic library setting. In this context, citizen science not only works to create a sense of community and increase science literacy, it is a versatile tool for the academic mission of teaching, research and community engagement at all levels. This section will help you think through the many roles academic librarians can play in promoting citizen science at their institutions and in the greater community, from supporting existing citizen science efforts to introducing citizen science to faculty interested in demonstrating aspects of scientific research and bolstering curricular concepts and skills for students through active participation in real scientific research.

Collaborate with Faculty

There are thousands of citizen science projects covering myriad scientific disciplines. Create opportunities for demonstrating to faculty how citizen science can be a versatile teaching tool, providing opportunities to incorporate discipline-agnostic concepts/activities such as observation, analysis, reporting and communicating.

While citizen science is not limited to any particular discipline, existing projects and practitioners trend toward the life sciences and environmental sciences, so this may be the logical place to start. You can use the SciStarter Project Finder to identify a couple of projects that align with what is being taught and reach out to faculty to discuss ways of incorporating citizen science into their courses. **SciStarter.org/finder**

Participation in citizen science can range from a single data collection activity, seasonal activities or ongoing activities not tied to a calendar. In addition, many projects are completely virtual. Here's an example of how North Carolina State University invites all students and faculty to engage. **SciStarter.org/NCSU-home**

Citizen science can be incorporated into the curriculum to support a number of course learning objectives. Offer to work with faculty to identify projects that can be used to teach one or more of the following:

- Science as a process
- Conducting Research
  - Observation/data collection skills
  - Data analyzation/drawing conclusions
  - Communication of concepts/findings
- Project design study
- Science awareness/literacy – contextualize course concepts
- Community engagement
- Student-shared experience (even if done by different majors, virtually, around the world)
- Social/environmental justice
- Academic writing skills
- Contribution to scientific research/knowledge

Faculty may be concerned with data accuracy as, by definition, citizen science takes some control out of the hands of researchers. With well-designed projects, ccommunity participants provide as accurate data as their professional counterparts (if not more) when following the same project protocols. This is an issue that has been addressed repeatedly in the literature, which can be read online.
bit.ly/TheoryAndPracticeCSA

Faculty may also be concerned with "fitting" citizen science into courses. So long as the integrity of the selected citizen science project is intact, faculty have a wide range of options for incorporating citizen

science into a course from standalone assignments to semester-long endeavors to accessing existing open citizen science project data for student-lead analysis.

Learn more about how faculty are utilizing citizen science in the Citizen Science Association's webinar series on Citizen Science in Higher Education: **bit.ly/HigherEdCSA**

ACADEMIC COMMUNITY BENEFITS

Academic libraries support the teaching and research missions of their institutions of higher education and establish working relationships with faculty, staff and students, both as individuals and as affiliates of offices, labs, schools, colleges, committees, professional associations, etc. Work with your colleagues to learn what they know about the academic landscape—unit priorities, areas of expertise, communication networks, etc. Can you plan to incorporate citizen science into intro-to-college courses, science courses, graduate research, virtual courses, etc.?

Citizen science allows you to leverage your library resources in a number of ways. In addition to staff expertise, your library can check out physical materials and provide both space and technology for public events and presentations. Your library can also offer a wealth of resources—both historical and current—that can be used to further expand and contextualize the scientific knowledge created through citizen science.

Here are some additional benefits to consider:

- Inspire students to study science
- Build community
- Demonstrate the value of higher education through activities in the community
    - On-campus activities could include participating in Citizen Science Month (April), engaging students in university housing (dorms), participation by student groups, encouraging friendly campus competitions and engaging non-science majors
    - Develop and maintain partnerships with local leaders and community organizations including other higher education institutions, advocacy groups, cultural institutions and public agencies
    - Share reports and presentations of faculty and student findings with community groups
    - Introduce citizen science to the broader community through partner libraries such as public library Lifelong Learning programs, school libraries with age-appropriate projects and curricular materials and special libraries with topical expertise and outreach opportunities

Learn More:

Find additional information in this Library Guide **libguides.asu.edu/citizenscience**, which contains links to a variety of academic resources.

The Network of the National Library of Medicine Mid-Atlantic Region created a two-part webinar series just for academic libraries that introduced attendees to citizen science, provided tips and best practices for getting started and sustaining citizen science on campus and showcased resources that can be integrated into citizen science effort.

Part 1: **bit.ly/NNLMAcademicLibrariesPart1**

Part 2: **bit.ly/NNLMAcademicLibrariesPart2**

SECTION 4:

CELEBRATE CITIZEN SCIENCE MONTH

Plan your citizen science event, promote featured projects and learn about facilitator resources

MISSION

"Informing and engaging the public on the core principles and practices of citizen science and amplifying opportunities to participate through public libraries and community organizations during Citizen Science Month."

OVERVIEW

SciStarter, in collaboration with the National Library of Medicine, Arizona State University and other partners, presents Citizen Science Month, an annual event to celebrate and promote all things citizen science: amazing discoveries, incredible volunteers, hardworking practitioners, inspiring projects and anything else citizen science related!

Citizen Science Month kicks off in April each year, which coincides with the anniversary of Earth Day, National Library Week, City Nature Challenge and other events. Hundreds of diverse events are held across the globe and there are many ways your community can participate.

Find free resources, support and an event calendar at **CitizenScienceMonth.org** *on SciStarter*

GET STARTED

Explore background materials, resources and find support bringing Citizen Science Month to your community at **CitizenScienceMonth.org**. Here are some of the resources you will find, which are periodically updated:

- Downloadable logos
- Event calendar and map (add and find events at **SciStarter.org/events**)
- People Finder tools to promote and recruit people for your event
- Posters and fliers
- Press release template
- FAQs
- Library and Community Guide to Citizen Science (downloadable version)
- Details on featured projects
- Embeddable Project and Event Finder from SciStarter
- Additional resources from the Network of the National Library of Medicine
- Reading lists
- Sign-up link for continued engagement and feedback
- Introduction to Citizen Science Tutorial (in English and Spanish)

scistarter
Science we can do together.

ASU School for the Future of Innovation in Society
Arizona State University

All of Us RESEARCH PROGRAM | NIH U.S. National Library of Medicine
National Network of Libraries of Medicine

CITIZEN SCIENCE ASSOCIATION

NATIONAL GEOGRAPHIC

SCIENCE FRIDAY

Host a bioblitz.

iNaturalist (**iNaturalist.org**), National Geographic and the California Academy of Sciences have created a fun way to connect diverse communities with the natural world around them. Invite local speakers and help challenge your community to find as many species as possible with a bioblitz event (**iNaturalist.org/pages/bioblitz+guide**). With an iNaturalist app, digital camera or phone/tablet with camera, you can help your community learn how to make observations with fellow naturalists and discuss findings. Some libraries and community organizations offer a kit for checkout that includes a lens for close-up or telephoto shots (**SciStarter.org/library**).

Become a citizen science hub.

Libraries and community-based organizations (CBOs) can help people follow these steps to track the success of Citizen Science Month activities using iNaturalist and SciStarter:

1. Invite your patrons or community members to go to **SciStarter.org** and create an account.
2. Go to **iNaturalist.org**, download the app and create an account. Write down the email username and password for Step 3.
3. Return to **SciStarter.org**, click on the username at the top of the screen, then click "Account Settings" and scroll to "iNaturalist Integration."
    a. Enter the iNaturalist username.
    b. Click "Save Changes."

Now, contributions through the iNaturalist app will be synced with SciStarter and participants will be credited for each contribution to their SciStarter dashboard moving forward!

FIND SUPPORT

There are lots of ways to find support as you build your program for Citizen Science Month. Here is just a sample of how we can support your efforts:

Sign up to receive updates.

Citizen Science Month supports libraries, institutions, diverse community organizations groups, museums, galleries, archives and diverse individuals all around the world to host events and introduce millions to citizen science: real scientific research. To receive emails about Citizen Science Month, sign up at **CitizenScienceMonth.org/MailingList**.

Join our weekly calls.

These calls are open to everyone and completely optional. Think of them as "office hours" when anyone planning activities leading up to and during Citizen Science Month can share ideas, get feedback, make connections and leverage resources and support. Check out **CitizenScienceMonth.org/MailingList** for the link and schedule.

Discover planning resources.

SciStarter provides planning resources and checklists in this guide and at **CitizenScienceMonth.org**.

Explore additional Citizen Science Month resources.

There are free tools and templates to introduce citizen science to your community patrons and to plan a Citizen Science Month event in your library.

CITIZEN SCIENCE MONTH

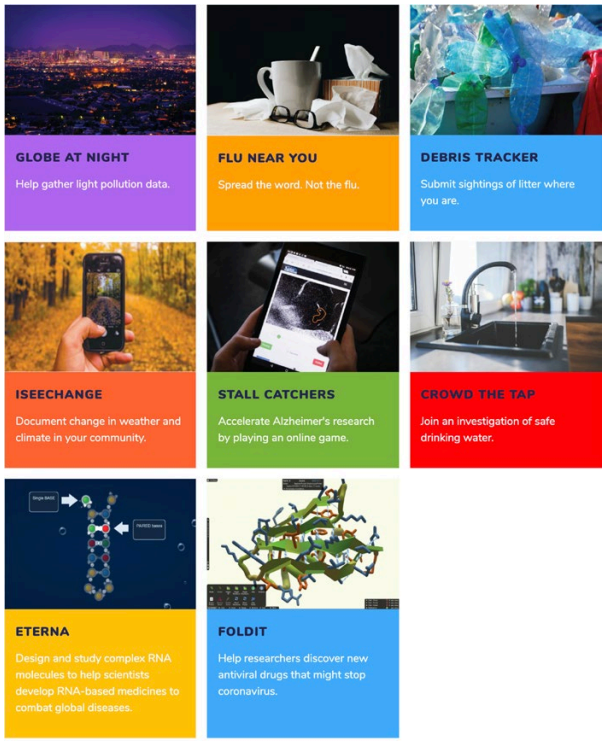
The Citizen Science Month webpage on SciStarter.org (**CitizenScienceMonth.org**) features resources for planning a Citizen Science Month celebration, including:

- Logos and promotional materials
- Event calendar and map (add and find events)
- Information about how to join office hours
- Themed days
- An Introduction to Citizen Science Tutorial offered in English and Spanish
- Reading lists
- Links to embeddable Project Finders
- Information on Citizen Science Kits for libraries

Citizen Science Month offers thousands of opportunities for your community members to turn their curiosity into impact. This guide offers tips and resources to support citizen science engagement at your library. Citizen science will reveal amazing worlds to discover, interesting people to meet and meaningful community connections. We invite you to refer to this guide at your leisure to find tips and resources to help you bring citizen science to your library.

FEATURED PROJECTS

Check out the National Library of Medicine's featured projects. They're perfect for a program about the environment or human health! Also embedded on this page is the Introduction to Citizen Science Tutorial, which takes about 30 minutes for an individual to complete and offers a certificate of completion at the end. The tutorial was written to be accessible for all age levels and is offered in English and Spanish. **SciStarter.org/NLM**



STEP-BY-STEP GUIDE FOR HOSTING A CITIZEN SCIENCE MONTH EVENT

There's no right or wrong way to participate in Citizen Science Month and each community will have its own needs and preferences. Here we have organized planning activities into three levels. You may find that none of these fit your situation and that's totally fine! This entire guide is designed to be just that—a guide, not a rule book.

LEVEL 1 – Turn Viewers Into Doers: Promote Citizen Science Month by simply displaying or distributing posters and fliers to create awareness among your community. Connect them to projects through the citizen science hub at **SciStarter.org**. Find everything you need at **CitizenScienceMonth.org**.

In addition, consider hosting a "viewing party" by playing any of the following programs on monitors throughout your library or community meeting space. Each of these videos will provide context as to what citizen science is and how everyone can become involved. This will help build awareness about the important role everyday people have in science through citizen science.

Learn More:

- PBS: The Crowd & The Cloud series: **CrowdandCloud.org**
- PBS: SciGirls Citizen Science series: **pbskids.org/scigirls/citizen-science**
- PBS: Nature TV's SpringLIVE! aired on April 30, May 1, May 2 in 2019 on PBS. These shows were designed to engage people in citizen science right where they are! **pbs.org/wnet/nature/american-spring-live/**
- SciStarter and Citizen Science are featured on NatGeoKids and Disney+ in "Weird But True" Season 3, Episode 10 (Subscription required): **bit.ly/DisneyPlusWeirdButTrue**
- Dozens of short videos can be found on SciStarter: **SciStarter.org/citizen-science-videos**

LEVEL 2 – Give the Community a Hands-on Understanding of Citizen Science: Bring hands-on citizen science experiences to your community with the following next steps:

1. Complete Level 1 and introduce citizen science resources in your library.
2. Choose a few citizen science activities from SciStarter. The best place for an organization to start is on **SciStarter.org/NLM**. These projects are particularly well suited for libraries and many other community-based organizations.

   Tip: Regardless of the project you select, reach out to local citizen science practitioners to invite them to come talk about their research and highlight how the community can get involved. You may also want to invite government officials who are making decisions for their jurisdictions on topics related to citizen science projects. Local citizen scientists can also talk about their involvement, help onboard others and foster a community of participants. By encouraging them to continue to meet on a regular basis, your organization will become a community hub for citizen science.

3. Embed SciStarter's free Project Finder on your organization's website and/or public computers. It's as simple as selecting filters for the types of projects you want to display and share (based on age, topic or location) and then copying and pasting the code on your website or browser. Instructions are at **SciStarter.org/widget**.
4. Promote activities through your communications and marketing distribution channels (newsletters, emails, displays, etc.), fliers and posters displayed at your facility and on your website. If there are presenters involved, ask them to help promote their appearance as well.
5. Evaluate outcomes. Consider sharing surveys with attendees and presenters to see what worked and what can be improved. Ask what other citizen science topics they might be interested in. If you join any of the Citizen Science Month weekly planning calls, you'll gain access to evaluation templates created by Arizona State University specifically for Citizen Science Month.

LEVEL 3 – Plan a Citizen Science Month Event: Ready to host a Citizen Science Month event? After completing steps for the previous levels, reviewing the materials on **CitizenScienceMonth.org** and brainstorming your topic, you have the option to receive additional assistance.

At SciStarter, we want to make sure citizen science programming is accessible to all, especially with virtual opportunities. Wherever you are in the world, you can apply to host a virtual program with SciStarter's support, which can include social media promotion, access to our Zoom webinar account, facilitation assistance and more.

Note: Anyone can add an event to the event calendar for citizen scientists around the world to discover it (**SciStarter.org/events**). This is a special opportunity to apply to receive extra support from SciStarter.

We're opening up this opportunity to our facilitator community (you!).

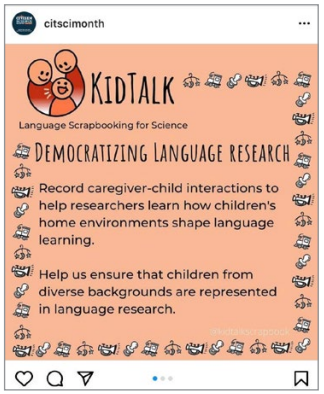
These are the steps:

1. Select a potential event time via **scistarterevents.youcanbook.me** (password: citsci)
2. Email **CarolineN@SciStarter.org** with your event idea
3. Join our weekly office hours via the link at **CitizenScienceMonth.org/MailingList** to confirm your event. We established our office hour times for a global audience after conducting a poll last year.

We can't wait to help you turn your community's curiosity into impact with citizen science.

Additional opportunity:

Even though the next Citizen Science Month is in April 2021, it's never too early to celebrate and we have social media takeovers going on to keep the citizen science fun active year-round with @CitSciMonth (**twitter.com/CitSciMonth** and **instagram.com/CitSciMonth**).



Anyone can sign up for a social media takeover. We've had individuals, community groups, nonprofits, libraries and more take over to share their insights. Review our welcome document (**bit.ly/CitSciMonthTakeover**) to learn how you can get involved.

PLANNING A VIRTUAL EVENT

So you want to plan an online, live-streamed, citizen science event... You're in the right place!

STEP ONE:

Watch the Science Friday and SciStarter event webinar

Science Friday and SciStarter discuss the best use cases for different platforms (e.g., Zoom versus Google Meet).

The webinar was a collaboration between the Science Friday and SciStarter teams to help facilitators (librarians, museum professionals, educators, etc.) transition in-person events they had planned for CitSciMonth 2020 to virtual contexts.

https://blog.scistarter.org/2020/03/webinar-recording-host-or-facilitate-remote-live-streamed-citizen-science-events/

STEP TWO:

Watch the Digital Accessibility Webinar

Citizen science is for everyone, so virtual events should be too! This webinar, presented by Kelli Ham of the Network of the National Library of Medicine, showcases ways to ensure virtual events don't leave out folks who may be visually or hearing impaired.

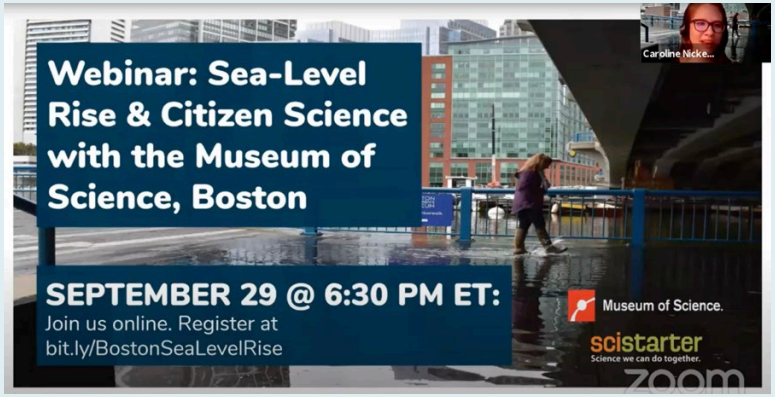
https://blog.scistarter.org/2020/04/webinar-recording-of-digital-accessibility-best-practices-for-creating-user-friendly-presentations-and-content/

STEP THREE:

Check out some the "greatest hits" of past events

SciStarter periodically showcases various videos (webinars with library staff, how-to videos from project leaders, how to use SciStarter, etc.) on the Citizen Science Videos page (**SciStarter.org/Citizen-Science-Videos**).

These particular recordings are examples of...
A library event: **bit.ly/StallCatchersOlathe**
An event with a museum: **bit.ly/MOSSeaLevelRise**
An event with a global organization: **bit.ly/SciStarterCitSciAsia**
An event with a media partner: **bit.ly/COVIDDiscoverMag**



STEP FOUR:

Planning your event!

Now that you have the lay of the land, you're ready to plan your own event.

Do you know...

- The intended audience?
- The event platform you'll use?
- Whether your event will be completely virtual or a virtual/in-person hybrid?
- The citizen science project(s) you'd like to feature?
- The featured speakers and facilitators?
- In-event activities for the audience?
- Poll questions you'll ask the audience (available if you're using Zoom)?
- The post-event call to action for the intended audience?
- The follow-ups you'll send post-event (surveys, other events in a series, etc.)?

Here's one example: SciStarter and ASU partnered with the OSHER Lifelong Learning Institute at ASU to help their 50+ older members learn about and engage in citizen science.

The intended audience? 50+ community.

The event platform you'll use? We use Zoom because many community members have Wi-Fi and are growing accustomed to Zoom. There are substantial differences between Zoom meetings and Zoom webinars; Zoom meetings allow for everyone to have their video and audio available, whereas Zoom webinars limit this ability to panelists. Zoom webinars are more secure and less vulnerable to being hijacked by potential bad actors than Zoom meetings are, but a Zoom webinar account is generally more expensive. Get in touch with SciStarter (**info@SciStarter.org**) if you'd like help hosting a Zoom webinar.

Whether your event will be completely virtual or a virtual/in-person hybrid? Completely virtual (although we will experiment with hybrid events—both virtual and in person—soon!)

The citizen science project(s) you'd like to feature? We chose projects people can do from home. You can search for projects based on location and/or select "online" from the SciStarter Project Finder.

The featured speakers and facilitators? We used the "contact project scientist" link to email an invitation to the project scientists. (You'll see this on every project page on SciStarter, if you're logged in.)

Interactive event activities? Ask viewers to introduce themselves and where they are tuning in from by using "chat" on Zoom or comments on Facebook and YouTube; showcase a Zoom poll in PowerPoint slides to get a sense of who tuned in and to break the ice a bit; click through the **SciStarter.org/NLM** "Introduction to Citizen Science" module; demonstrate how and invite users to create SciStarter accounts; give an overview of a particular project on **SciStarter.org/NLM** with a description of the project's goals, tasks, how data will be used, and why you selected the project;

demo the project (crowdsource observations and analysis in real-time "Is this blood stalled or flowing?"); conduct a Q&A with the project scientist; and most importantly, have fun!

Poll questions you'll ask the audience (available if you're using Zoom)? Where are you dialing in from? Have you ever done citizen science before? Are you an educator, parent, student, etc.?

The post-event call to action for the intended audience? Go to SciStarter.org and participate in a featured project.

The follow-ups you'll send post event (surveys, other events in a series, etc.)? See survey template in **Addendum C**.

STEP FIVE:

Scheduling and Promotion

Once you know who you're planning the event for, why you're planning it and who needs to be involved, you can get everything scheduled! Assuming you're using Zoom, send all the panelists a Google calendar invite for a short practice before the event, solicit headshots and bios of speakers so you can create a "Speakers" Slide, send details on slide templates if speakers will present slides and then send the speakers an invite for the event itself (with some pre-event setup time built in). Designate point people to moderate comments and share questions in chat on Zoom, in comments on Facebook and YouTube and on posts on Instagram.

Technical Dress Rehearsals

Invite speakers and moderators to join you online to review the event agenda and to test audio, visuals, Wi-Fi connections, backgrounds, lighting, etc. If Wi-Fi is unstable, speakers can call in via phone and the moderator/host can present that speaker's slides. If you're using Zoom, it's easy to give others screen-sharing control and to add closed-captioning by clicking the relevant buttons within the Zoom interface.

Review the following with your panelists:

Online Setup

- Location: quiet, free of distractions
- Lighting: avoid backlighting
- Audio: sound check before event for volume and quality
- Screen image: web camera at or slightly above eye level, appropriate backdrop, and dress
- Internet: strong bandwidth support video, and sound

Production Supporters

- Monitors chat, Q&A, and other streaming platforms
- Drops inappropriate viewers
- Engages with viewers and answers questions during event
- Backup for presenter having technical difficulties

Presentation Material

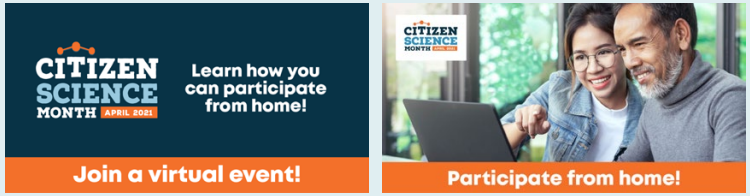
- Engage with audience: polls, ask for zip codes to track demographics
- Slides: print out or have electronic version available
- Embedded videos: do they work?
- Live demos: can be technically challenging

Promote the event

Examples of graphics you can use to promote your event on social media are available at **CitizenScienceMonth.org/Resources**. Design a social media toolkit for all partners, with graphics, suggested tweets, Instagram posts, and Facebook event links, as well as tags for all featured partners across the different platforms. See **Addendum D:** Sample Social Media Toolkit, for examples within this guide. Add your event to **SciStarter.org/events**, and ping relevant listservs and other email lists.

Instagram tiles

Facebook banners



STEP SIX:

Host the Event!

It's the day of.

Don't be afraid to have fun! Have folks make their SciStarter accounts on **SciStarter.org/NLM** during the event, and encourage them to simultaneously experiment with different projects "alongside" you (from a physical distance).

STEP SEVEN:

Follow-up

Your event has now concluded! Hopefully you ended with strong calls to action ("Take our survey to let us know how we did" and "Do a citizen science project on **SciStarter.org/NLM**"). Email all attendees a link to the recording, survey, and citizen science call to action afterward and try to promote other events on **SciStarter.org/events** for continued engagement. Typically, email once on the same day after an event and once two weeks later, to make sure you reach everyone. You can email all registrants, even ones that didn't attend the event.

Thank you for turning your curiosity into impact with citizen science and getting your community started with this work!

EVENT PROMOTION TIMELINES

There are lots of ways to ensure your Citizen Science Month events are successful. Here are ideas of how to prepare for your event.

THREE MONTHS PRIOR TO EVENT:

Learn more about Citizen Science Month. There are many great resources, ideas, downloadable posters and fliers, press release templates, logos and webinars on how to host a Citizen Science Month event. There are also books and popular citizen science activities to engage your community leading up to the big day. Find all of this and more at CitizenScienceMonth.org.

Determine the type of event you'd like to host. You can make your event as big or small as you would like it to be based on your resources! You may want to organize a virtual event or a hybrid event. You could even just highlight one cool project and some citizen science books online. Some citizen science projects may require participants to use computers. Will they be available? Do you have enough Wi-Fi to support a small crowd (outside the library or community center)? These considerations can help you select the right type of event to host.

SciStarter Program Manager Caroline Nickerson (right) with SciCheer Della (left) of the Seahawks Dancers.

Use the **Citizen Science Month Programming Checklist: Template for Libraries** (see Addendum A) to help outline the logistics for the event.

Reach out to SciStarter if you'd like support to find volunteers to participate in the event, help facilitate your event and/or help promote your event. Email: CarolineN@SciStarter.org.

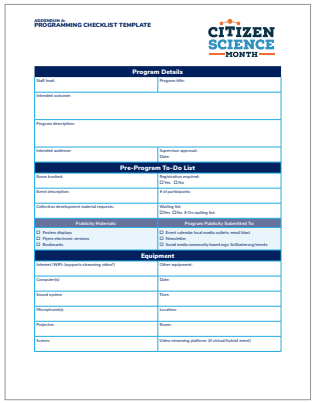
Put a Save-the-Date notice in your newsletter or promotional materials. Some options:

- *"Love citizen science? Not sure what citizen science is? All are welcome to join us for Citizen Science Month this coming April! Find resources and activities for all ages to learn more and discover opportunities to engage in local and global projects in need of your help."*
- *"We are celebrating Citizen Science Month this April! Citizen science is a way for people of all ages to collect, share or analyze data to help scientists address local or global questions. Come join us as we engage in outdoor environmental research!"*

*Find additional, free promotional materials here: **CitizenScienceMonth.org***

Develop event master plan. Begin outlining the event timeline activities (such as finding citizen science providers and/or community partners, buying materials for activities, etc.), assignment of roles and responsibilities and budget (snacks are always a nice touch!).

Identify and contact speakers and partners. See tips in Section 3: Bring Citizen Science to Your Community. Find examples of emails to send to potential partners in Addendum B of this guide.


PROGRAMMING CHECKLIST TEMPLATE

CITIZEN SCIENCE MONTH

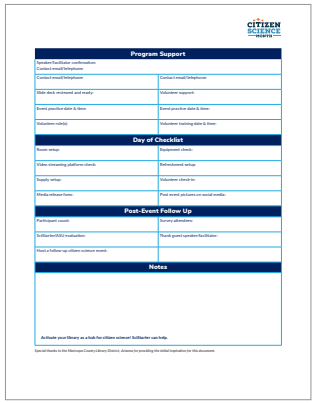
Program Details

Pre-Program To-Do List

Publicity Materials

Program Publicity Submitted To

Equipment


Program Support

Day of Checklist

Post-Event Follow Up

Notes

Programming Checklist

Activate Publicity Plan:

- Request logos from sponsors, partners and your organization for online and printed materials.
- Develop publicity pieces that our organization, presenters, event team, sponsors and partners can use, such as newsletter articles, ads, radio spots, print blog posts and newspaper articles.
- Develop a media list and prepare press releases and media kits highlighting the presenters and activities of your organization's event.
- Highlight the event on Facebook and other social media platforms.
- Register your event on SciStarter.org and then use the People Finder (both are available on CitizenScienceMonth.org) to invite people, including local project leaders, to the event.
- Register your event on other event and community calendars.

ONE MONTH PRIOR TO EVENT:

Shore up people power. Confirm that your event will be adequately supported by staff and volunteers.

Release press announcements. Highlight keynote speakers and high-profile activities that will be taking place at your community event. Post your event press release on your organization's website and circulate to all partners, affiliated organizations and sponsors. Add your event to CitizenScienceMonth.org by clicking on "Register Your Event" in the "For Facilitators" section.

Develop an evaluation plan. The ASU and SciStarter teams may also ask you to participate in summative and formative evaluations. We also survey event participants. There's a template you can modify to solicit feedback from your event participants in Addendum D of this guide.

Finalize materials for the event. Finalize all activity worksheets, signage, evaluation surveys, etc.

WEEK OF EVENT:

Confirm details. Review the completed Citizen Science Month Programming Checklist: Template for Libraries and Community-Based Organizations (see Addendum A) to determine possible omissions and to ensure that backup plans are developed for any situation (e.g., more volunteers).

Meet with volunteers. Prior to the event, brief them about their event roles, timelines and other key event information. If they will be facilitating an activity, check to see that they are comfortable with the activity. Remember to thank them for their time and talents! They cannot be thanked enough!

Take to the airways and social media. Have key members of the event team and others begin to heavily promote your community event. Also, confirm whether the media will be attending the event. Tag **@SciStarter** and **@CitSciMonth** and use the hashtags **#CitSciMonth** and **#CitizenScience**.

DAY BEFORE EVENT (IN-PERSON EVENTS):

Complete setup. Ensure that all signage is up, tables and chairs for presenters are in place, hands-on materials are stocked and located where activities will take place, and AV works, if needed.

Meet with event team. Do a thorough review of the Event Master Plan and walk-through of the library or event space where the citizen science event will be taking place.

DAY BEFORE EVENT (VIRTUAL EVENTS):

Check your virtual communications and platform. If you're using Zoom, make sure you've pinged all registrants via email and programmed in any poll questions.

Meet with event team. Do a soundcheck and make sure the whole team is on the same page for the virtual run-of-show.

EVENT DAY (IN-PERSON EVENTS):

Open the doors and HAVE FUN. Congratulations! Share highlights during your event by posting pictures and updates on social media. Tag **@SciStarter** and use **#CitSciMonth** and **#CitizenScience** hashtags. SciStarter and partners will repost many of them!

Catalyze ongoing engagement in citizen science. Encourage everyone to create a SciStarter account to help them sustain and deepen their participation in citizen science! Find tips and resources in **Section 5**: Beyond Citizen Science Month.

EVENT DAY (VIRTUAL EVENTS):

Launch your Zoom event and HAVE FUN. This will be awesome! Congratulations! Share highlights during your event by posting pictures and updates on social media. Tag **@SciStarter** and use **#CitSciMonth** and **#CitizenScience** hashtags. SciStarter and partners will repost many of them!

Catalyze ongoing engagement in citizen science. Encourage everyone to create a SciStarter account to help them sustain and deepen their participation in citizen science! Find tips and resources in **Section 5**: Beyond Citizen Science Month.

AFTER EVENT:

Send thank-you notes to volunteers and partners.

Survey participants for additional feedback. Sending follow-up emails is also a great way to keep momentum going among event participants.

Activate post-event publicity and member development opportunities. There may be opportunities for relationship growth after the event.

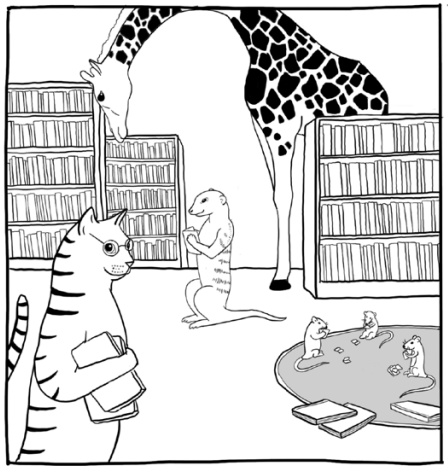
Consider hosting a follow-up event. You may have been bitten by the citizen science bug! Find tips on sustaining engagement in **Section 5**: Beyond Citizen Science Month.

Review evaluations. Review the evaluation data and glean lessons learned: what went well, what didn't, etc. Find summative evaluation reports from ASU, Science Regarding Citizen Science Month and Libraries as Communities Hubs for Citizen Science at **SciStarter.org/Library-Resources**.

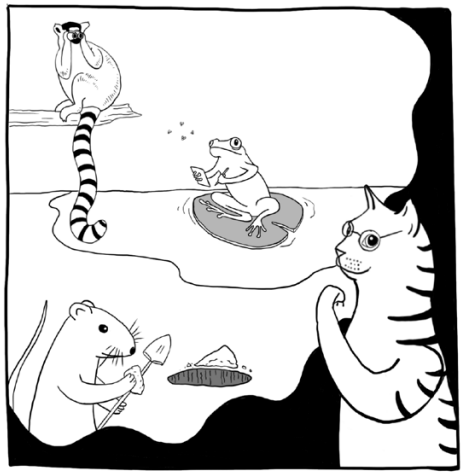
Citizen Science Club tabling at Wolfpack Welcome Week, where students explore all the student organizations North Carolina State has to offer!

PLAN YOUR OWN CITIZEN SCIENCE EVENT

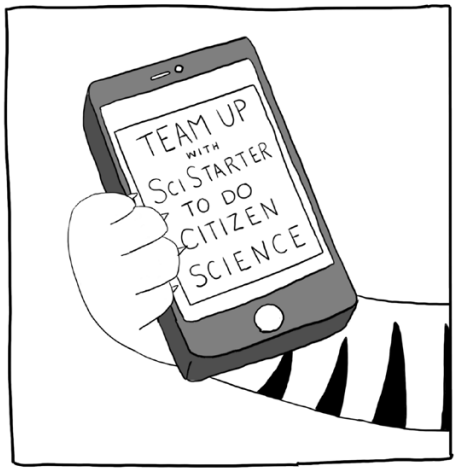
Illustrated by Iris Gottlieb



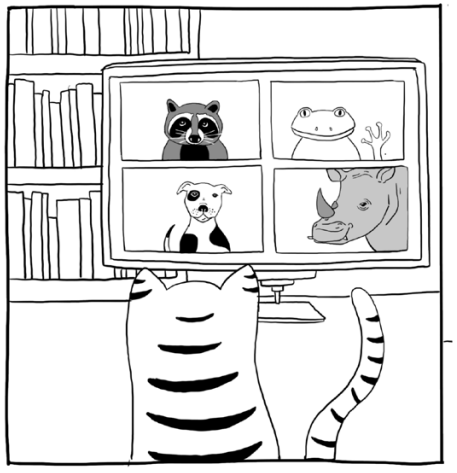
CARLA IS A LIBRARIAN. SHE WANTS HER LIBRARY TO BE A PLACE WHERE PEOPLE CAN DEVELOP THEIR CURIOSITY AND MAKE AN IMPACT ON THEIR COMMUNITY.



SHE'S HEARD ABOUT CITIZEN SCIENCE, WHERE EVERYDAY PEOPLE COLLECT AND SHARE DATA WITH SCIENTISTS TO ACCELERATE RESEARCH.



CARLA SEES A POST ABOUT SCISTARTER.ORG, WHICH CONNECTS PEOPLE TO THOUSANDS OF CITIZEN SCIENCE PROJECTS AND LOTS OF FREE RESOURCES, INCLUDING THOSE FOR CITIZEN SCIENCE MONTH (CITSCIMONTH) IN APRIL.

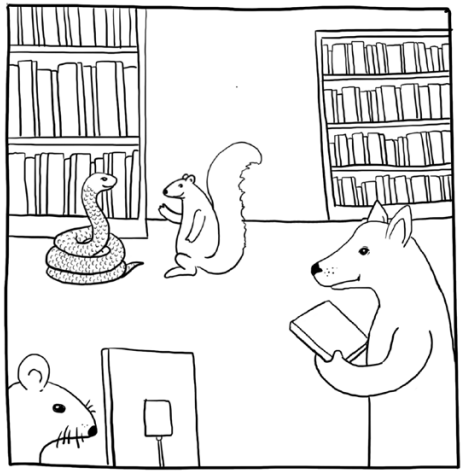


SHE JOINS ONE OF THE PHONE CALLS OFFERED BY SCISTARTER EACH WEEK TO HELP PEOPLE HOST A CITSCIMONTH EVENT AND LEARNS ABOUT A CURATED PAGE OF SIX PROJECTS SELECTED BY THE NATIONAL LIBRARY OF MEDICINE. SCISTARTER.ORG/NLM

CARLA WANTS TO ENGAGE THE SENIOR POPULATION USING THE DIGITAL RESOURCES AT HER LIBRARY, SO SHE PICKS THE PROJECT STALL CATCHERS, AN ONLINE GAME WHERE VOLUNTEERS CATEGORIZE IMAGES FROM BRAIN STUDIES.

SHE SELECTS A TIME AND DAY FOR THE SENIORS TO COME TO THE LIBRARY TO LEARN ABOUT CITIZEN SCIENCE AND PLAY STALL CATCHERS, TOGETHER.

SHE REGISTERS HER EVENT ON CITIZENSCIENCEMONTH.ORG, AND BEGINS SPREADING THE WORD! SHE CONTACTS OTHER COMMUNITY GROUPS AND USES FREE PUBLICITY MATERIALS AT CITIZENSCIENCEMONTH.ORG TO LET PEOPLE KNOW ABOUT HER EVENT.



THE CITIZEN SCIENCE EVENT IS A HIT! PEOPLE MAKE NEW CONNECTIONS IN THEIR COMMUNITY, AND THE BRAIN RESEARCHERS GET DATA. CARLA IS ALREADY GETTING REQUESTS TO DO ANOTHER EVENT AND SHE CAN TURN TO SCISTARTER.ORG TO FIND LOCAL OR GLOBAL PROJECTS!

LEARN MORE ABOUT CITSCIMONTH, FIND RESOURCES OR REGISTER YOUR EVENT AT:

CITIZENSCIENCEMONTH.ORG

CITIZEN SCIENCE MONTH SUMMARY

Citizen Science Month is held annually in April, offering thousands of opportunities for you to turn your curiosity into impact. There's something for everyone, everywhere! Join a project or event from wherever you are to help scientists answer questions they cannot answer without you. Together, we can move the world forward.

Find all things Citizen Science Month: **CitizenScienceMonth.org**

Check out our featured projects, which are perfect for beginners: **SciStarter.org/NLM**

Browse featured events to join a virtual citizen science project: **SciStarter.org/Events**

LINKS FOR FACILITATORS

- Register your virtual event to broaden your reach: **SciStarter.org/Add-Event**
- Download resources for your virtual event, including step-by-step planning guides, promotional materials and more: **CitizenScienceMonth.org/Resources**
- Sign up for planning updates: **CitizenScienceMonth.org/MailingList**
- Review Frequently Asked Questions: **CitizenScienceMonth.org/FAQ**

SciStarter Program Managers Caroline Nickerson and Yang Cao at the Philadelphia Science Festival.

ASU Academic Librarian Dan Stanton at the Citizen Science Association Conference.

The Los Angeles Public Library won the Megathon in 2019, accomplishing more Alzheimer's research than any other team!

Victor Sunday and a member of the Unique Mappers Team. Port Harcourt, Rivers State, Nigeria.

RESULTS FROM CITIZEN SCIENCE MONTH 2020

Watch a one-hour webinar recording of "What We Learned from Citizen Science Month 2020," presented by SciStarter, ASU and the Network of the National Library of Medicine, with an introduction from the Citizen Science Association:

blog.scistarter.org/2020/07/webinar-recording-what-we-learned-from-citizen-science-month/

Download a PDF (**media.scistarter.org/curated/WhatWeLearnedFromCitizenScienceMonth_July_2020.pdf**) version of the slides we presented, which include a summary of the program evaluation outcomes.

The information and outcomes shared come from SciStarter analytics (web, social media, project contributions) and SciStarter records, as well as from evaluation work from University Office of Evaluation and Educational Effectiveness at ASU, which included a Tutorial Survey, Participant Survey, Facilitator Survey, Facilitator Focus Groups and Project Scientist Interviews.

QUICK HISTORY: FROM CITSCIDAY TO CITSCIMONTH

- 2016: Citizen Science Day
- 2017: Citizen Science Association and SciStarter form the Citizen Science Working Group
- 2018: Events at the USA Science and Engineering Festival in collaboration with the National Park Service, City Nature Challenge, SciStarter and the Federal Community of Practice on Citizen Science and Crowdsourcing
- 2019: Stall Catchers Megathon. Over 1,500 citizen scientists completed 3.5 months of Alzheimer's research, online, in one weekend!
- 2020: 121++ events around the world, a 375% increase (compared to April 2019) in the number of people who JOINED citizen science projects on SciStarter! Social media takeover of the new @CitSciMonth Twitter account resulting in 365,218 impressions

PARTICIPANT INSIGHTS

Introduction to Citizen Science Tutorial Insights

- Overall, users of the "Introduction to Citizen Science" tutorial who completed the evaluation survey reported gains in awareness, interest, understanding and comfort around citizen science as a result of completing the tutorial.

Direct Quotes from Event Facilitators

- "We were incredibly fortunate to have one-on-one coordination with SciStarter staff during the planning, promotion and execution of our event. Nothing beats this personal attention and collaboration! Otherwise, we were very grateful to use SciStarter's Zoom account to run the event itself."
- "The Zoom account with 100-person access allowed us to reach a large audience; also, Caroline's assistance was invaluable walking us through this process and how to run a successful seminar."
- "The people coming to us from SciStarter are really ready to be immersed in citizen science. And so, they're the ones really contributing a lot."

- "These newfound outreach capacities helped to promote project participation among 'new audiences' across the nation and globe."
- "[SciStarter was] very, very helpful putting together, helping select projects…help[ing] us get all the little pieces together."
- "SciStarter…really helped promote the projects, more so than any organization I've worked with, including my own [informal learning space]."
- Monday after the event: "The events seem to have had an impact on my project. We've had 492 classifications since Thursday, which is amazing." - Patrick Treuthardt, Spiral Graph

Insights from Participants

- For the sample size (n = 25), it is notable that under-represented in biomedical research groups were represented across numerous categories.
- Participants self-reported average gains in knowledge of science and citizen science, confidence in participating in citizen science and motivation to participate again in the future.
- Notably, most participants (19 of 22 respondents) also reported that the event they attended made them feel more connected to others while practicing physical distancing due to the COVID-19 pandemic.
- Moreover, analytics from the SciStarter NLM microsite provide supplemental evidence that citizen science interest and engagement peaked during Virtual Citizen Science Month, with most featured projects evidencing participation beyond April.

Direct Quotes from Participants

- "It was an excellent opportunity to know more about the other project[s] around the world."
- "I felt extremely hopeful and inspired by listening to the wonderful presenters from the projects on SciStarter. I'd attend more events, in person or virtually, any day."

CitSciMonth 2021: April

- It's never too early to start planning!
- Sign up for one of the weekly global social media takeovers of @CitSciMonth on Twitter: **bit.ly/CitSciMonthTakeover**
- Join one of the open global weekly calls: Thursdays at 8 AM and 11 AM ET
- Sign up to keep up with facilitator updates: **bit.ly/CitSciMonthFacilitatorUpdates**

Library Partnerships Recap

Libraries are quickly becoming community hubs for citizen science. Citizen science events fit well with the mission to use libraries to strengthen communities and transform lives through education and lifelong learning. Here are examples of how libraries successfully partnered with citizen science to accomplish this mission:

Summer Reading Program

Summer reading programs offer a variety of library events and activities designed to encourage school children to read during summer vacation, use the library and develop the habit of reading. The Riverside Regional Library in Missouri was one of many libraries prepared to engage in the American Library Association's long-running, national summer reading program. They chose to partner with their local International Dark-Sky Chapter to support astronomy-based citizen science research. However, unexpected public library closures due to COVID-19 made it challenging for libraries to organize planned programs and events.

With the support of the Network of the National Library of Medicine (NNLM), Globe at Night project scientist, SciStarter and the International Dark-Sky Association, the Riverside Regional Library was able to transition programming to a virtual program. The Riverside Regional Library, in collaboration with the Missouri Chapter of the International Dark-Sky Association and SciStarter, used a video conferencing platform to introduce the community to citizen science through the Globe at Night project, which measures light pollution.

Project scientist Dr. Connie Walker was interviewed about her personal journey to a science career and the research project she oversees. Missouri International Dark-Sky Chapter President Don Ficken discussed the important role of libraries in educating communities about light pollution and its influence on health and ecology. Attendees learned how to participate in Globe at Night and engaged in two-way dialogue, posing their own questions to panelists on Zoom.

View the Riverside Regional Library virtual event and consider using it for your own programming on **SciStarter.org/NLM**.

Read about how this event helped jumpstart a citizen science kit program, as covered in the local Missouri news at **bit.ly/MissouriLibrary**.

Fall Programming

Offering a safe and healthy environment quickly became a top priority for public libraries as they pivot their services to address the health concerns posed by COVID-19. Many libraries are not able to open their doors to large gatherings, making this fall event programming more valuable than ever.

The Network of the National Library of Medicine (NNLM), a program of the National Library of Medicine (NLM) and the All of Us Research Program have expanded their partnership with SciStarter in Fall 2020 to support awareness and engagement in citizen science projects to advance research on human and environmental health. As a result, a new four-part public series of virtual events provides accessible, bilingual resources to 1) introduce citizen science programs and hands-on projects to the public and 2) library staff and leaders from community-based organizations (CBOs) in bringing citizen science to their audiences.

The first hour of each online event is open to the public. The final half-hour will provide step-by-step instructions and links to resources to support library staff and leaders from CBOs seeking to facilitate citizen science programming for their audiences. Three Medical Library Association (MLA) continuing education credits are offered upon completion of the 90-minute program for eligible participants. Learn more about these events and access resources/recordings at **SciStarter.org/NLM**.

Next up...Citizen Science Month 2021.

SECTION 5:

BEYOND CITIZEN SCIENCE MONTH

Ideas for sustained engagement and awareness growth throughout the year

Citizen Science Month is a great way to kick-start, maintain or expand the promotion of your organization's initiatives in citizen science. Build on all the great work you did—and contacts you made. Your organization is a community anchor that provides opportunities for everyday people to actively contribute to important issues through citizen science. That is powerful!

Now that you've introduced citizen science to your community, encourage people to stay engaged through SciStarter. Members can check their SciStarter dashboard for new and recommended projects and events. The dashboard helps them track their interests and contributions.

Here are additional ways to keep your community interested and engaged:

Bulletin Boards/Kiosks: Create an informational bulletin board around locally relevant or national citizen science issues.

- **Trivia and Voting (with sheets of sticky dots):** Let's say your organization installed a rain gauge, so community members can report precipitation to a project known as CoCoRaHS (**SciStarter.org/cocorahs-rain-hailsnow-network**). Create a trivia question to see if people can guess the average precipitation in any given month. People can use the sticky dots to vote on an answer.
- **Awesome pictures with cool facts:** There are many websites such as NASA, the National Institutes of Health, and others where organizations can download or request incredible photographs and cool facts. A good example for upper-elementary-aged youth is NASA's Space Place (**spaceplace.nasa.gov**). Websites such as Earth Observatory (**earthobservatory.nasa.gov**) and NASA Science News (**science.nasa.gov/science-news**) are great sources for older participants. You can post relevant citizen science projects next to these facts!
- Post reading lists, included those in this guide (see page 47)
- Distribute handouts that tie into the theme of your citizen science bulletin board

Loanable Science Tools: Discover information on new citizen science kits! PDFs of materials, information on how to build, borrow or buy kits and "how to" instructions can be found at **SciStarter.org/library-resources**.

Library Telescope Programs and Family Activity Backpacks contain science tools, books and activities, which are very popular for enhancing citizen science experiences. Contact your local astronomy club or Cornerstones of Science (**CornerstonesofScience.org**) about obtaining a high-quality, user-friendly telescope to start a Library Telescope Program within your organization.

Find a project on **SciStarter.org** that aligns with your community's interest areas. If you create a SciStarter account, you will have access to a button to "message the project scientists" on each project page. Invite the scientist to participate in an in-person or virtual event to talk about their project and lead people in doing the project.

Book Displays: Create book displays and invite community members to provide recommendations. Book displays are particularly good when supporting an upcoming presenter's talk. (**Section 6**: Citizen Science Resources lists a number of books that would be ideal for a book display.)

STAY ENGAGED

Talk with your community:

Ask your community for advice on how to enhance STEM programming year-round and what additional presentations they would like to see offered. Ask for recommendations on books, assistance with creating informative passive programs such as thematic bulletin boards or loanable backpacks, ideas for other presenters and providers, support with continued participation in data collection and developing recommendations that are relevant to your community and the research.

Offer ongoing support:

Engage with people directly for data collection, spread word-of-mouth information about citizen science, provide a safe and free space for people to engage in citizen science together and offer space for subject matter experts to present research, findings and get community feedback.

Connect existing programs and communities to active citizen science projects. The following are particularly popular projects:

Stargazing Parties

Invite your local astronomy club to bring solar and/or night-viewing telescopes to your library or community meeting space. Local astronomers are well versed in working with the public and sharing relevant Earth and space information in a meaningful and engaging manner. They can share their data with Globe at Night (**SciStarter.org/globe-at-night**) to help scientists monitor light pollution in the night sky.

Health Awareness Fairs

Invite your local hospitals, grocery stores and health and wellness organizations to your library or meeting space. Have each group bring activities where your community members can:

- **Look through microscopes...**then introduce them to Stall Catchers: **SciStarter.org/stall-catchers-by-eyesonalz**
- **Learn how to grow healthy food...**then introduce them to a soil quality monitoring project: **SciStarter.org/citizen-science-soilcollection-program**
- **Go on a healthy hike...**then introduce them to iNaturalist: **SciStarter.org/iNaturalist**

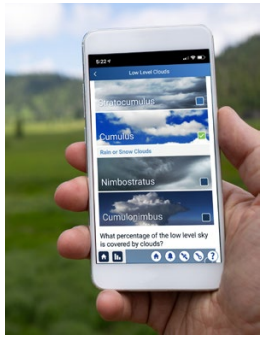
Book clubs

Select monthly topics related to a citizen science project during spring/summer months. Find a book list in **Section 6** of this guide.

Story time

Include hands-on citizen science activities for families. (See **Section 6**: Citizen Science Resources for a children's book list.)

GLOBE Clouds Citizen Science: Guide Libraries



Whether you're planning for a special event or an ongoing program, there are many ways to bring citizen science into your library programs. Using the free NASA GLOBE Observer mobile app, citizen scientists of all ages can learn more about clouds and contribute to NASA science by taking photographs of clouds and recording sky observations. This guide provides a step-by-step guide to NASA's GLOBE Observer Clouds, including ideas and resources for library programming. **observer.globe.gov/libraries_clouds**

For naturalists and nature lovers

Organize a local bioblitz using the iNaturalist app (**iNaturalist.org**) and share local observations of biodiversity. (See **Section 4**: Celebrate Citizen Science Month in this guide for tips on hosting a bioblitz.)

Civic engagement connections

City planners, for example, are seeking ways to protect and shape the future of our cities. Citizen scientists can help inform their decisions by collecting and sharing data such as population, water quality and availability, air quality and infrastructure. Host discussions between planners and everyday people to catalyze or enhance connections. Involve diverse communities in formulating research agendas and collecting and analyzing data to help inform decision-making. Contact the appropriate municipal or state planning offices or your local association/council of governments for regions and metropolitan areas.

Embed the SciStarter Project Finder on public computers

Introduce your community members to other citizen science experiences and connect with project leaders and other local citizen scientists! This could take the form of a citizen science club or regularly scheduled meetup. Use the SciStarter widget to help raise awareness on your community's public communities. It's as simple as selecting filters for the types of projects you want to display and share (based on age, topic or location) and then copying and pasting the code on your website or browser. Instructions are at **SciStarter.org/widget**.

Install instruments and sensors at your library

There are so many options to engage your community with weather and the environment. Here are just a few:

- Install a "Purple Air" air quality sensor to monitor local air quality conditions and give your community access to the data. **SciStarter.org/air-quality-citizen-science**
- Install the CoCoRaHS rain gauge so interested people can volunteer to record precipitation data for the National Weather Service. **SciStarter.org/cocorahs-rain-hail-snow-network**
- Use Picture Post to allow people to place their cameras and phones on a fixed base to share pictures of changing landscapes. **SciStarter.org/picture-post**
- Discover more tools and instruments. **SciStarter.org/tools**

Congratulations! We hope this guide has helped you:

Learn more about Citizen Science and the benefits to your community

Discover STEM-related issues of interest or concern in your communities

Connect existing programs and diverse communities to projects on SciStarter

Access resources to help everyday people learn about and engage in citizen science projects in need of assistance

Facilitate access to information, resources, projects and even instruments needed to collect and analyze data

Plan Citizen Science Month events

Sustain ongoing engagement in citizen science

SECTION 6:

ADDITIONAL CITIZEN SCIENCE RESOURCES

Websites, articles and book recommendations

WEBSITES

SciStarter
https://SciStarter.org

Citizen Science Association
https://www.citizenscience.org

Zooniverse
https://www.zooniverse.org

iNaturalist
https://www.inaturalist.org

CitSci.org
https://www.citsci.org

Federal Inventory of Citizen Science Projects
https://www.citizenscience.gov

Science-Technologies Activities and Resources for Libraries
https://www.starnetlibraries.org

Policy connections to citizen science: Expert and Citizen Assessment of Science and Technology
https://ecastnetwork.org/

Arizona State University Libraries Citizen Science page
https://libguides.asu.edu/citizenscience

The National Library of Medicine supports and provides resources for citizen science.

MedlinePlus
https://medlineplus.gov

MedlinePlus Genetics
https://medlineplus.gov/genetics/

NNLM Crowdsourcing and Citizen Science
https://nnlm.gov/national/guides/ccs

ChemIDplus
https://chem.nlm.nih.gov/

ARTICLES

Ignat, T., Ayris, P., Labastida i Juan, I., Reilly, S., Dorch, B., Kaarsted, T., & Overgaard, A. K. (2018). *Merry work: libraries and citizen science.* Insights, 31, 35. DOI: **http://doi.org/10.1629/uksg.431**

Ayris, P. & Ignat, T. (2018). *Defining the role of libraries in the Open Science landscape: a reflection on current European practice.* Open Information Science, 2(1), pp. 1-22. Retrieved 17 Oct. 2018, from **http://doi.org/10.1515/opis-2018-0001**

Find citizen science blogs for a general audience on **blog.SciStarter.org**.

BOOKS

Help your community discover citizen science by creating a display of these books and others, which describe how to engage in citizen science and the impacts that the public has had on scientific investigations.

Apt Russel, Sharman. *Diary of a Citizen Scientist: Chasing Tiger Beetles and Other New Ways of Engaging the World.* Oregon State University Press, 2014.

Busch, Akiko and Debby Cotter Kaspari (Illustrations). *The Incidental Steward: Reflections on Citizen Science.* Yale University Press, 2013.

Buzzeo, Toni and Holly Berry. *A Passion for Elephants: The Real Life Adventure of Field Scientist Cynthia Moss.* New York, NY: Dial Books (Penguin Young Readers), 2015.

Cavalier, Darlene and Eric B. Kennedy. *The Rightful Place of Science: Citizen Science.* Consortium for Science, Policy & Outcomes, Arizona State University, 2016.

Cavalier, Darlene; Hoffman, Catherine; Cooper, Caren. *The Field Guide to Citizen Science How You Can Contribute to Scientific Research and Make a Difference.* Timber Creek Press, 2020. **http://bit.ly/FieldGuideCitSci**

Coburn, Jason. *Street Science: Community Knowledge and Environmental Health Justice.* MIT Press, 2005.

Cooper, Caren. *Citizen Science: How Ordinary People are Changing the Face of Discovery.* New York: Overlook Press, 2016.

Cousteau, Phillippe, Deborah Hopkinson and Meilo So. *Follow the Moon Home: A Tale of One Idea, Twenty Kids, and a Hundred Sea Turtles.* San Francisco, CA: Chronicle, Books, LLC, 2016.

Dickinson, Janis L., Rick Bonney and Richard E. Bonney. *Citizen Science: Public Participation in Environmental Research.* Ithaca: Cornell University Press, 2012.

Griffin Burns, Loree and Ellen Harasimowicz. *Citizen Scientists: Be a Part of Scientific Discovery from Your Own Backyard.* New York: Henry Holt and Company, LLC, 2012.

Hannibal, Mary Ellen. *Citizen Scientist: Searching for Heroes and Hope in an Age of Extinction.* New York: The Experiment, 2016.

Kurlansky, Mark and Frank Stockton. *World Without Fish.* New York, NY: Workman Publishing Company, 2011.

Landgraf, Greg. *Citizen Science Guide for Families: Taking Part in Real Science.* Chicago, IL: American Library Association, Huron Street Press, 2013.

Trautmann, Nancy M. *Citizen Science: 15 Lessons That Bring Biology to Life, 6-12.* Arlington, Virginia : NSTA Press, National Science Teachers Association, 2013.

BOOKS FOR CHILDREN

Bathala, Neeti, Jennifer Keats Curtis and Veronica V. Jones (Illustrator). *Moonlight Crab Count.* Arbordale Publishing, 2017.

Cousteau, Philippe, Deborah Hopkinson, and Meilo So (Illustrator). *Follow the Moon Home: A Tale of One Idea, Twenty Kids, and a Hundred Sea Turtles.* Chronicle Books, 2016.

Forrester, Anna. *Bat Count: A Citizen Science Story.* Arbordale Publishing, 2017.

Fontichiaro, Kristin. *Citizen Science.* Cherry Lake Publishing, 2018.

Griffin Burns, Loree and Ellen Harasimowicz (Photographer). *Citizen Scientists: Be a Part of Scientific Discovery from Your Own Backyard.* Henry Holt, LLC, 2012.

Kovacs, Vic. *Get into Citizen Science.* Crabtree Publishing Company, 2018.

Lee Heinecke, Liz. *Outdoor Science Lab for Kids: 52 Family-Friendly Experiments for the Yard, Garden, Playground, and Park.* Quarry Books, 2016.

ADDENDUM A:
PROGRAMMING CHECKLIST TEMPLATE

CITIZEN SCIENCE MONTH

Program Details	
Staff lead:	Program title:
Intended outcome:	
Program description:	
Intended audience:	Supervisor approval: Date:

Pre-Program To-Do List	
Room booked:	Registration required: ☐ Yes ☐ No
Event description:	# of participants:
Collection development material requests:	Waiting list: ☐ Yes ☐ No # On waiting list:
Publicity Materials:	**Program Publicity Submitted To:**
☐ Poster displays ☐ Fliers ☐ Bookmarks	☐ Event calendar local media outlets: email blast ☐ Newsletter ☐ Social media community-based orgs: SciStarter.org/events

Equipment	
Internet/Wi-Fi: (supports streaming video?)	Other equipment:
Computer(s):	Date:
Sound system:	Time:
Microphone(s):	Location:
Projector:	Room:
Screen:	Video streaming platform: (if virtual/hybrid event)

Program Support	
Speaker/facilitator confirmation: Contact email/telephone:	
Contact email/telephone:	Contact email/telephone:
Slide deck reviewed and ready:	Volunteer support:
Event practice date & time:	Event practice date & time:
Volunteer role(s):	Volunteer training date & time:

Day of Checklist	
Room setup:	Equipment check:
Video streaming platform check:	Refreshment setup:
Supply setup:	Volunteer check-in:
Media release form:	Post event pictures on social media:

Post-Event Follow-up	
Participant count:	Survey attendees:
SciStarter/ASU evaluation:	Thank guest speaker/facilitator:
Host a follow-up citizen science event:	

Notes

Activate your library as a hub for citizen science! SciStarter can help.

Special thanks to the Maricopa County Library District, Arizona for providing the initial inspiration for this document.

EXAMPLE EMAIL TO UNIVERSITY CONTACT

Hello,

I am contacting you with regard to a bioblitz being held at the Best City Library and County Preserve on Saturday, December 1 at 9am. We would like to invite you to participate in recording and identifying observations made in the County Preserve that morning and act as a biology/nature expert. We would also encourage you to enlist the help of any other Best State University undergraduate, graduate biology students or instructors that would be willing to join the community for this citizen science event.

This bioblitz is supporting two efforts at our library. First, the Best City Library encourages children and adults to connect with, enjoy, and preserve nature in their "backyards" through library programming for all ages. Second, the Best City Library is committed to partnering with other community organizations to identify, study, and address local/national/global issues of interest to the community through facilitating citizen science.

During the bioblitz, we will be breaking participants into groups of 5–10 people, and assigning them to a specific area of the County Preserve to make observations and take photos through the iNaturalist app on their phone or on their digital camera. If using cameras, the photos can then be uploaded to their iNaturalist account on computers we will have set up in the library. We are hoping to include experts in each group, not as a tour guide or to lead a nature walk, but rather to model searching and observing and encourage participants to use iNaturalist. Our schedule for the morning is as follows:

9am: Best City Library, Science Room; 123 Library Lane, Best City, ST 12345

- Introduce iNaturalist, encourage last minute app uploads and iNaturalist and SciStarter.org account creations.
- Introduce biologist/nature subject experts
- Review goals of bioblitz
- Break into groups and assign to County Preserve location

9:30am: Head out to assigned areas in County Preserve and begin making observations.

11:30am: Meet back in the Science Room to share findings, make identifications (if possible), and upload digital camera photos to iNaturalist.

Noon: Program ends.

Please reply to this email with your ability to participate.

We would love to have you join us.

If you have any questions, please contact:

Regards,

EXAMPLE EMAIL TO SCIENCE FESTIVAL ORGANIZATION

Dear XX:

I'm writing to invite you to join SciStarter and Arizona State University to celebrate Citizen Science Month this April. In particular, I'm hoping you will engage your network of librarians to organize meetups in libraries across Atlanta on Citizen Science Day. We will provide promotional materials (downloadable bookmarks, fliers, posters, a Library and Community Guide to Citizen Science, and more), digital resources (embeddable project/event finders), and training for librarians, staff and volunteer facilitators (through open, weekly calls each Thursday EST and webinars). The central project is NASA GLOBE Observer: Clouds. GLOBE Observer invites you to make environmental observations that complement NASA satellite observations to help scientists studying Earth and the global environment. All you need is a smartphone or tablet, and then you can begin ground-truthing satellite data.

We are asking people meet in local libraries by 1:30 PM EST. They'll need access to tablets and/or smartphones and Wi-Fi so they can download the GLOBE Observer app.

1:30–2 PM: The team will demo how to use the GLOBE Observer: Clouds app to ground-truth satellite data by recording observations of and taking pictures of clouds.

2–3 PM: The group will go outside and make observations through the app.

3–3:30 PM: We'll end by viewing videos from the GLOBE team about the importance of our contributions.

Here's a little more information and link to a sign-up form librarians and other interested event hosts should complete: **CitizenScienceMonth.org/MailingList**

You all are wizards at drumming up interest, finding partners, and organizing pretty amazing public STEM events. I hope you will consider working with us to blow this out of the water throughout Atlanta as a post-Atlanta Science Festival activity...perhaps?

Sincerely,

EXAMPLE EMAIL TO COMMUNITY ORGANIZATION:

Dear Community Partner,

I'm writing to you from NAME OF LIBRARY. Our library is hosting a Citizen Science Month Celebration on April 13, 2020, from 12:00 to 4:30 PM. Citizen Science Month is an annual event created by SciStarter.org and the Citizen Science Association to celebrate and promote all things citizen science: amazing discoveries, incredible volunteers, hardworking practitioners, inspiring projects, and anything else citizen science–related! Citizen science is the public involvement in inquiry and discovery of new scientific knowledge. A citizen science project can involve one person or millions of people collaborating toward a common goal. Typically, public involvement centers around data collection, analysis, or reporting.

Our library will also present posters about citizen science, have speakers [note: add whatever activities/projects your library is considering] …

We'd like to discuss with you the possibility of inviting volunteers from your organization to come to our library to participate in our citizen science activities or facilitate citizen science projects for other volunteers. Students may appreciate this opportunity to acquire volunteer hours and we will provide volunteer certification letters.

No experience is needed. Our library and our collaborators (including SciStarter and Arizona State University) can provide training leading up to and during the event. Ideally, this will spark opportunities for ongoing collaborations.

Thank you for your consideration and I look forward to hearing back from you to explore this further. I can be reached at PHONE and EMAIL.

Kind regards,
Your Local Librarian

ADDENDUM C:
SURVEY TEMPLATE

This survey template was provided by the University Office of Evaluation and Educational Effectiveness at Arizona State University. It is meant to evaluate an online event.

1. Were you familiar with SciStarter before this event? ☐ Yes ☐ No
2. Was this your first time participating in a citizen science event? ☐ Yes ☐ No
3. Was this your first time participating in a virtual citizen science event? ☐ Yes ☐ No
4. What did you like best about the virtual citizen science event?

5. Did you experience any challenges or barriers to participating in the virtual citizen science event? Please explain.

6. What could be improved for next time? What recommendation(s) do you have for improving a virtual citizen science event like this in the future?

7. Based on your experience participating in the virtual citizen science event, please rate your level of agreement or disagreement with the following statement:

This event helped me...	STRONGLY DISAGREE	DISAGREE	SLIGHTLY DISAGREE	SLIGHTLY AGREE	AGREE	STRONGLY AGREE
Learn more about science						
Learn more about citizen science						
Feel confident in my ability to participate in citizen science						
Feel motivated to participate in citizen science in the future						
Feel more connected with others while practicing physical distancing as a result of the COVID-19 pandemic						

8. Please provide additional information related to your responses above.

9. Age range

☐ 18–24 years old ☐ 25–34 years old ☐ 35–44 years old ☐ 45–54 years old
☐ 55–64 years old ☐ 65–74 years old ☐ 75 years or older ☐ Prefer not to answer

10. Gender identity (please select all that apply)

☐ Female ☐ Male ☐ Transgender ☐ Non-binary
☐ Not listed; please specify:
☐ Prefer not to answer

11. Racial/Ethnic identity (please select all that apply)

☐ African American/Black
☐ Asian American/Asian (including Indian, Filipino)
☐ Latino/a/x American/Hispanic (including Mexican American)
☐ European American/White
☐ Arab American/Middle Eastern
☐ Native American/American Indian
☐ Not listed; please specify:
☐ Prefer not to answer

12. Ability status

☐ I have condition(s) that are covered under the Americans with Disabilities Act
☐ I do not have condition(s) that are covered under the American with Disabilities Act
☐ Prefer not to answer

13. Anything else you would like to share?

This toolkit promoted an air quality sensor event. Learn more about air quality sensors and the CanAirIO project on **SciStarter.org/NLM**.

TWITTER

1. Learn how YOU can build your own air quality sensor & monitor #AirQuality. Join @SciStarter, @Cos4Cloud, @canairq, @AllofUsCA, @NNLMPNR & @NNLMAoU online on November 18 to get started. #CitizenScience
   English-language event: **https://bit.ly/NNLMCanAirIO**
   Webinar en español: **https://bit.ly/NNLMCanAirIOEspanol**
2. #CitizenScience is real science done by people like you! A little of your time makes a big difference to researchers. Join @SciStarter, @Cos4Cloud, @canairq, @AllofUsCa, @NNLMPNR & @NNLMAoU online on November 18 to get started. #CitizenScience
   English-language event: **https://bit.ly/NNLMCanAirIO**
   Webinar en español: **https://bit.ly/NNLMCanAirIOEspanol**
3. Discover #CitizenScience with @SciStarter, @Cos4Cloud, @canairq, @AllofUsCA, @NNLMPNR & @NNLMAoU. Join us on November 18 to learn about how you can take action on #AirQuality monitoring in your community.
   English-language event: **https://bit.ly/NNLMCanAirIO**
   Webinar en español: **https://bit.ly/NNLMCanAirIOEspanol**

INSTAGRAM

1. Learn how YOU can build your own air quality sensor & monitor #AirQuality. Join @SciStarter, @Cos4Cloud, @canairq, @AllofUsCA, @NNLMPNR & @allofusresearch online on November 18 to get started. #CitizenScience
   English-language event: **https://bit.ly/NNLMCanAirIO**
   Webinar en español: **https://bit.ly/NNLMCanAirIOEspanol**
2. #CitizenScience is real science done by people like you! A little of your time makes a big difference to researchers. Join @SciStarter, @Cos4Cloud, @canairq, @AllofUsCa, @NNLMPNR & @allofusresearch online on November 18 to get started. #CitizenScience
   English-language event: **https://bit.ly/NNLMCanAirIO**
   Webinar en español: **https://bit.ly/NNLMCanAirIOEspanol**
3. Discover #CitizenScience with @SciStarter, @Cos4Cloud, @canairq, @AllofUsCA, @NNLMPNR & @allofusresearch. Join us on November 18 to learn about how you can take action on #AirQuality monitoring in your community.
   English-language event: **https://bit.ly/NNLMCanAirIO**
   Webinar en español: **https://bit.ly/NNLMCanAirIOEspanol**

FACEBOOK EVENTS:

https://www.facebook.com/events/676059099713236/

https://www.facebook.com/events/719419561979023