

Toolkit for Librarians: Building community and science literacy through NASA citizen science projects

Version 1.1; September 2025; Prepared by Sarah Kirn with input from Kara Reiman.

Dear Librarian,

Thank you for your interest in building community and scientific literacy with your library patrons through NASA citizen science projects.

Doing a citizen science project can tell you more about what citizen science is than any description ever could. We're taking this "experiential learning" approach here, both for your preparation as an event leader and in the event that you might offer your patrons.

This toolkit includes all that you need to host your first **NASA citizen science program**. It includes:

- Background information for you on:
 - What citizen science is.
 - Why you might bring citizen science into your library.
 - Why are we starting with Daily Minor Planet, one of the ~three dozen projects that you and your patrons can explore next.
- A guide for you to prepare for the event, from learning about the project to what kind of space and equipment you'll need (total prep time estimated at 30-45 minutes).
- An editable poster to advertise your event.
- An editable agenda to guide a 60-minute program with patrons.
- A printable handout to help patrons find the best project for them.

Try using the kit as-is! The experience will no doubt fill your head with ideas for how to customize subsequent events! Of course, that is just a suggestion - use these resources and ideas as you like!

Happy Sciencing with NASA!

P.S. A special note for school librarians: The normal safeguards that are in place to protect children's personally identifiable data online apply here as well. Projects that require logins will require you to secure parent or guardian permission for youth under 13 years of age. A number of projects, including all of those hosted by the Zooniverse platform, do not require any login and may be done anonymously by anyone. If you are planning to do extended work with youth on these projects, consider securing parent permission so students can create logins, which allow them to track their contributions through time and interact with other participants in the project Talk forum.

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Do you have questions or suggestions? Please email them to sarah@gmri.org. Once you have led an event, we'd love your feedback! Please send an email or [fill out this simple feedback form](#).

The what, why, and how

Citizen science 101

You may already be familiar with citizen science under a different name, like “community science” or “participatory science”. Collaborative research projects and methods are an area of exciting growth in science. There are research questions and tasks that scientists cannot address alone, new innovations that enable easy collaboration across space and time, and new scientific instruments that collect more data than can be analyzed by formally trained scientists.

As you dig deeper with us, keep in mind:

- There is a huge variety of citizen science projects across research fields from astrophysics to zoology, from environmental monitoring to biodiversity research.
- Projects engage volunteers in a huge variety of tasks, both indoors and outside, many requiring no more than an internet-connected device, and some requiring special equipment.
- Projects prioritize different goals. Some projects chase scientific discoveries, new knowledge, or a monitoring mission, and provide just the basic training to volunteers. Other projects prioritize participants’ learning about science over scientific discoveries. All these projects are valuable. The important thing is to find a project whose purpose aligns with yours or your patrons’ needs and interests.
- All NASA -sponsored citizen science projects share a few things in common (there’s a federal policy that drives this). Specifically, they all:
 - Pursue a clear scientific question that can only be answered with lots of people’s help.
 - Provide meaningful experiences for the voluntary participants.
 - Are as open, inclusive, and transparent as possible with regards to people and to the science being done.
 - Require no citizenship status - all are welcome.

Like many things, citizen science is best understood by doing it, which is how we will begin.

Why bring citizen science to your library?

Life in the 21st century is full of information and data. But what does it mean? What is real? Who and what can we trust? Having first-hand experience doing science gives people a chance to discover for themselves the practices of science that support the strength of its findings: redundancy, peer review, open discourse, and replication. Citizen science projects also help people get to know other people who are interested in science, and get to know scientists themselves, all of which can strengthen participants’ sense of well-being.

Who does these projects and why?

You can [get to know some of the participants in NASA-sponsored citizen science projects](#) on NASA’s website. Like the projects themselves, there are a lot of profiles to choose from! Here are some to start with:

- [Rosa Castro](#) describes her life-long love of astronomy, from her childhood dream of being an astronaut to her return to astronomy as a way to rebuild eye-hand coordination following surgery.

- [Timo van der Straeten](#) strives to discover if there is other life in the universe and along the way has learned that his autism can help him do good things.
- [Melina Thévenot](#) learned that failure can be OK, and found a community of people who helped her feel less alone, all the while looking for Planet 9!
- [Josh Hamilton](#) began pursuing astronomy questions as an expression of his Catholic faith. What he learned about science from NASA's Disk Detective project gave him confidence in COVID vaccines.

Why start with Daily Minor Planet?

We will start with Daily Minor Planet, a data classification project that can be done anytime, anywhere with an internet connected device. Good eyesight - or a good pair of glasses - helps, but no prior knowledge is required. This project can be done by anyone, either anonymously or after logging in (so credit can be given for discoveries). Children under 13 years of age may participate without registering for an account, or if they have permission from a guardian or parent, they may make accounts.

Daily Minor Planet is a stalwart project with a charismatic mission: protect Earth from surprise encounters with asteroids! [Participants in this project have a very real opportunity to identify previously undiscovered asteroids - and earn the right to name them!](#) It's also a great example of humans and machines working together on the things each are best at:

- Data (images) are collected every night by the Catalina Sky Survey.
- Computers running powerful algorithms detect images of the sky that might include moving objects.
- Scientists and project volunteers - like us! - provide the human review essential to confirm the identification.

NASA sponsors citizen science projects across five distinct areas of research. At any time, **there are dozens of active projects**. Some of these, especially the ones that need humans' help sorting through datasets, sometimes run out of work for volunteers to do. To the seasoned participant, the message "Finished! Looks like this project is out of data at the moment!" is a great sign of progress. That message is not convenient for someone hosting an event! As the title suggests, the Daily Minor Planet posts new data daily (or nearly so).

[The handout for participants](#) at the end of this kit has information on how and where to learn about other NASA-sponsored citizen science projects.

Your feedback, please!

We - the team of people behind these resources - want to know if this set of resources has been helpful to you and how we can make it better!

Please take a moment to send us your feedback by [filling out this very simple form](#), as often as you like. You can use it to request additional materials or resources, to ask questions, etc.

Event prep guide (estimated time: 30-45 minutes)

Preparing for the content

You do not have to be an expert in science or in the project to lead a great citizen science event!

In fact, modeling comfort with **not** knowing and then figuring it out WITH your audience is a powerful strategy to empower your group to explore on their own. Keep that in mind even if you DO know the answer.

That said, spending enough time with the project to know how it is laid out and what is involved in participating will give you confidence in the event. **We encourage you to take 15-30 minutes to look around [the project website](#), using the Event agenda below as a guide. And make sure that you do some classifications yourself**, either as a registered participant or anonymously. Nothing will help you understand a project better than doing it yourself.

Choosing and preparing a space

Pick a room – in your library or at a partner organization nearby – that will comfortably hold the number of people you expect. Then make sure that you have the following available in the space:

- Some means of sharing a screen and sound with your attendees (there is a short video to show). A computer and a projector or monitor/TV will work well.
- Have convenient outlets or power strips available for folks who need to plug devices in.
- Strong wifi (and its password, if applicable) to let people access the project website.
- Sufficient copies of the [Handout for participants](#) to distribute at the end.

Editable poster to advertise event

Here is a link to an [editable event poster template in google slides](#). Two versions are offered in this single file: a full color poster and a black and white poster. Make a copy of the file (click on “File” just below the document’s name, choose “Make a Copy”), edit to your heart’s delight!

If you do not have a Google account, you can still view and download this file and open it in whatever slide presentation software you have (e.g., Powerpoint or Keynote) to make your edits.

Suggested event agenda

This section has three kinds of information. To help you navigate, we have used the following formatting for each type:

1. Information for you as the event leader.
2. Information to share with event attendees, structured and written in a way that you might present it.
3. **The critical messages to get across to participants.**

Feel free to copy this “Suggested event agenda” section into your own document and modify it to suit your style.

Welcome

Welcome. It's great to see so many science fans in our community! And not only science fans, but people who want to do science and help build knowledge - your own knowledge and that of NASA scientists.

We have a few goals for our time together. By the end of our time, I hope we have each:

- Had fun - together! - doing a project here at the library that you can all continue at home.
- Met other people in our community who are interested in science.
- Learned something new.
- Helped protect Earth from asteroids!

We will focus on just one of many NASA-sponsored citizen science projects. If you like what we do in our hour together, I encourage you to check out the other opportunities. Make sure that you pick up a handout on your way out the door - this has more information on the kinds of projects available.

Here is how our time together will be used

You can share this with your group so that your participants know what to expect, or just use it as your own roadmap for the event.

Regarding the introductions: this may not be a regular part of your library programs, but it is a nice way for young people especially to learn more about why adults choose to spend their time on scientific projects, and to reinforce that science is more than a subject in school!

(3 min) Intro/overview

(2-5 min) A round of introductions - I will invite you to meet a few folks near you. Share your name, one sentence on what brought you here tonight, the last thing you read (book, website, letter - whatever). And get to know your neighbors!

(15 min) We'll take a few minutes to look at the project website together

(10 min) - For those who want to figure out the project together, I will lead a walk through of the tutorial; others can get started on their own or in groups

(20 - 30 min) We'll all take some time to work on the project - again, in pairs, teams, or by yourself

(10 min) Come back together to share, answer each others' questions, etc.

On your way out: take a handout so you can continue to with these projects at home

So, let's get started.

Turn on computer display, navigate to science.nasa.gov/citizen-science, scroll down to Daily Minor Planet. Click on the [Read Project Summary](#) link to open that page.

Introduction to the Daily Minor Planet project

Start with the [Daily Minor Planet Summary page](#) - point out

- Watch the video together (it's short)
- Read through/aloud the "What you'll do," "Requirements," and "Get started" and "Learn more"
- Look at the members of the science team - these are the people who work on the Near-Earth Object (NEO) Observations Program, also known as NASA's Planetary Defense Program
- Scroll back up to "Get Started" and use the "Go to Project Website" links to go to the Zooniverse project page

[Project Homepage](#) - point out:

- Top row of links (grey on black) - "sign in" is optional, but encouraged if you want to continue as it will give you access to your record of classifications and to participate in the Talk forums - more on those in a bit.
- This project is available in multiple languages (The translations are often made by volunteers who are native speakers of those other languages and who want to make the project more accessible)
- Explore project links
 - **About** - Here is where you can find more info on the project and people
 - Research
 - The Team
 - FAQ - you'll find great information here about how this collaboration between project scientists and volunteers works,

how often you might expect to see an asteroid, and how many people look at each possibly interesting object.

■ Results

- **Classify** - this is where the action is and where we'll spend most of our time.
 - **Talk** - forum where you can ask for help, share links to unusual images, etc. You will need to sign-in to participate in Talk discussions.
 - **Collect** - you can save images here that you want to see again.
 - **Recents** - your most recent classifications. This will be really helpful for us tonight - we can use this to come back to subjects/images you have questions about.
- Navigate to "Classify"

Classify page - point out:

- Tutorial pops up (if you aren't signed in; if you are signed in and have completed the tutorial, it will not automatically open). **Everyone should start with this. We'll come back to it in a moment. Close the Tutorial window to continue the tour.**
- Demonstrate: You can re-open the Tutorial any time - look at the upper right.
- Directly behind the Tutorial window, there is an aqua box labeled "Field Guide" - open this and explore! It has useful examples to look over if you're curious or if you get stuck. It's a great reference.
- Bring the audience's attention to the subject window on the left. **I encourage you to check out the controls below the image and above the Field Guide link. Click on all the buttons to see what controls you've got and to figure out what works for you.**
 - Move; Zoom in and out; rotate
 - Reset the image
 - "Invert subject" tool - this changes the image from dark on light to light on dark
- Ask: How many of you would rather do this tutorial together? If so, move up to the front; if you'd like to do it on your own, head to the back!
- **You can't mess up this project - or any, in fact. The scientists have built in tools to verify our contributions. You will not be the only person to look at each image. Your decision on whether it does or doesn't have an asteroid will be pooled with the decision of a few other people.**

Images that have had multiple people say “yes” will be reviewed by a scientist. So go for it, have fun, and learn as you go!

Optional: With the people who want to, do the tutorial together. Read the text, discuss the examples.

If people are still uncertain, review the contents of the field guide together and discuss the examples.

Play/Work time: 30 minutes to do the project

Wrapping up: Reflection/ Conclusion

Having a group conversation is a nice way to share questions, give participants a chance to answer each others' questions, and surface the cool things that might have been learned by a few and missed by others. Encourage people to use the “Recents” page to show each other examples, or get other people to look at challenging - or exciting! - objects.

Would anyone like to share?: If no one starts talking, try one of the following prompts:

- Did anyone get stuck? What's your question? Does anyone else know the answer? (It's best if other participants can answer each others' questions!)
- What surprised you?
- What did you learn? Anything that might connect with the rest of your life?
- Is anyone interested in another event like this, focused on Daily Minor Planet or another project?

Handouts: place near the door so people can take them as they leave.

[Handout for participants](#) (follow link to printable file)

Community connection ideas

Groups to engage and ways to engage them – a partial, preliminary list of ideas!:

- **Residents of retirement communities or nursing homes:** Participants often find citizen science projects a great way to stay connected with other people and contribute to something outside their day-to-day lives. Some have even developed friendships with other participants in other communities or countries. Retired folks often make up a large portion of the volunteers in citizen science projects.
- **Local amateur astronomy clubs** might be interested in learning more about projects they can do online, regardless of weather, with members at star-watching events and/or be interested in inviting attendees to join their activities. Some astronomy club members may be interested in sharing what they know about the stars with a new audience as part of a library-hosted event. [NASA's Night Sky Network](#) has a searchable database of astronomy clubs (look for the Nationwide Clubs link in the middle of the header).
- **Outdoor recreators** (birding clubs, garden clubs, etc.): these groups might be especially interested in the "projects that take you outside" collection of the handout.
- **Your story and/or suggestion here!** We welcome your stories of community connections made and strengthened through these projects, and what you did to forge the connections. Please share your experiences in an email to sarah@gmri.org.

Additional resources for librarians

- From SciStarter: The Citizen and Community Science Library Network offers resources, professional development, an international network to build and share best practices. Learn more and join (for free!) at <https://pages.scistarter.org/library-about/>. SciStarter also has great search tools to help you or your patrons find the projects that best fit their interests.
- [Star Library Network \(Star Net\)](#): The STAR Library Network (STAR Net) is a hands-on learning network for libraries and their communities across the country. STAR Net focuses on helping library professionals build their STEM skills by providing "science-technology activities and resources" (STAR) and training to use those resources. The Star Net's resource on how to be a "Guide on the Side" not a "Sage on the Stage" when facilitating STEM learning might be useful, <https://www.starnetlibraries.org/resources/guide-on-the-side/>
- Some NASA-sponsored citizen science projects have specific resources for librarians. NASA's GLOBE (Global Learning and Observations to Benefit the Environment) Program is one of these, focused on advancing Earth systems science through engaging people worldwide in data collection and analysis. The program offers a GLOBE Observer Library Guide (<https://observer.globe.gov/libraries>) with sample programs created by library partners.