

MEASURING LIGHT IN THE NIGHT

Help gather light pollution data.

Citizen Science Kit Building Guide



This guide is designed to help you:

- Introduce the **Globe at Night Project** to your staff and community.
- Build *Measuring Light in the Night* kits for library users to check out.
- Use and promote kits with turnkey marketing materials.
- Grow and sustain use of kits by connecting with communities and library network.

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Project Overview

Light pollution is intrusive artificial (usually outdoor) light. Too much light pollution can wash out starlight in the night sky, interfere with astronomical research, disrupt ecosystems, have adverse health effects, and waste energy.

[Globe at Night](#) is an international citizen science project that involves the public in measuring and collecting night sky brightness observations to help scientists understand the impact of light pollution.



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Kit Details

This kit includes components to purchase or download and print, including: an easy-to-use **Sky Quality Meter** (SQM-L), **LED flashlight**, **constellation guide**, and **instructions** to use the Globe at Night and SciStarter websites to share observations and data. The data is used by scientists to monitor levels of light pollution and help inform participants on steps they can take to address the impacts of light pollution on local energy consumption, plants, wildlife, and human health.

Library users who check out this kit will be directed to this public-facing web page to view related videos, access supplemental resources, and to log their citizen science data:

<https://scistarter.org/library-kits/measuring-light-in-the-night>

Age Levels

Primarily for adults or children with help from an adult. The Globe at Night citizen science project is an ideal family and multigenerational activity. With the help of an adult, children can begin learning about the night skies above them. This kit and project can be demonstrated as part of a stargazing event or discussion about astronomy and light pollution.

Funding Kits

Once you have an idea of what the kit components and related programming might cost, consider reaching out to your [state library](#) to inquire if they will provide grants to support your purchases and programs through the [Grants to States](#) program.

Building & Cataloging Kits

Before you begin assembling your kit(s) consider where they will be stored when not in circulation. Are there space limitations? Do kits need to be stackable? Another consideration is how the kits will be used in the field by the citizen scientists. Choose the box, bag, or pack that best fits the library and library user's needs.

Supply Lists

The following items are suggestions to build a kit that provides tools and resources to support this citizen science project. These items may become unavailable and require substitutions. Unless "**Do not substitute**" is noted for a specific tool due to the project's data collection protocol, use your best judgement to find a comparable substitution.

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| Order Date/Qty | Description | Cost (Approx) | URL |
|----------------|--|---|--|
| | <p>Sky Quality Meter-L (SQM-L) (Do not substitute) - Hand-held meter for measuring sky brightness.</p> <p>Note: The SQM unit's serial number should be written on the meter so users can easily access it. Participants will need it when they upload data. We suggest adding the number in a light colored permanent marker.</p> <p>To find the serial number, turn the meter on, press and release the "Start" button, and then press and hold the "Start" button until you see the Serial number (a four digit number that will appear after temperature readings and the model number.)</p> | <p>\$103</p> <p>For discount, apply code: GAN-USE</p> | <p>http://unihedron.com/projects/darksky/</p> |
| | <p>Red LED flashlight - Designed to help guide participants to nighttime viewing areas without disrupting user nightvision or nocturnal animals who are less sensitive than humans to the red range of light.</p> | <p>\$9</p> | <p>https://amzn.to/3znKino</p> |
| | <p>Planisphere - Rotating star finder (planisphere) that helps participants identify constellations at any time of night during the year.</p> | <p>\$11-12</p> | <p>https://amzn.to/2WeFhPv</p> |
| | <p>Storage Options -</p> <p>Clear plastic box (4 liters) - Provides easy stacking during storage.</p> <p>Clear plastic totes - Vendors may be able to offer the ability to brand totes.</p> | <p>\$4 - \$17</p> | <p>Clear Box: https://amzn.to/3BqL5FS</p> <p>Clear Tote: https://bit.ly/3rritrM</p> |

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Print Materials

Customize, print, and laminate the following materials to go in the kit along with the above supplies.

| Printed | Description | URL |
|---------|--|---|
| | Activity Guide - Globe at Night project overview and directions. | https://bit.ly/3myqeeT |
| | Globe at Night Data Worksheet - Participants can record data on this sheet to enter online later. | https://bit.ly/3ziSkOA |
| | Sky Quality Meter Instructions - This helpful guide provides data context and troubleshooting tips. | https://bit.ly/3DcRJ3G |
| | Outer Kit Label - Place on kit storage to help staff and library users identify kits. | https://bit.ly/3AsRIfe |
| | Astronomy & Space Booklist | https://bit.ly/3B0yQim |
| | Borrowing Agreement (optional) - Editable checklist document to fit library needs for staff and customers during checkout/in process. | https://bit.ly/2UvLVRI |

Questions about materials? Contact librarynetwork@scistarter.org.

Cataloging Kits

- **Add Barcodes** - add a barcode to the kit container, each component in the kit component in the kit, the laminated Activity Guide, Checkout Card, and Waiting List Card. Ensure the barcode is visible on the storage container for easy identification,
- **Add Kit Labels** - provided above in the “Print Materials for the Kits” is a link to a 2x4” label template to easily identify kits by name on the storage container. Consider numbering multiple copies of the same kit, i.e., “Measuring Light in the Night Kit #1”.
- **Add Security Tags** - Adhere Tattle-tape™ or a RFID tag to ensure kits don’t leave the library without first being checked out.
- **Create a Bibliographic Record** - Many libraries use WorldCat as a guide to create a bibliographic record for your library’s management system. Here is an example: https://www.worldcat.org/title/citizen-science-measuring-light-in-the-night/oclc/1052623244&referer=brief_results.

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Promoting & Circulating Kits

Promotional Materials

Print the resources below to promote citizen science and the Measuring Light in the Night kit at your library. We suggest laminating each item for longer use.

| Printed | Description | URL |
|---------|---|--|
| | Measuring Light in the Night Rack Cards - Place cards in a sign holder to promote awareness of the kit. | https://bit.ly/3kKKHwh |
| | Measuring Light in the Night Check Out Card - Add barcode then place cards in sign holder for library users to take to the circulation desk to start the check out process. | https://bit.ly/36WZ5t2 |
| | Measuring Light in the Night Waiting List Card - Add barcode to the card, then display for library users to take to the circulation desk for staff assistance with the hold request. | https://bit.ly/3rsVjB8 |
| | Measuring Light in the Night Bookmark - Use in a variety of ways like book displays, outreach events, and as event handouts. Consider adding them to the kits. | https://bit.ly/3wXvryp |
| | Measuring Light in the Night Flier - Display as a shelf talker, in related material areas in the library, at outreach events. Consider adding them to the kits. | https://bit.ly/36ZMDc9 |
| | Citizen Science at your Library Bookmark - Use in a variety of ways, such as in book displays, outreach events, and as event handouts. | https://bit.ly/2VZZlW9 |
| | Check It Out Citizen Science at Your Library Posters - Display double sided posters (comes in two sizes) to put in a sign holder or for use in a display to let everyone know your library is a Hub for Citizen Science! | 22x28" https://bit.ly/3jXQWL5 18x24" https://bit.ly/3LZpoHT |

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| | Check It Out Citizen Science at Your Library Rack Card - Place cards in a sign holder to promote awareness of citizen science. | https://bit.ly/3CMkK62 |
| | Optional Floor Display Stand * Use to display multiple rack cards, includes acrylic literature tray to offer flexible configuration to display the poster, check out cards, and promotional materials. Approx. \$367.99 | https://bit.ly/3izltyo |



Circulating Kits

Typically, libraries make the kits available for two-week check out periods. When establishing the circulation process, consider the following:

- Will you download and use the provided Borrowing Agreement (<https://bit.ly/2UvLVRi>) or will staff check out kits like other library materials?
- For group events, consider creating an accessory kit with extra Sky Meters, Red Light Flashlights and Planispheres.
- What is your policy regarding lost or damaged kit materials?
- Will you allow kit checkout renewals?
- What will be the process for checking kits back into the library?
- Who is the staff contact for kit questions, and maintaining/replenishing/replenishing kits?

Register Your Kit

Once kits are moved into circulation, be sure to register your library in the Global Citizen Science Kits and Tools Database on SciStarter so citizen scientists looking for the kits can find them at your library! Register your kit at <https://www.SciStarter.org/tools>.

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Preparing & Supporting Library Staff

Help staff build confidence and knowledge of citizen science, the kits and related programs by using and promoting the following resources:

Host a Staff Meeting

Consider hosting quarterly staff meetings to review library procedures for kit storage, locating kits in library software, checking out/in process, and replenishing kit supplies process.

Promote Online Training Tutorials

Staff can complete a two-part, self-guided, online training tutorial developed by the National Library of Medicine, Arizona State University and SciStarter, designed to help increase knowledge and confidence in citizen science.

1. [Part 1: Foundations of Citizen Science](https://SciStarter.org/training) - Staff will be able to answer basic questions about citizen science, and related research projects (<https://SciStarter.org/training>).
2. [Part 2: Libraries as Community Hubs for Citizen Science](https://www.SciStarter.org/library-training) - Staff will be able to support the libraries as a community hub for citizen science including how to host programs, build kits and engage the community (<https://www.SciStarter.org/library-training>).

Upon completion of both parts, staff will earn **badges** and **professional development credits** from the Medical Library Association (limited time offer).

Read the Library and Community Guide to Citizen Science

This guide provides a general introduction to citizen science, explores ways libraries can catalyze and support citizen science engagement, highlights resources to find local citizen science projects, and provides tips to connect your existing programs and communities to projects on SciStarter.org (<https://SciStarter.org/LibraryGuide>).

Join the National Citizen and Community Science Library Network

Encourage staff to join the network to stay current on developments, learn about/share best practices, and to access additional resources (<https://scistarter.org/library-network>).

Partnerships & Events

Partnerships

Partnering with community-based organizations can provide access to new and underserved communities. Once you have identified possible community partners (Girl Scouts, 4-H, OSHER,

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NASA Night Sky Network, etc), reach out and begin a dialogue to communicate shared expectations and co-create programs that meet the needs of your community.

See the Partnership section of <https://SciStarter.org/library-training> and the Library and Community Guide to Citizen Science, <https://SciStarter.org/LibraryGuide>, for partnership ideas.

Events

Once you have established partnerships, consider hosting an event to support educating the community about citizen science or a specific research project. Use the following resources:

- **Review the Library and Community Guide to Citizen Science** (<https://SciStarter.org/LibraryGuide>) for case studies, and other ideas for events. Download the Programming Checklist and sample letters to help organize your event.
- **Complete the Libraries as Community Hubs for Citizen Science tutorial** (<https://SciStarter.org/library-training>). This is full of resources to help library staff plan, and provide citizen science activities to their community.

Sustaining Engagement

Now that you've built kits, created a process to check them out, partnered with community based organizations, and offered citizen science activities, you will need to continue educating library users about citizen science, and how their contributions can impact scientific research and answer questions.

To maintain the momentum, think about future programs where local experts, like amateur astronomers, would come and talk to your community about astronomy and the night sky.

Check out the NASA Night Sky Network map to find an Astronomy Club near you:

<https://nightsky.jpl.nasa.gov/club-map.cfm>.

SciStarter.org Curated Videos

SciStarter.org (<https://bit.ly/3m3l62l>) has curated videos with citizen science project leader interviews that can be used in a library program or linked from your library's website. Some libraries hold meetups on a regular basis to focus on a specific project or discuss other citizen science projects. This could be a great recurring event to do with your community based organization partner.

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SciStarter.org/Events

You've done all the footwork to plan an event, and now it's time to let everyone know about this awesome opportunity! Once you create a SciStarter.org account, you are able to post your events on <https://SciStarter.org/events>. Whether it's a face-to-face or virtual event, let people know your library is an event hub for citizen science.

The People Finder on SciStarter

The People Finder (<https://SciStarter.org/people-finder>) is a SciStarter tool that gives you the opportunity to message SciStarter account holders and project owners in your area. Reach out to this community to announce your upcoming citizen science events..

Citizen Science Month

This is a month-long celebration to feature citizen science in a way that meets your community's needs. The Library Guide, Section 4 has a step-by-step guide about Citizen Science Month for different participation levels and needs. There are tips to plan a virtual event using the many available SciStarter.org resources (<https://CitizenScienceMonth.org>).

SciStarter Affiliates

SciStarter Affiliate Projects (<https://SciStarter.org/Affiliates>), like the Globe at Night, are citizen science projects that partner with SciStarter to credit your contributions in your SciStarter Dashboard. If you participate in a SciStarter Affiliate, the number and frequency of your contributions will be credited in your SciStarter Dashboard, usually within 24 hours (on average).