

Public Libraries: Hubs for Community Science

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Abstract

Libraries are local community centers and hubs for learning, with increasing numbers of public libraries responding to the need to increase science literacy and support 21st century skills by adding STEM programs and resources for patrons of all ages. The Institute for Global Environmental Strategies (IGES), through the NASA Earth Science Education Collaborative (NESEC) cooperative agreement, is working with several libraries to pilot and implement collaborative models for engaging their local communities in STEM and citizen science. During spring and summer 2019, eight public library systems across the United States piloted activities and programs related to NASA's GLOBE Observer citizen science app, which enables citizen scientists to contribute observations that complement NASA Earth observations. These include activities related to citizen scientist observations of Clouds (photographing clouds and recording sky observations), Mosquito Habitat Mapper (identifying water sources that are potential mosquito habitat and the presence of mosquito larvae; sampling and counting larvae; and using a clip on magnifier to identify the type of mosquito), and Land Cover (photographing the landscape and classifying land cover). Examples include the Pioneer Library System in Oklahoma, Southwest Oklahoma City Public Library, that is implementing GO Oklahoma! a citizen science campaign to collect GLOBE Observer Mosquito Habitat Mapper observations to support research by partner scientists at University of Oklahoma-Norman and Southern Nazarene University. The Los Angeles Public Library System has been field testing GLOBE Observer activities as part of its Neighborhood Science Program and will be incorporating these resources into circulating kits the library is developing for citizen scientists related to GLOBE Clouds and Mosquito Habitat Mapper that they will be piloting with Los Angelenos during fall 2019. Insights from the library pilot testing and programs include promising practices, requested resources, programming ideas and approaches, and particularly approaches to leveraging NASA subject matter experts and networks, to support local library programming.

Public Libraries: Hubs for Community Science

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LOS ANGELES
PUBLIC LIBRARY



Pioneer
LIBRARY SYSTEM



TOOLKIT for INFORMAL EDUCATORS

Hands-on activities,
games, and resources
(e.g., books, videos,
FAQs) to build content
knowledge and skills

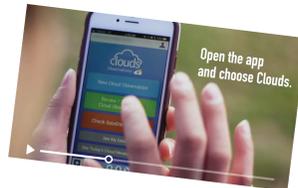
GLOBE clouds

Create a Cloudscape



In this activity, participants create a collage using different materials to represent the various types of clouds.

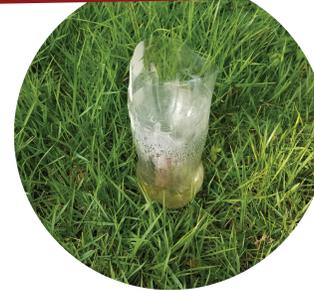
This activity can be completed individually or as a collaborative project.



You can supplement this activity with a video, like [Clouds: Getting Started](#).

GLOBE mosquito habitat mapper

Build a Mosquito Larva Trap



Participants can upcycle a plastic bottle and turn it into a larva trap. This activity can be completed as part of a class or a “Leave a Bottle, Take a Bottle” station where visitors can donate or use materials.

Once larvae have been collected using the trap, participants can identify them using a clip-on microscope and the GLOBE Observer app.



GLOBE Land Cover Adopt a Pixel

Take a Land Cover Walk

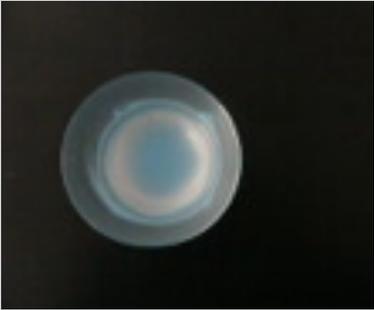


Lead participants on a walk during which they learn to identify different types of land cover and discuss the effects that these land cover types have on the environment.

It is helpful to also print copies of the [Land Cover Reference Guide](#).



GLOBE Observer Tool: Clouds

What Observers Are Doing	Activity or Resource that Prepares/Supports Observers	Activity Preview	Comments
Estimating % of the entire sky covered with clouds	Activity 1: Estimating Cloud Cover Make simple models of cloud cover using blue and white paper to practice estimating the percentage of cloud cover.		Time: 15-30 minutes Level: All ages (school-aged children, families, adults) Watch short video clip of Jessica Taylor walking librarians through why and how to do this activity
Identifying sky color and Visibility	Activity 2: Sky Conditions – Using the “Sky Condition” chart and plastic cups of water, participants add drops of milk (representing aerosols) to see how that changes the sky color.		15-30 minutes, relevant for school-aged children (up to ages 14) and families.
Identifying cloud type and height	Activity 3: My Cloud Clues and Cloudscape Instructions are provided for conducting an activity that combines these two existing activities. Note – This activity is in two files.		45 - 90 minutes Level: School-aged children (upper and lower elementary) and families

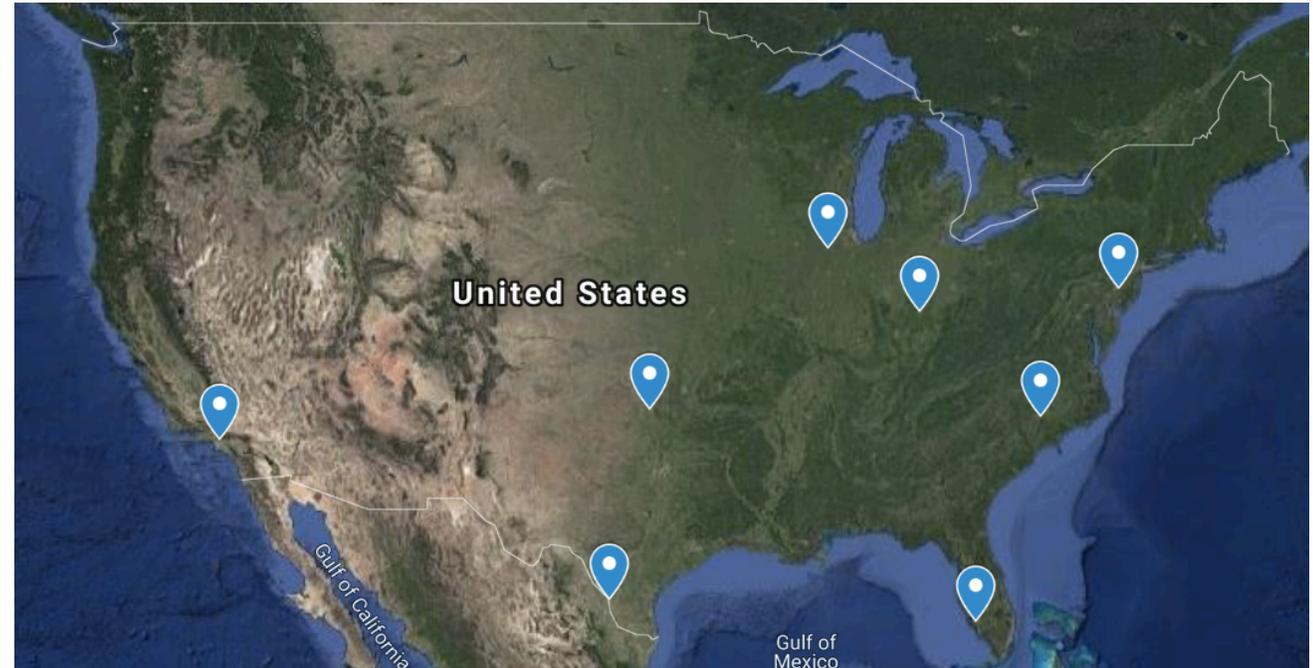
Library Field Testing of GLOBE Observer Toolkit

Participating libraries recruited through STAR Net Library network

- Field tested GLOBE Observer and 10 toolkit activities in at least two programs and completed online surveys by NESEC evaluator (Oregon State University)
- Provided supplemental materials and resources
- SW Oklahoma City – is partnering on GO Oklahoma regional challenge

Libraries:

- LaSalle Public Library (IL)
- Haddonfield Public Library (NJ)
- Lamar Bruni Vergara Inner City Branch (TX)
- Lee County Library System (FL)
- Kenton County Public Library (KY)
- Cumberland County Public Library (NC)
- Los Angeles Public Library (CA)
- SW Oklahoma City Public Library



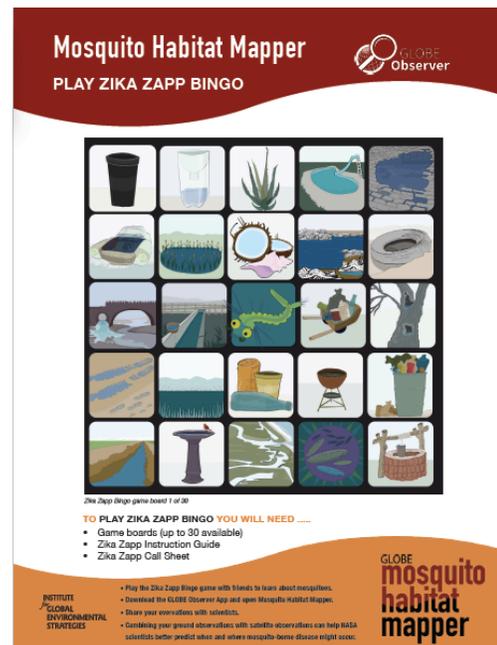


Library Programming Using GLOBE Observer



Outcomes

- Generally libraries found the activities easy to prep for and set up, and positive rankings.
- Libraries also developed extensions and adaptations.
- We now have a rich set of data on how the libraries implemented GLOBE Observer, challenges, what worked well, questions from patrons, and new resources that are needed.
- Updating activities based on feedback and developing new resources based on the library feedback.



Bingo

Name that Habitat

Draw-a-rama

A Tale of Two
Libraries

Los Angeles Public Library:
Neighborhood Science Program

SW Oklahoma City Public Library:
GO Oklahoma



Vivienne Byrd

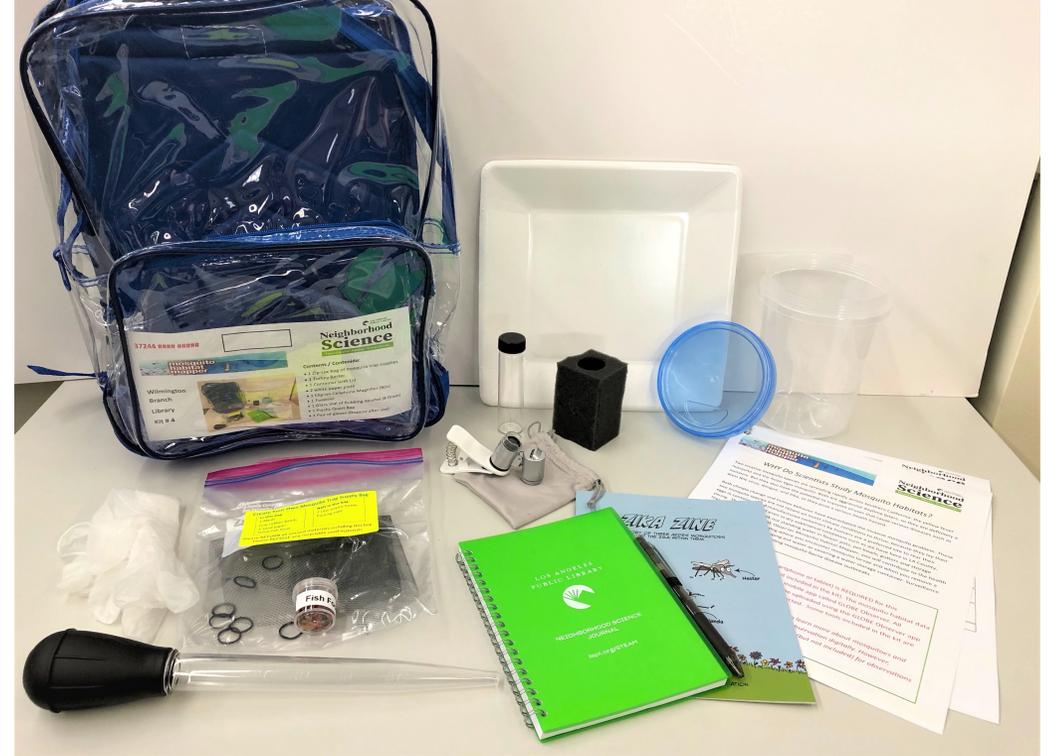
Librarian

Through the Neighborhood Science program in the branches of Los Angeles Public Library, we are providing the participants with knowledge of mosquitoes and tools to track, record, and share their habitat information with researchers and scientists using the GLOBE Observer Mosquito Habitat Mapper app. We want our program participants to know that they also have the power to stop the spreading of the mosquito population and prevent possible disease outbreaks. >>



Los Angeles Public Library: Pilot Circulating Kits for GLOBE Citizen Science

- Two pilot kits: GLOBE Clouds and Mosquito Habitat Mapper
- Include materials from GLOBE Observer Toolkit
- Worked together to develop description of local science relevance (example, next slide)
- In development: Trees



Los Angeles Public Library: Pilot Circulating Kits for GLOBE Citizen Science

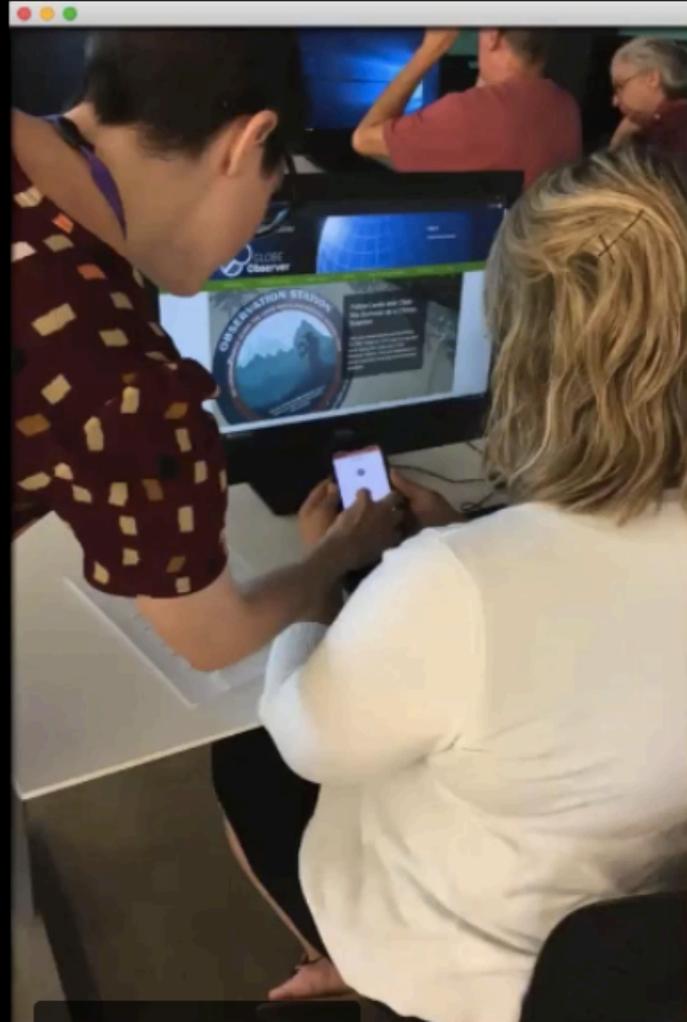
Why do scientists study mosquito habitats?

Two invasive mosquito species are spreading rapidly across Southern California- the yellow fever mosquito and the Asian tiger mosquito. Both are aggressive daytime biters, so they are definitely a nuisance. But they also have the potential to transmit viruses that cause serious diseases such as West Nile virus, dengue, and Zika, so they pose a serious health hazard.

*Both climate change and human behavior have exacerbated the invasive mosquito problem. These two mosquito species are not reliant on moist climate conditions to thrive, because they lay their eggs in containers, and manufactured containers by humans are a preferred site to rear their young. **That means that even in dry subtropical conditions such as we have here in LA County, these mosquitoes can seek out standing water in flowerpots, pet bowls, gutters and storage containers.** Using the GLOBE Observer Mosquito Habitat Mapper, **you will contribute to the health of your community** by reporting where you encounter mosquito larvae and when you remove a breeding site from use by dumping out water or covering a water storage container. Surveillance and mitigation are key to preventing mosquito borne disease outbreaks.*

SW Oklahoma City Public Library: GO Oklahoma

A GLOBE Observer regional challenge working with local partners to collect Mosquito Habitat Mapper data in the Greater Oklahoma City-Norman, OK area that supports NASA Research by partner scientists at University of Oklahoma, Norman, and Southern Nazarene University



PowerPoint Slide Show - [Webinar 8.pptx]

OUR FIRST PROGRAM FOR ADULTS

We presented the GO OK program and an app walkthrough using a Prezi presentation in our Computer Training Center.

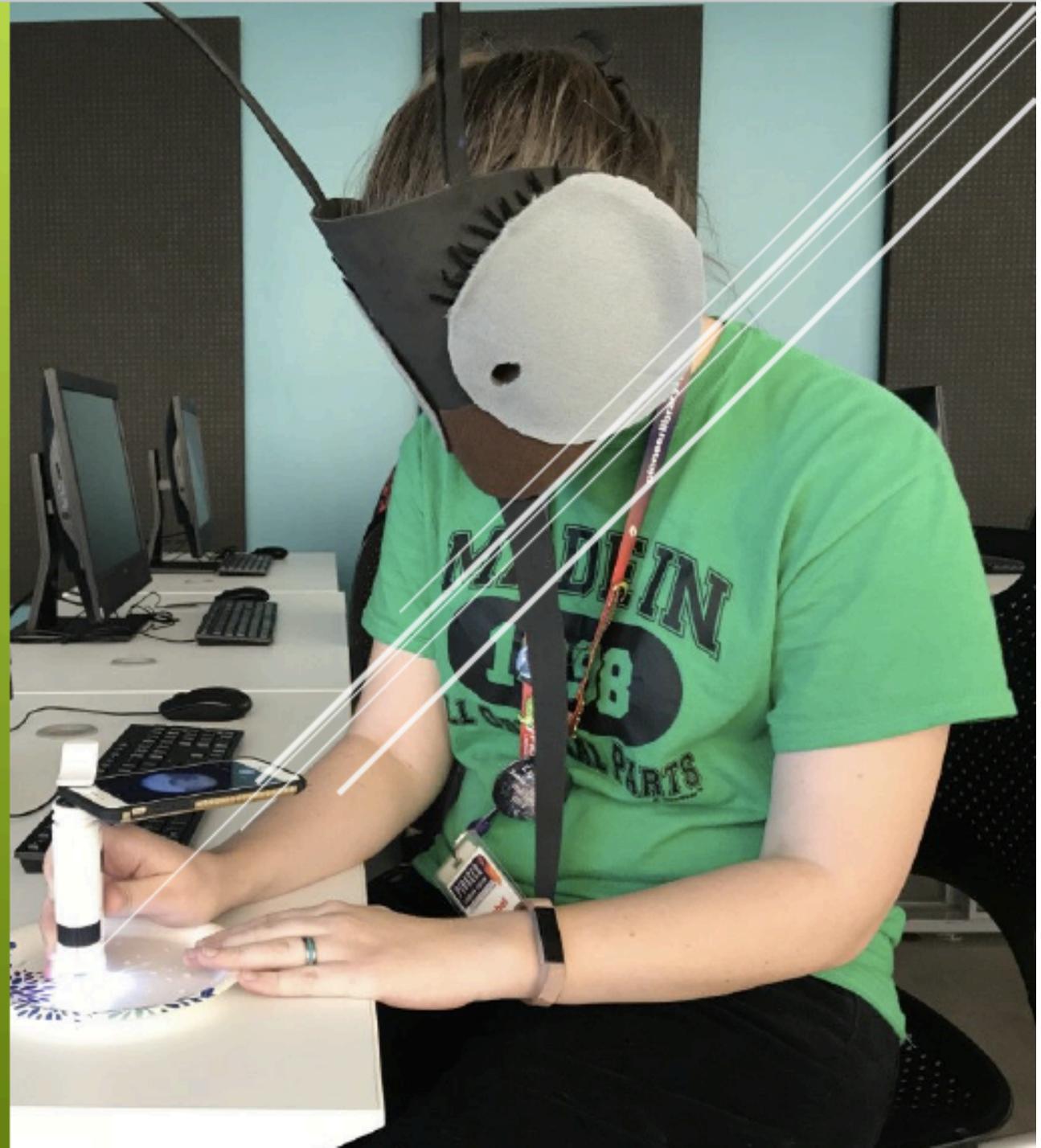
We had three people attend our first program and they were signed up that day. They were sent home with microscopes and ovitraps.



Rachel Fite and Sara Quesenbury, SW Oklahoma City Public Library, presenting at a GLOBE Mission Mosquito Webinar

THOUGHTS ON FIRST PROGRAM

- It was helpful to have FAQ's ready for participants to take home.
- This one had a super quick turnaround, and I would love to see what angles and interest we could generate with more time.

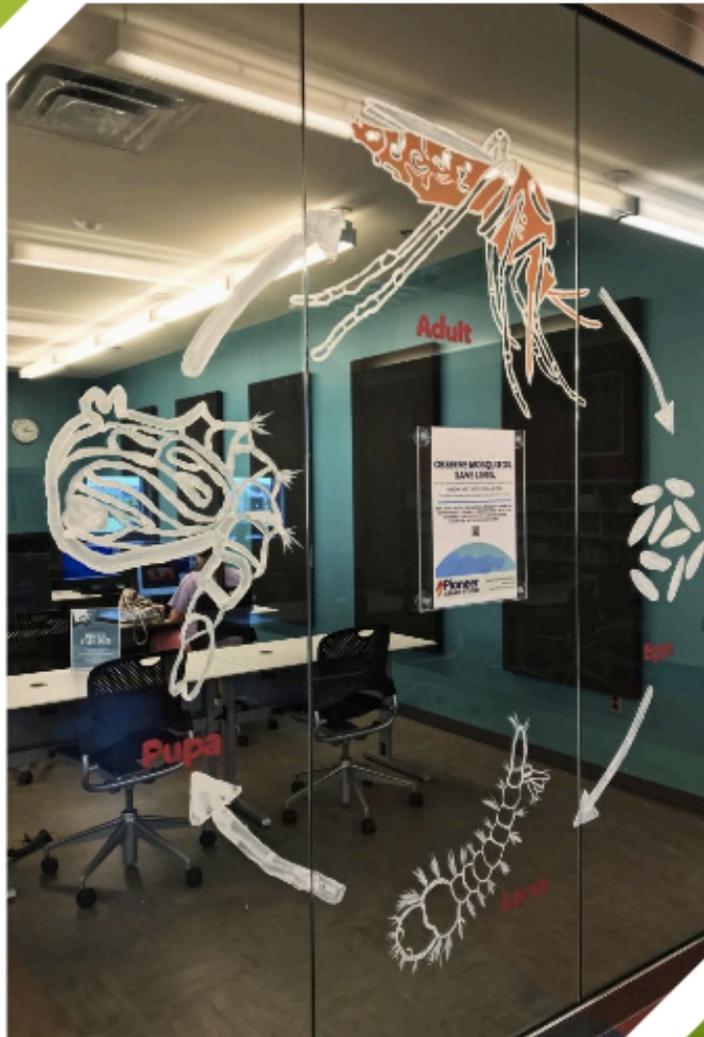


OUR SECOND PROGRAM: CHILDREN AGE 8-11

- ▶ For this program, we had already had a series of discovery camps throughout the summer, so we tacked this one on as a bonus discovery program with an email blast to those who had participated in the original series.
- ▶ We asked Dr. Caio Franca to come and share with kids age 8-11 about his work and the GO OK program, and then we had the kids design and create their own ovitraps.
- ▶ Then they looked at larva through the 60x microscopes and used the GLOBE Observer app to send their observations in to show them the process.



PUBLICITY



- ▶ We painted this mural on the wall of our computer training center and created variations of the flyer to the left for each program.
- ▶ After the programs were over, we advertised how patrons can schedule a librarian for one-on-one training (we had two people give us a call to get set up individually).
- ▶ Our marketing and communications department created Facebook and Instagram posts promoting the programs.
- ▶ One of our selectors created a "Calling All Scientists!" themed curated list on Overdrive (one of our platforms for ebooks and eaudiobooks) also advertising the program, and at its highest point, 93 of the 101 books on the list were checked out, and 35 of the books still have a holds list so will continue to be checked out as well. We loved that promoting this program promoted scientific literacy through other venues as well!

Resources

GLOBE Observer - observer.globe.gov

Toolkit for Informal Educators - observer.globe.gov/toolkit

GO Oklahoma - observer.globe.gov/go-Oklahoma

LAPL Neighborhood Science - www.lapl.org/steam/neisci

STAR Net Libraries - <http://www.starnetlibraries.org/>

Contact: theresa_Schwerin@strategies.org

nesec



**NASA Earth Science
Education Collaborative**