

A close-up photograph showing two hands working on a colorful, textured object, possibly a 3D-printed model or a craft project. The object is primarily orange and red, with several small, translucent, dome-shaped components attached. A red wire is connected to one of these components, which is glowing with a bright red light. Other components are glowing with green and blue light. The background is dark, and the overall scene suggests a hands-on STEM learning activity.

Museum and library partnerships:
Hands-on STEM learning for everyone

ASTC 2018

Overview

INTRODUCTION – COLLABORATION

Rae Ostman, Arizona State University

PRESENTATIONS – PARTNERSHIP PROJECTS

Keliann LaConte, Space Science Institute

Dawn La Valle, Connecticut State Library

Tara Cox, The Franklin Institute

Anna Hurst, Astronomical Society of the Pacific

Jeannie Colton, Arizona State University

Darlene Cavalier, Arizona State University

Cheri Grinnell, Kentucky Science Center

QUESTIONS

RESOURCES & DISCUSSION

Why collaborate?

**To achieve something
you can't do on your own!**

- Share resources, expertise, and connections
- Build upon existing strengths
- Reach new audiences

Resources



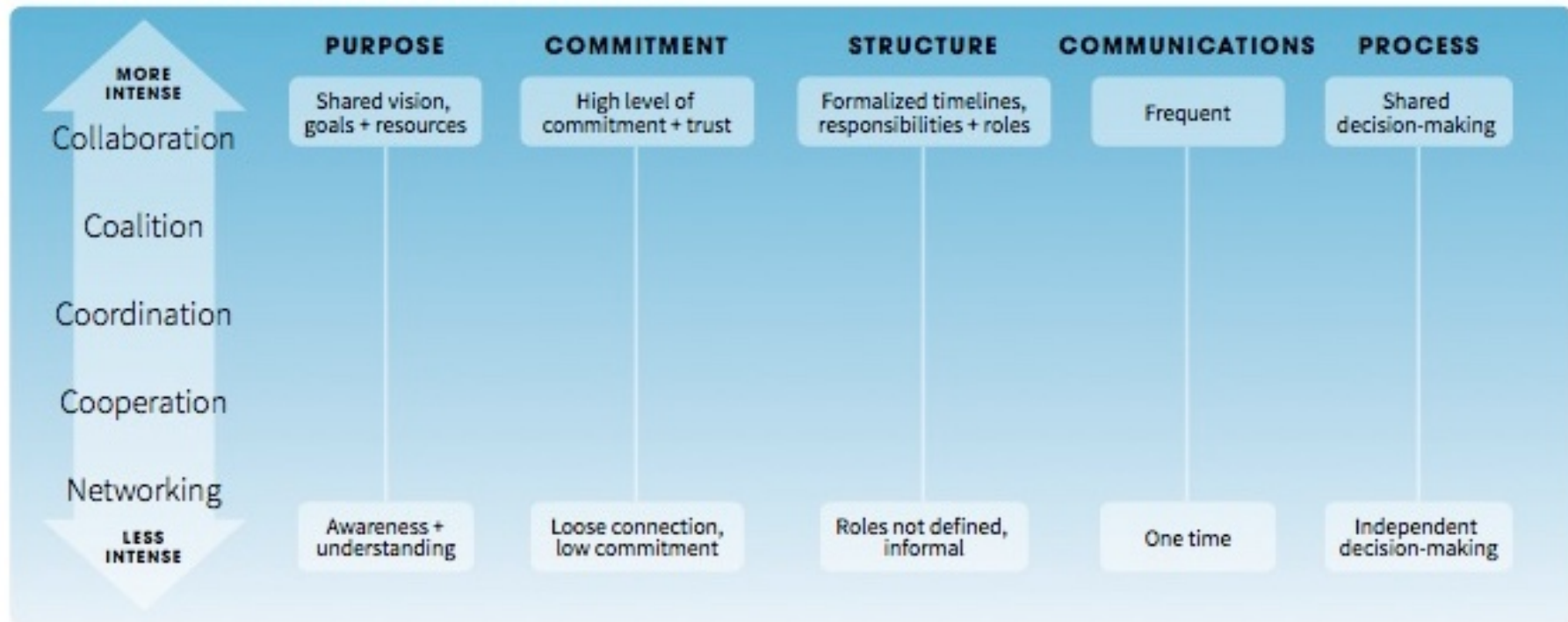
Creating Successful Collaborations: Museum and Community Partnerships



Available at www.nisenet.org/collaboration-guide

Levels of partnership

PARTNERSHIP CONTINUUM AND CHARACTERISTICS



Collaboration tips

- Be patient! Collaboration takes time.
- Be clear about your goals and expectations.
- Get to know each other. Each partner has a lot to offer.
- Talk about how things are going. Communication is critical.
- Stay focused on your goals, and don't forget to celebrate your successes!

Thank you

The **Nanoscale informal Science Education Network** was supported by the National Science Foundation under award number 0940143. Any opinions, findings, and conclusions or recommendations expressed in this presentation are those of the authors and do not necessarily reflect the views of the Foundation.



Keliann LaConte

Libraries & STEM: A National Perspective



Science-Technology Activities &
Resources For Libraries

Use of Informal Science Venues

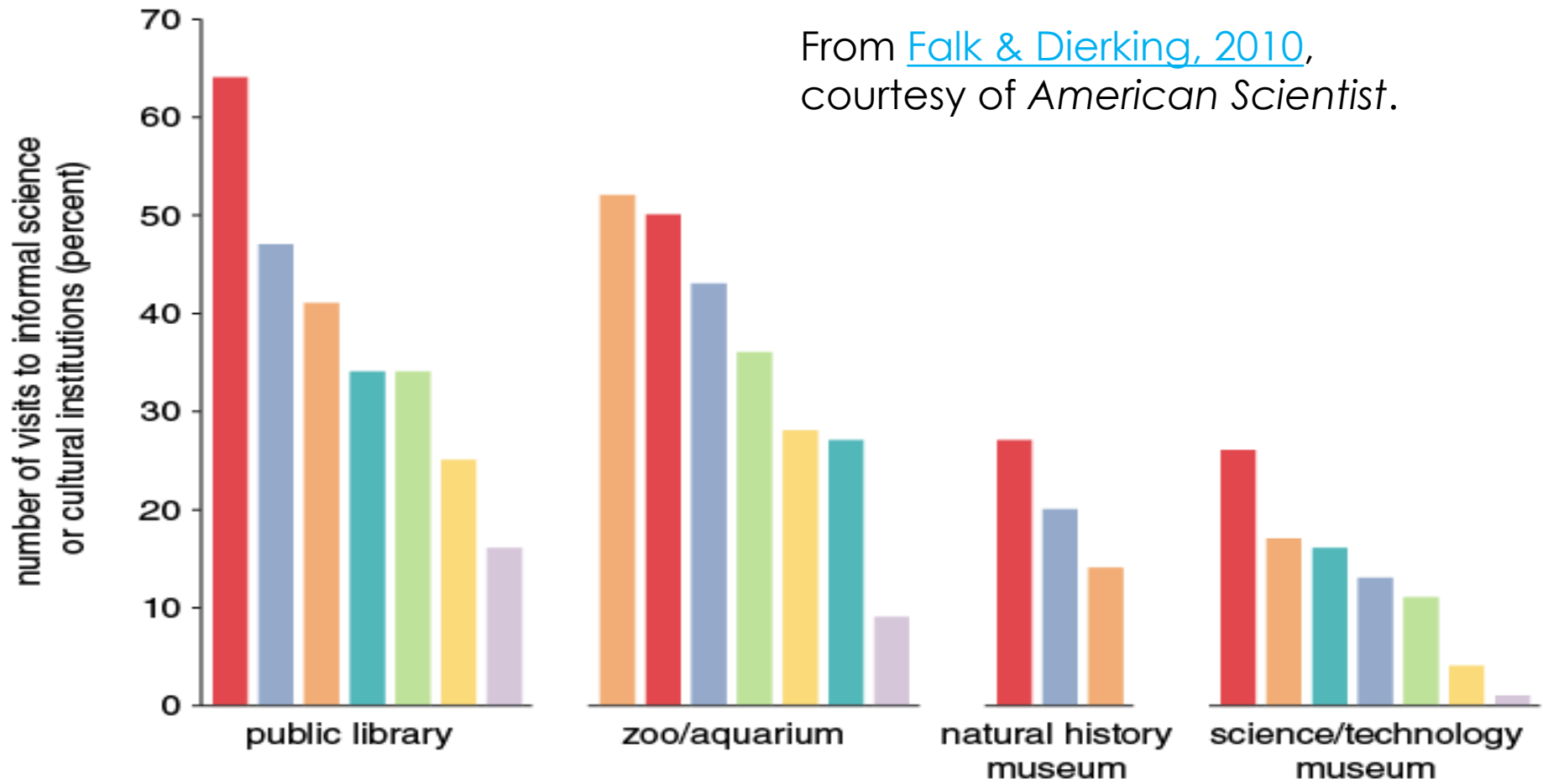
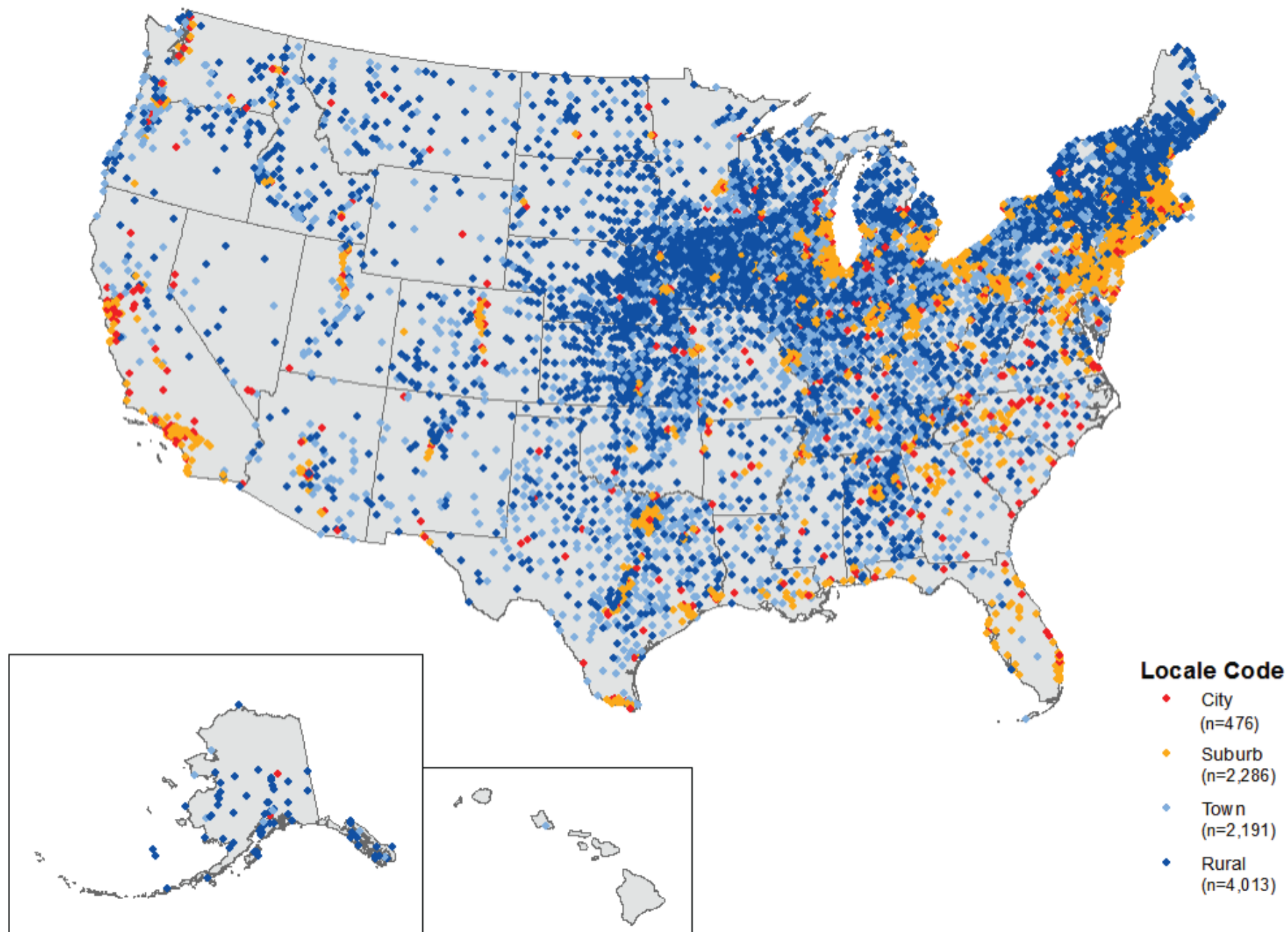


Figure N-1. Public Library Administrative Entities in the United States, Fiscal Year 2014



U.S. Libraries: Quick Facts






- 16,000 library locations
- 1.5 billion visits per year
- Latinx Use: 72%
- African-American Use: 69%

STAR Net Project Stats

- Over 1.5 million patrons have visited *STAR Net* exhibitions
- Over 200,000 patrons have attended *STAR Net* programs
- Over 8,000 members have joined the *STAR Net* Online Community

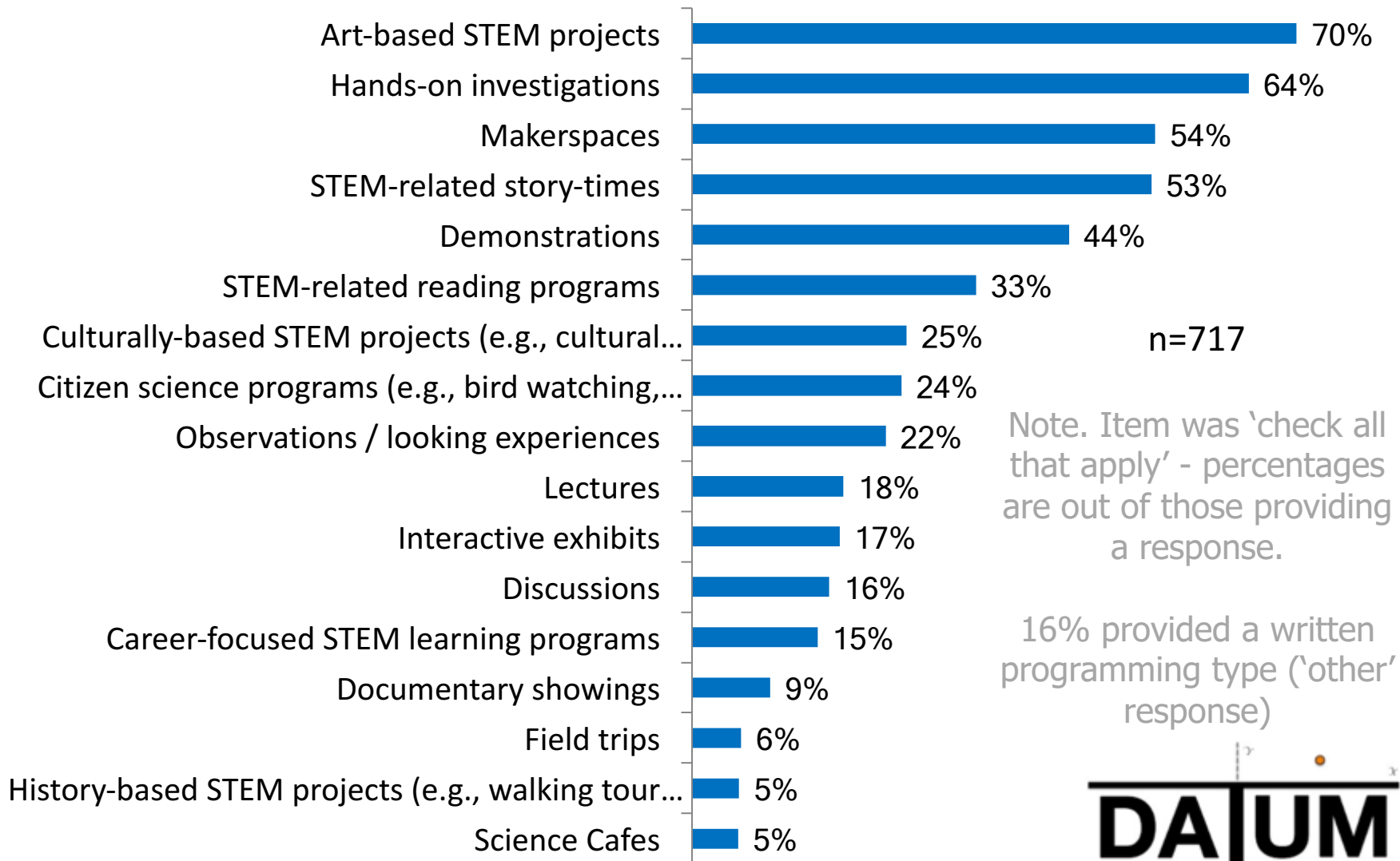
Survey of U.S. Libraries

STEM Programming in Libraries

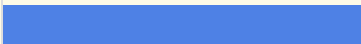

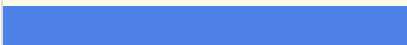

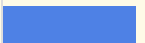




How frequently do you offer STEM programming at your library?				
#	Answer		Response	%
1	We tried it once		30	7%
2	Occasionally (2 or more times a year)		138	30%
3	Monthly		122	26%
4	Frequently (more than once per month)		135	29%
5	Summer only		36	8%
	Total		461	100%

STEM programming is offered somewhat frequently, often **integrated into existing literacy and arts programming** like hands-on investigations, art-based STEM projects, and STEM-related storytimes (Hakala et al., 2016; n=455)

Type of STEM Programming (2017)



What general age levels do you target with STEM programming? Please check all that apply.

#	Answer		Response	%
1	Pre-K		271	57%
2	Elementary students		414	87%
3	Middle school students		305	64%
4	High school students		179	38%
5	Young adults		100	21%
6	Adults		108	23%
7	Seniors		49	10%
8	Mixed ages (Families)		171	36%
9	Other:		15	3%

Children aged **Pre-K through middle school** are the most common target audience (Hakala et al., 2016; n=455).

2017 Solar Eclipse Event

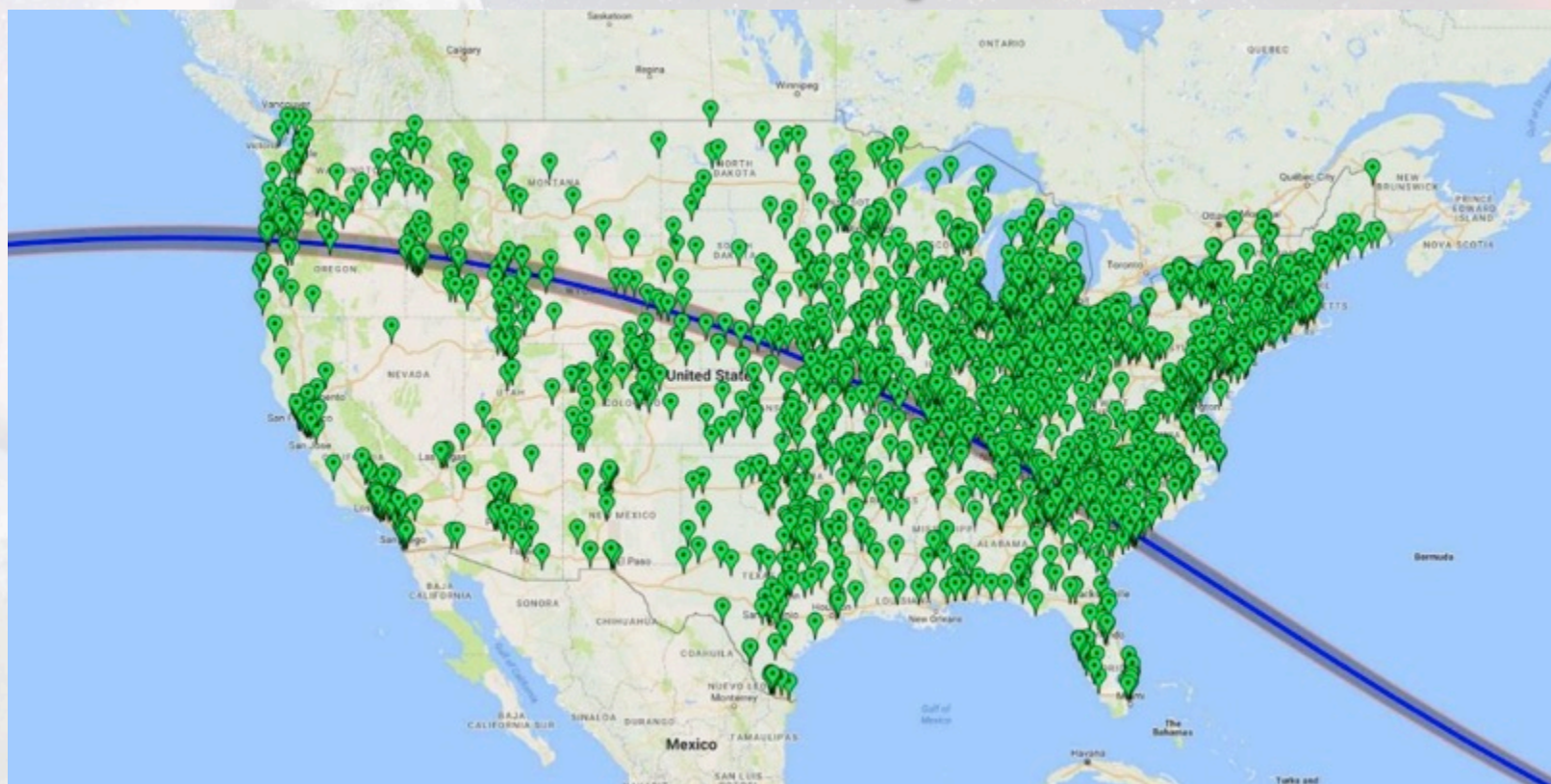




Photo courtesy of Grand Tetons Public Library

A black and white photograph of an astronaut in a full spacesuit standing on the lunar surface. The astronaut is facing away from the camera, looking towards the horizon. To the left, an American flag is planted in the ground. The ground is covered in footprints and shadows. The sky is a solid black, representing the vacuum of space.

What's Next?

Universe of Stories

June-August 2019

STAR Net

starnetlibraries.org

**Collaborative Summer
Library Program**

cslpreads.org

STEM Resources for Library Staff

STEM ACTIVITY Clearinghouse

<http://clearinghouse.starnetlibraries.org>

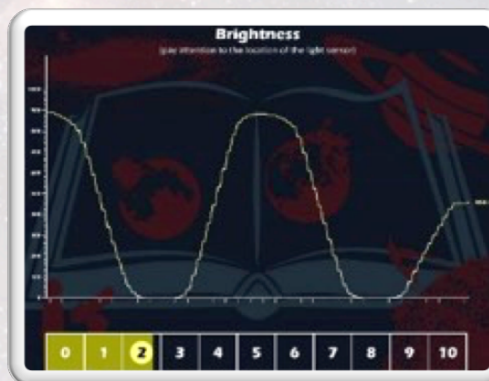
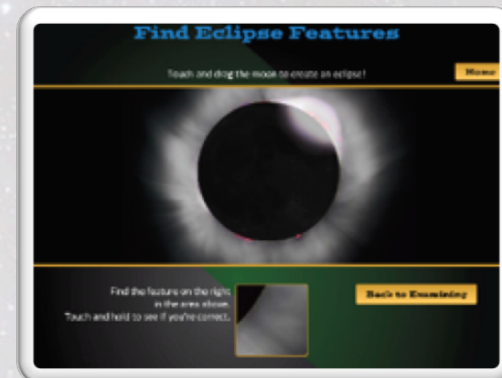


Credit: T.L.L. Temple Memorial Library



**Searchable
Hands-on
Free
Curated
Trusted**

Apps





Credit: St. Tammany Parish Library



Science-Technology Activities &
Resources For Libraries

Join us!

www.starnetlibraries.org

Dawn La Valle

State Libraries Empower Libraries to Engage in STEM Activities through Statewide Services



- Research and development; beta testing new concepts, technologies, equipment
- Professional Development Workshops
- Experiential learning
- Tech Sand Boxes; Collections
- Resource Sharing
- Consulting
- Statewide Strategic Partnerships
- IMLS/LSTA Grant Opportunities

State Library Agencies (SLAs) Leading the Way to Engaging Libraries in STEM



- **Maine State Library** awarded IMLS National Leadership grant with the goal to enable the nation's State Library Agencies to have a field-tested, replicable science literacy methods that they can use to enable their public libraries to become skilled STEM facilitators.
- Empowering public libraries to build their science literacy capacity to enable libraries and librarians to connect with their communities and to engage their communities in meaningful informal science and technology experiences
- Project capitalizes on decade long strategic partnership between the Maine State library and Cornerstones of Science
- https://www.maine.gov/msl/libs/grant_projects/imls_leadership_grant.shtml

SLAs Leading the Way with STEM Professional Development for Librarians



- **VELI-STEM** a partnership between the **Vermont Department of Libraries** and the Vermont Center for the Book, focusing on early literacy through inquiry into science, technology, engineering and math.
- Project sequence allows for three years of progressive development for librarians to understand what it means to engage children in inquiry-based experiences, the nature of facilitation and guidance that adults can offer in order to challenge, and engage children and to strengthen content knowledge.
- www.veli-stem.weebly.com
- Creating community collaborations with a focus on STEM Education:
<https://www.slideshare.net/1amariposa/libraries-museumsstem>

Statewide Resource Sharing: Providing Libraries with Stem Kits



SLAs Uniquely Positioned to Foster Strategic Partnerships



PROUD #IMLSGRANT RECIPIENT!

THE INSTITUTE OF MUSEUM
AND LIBRARY SERVICES

- IMLS – Institute for Museums and Library Services offers Talking Points: Museums, Libraries and Makerspaces.
- SLAs foster strategic partnerships with Depts of Economic Develop; Arts and Culture; Museums, higher education, private sector and other key stakeholder groups
- SLAs collaborate amongst themselves on national initiatives sharing professional development, resource sharing and partnering opportunities to benefit their library communities
- Library community – YouMedia Centers (Hartford CT), Meteorology Maker's Club (Norman, OK), Makelabs (Chicago, IL), Anythink Places (Thornton, CO)

For more information contact:

Dawn La Valle | Director, Division of Library Development |
Dawn.lavalle@ct.gov | Office: (860) 757-6665
<http://libguides.ctstatelibrary.org/dld/home> |
231 Capitol Ave. Hartford CT 06106 | Fax: (860) 757-6503



Tara Cox



Leap
into
science
— Engineered by —
THE FRANKLIN INSTITUTE

Cultivating a National Network for
Informal Science and Literacy

What is Leap into Science?

Leap
into
science
— Engineered by —
THE FRANKLIN INSTITUTE



Preschool

Ages 3-5
Structured
Activities



Family

All Ages
Mix of structured &
station-based



Elementary

Ages 6-10
Structured
Activities

Goals for Children & Caregivers

Leap
into
science
— Engineered by —
THE FRANKLIN INSTITUTE

Have fun
learning
together

Think
scientifically

Build
positive
attitudes
towards
science

Caregivers are learners
themselves, and facilitators for
their children's learning



Program Origins



2007-2010

Developed and piloted resources
with The Free Library of
Philadelphia and early literacy
partners

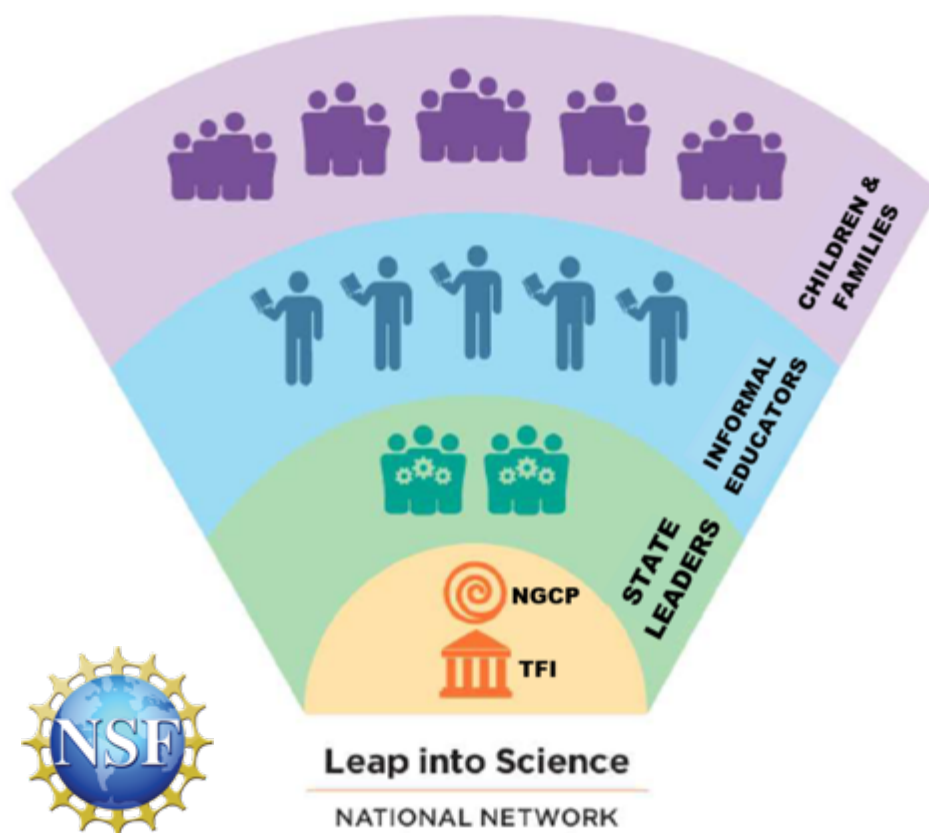


2010-2017

Piloted in 11 cities around the
US to refine curriculum and
training resources



National Scale-up



- Network of informal educators committed to engaging underserved communities in science & literacy
- State-level interdisciplinary partnerships between museums, libraries, and OST organizations
- Aiming for a sustainable train-the-trainer model

Who leads the National Network?



STEM & PD
expertise

Tested resources

National strategy



Network & collaboration
expertise

National partnerships

Gender equity



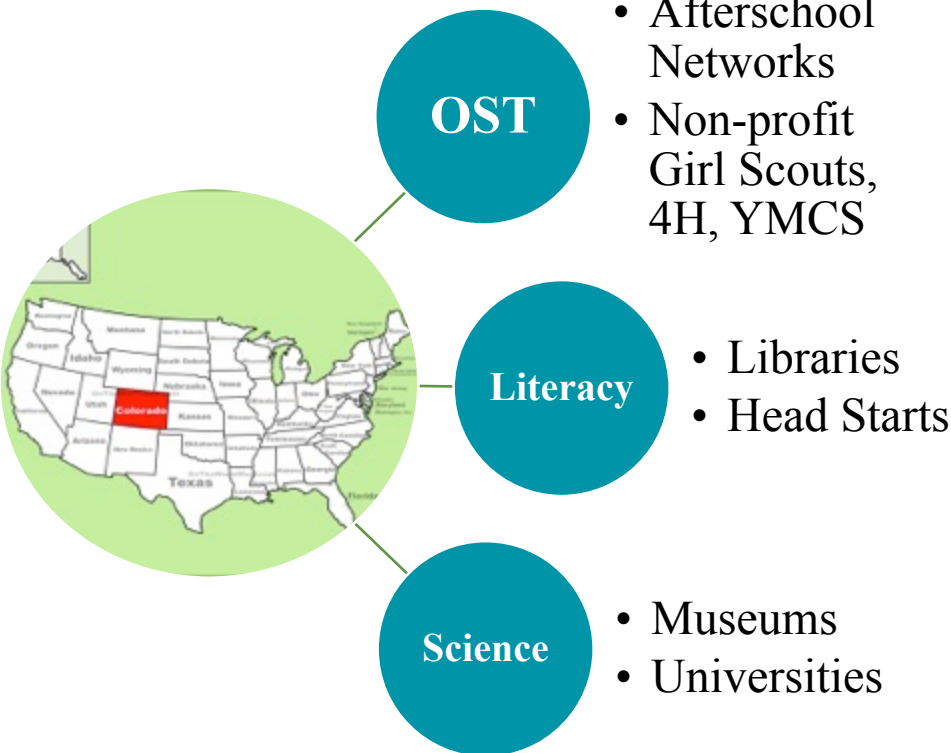
INSTITUTE FOR
Learning Innovation

Research expertise

Depth in
understanding of
informal family STEM
learning

Impacts on scale-up

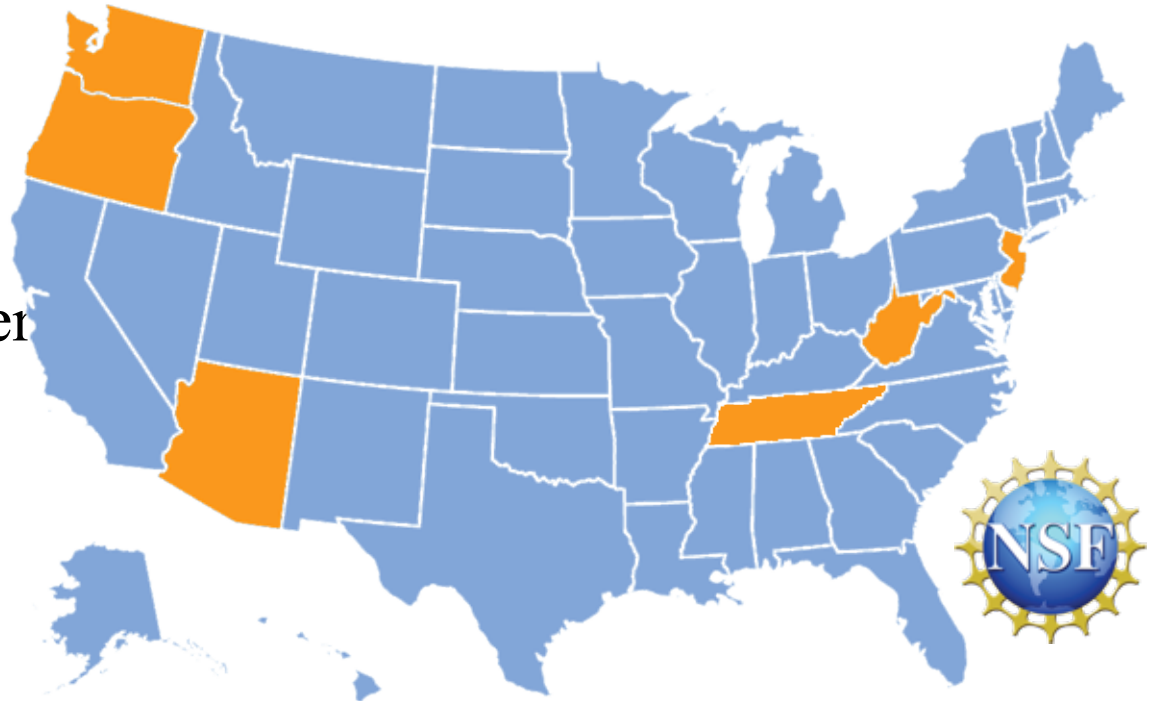
State Leadership Teams



- All state leaders must be committed to statewide outreach
- Trainers must have experience leading trainings
- State leaders must facilitate access to informal educators in rural and urban areas

Goal by 2021

15 states will have
disseminated
Leap into Science
programming to over
2000+ educators in
rural and urban
communities.



For more information please visit
[Leap.fi.edu](https://leap.fi.edu)

Anna Hurst



www.astrosociety.org

Anna Hurst: ahurst@astrosociety.org





A Program from the Astronomical Society of the Pacific

www.astrosociety.org/MySkyTonight



My Sky Tonight is based upon work supported by the Division of Research On Learning (DRL) of the National Science Foundation under Grant no. AISL #1217441. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.



Engage young children in
developmentally appropriate
astronomy activities

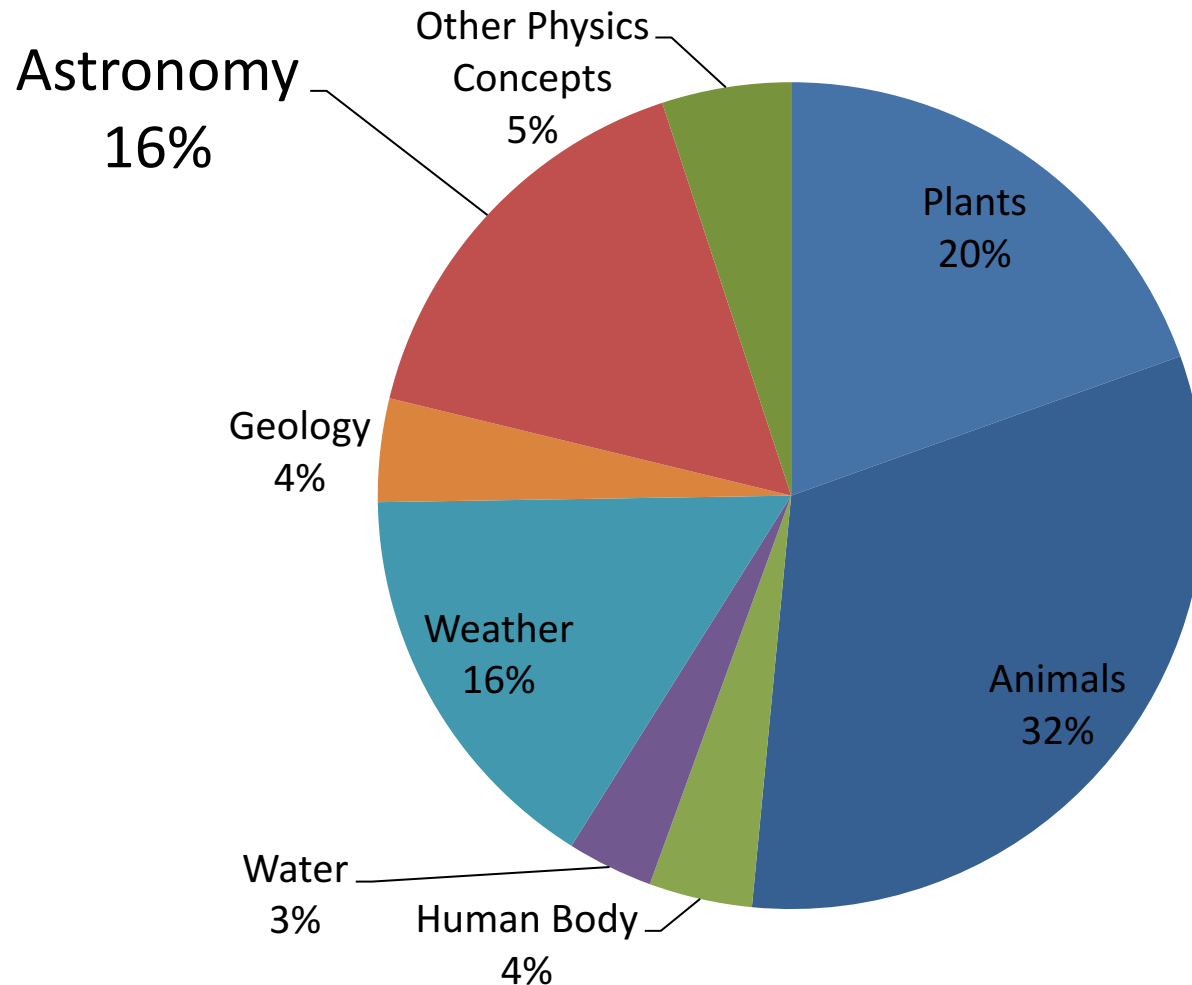


Engage young children
in *science practices* as
they investigate
astronomy

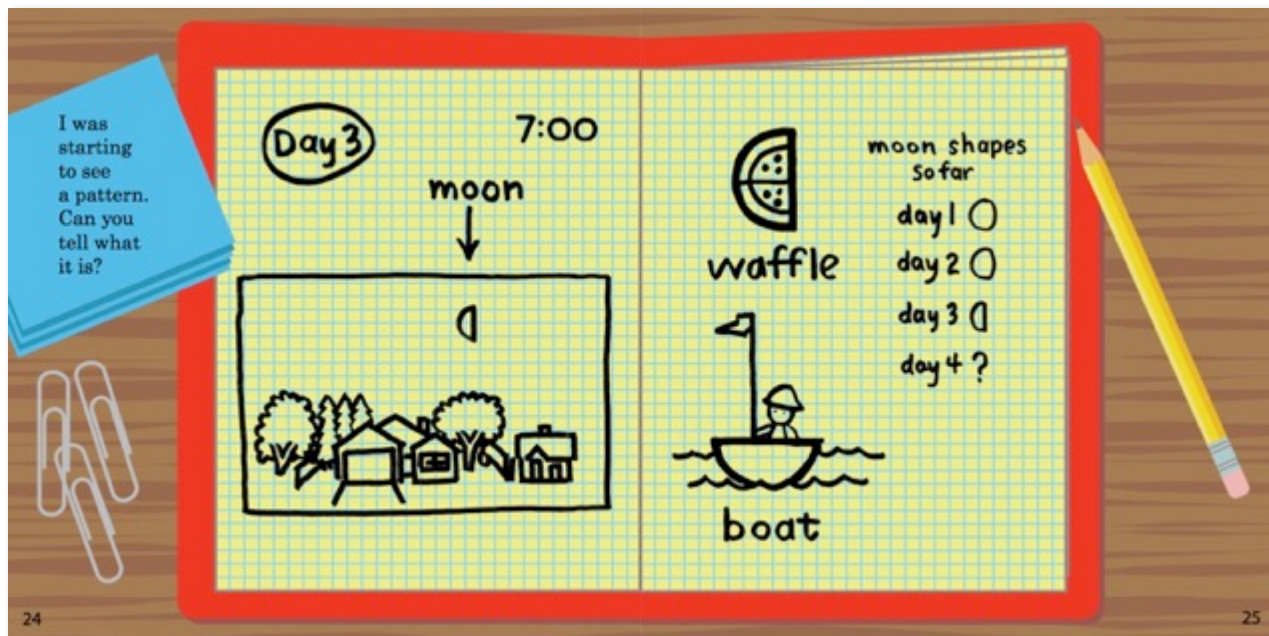


www.astrosociety.org/MySkyTonight

Diary Study: Conversations About Nature









A Program from the Astronomical Society of the Pacific

www.astrosociety.org/MySkyTonight

Anna Hurst: ahurst@astrosociety.org



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Night Sky Network

Astronomy clubs bringing the wonders of the universe to the public

In partnership with the
Astronomical Society of the Pacific



LOGIN

CLUBS & EVENTS

NIGHT SKY PLANNER

OUTREACH RESOURCES

ABOUT THE NETWORK

SITE SEARCH

FEATURED



What NSN Outreach Toolkits Are Available to Member Clubs?

The Night Sky Network's toolkit collection has received many updates over the many years of the program. Some of our older ones are no longer available, while newer kits have since become available on a variety of topics.

This article lists all of the toolkits that are now available to Night Sky Network member clubs that regularly report on their outreach events. [read more](#)

CURRENT LOCATION

Search US zip, city or place 

- [set to current location](#)
- [clear location](#)
- [advanced event search](#)
- [advanced club search](#)

FOLLOW THE NIGHT SKY NETWORK



37,236 Events held since 2004

4,107,238 People Reached

CLUBS & EVENTS

EVENTS IN YOUR AREA

[+ more events](#)

CLUBS NEAR YOU

[+ more clubs](#)

[+ more news](#)

Jeannie Colton



Jeannie Colton
Program Coordinator
Center for Innovation in Informal STEM Learning

FRANKENSTEIN²⁰⁰

- Flexible programming
- Relevant content
- Ease of use



Examples from our partners

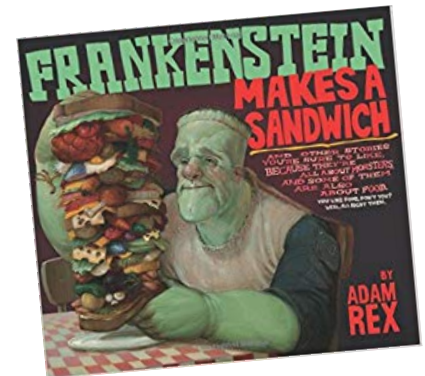
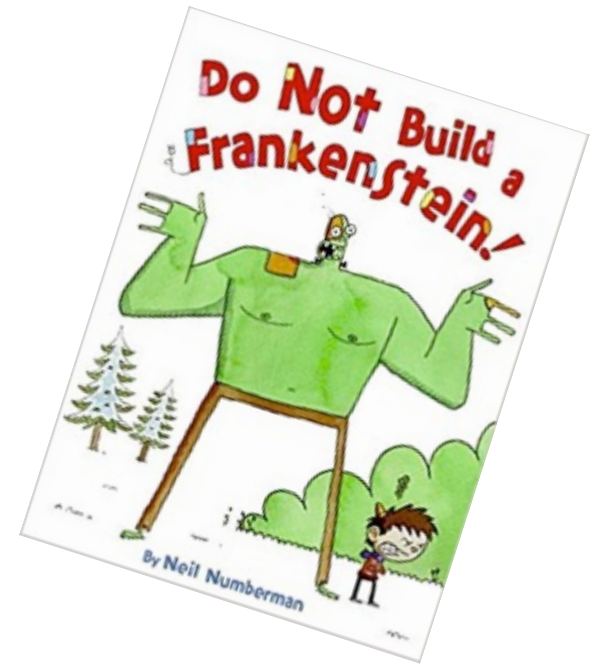
- Sci-Port Discovery Center and Barnes & Noble
- Maine Discovery Museum and Bangor Public Library
- Kaleideum and Center for Women Writers



Book List

A recommended book list for various ages is available in the planning guide, which can be found on the NISE Network website:

http://www.nisenet.org/sites/default/files/frankenstein200_event_planning_guide_0.pdf





Download the Frankenstein200 resources

<http://nisenet.org/frankensteinkit>

Frankenstein200 is supported by the National Science Foundation under award number 1516684. Any opinions, findings, and conclusions or recommendations expressed in this presentation are those of the authors and do not necessarily reflect the views of the Foundation.



THANK YOU!!!

Darlene Cavalier

**CHECK
IT OUT!**

CITIZEN SCIENCE

AT YOUR LIBRARY

Darlene Cavalier

@ASU_SFIS

@SciStarter

SciStarter.org



Libraries as Community Hubs for Citizen Science

Goal: Develop a field-tested, replicable, low-cost toolkit of citizen science resources for public libraries.

- ✓ Develop and evaluate citizen science toolkits
- ✓ Create associated resources to train, support, and communicate with librarians and citizen scientists
- ❑ Work with stakeholders to create a plan to scale the model to interested libraries, statewide then nationally.

Libraries as Community Hubs for Citizen Science

Considerations:

- Capacity of libraries, librarians and staff
- Interests/concerns of communities
- Criteria for physical and digital tools, projects, and assets
- Programming support
- Web companion support
- Scale (local vs regional vs national)

Libraries as Community Hubs for Citizen Science

Timeline:

- January – September 2018: Community Dialogues (STAR Net model)
- October – December: Phase One kits in circulation
- January-March: Phase Two kits in circulation
- April: Activate promotions; Phase Three kits implemented in libraries
- Ongoing evaluations through Sept. 2019



Celebrate the incredible contributions people like you have made to science on **Citizen Science Day**

What is Citizen Science?

Citizen science is real science done by everyday people like you! Whether you're helping scientists monitor local air quality or sharing pictures from your garden to help track plant and species populations, there are resources to help you engage in your interests, from Astronomy to Zoology!

Check out upcoming Citizen Science events on Scistarter.com (visit scistarter.com/citizen-science-day). Ask your librarian about upcoming and ongoing science programs at your library!

Some Popular Citizen Science Projects of 2017!



Stream Sniffer

Whether it's on a hike or visiting your neighborhood stream, snap a picture to help preserve the health of your stream by snapping a *Citizen Sniffer*.
Location: North America



Endangered

Listen to the unique songs of endangered Pacific Northwest killer whales to help identify human-related sounds, which put whales in danger.
Location: Global



Synapse

Join hundreds of thousands of other players to help map the 3D neural network of the human brain with an engaging video game!
Location: Online Only

"Libraries as Community Hubs for Citizen Science" Project

Your library is part of a first-of-its-kind ASU initiative supported by the Institute for Museum and Library Services (IMLS) to help libraries connect communities to Citizen Science! Look for more information soon on how you can help shape the development of Citizen Science Toolkits complete with instruments, instructions, and resources to support citizen scientists.

Participating Libraries:

Apache Junction Public Library
Southeast Regional Library
Mesa Public Library
Tempe Public Library
Scottsdale Public Library (Mustang)
White Tank Library



Citizen Science Day: April 13, 2019

Let Us Know!



What are you interested in investigating through participatory science programs?

What type of citizen science have you participated in?

Examples: air quality, nature, health and medicine, space, animals, etc.

Write your answer(s) on the "leaves" provided and post them on the tree below!



Cheri Grinnell

(remote presentation)

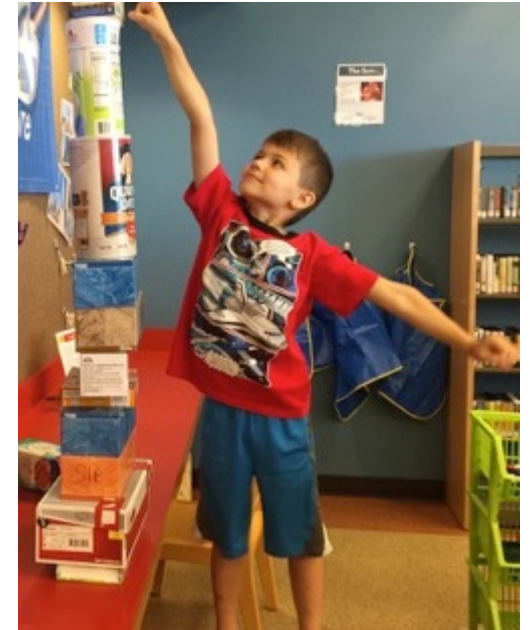
Breaking Down Barriers





Library

- Community gathering place
- Community resource
- On the front lines of education



Museum

- Place of learning
- Educational resource
- On the front lines of education



It's a natural partnership

3 month residencies in libraries across the state of Kentucky





“This exhibit brought in many new families that I was able to speak with and let them know we have programs even after the exhibit is gone. Making that first contact with families is crucial to them returning to be consistent users of the library and this could not have easily happened for some of these families without the exhibit being here.” **Lenisa Jones, Branch Manager, Marshall County Library**

“Science in Play 2Go helped me see the value in learning through play, recognize the science occurring with the simplest of materials and showed me I did not have to have all the answers to effectively facilitate the development of the skills needed for today’s world. In short, STEAM can be taught with a rock or a stick – it is the question that matters – it begins the journey...”

Janet Harris, Director, Muhlenberg County Library

“Science in Play 2Go has increased awareness of the Kentucky Science Center’s ability to provide science experiences for all ages in all corners of the state.” **Mira Gentry-Johnson, Senior Manager of Visitor Experience, Kentucky Science Center**

“I have taken my class on lots of field trips, but this has been the best. I just had to email you. It’s been several weeks and my students are still talking about it. It gave me a lot of ideas on how I could incorporate science in my classroom. Is it coming back?”

Logan County Kindergarten Teacher

“We only have one car. I could never bring my children to the museum. This is so wonderful!”

Oldham County Mom

Questions
Resources
Discussion

Thank you