

Fear Less!

Bringing Chemists and Chemistry Experiments into Your Museum



Science Museum of Minnesota



EXPLORE SCIENCE

Let's Do Chemistry

Association of Children's Museums – Interactivity Conference
Denver, CO May 2019

Presenters

- **Catherine McCarthy,**
Science Museum of Minnesota, Saint Paul, MN
- **Frank Kusiak,**
Lawrence Hall of Science, Berkeley, CA
- **Gini Philipp,**
WOW! Children's Museum, Lafayette, CO
- **Barb McMillan,**
The Children's Museum in Oak Lawn, IL

Session Agenda

- **Catherine McCarthy**
- **Activity** (Gum, & Chocolate)
- **Gini Philipp**
- **Barb McMillan**
- **Frank Kusiak**
- **Q/A Discussion**

Catherine McCarthy
Science Museum of Minnesota
Saint Paul, MN

Project Overview

Explore Science: Let's Do Chemistry



Children's Creativity Museum, San Francisco



Catherine McCarthy
Science Museum of Minnesota

cmccarthy@smm.org

May 2019

Association of Children's Museums - Interactivity



Project Goals

Putting research into practice

Hands-on activities that increase:

1. Interest,
2. Relevance
3. Self-efficacy

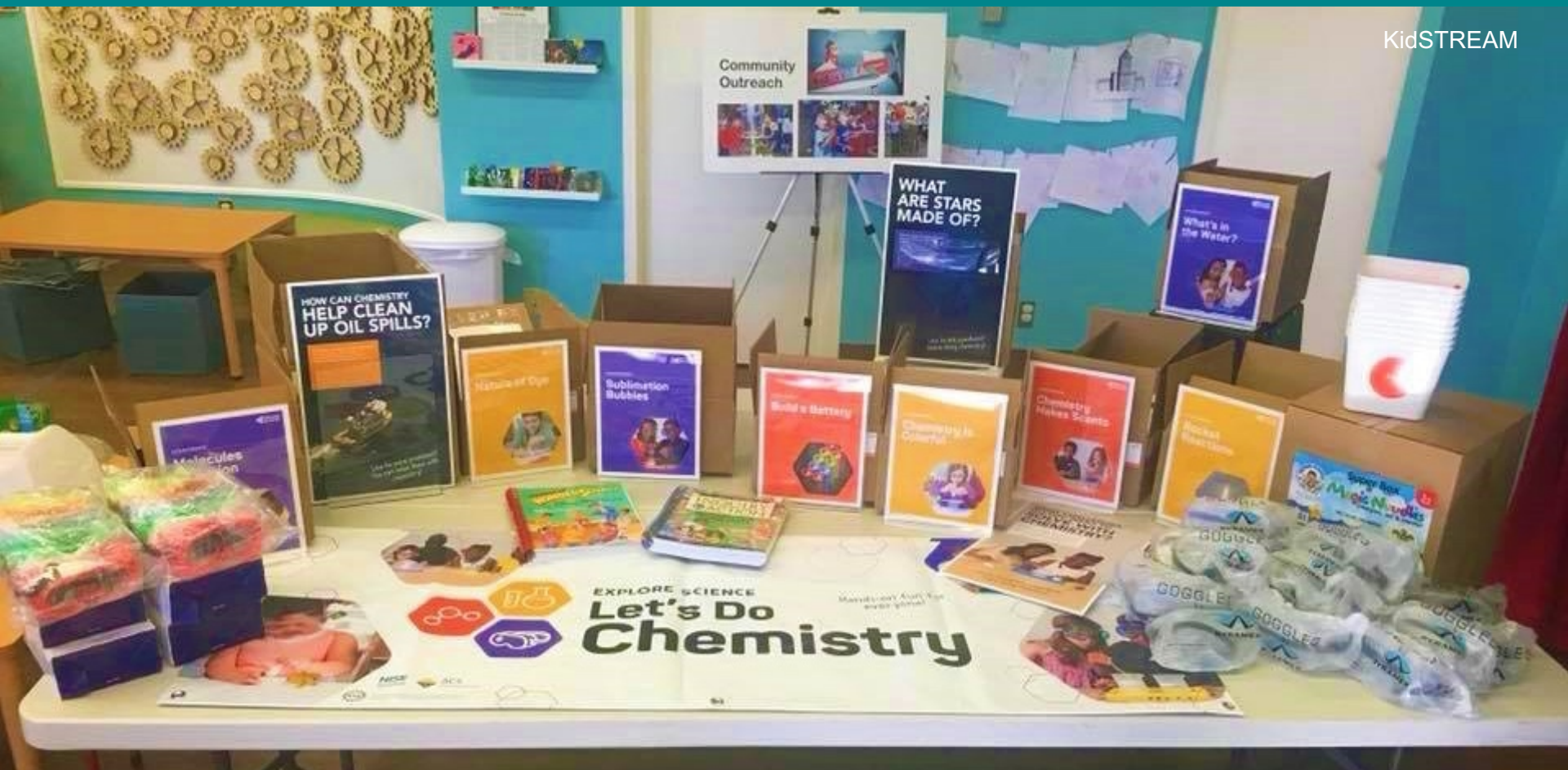


Explore Science: Let's Do Chemistry kit contents



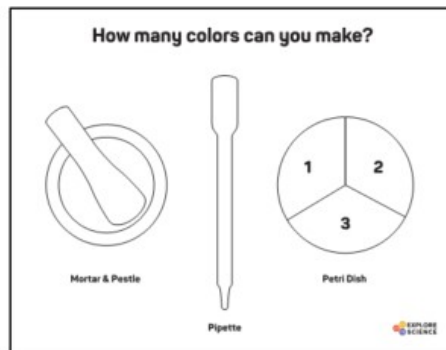
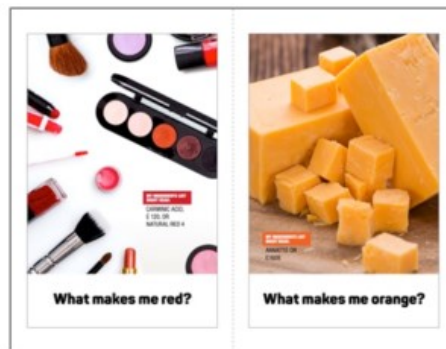
Explore Science: Let's Do Chemistry kit contents

KidSTREAM



Activity Guides

Activity guides



Training guides



Gum and Chocolate Training Guide

- learners will increase their feelings of **interest** in chemistry through hands-on exploration of chemistry concepts, and by making connections to everyday life
- learners will increase their understanding of the **relevance** of chemistry by explaining the applications of chemistry, and by reporting reactions to everyday life
- learners will increase their sense of **self-efficacy** related to chemistry through insight and new understanding and experiences as described below.

- Chemistry study how different material's behavior and change, and how materials interact with each other.

- Handwritten
- Drawing guide (bird, regular guide)
- Bentley's Elements, illustrations
- Traces
- Tracing
- Mosaic sign
- Set's paper (newspaper)

LET'S DO CHEMISTRY

Self-rates	Time to completion	Number of participants
Strongly agree, Agree, and Disagree	3-10 min each	40 per group

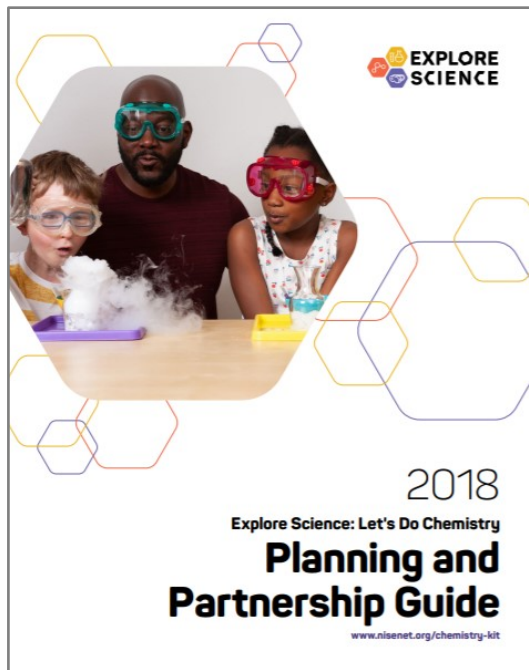
Interventi	Time to implement	Number of participants
Strong swimming, listening and	1-12 months	8-10 per group

[illegible]

Lesson five

1. Sketch a group (using your sketching group) of 10 people.
2. Designate one of the group the 'chattering' in gallery (about 5 min) so that the group can discuss the sketching group's work.
3. Have the sketching group leave the gallery and sketch the next group.
4. Repeat the process until all groups have had a chance to sketch the next group.
5. Repeat the process until all groups have had a chance to sketch the next group.
6. Repeat the process until all groups have had a chance to sketch the next group.
7. Repeat the process until all groups have had a chance to sketch the next group.
8. Repeat the process until all groups have had a chance to sketch the next group.
9. Repeat the process until all groups have had a chance to sketch the next group.
10. Repeat the process until all groups have had a chance to sketch the next group.

Event Planning an Partnerships Guide



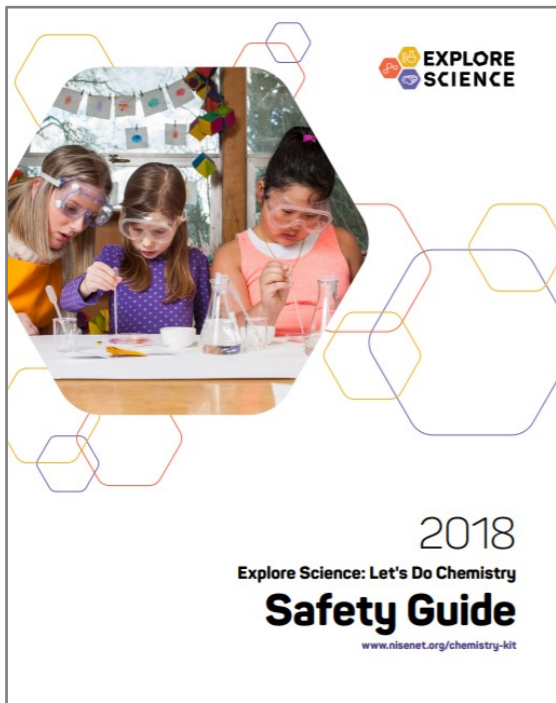
Event Planning and Partnership Guide

This guide contains everything you will need to begin planning and promoting your Let's Do Chemistry event.

Guide covers

- Planning timeline
- National Chemistry Week
- Collaborations and finding local experts
- Training staff and volunteers
- Additional resources
- Evaluating your event
- Promotional and marketing materials

Safety Guide



Safety Guide

Use this guide as you plan your Let's Do Chemistry event and as a resource before training, demonstrating, or facilitating the activities.

Guide covers

- Let's Do Chemistry kit safety practices and protocols
- General chemistry safety guidelines, protocols, and precautions
- Additional safety tips
- Chemistry materials and supplies
- Additional resources

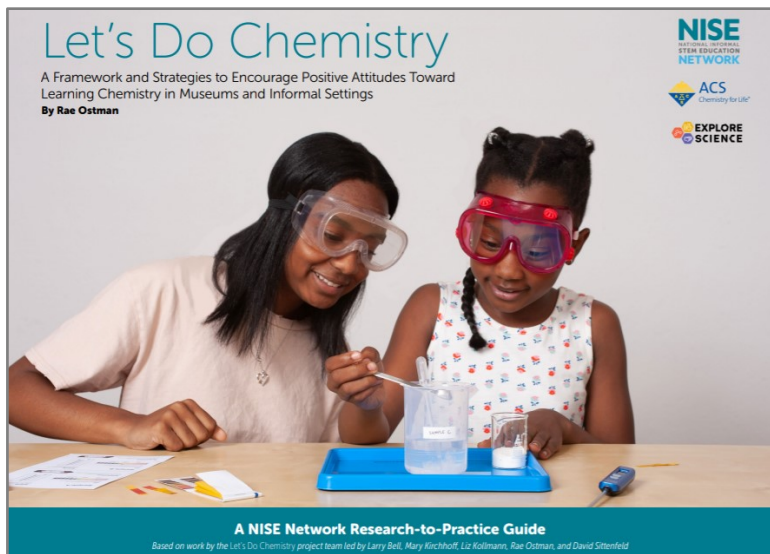
Framework and Strategies

Framework and Strategies Research to Practice Guide

This guide will help you and your facilitators run a fun, successful Let's Do Chemistry event and to encourage positive attitudes toward learning chemistry. Within the guide

Guide covers

- Let's Do Chemistry project overview
- Learning chemistry in museums
- Creating the framework
- Understanding the framework
- Using the framework



Professional Development Videos

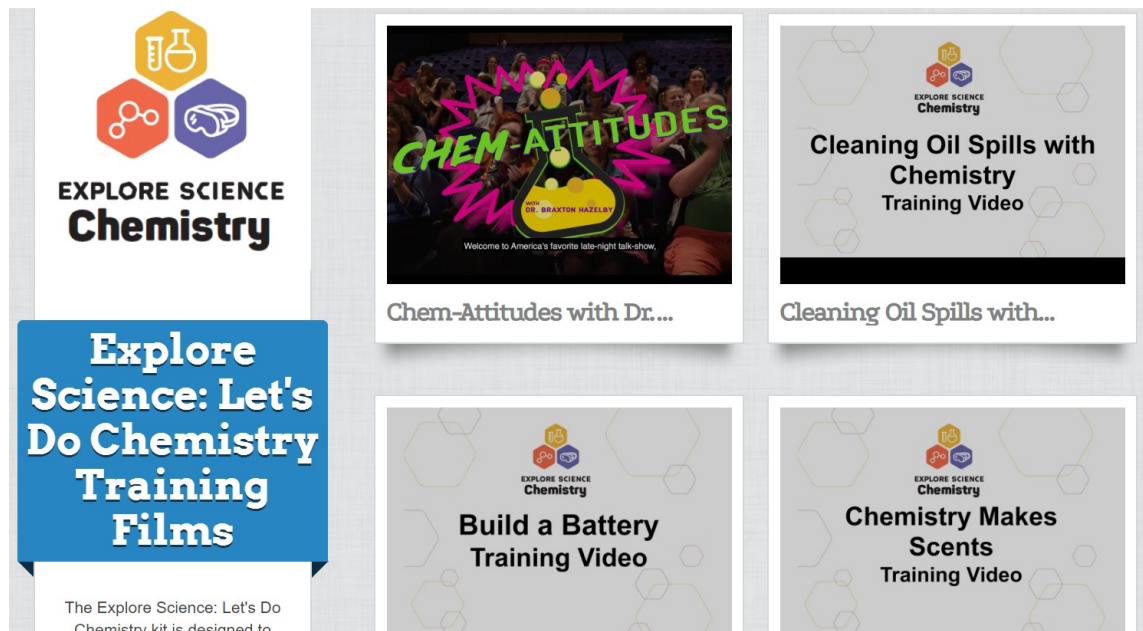
Training videos

Training videos for each hands-on activity intended for staff and volunteer educators

Facilitation video

Chem-Attitudes with Dr. Braxton Hazelby facilitation training video

This funny video will help you and your facilitators run activities in a way that encourages participation and positive attitudes towards learning about chemistry.



Digital Materials

Physical kits

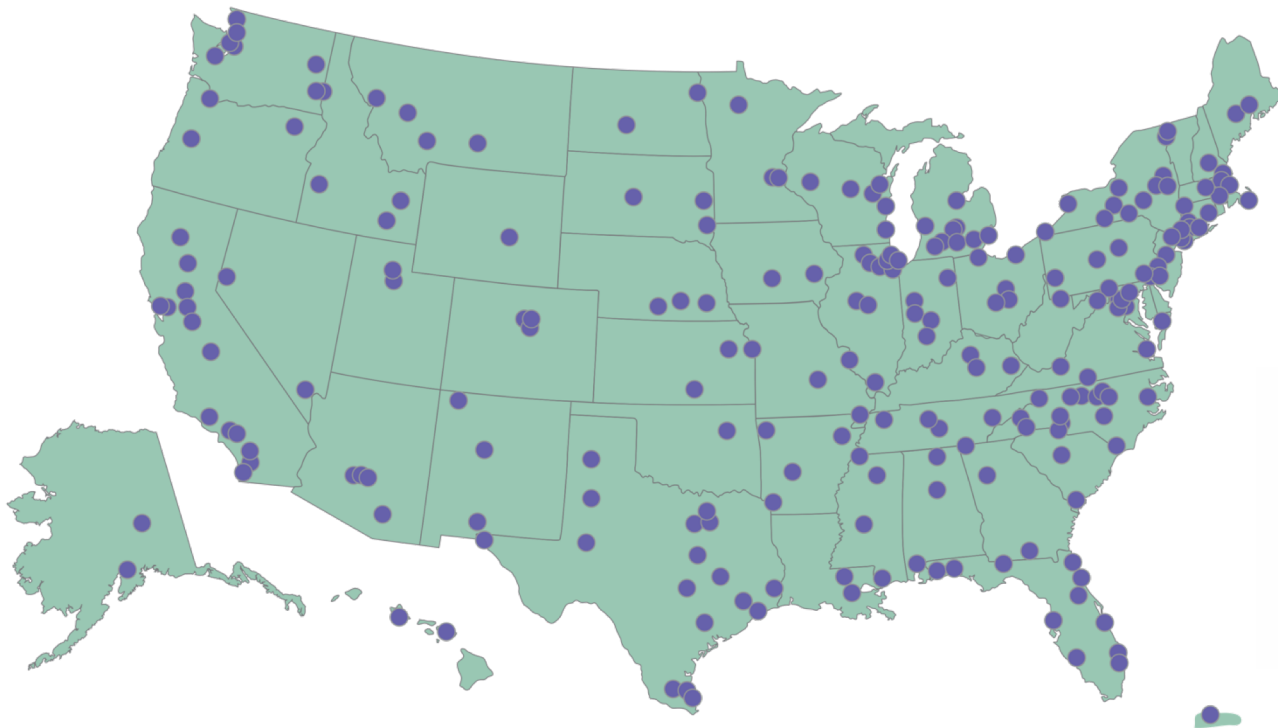
Include USB drive

Digital Download

www.nisenet.org/chemistry-kit



Explore Science: Let's Do Chemistry kits



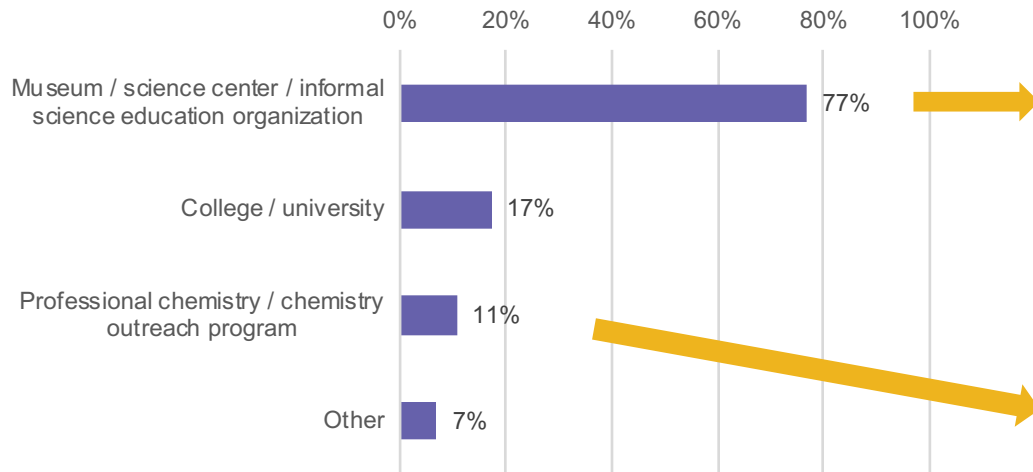
EXPLORE SCIENCE
Let's Do Chemistry

250 physical kits distributed across the US
museums, universities, ACS Local Sections & Student Chapters

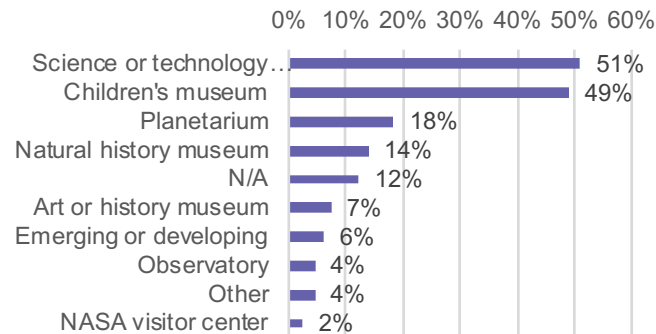
Who hosted Let's Do Chemistry events?

Organization type

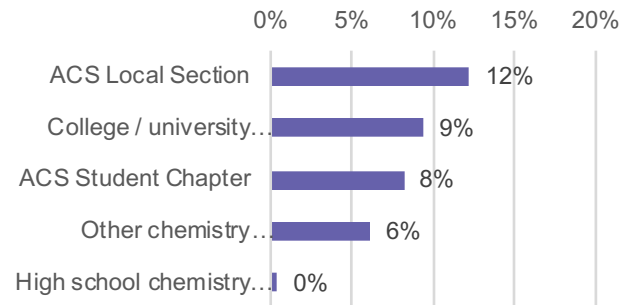
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Museum type



Chemistry organization



Public audiences reached through chemistry events

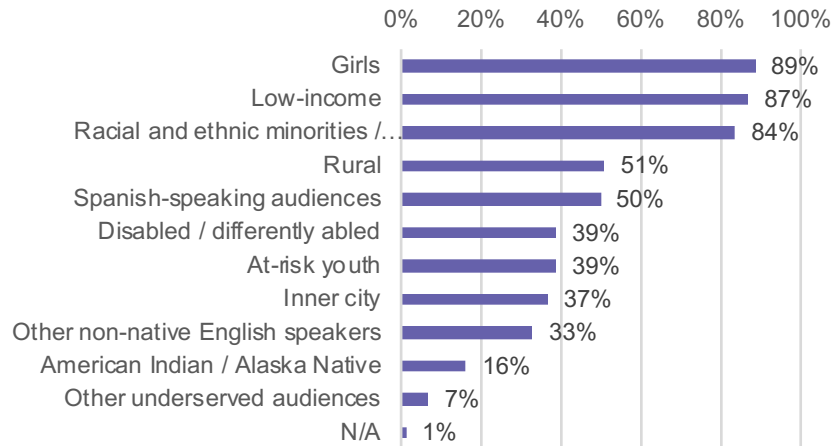


Shared by ECHO, Leahy Center for Lake Champlain, VT



Shared by Discovery Station, Hagerstown, Maryland

Event audiences



- **210,526 people reached** through October-November 2018 Let's Do Chemistry events across the US
- **6,121 volunteers participated** in and facilitated hands-on activities
- Many partners using in other ways

Events across the United States



Events across the United States



Museum of Science, Boston, MA



Science Museum of Minnesota,
Saint Paul, MN



Events across the United States



Children's Discovery Museum, Normal, Illinois



Children's Discovery Museum, Normal, Illinois



Discovery Station, Hagerstown, Maryland



University of Arkansas
Center for Mathematics
and Science Education



Fairbanks Children's Museum, Alaska

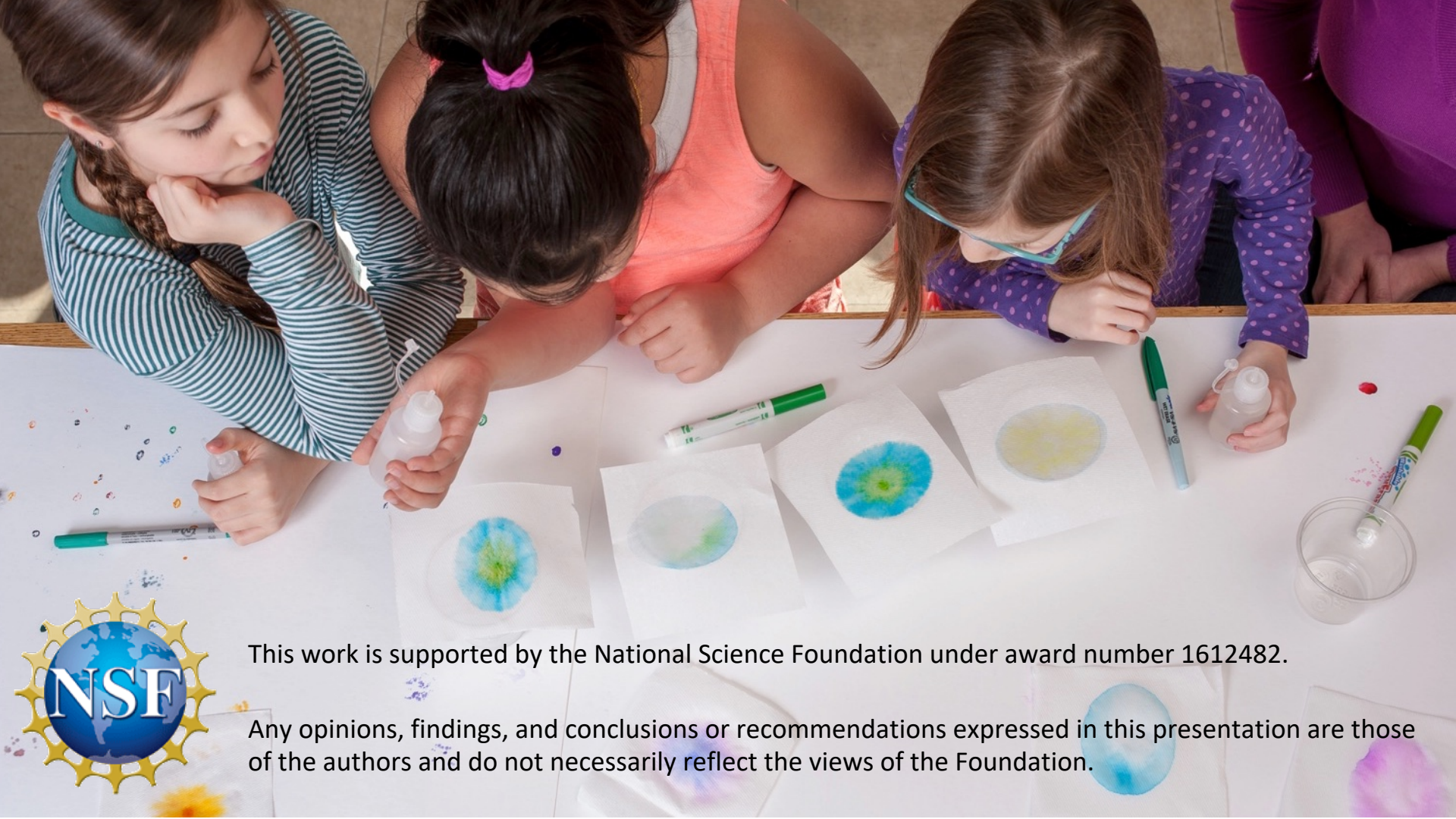


Fairbanks Children's Museum

Thank you to museum and chemist partners for hosting Explore Science: Let's Do Chemistry events!



Shared by Museum of Science, Boston



This work is supported by the National Science Foundation under award number 1612482.

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.



Gum & Chocolate



Gini Philipp

WOW! Children's Museum

Lafayette, CO

Gini Philipp, Director of Early Childhood Education



WORLD OF WONDER
CHILDREN'S MUSEUM

Lafayette, CO





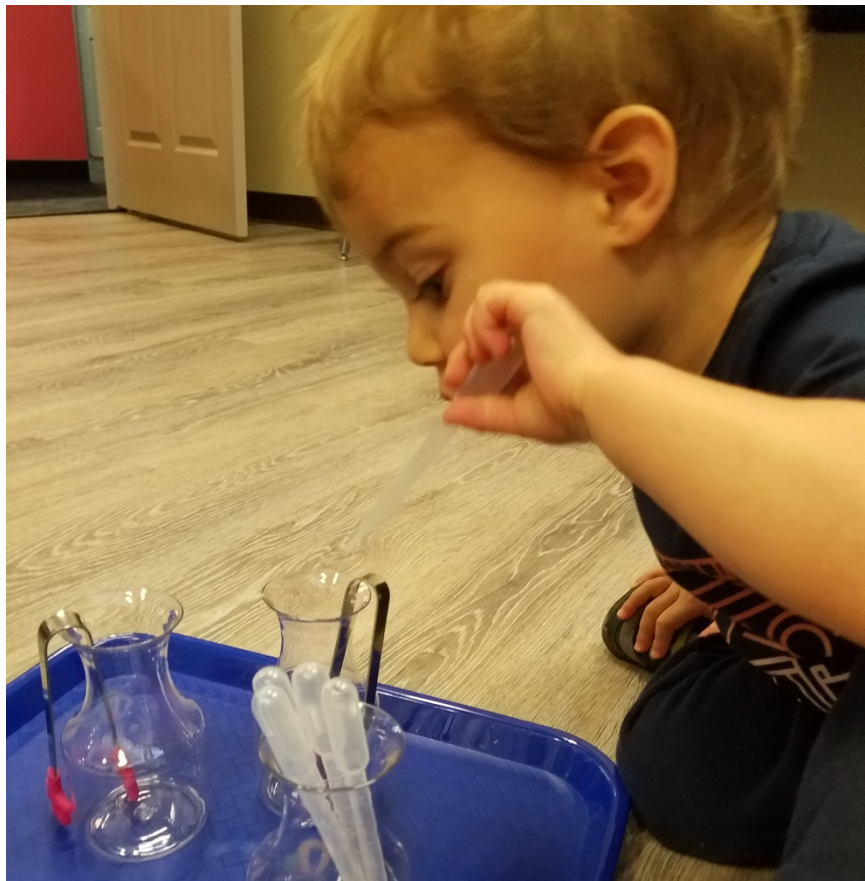
LET'S DO CHEMISTRY
WITH LITTLE
LEARNERS



Chemistry with
toddlers?!

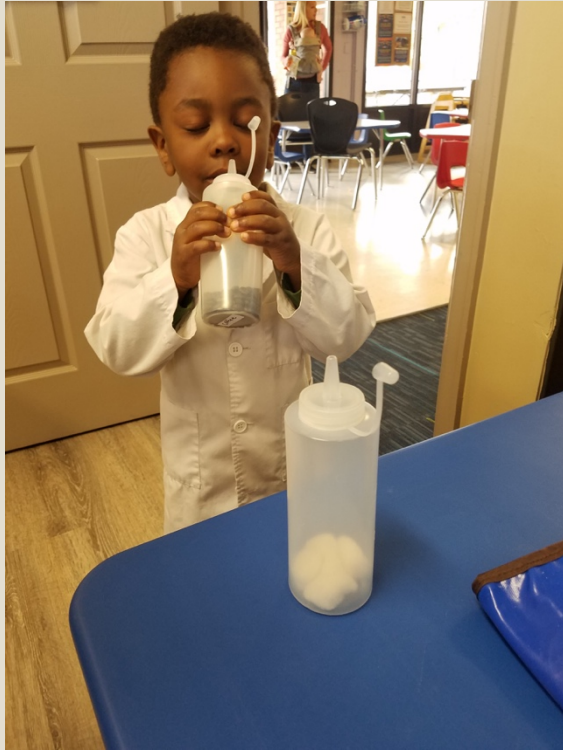


**Molecules
in Motion**



LOOSE PARTS: CHEMISTRY

Let's Do Tinkering!





Barb McMillan

The Children's Museum in Oak Lawn
Oak Lawn, IL

Children's Museum in Oak Lawn



Children's Museum in Oak Lawn



Children's Museum in Oak Lawn



Children's Museum in Oak Lawn



Children's Museum in Oak Lawn



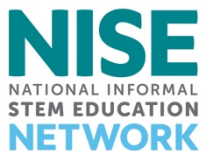
Children's Museum in Oak Lawn



Frank Kusiak

Lawrence Hall of Science,
Berkeley, CA

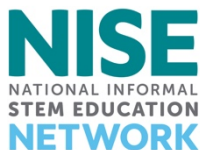
Getting Chemistry Event Help



Frank Kusiak
frank_kusiak@berkeley.edu
May 9, 2019



Chemistry Peeps



- Public Science Center for UC Berkeley
- 170,000+ total visitors per year
 - 60,000 school-aged children (mostly preK - 6)





Reaching Out to Subject Matter Experts

American Chemical Society

- National Chemistry Week (Last full week of October)
- 2019 Theme: Marvelous Metals
- National Chemistry Week Coordinator
Look Up:
<http://bit.ly/acs-coordinators>
- ACS Student Chapters:
<http://bit.ly/acs-student-chapters>

Alternative SME's

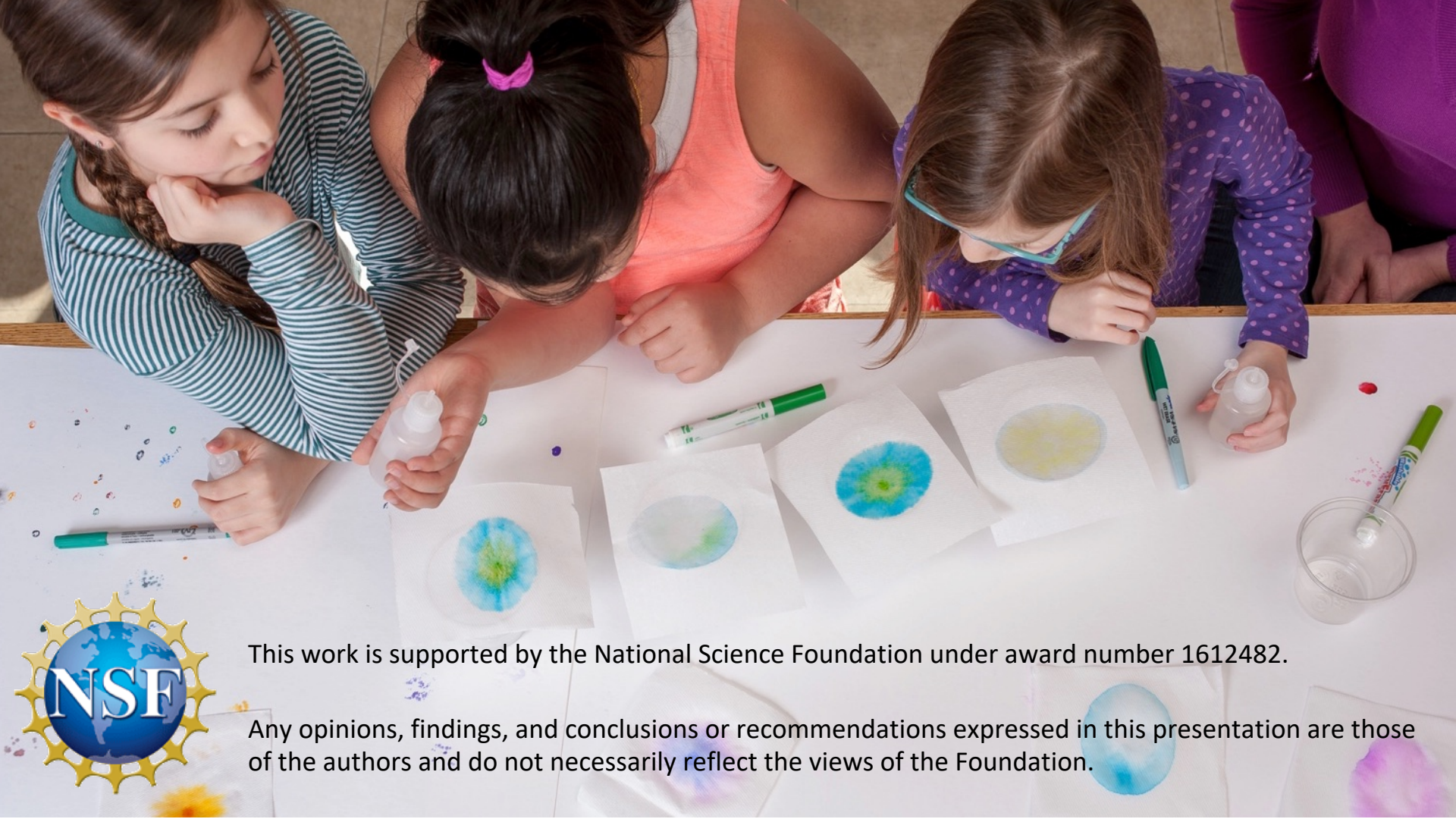
- Chemistry Departments/Research Center
 - Major universities chemistry/research departments have an outreach coordinator(s)
 - Find the “Contact Us” webpage and call them.
- Chemistry Honor Societies
 - Gamma Sigma Epsilon
 - Phi Lambda Upsilon
- Local High School/Middle School
 - <http://bit.ly/acs-chemclub>
- Local industry

What do you say?

- Be clear who you are and what your museum is.
- Have a date and time frame in mind, but make sure it's 3-4 months in advance.
- For a college/university, be mindful of when your event is and how it fits in the academic calendar. Be flexible if your event is far enough out.
- Be open to who will be willing to help:
 - it may be the outreach coordinator, faculty, or a student chapter!
 - Do you want just one person to help your staff understand concepts or do you want many volunteers?
 - Do you want to pair your volunteers with those coming from the university/club?
 - Don't make their commitment onerous (NISE materials help!)

So You Got An SME!

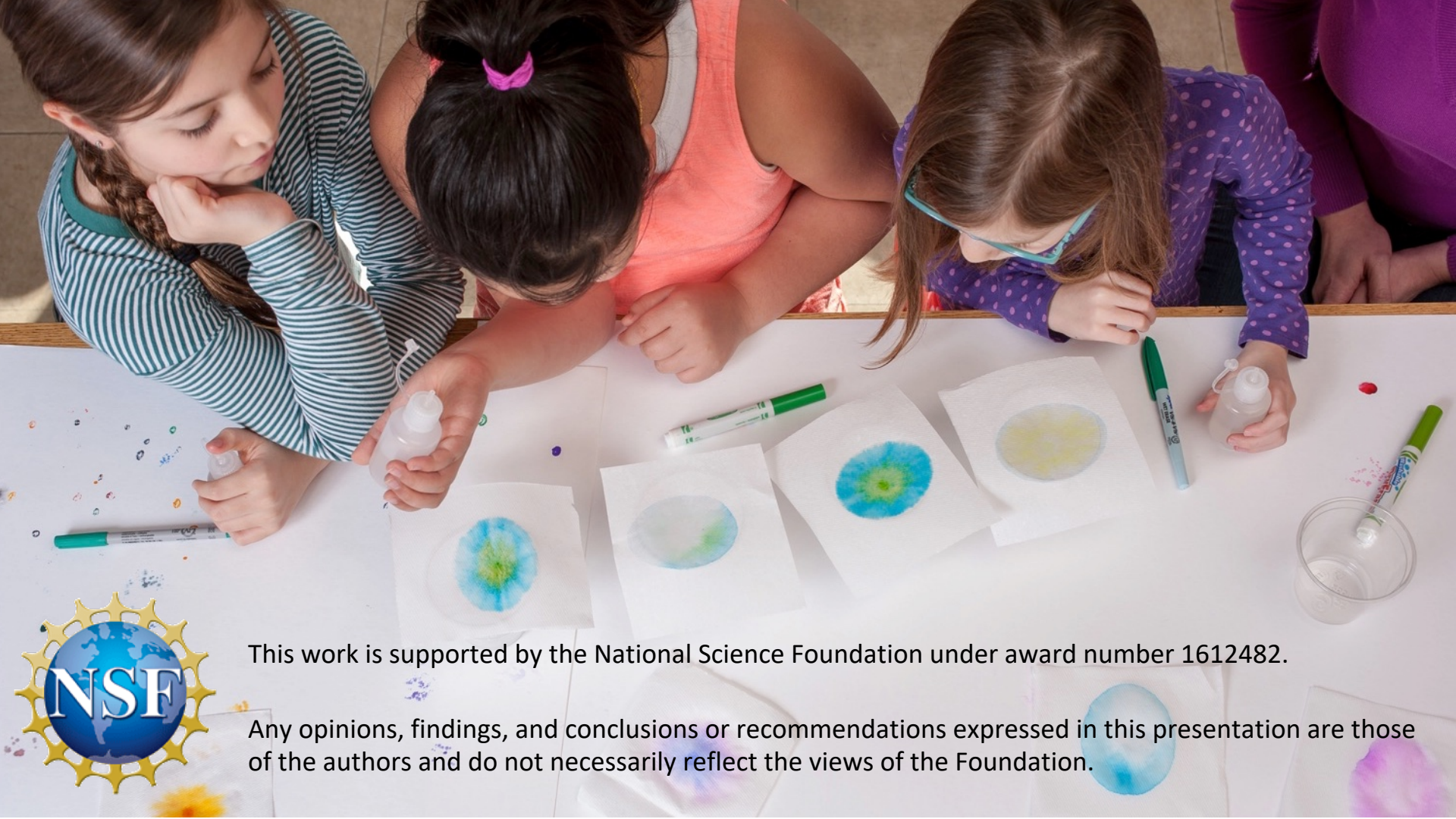
- Prepare them by being very clear what's expected and what they will expect.
- For NISE materials:
 - we provide materials digitally: send them the activity and facilitation guides in advance.
 - We also have activity training videos which are probably better than the guides for onboarding.
 - We also have training videos for SME's!
 - <http://bit.ly/nise-training-videos>
- Be prepared to maintain this relationship because there's a lot of turnover on both sides!



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Discussion