

Bringing chemists and chemistry experiments into your museum and out into your community



Science Museum of Minnesota



Agenda

- **Catherine McCarthy**, cmcarthy@smm.org
Science Museum of Minnesota, Saint Paul, MN
- **Patti Galvan**, P_Galvan@acs.org
American Chemical Society, Washington, DC
- **Emily Belle**, ebelle@sciencenter.org
Sciencenter, Ithaca, NY
- **Soma Chatterji**, ChatterjiS@carnegiesciencecenter.org
Carnegie Science Center, Pittsburgh, PA
- **Darrell Porcello**, porcello@gmail.com
Children's Creativity Museum, San Francisco, CA
- **Discussion and Questions**

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
ASTC 2019



Project Goals

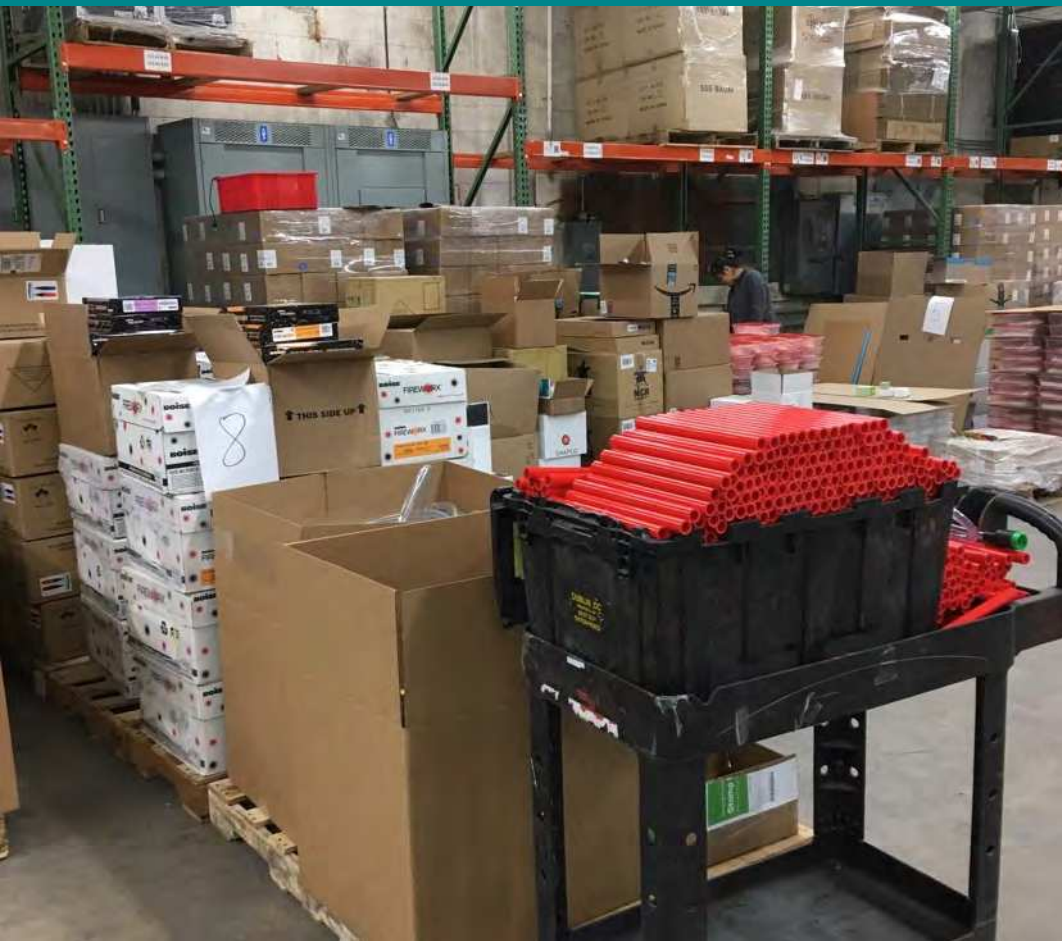
Putting research into practice

Hands-on activities that increase:

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



Explore Science: Let's Do Chemistry kit contents



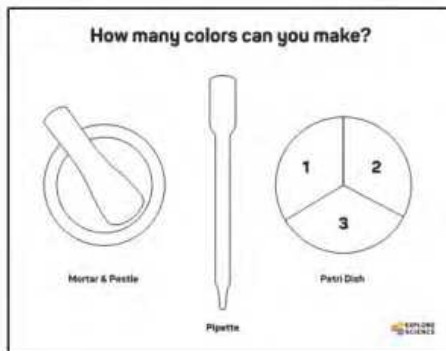
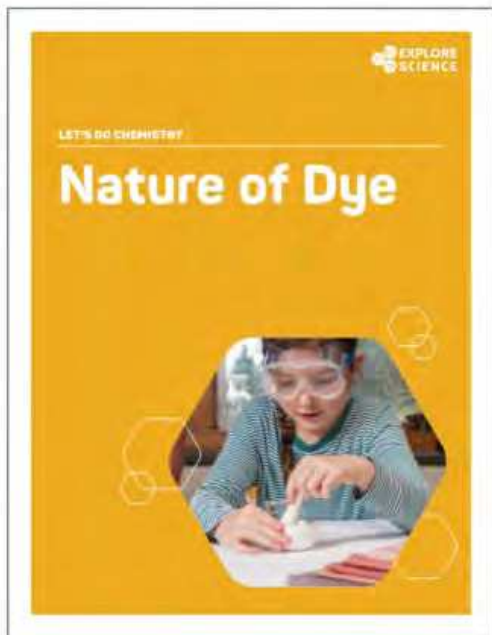
Explore Science: Let's Do Chemistry kit contents

KidSTREAM



Activity Guides

Activity guides

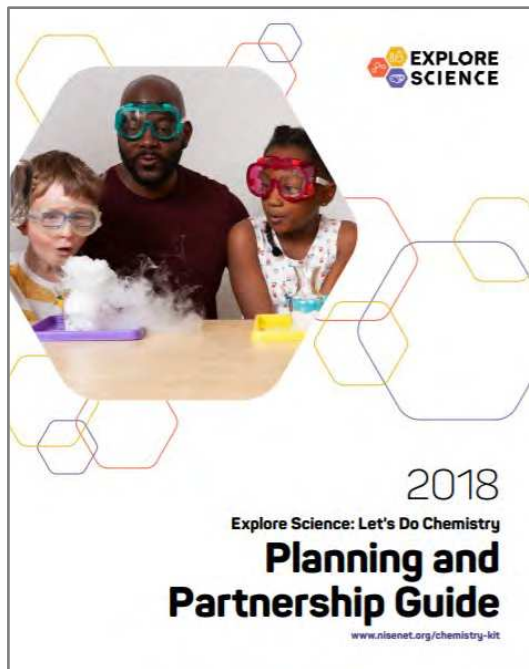


Training Guides

Training guides



Event Planning an Partnerships Guide



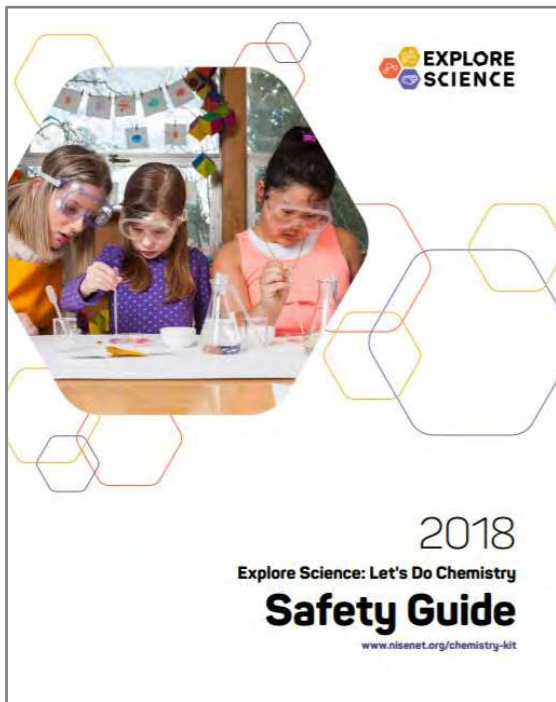
Event Planning and Partnership Guide

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

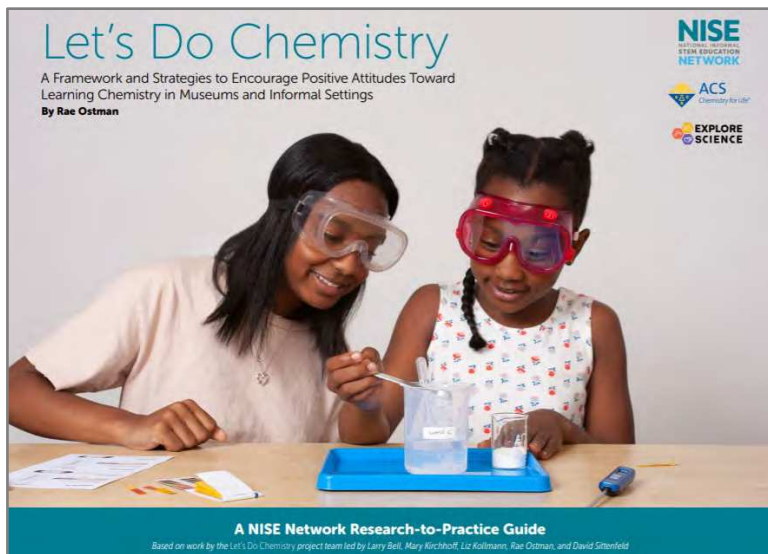
Framework and Strategies

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

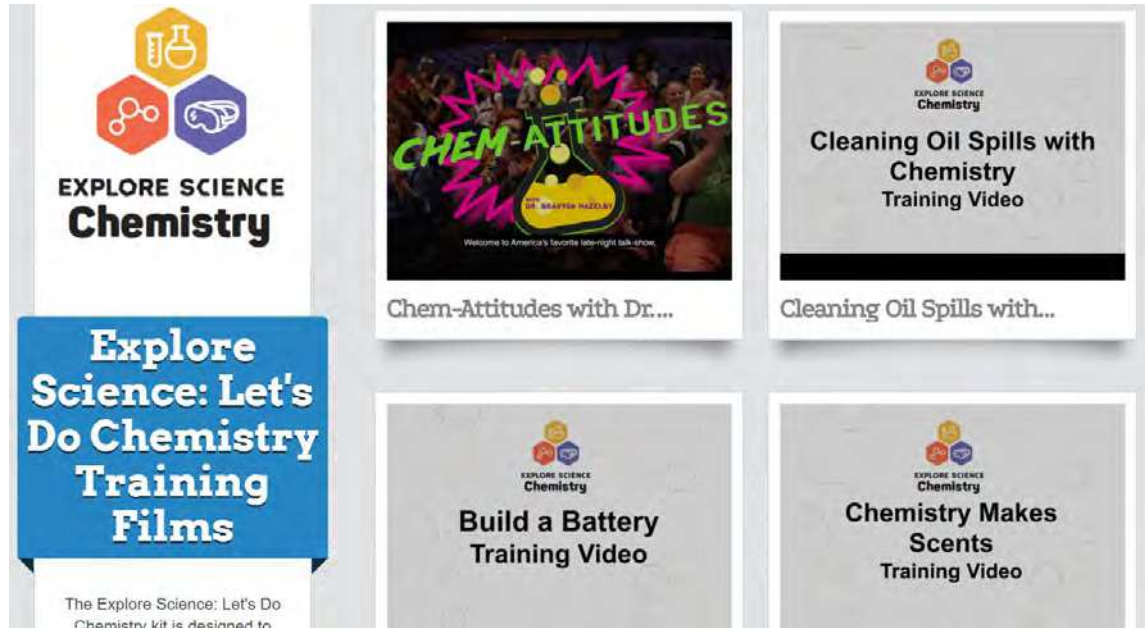
Training videos

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

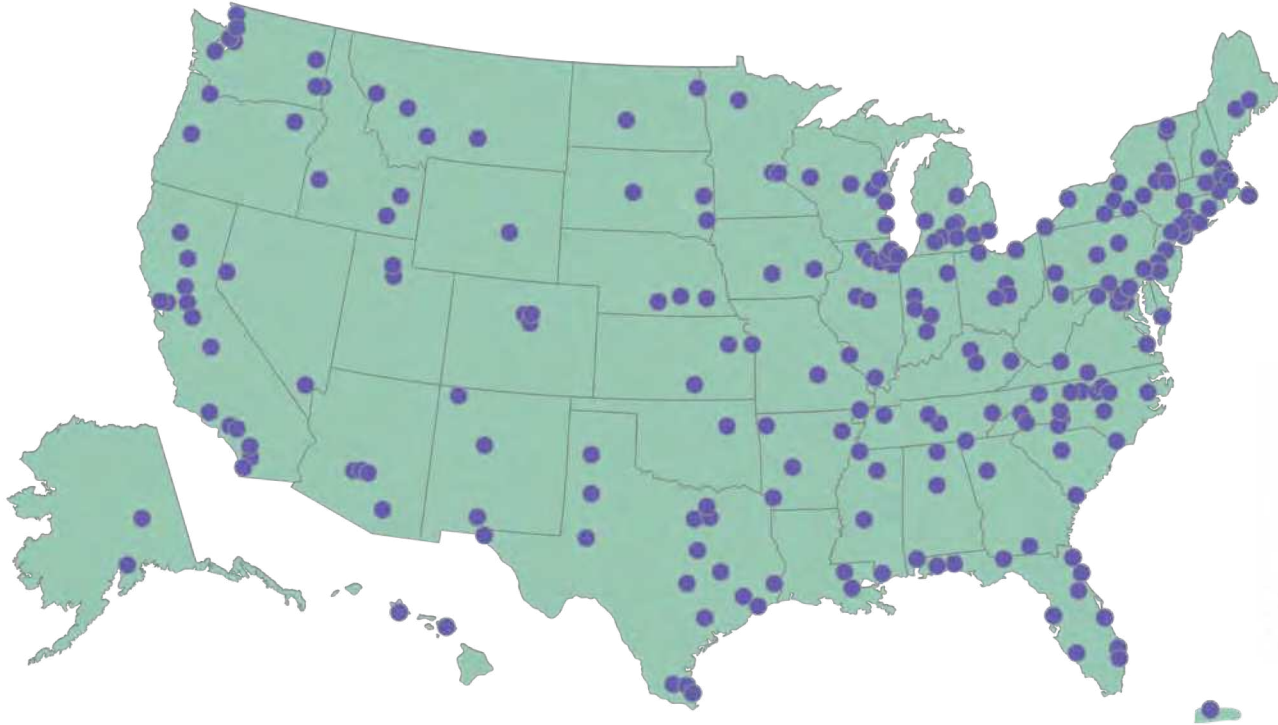
Include USB drive

Digital Download

www.nisenet.org/chemistry-kit



Explore Science: Let's Do Chemistry kits



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

Events across the United States



Science Museum of Minnesota



Shared by Sciencenter



Shared by Discovery Station



Shared by Museum of Science

Events across the United States



Museum of Science, Boston, MA



Science Museum of Minnesota,
Saint Paul, MN



EXPLORE SCIENCE
Let's Do Chemistry



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

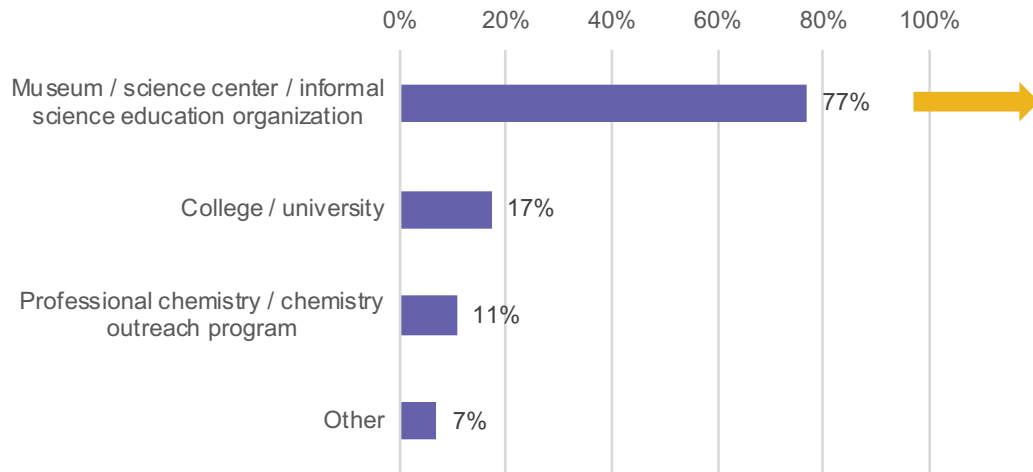


Fairbanks Children's Museum

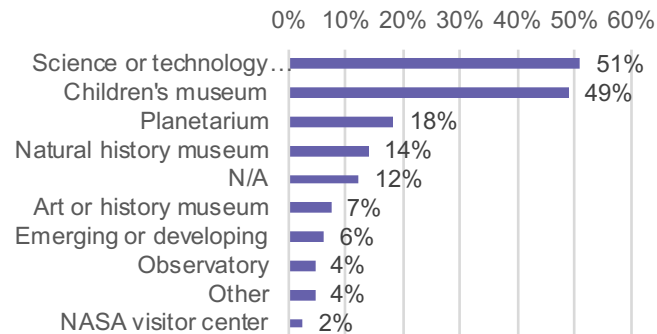
Who hosted Let's Do Chemistry events?

Organization type

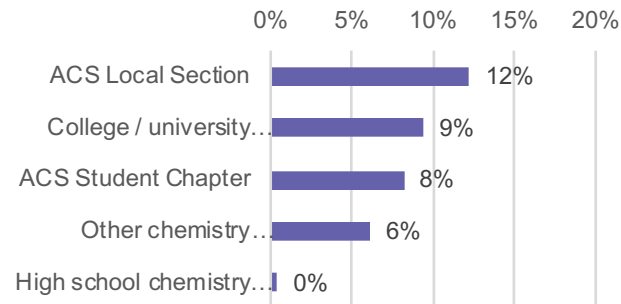
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Museum type



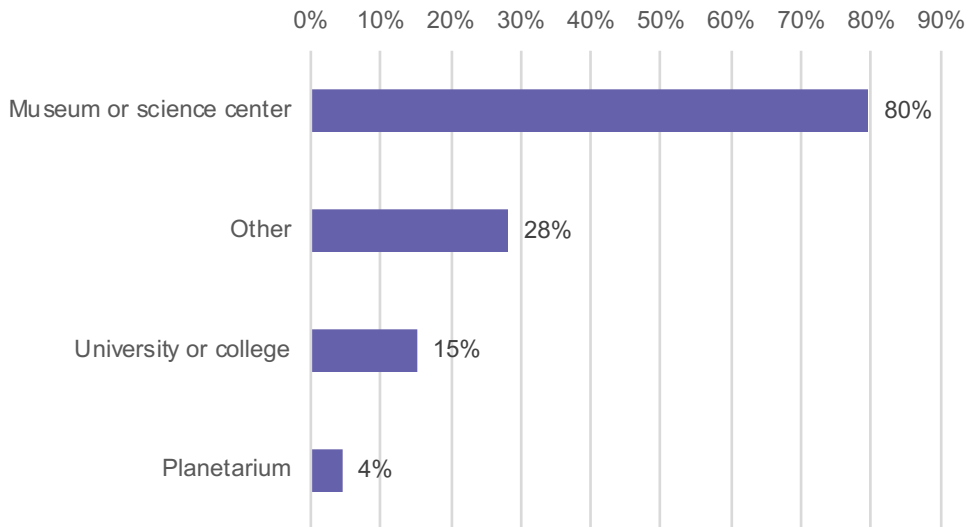
Chemistry organization



Where were events hosted?



Event location



Other locations included:

- Public library, K-12 schools, school district family science events
- Day camps, afterschool programs, outdoor field classroom
- Boys and Girls Clubs, Scouts
- Church, church camp
- Community organizations, community centers, local street markets, festivals, malls
- Fair grounds
- Hospital clinic
- State park, National laboratory

Public audiences reached through events

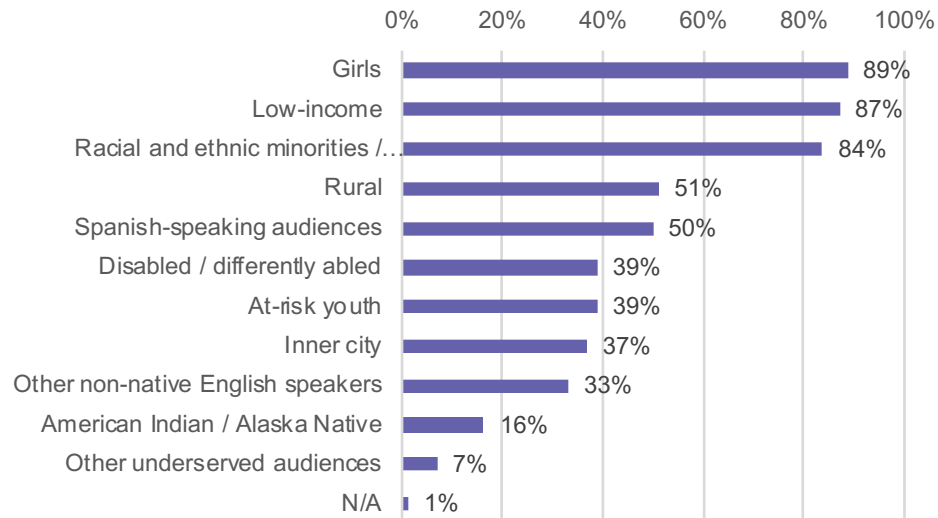


National Chemistry Week @ACS_NCW · 23 Oct 2018

Thanks to @airandspace and our volunteer chemists who taught over 320 people about the importance of #chemistry through 8 engaging hands-on experiments!

#NationalChemistryWeek @AmerChemSociety – at National Air and Space Museum

Event audiences



Public audiences reached through events



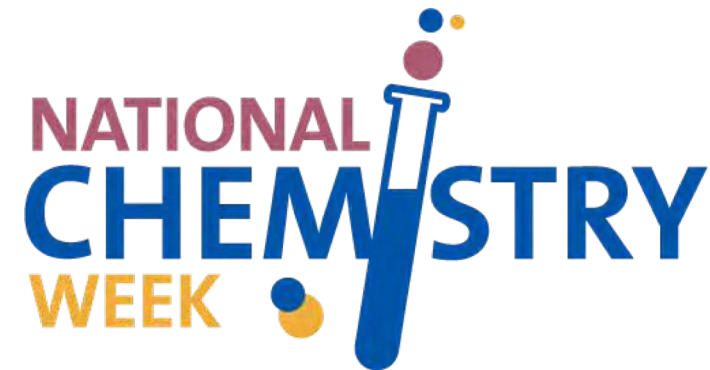
Shared by ECHO, Leahy Center for Lake Champlain, VT



Shared by Discovery Station, Hagerstown, Maryland

- **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 are already been using the materials in other ways following the Fall 2018 events

More Opportunities for Special Events



INTERNATIONAL
YEAR OF THE
PERIODIC TABLE
2019

nisenet.org/national-chemistry-week

National Chemistry Week and Let's Do Chemistry events

“The kit provided an easy way for NISE Network partners and ACS groups to make new connections and learn about each other” - David Horwitz, Outreach Programs Manager, ACS



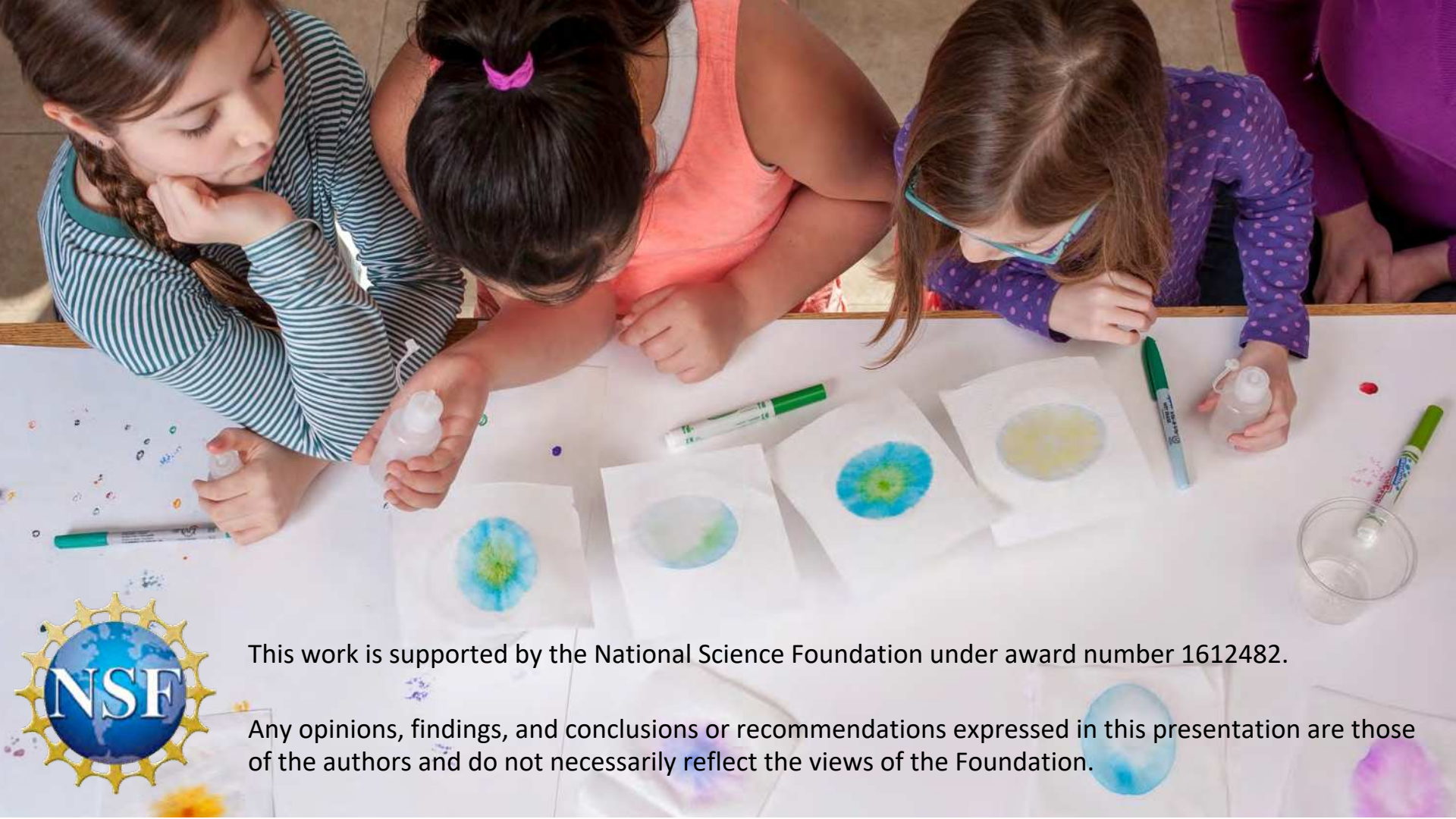
69% of Explore Science: Let's Do Chemistry kit recipients reported using their activities during National Chemistry Week (October 21st-27th, 2018)

40% of kit recipients reported utilizing ACS volunteers (ACS Local Sections or Student Chapters) for their events

30% of kit recipients reported collaborating with either a museum or ACS group

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





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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.

Patti Galvan
American Chemical Society
Washington, DC

American Chemical Society



Leverage ACS resources and *Let's Do Chemistry* for National Chemistry Week 2019

Patti Galvan
22 September 2019

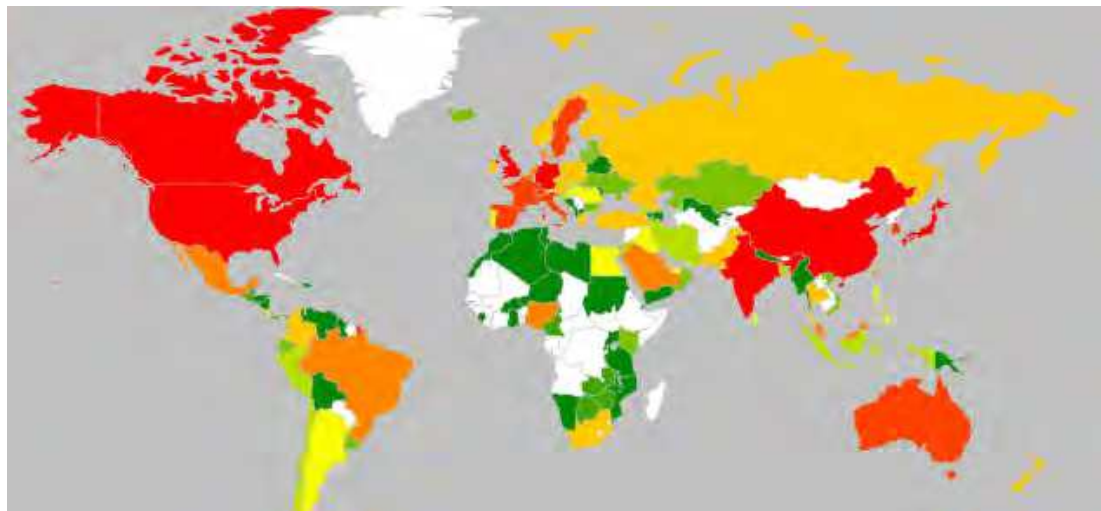


Who We Are



- A congressionally chartered professional society for chemists and related professionals, and the world's largest scientific society.
- **Vision:** To improve people's lives through the transforming power of chemistry
- **Mission:** To advance the broader chemistry enterprise and its practitioners for the benefit of Earth and its people

Who We Are



- Over 1,000 Members
- 500 – 999 Members
- 200 – 499 Members
- 100 – 199 Members
- 50 – 99 Members
- 20 – 49 Members
- 10 – 19 Members
- 5 – 9 Members
- 1 – 4 Members

More than 2,500 ACS members in Canada

1 Student Chapter at the University of Toronto Mississauga

81% of membership is in the US

Why NCW?



- National Chemistry Week (NCW) unites us in communicating the importance of chemistry to the public at the local, national, and global levels to make a positive change in the public's impression of chemistry.



NCW Reach in the U.S.



- NCW 2017
 - 81% of ACS local sections participated
 - 163K+ issues of the *Celebrating Chemistry* were distributed
- NCW 2018
 - 91% of ACS local sections participated
 - 167K+ issues of the *Celebrating Chemistry* were distributed
 - ACS local sections interacted with more than 75K+ people at in-person events
 - NCW reached more than 25M+ online



NCW Collaborations



The New York Local Section teams up with 19 universities and nonprofit organizations to host an annual NCW event at the New York Hall of Science for 1,200 attendees



NCW Collaborations



The Northeast Tennessee Local Section works with Eastman Chemical to provide 1,400 students a day of chemistry



NCW Collaborations



The Puget Sound Local Section
teams up a local student chapter to
visit 23 middle school classrooms



NCW Collaborations



The Permian Basin Local Section works with three high school ChemClubs to host tables of activities at the local mall and during the annual homecoming float parade



NCW Resources



NCW Coordinator Lookup Platform

A screenshot of a web browser displaying the ACS National Chemistry Week Coordinator Lookup page. The page has a dark blue header with navigation links for "ACS", "Publications", "C&EN", and "CAS", and a "Log In" button. The main content area features the ACS logo and the title "National Chemistry Week Coordinator Lookup". Below the title, there is a breadcrumb trail: "American Chemical Society > National Chemistry Week Coordinator Lookup". The main heading is "National Chemistry Week Coordinator Lookup". A sub-heading reads: "You can find National Chemistry Week Coordinators in a local section by entering either your state or a 5-digit zip code." There are two radio buttons: "Search by Zip Code" (selected) and "Search by State". Below the radio buttons is a text input field labeled "Zip Code:" and a button labeled "Find National Chemistry Week Coordinator".

www.ncwlookup.acs.org



NCW Resources

Educational Resources



www.acs.org/ncw

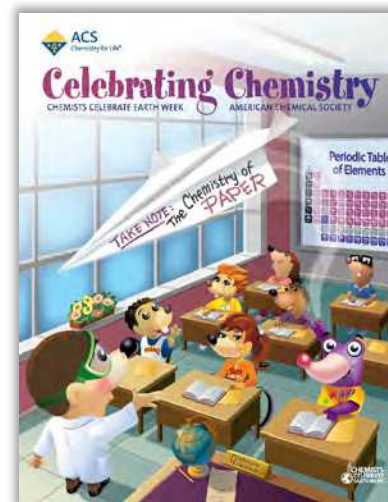
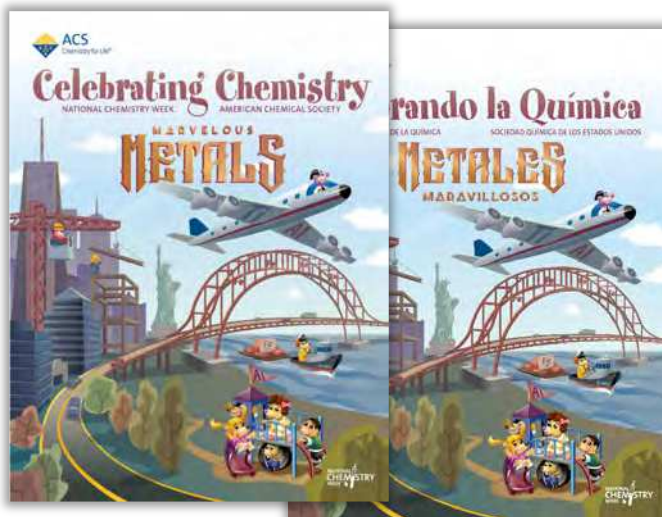


NCW Resources



ACS
Chemistry for Life®

Digital Celebrating Chemistry

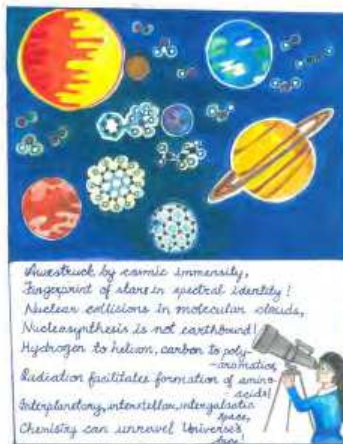


www.acs.org/celebratingchemistry



NCW Resources

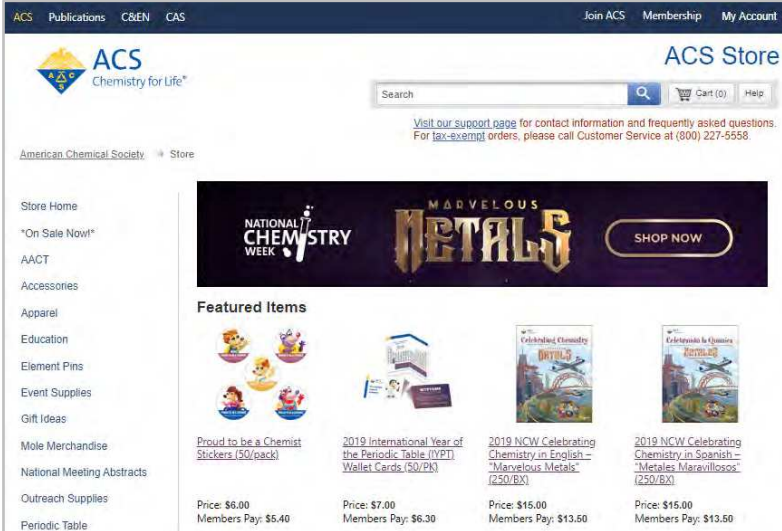
Illustrated Poem Contest



www.acs.org/ncw

NCW Resources

Promotional Items



The screenshot shows the ACS Store website interface. At the top, there are navigation links for ACS, Publications, C&EN, CAS, Join ACS, Membership, and My Account. The main header includes the ACS logo and the text "ACS Store". A search bar is present, along with a shopping cart icon showing 0 items and a help link. Below the header, there is a promotional banner for "NATIONAL CHEMISTRY WEEK MARVELOUS METALS" with a "SHOP NOW" button. The "Featured Items" section displays four products:

Item	Price	Members Pay
Proud to be a Chemist Stickers (50/pack)	\$6.00	\$5.40
2019 International Year of the Periodic Table (IYPT) Wallet Cards (50/PK)	\$7.00	\$6.30
2019 NCW Celebrating Chemistry in English - "Marvelous Metals" (250/BX)	\$15.00	\$13.50
2019 NCW Celebrating Chemistry in Spanish - "Metales Maravillosos" (250/BX)	\$15.00	\$13.50

www.store.acs.org



NCW Resources



Design Toolkit

Social Media

- #NCW
- #NationalChemistryWeek
- Marvelous Metals
- Twitter - @ACS_NCW
- Facebook - National Chemistry Week



www.acs.org/ncw



Are you planning a chemistry event during National Chemistry Week 2019?



NCW Resources

Find an Event



National Chemistry Week
11 likes · 26 likes

- 12 Science Saturday 2019: Marvelous Metals**
Sat 8 AM - Valdosta State University - Valdosta, GA
77 people interested
- 20 National Chemistry Week 2019**
Oct 28 - Oct 28 - Everywhere
100+ people interested
- 20 National Chemistry Week**
Oct 29 - Oct 29 - (Roanoke State Chemical Society) - Oak Ridge TN
100+
- 20 National Chemistry Week**
Sun 11 AM - New York Local Section of the American Chemical Society
100+
- 24 National Chemistry Week: Marvelous Metals**
Thu 7 PM - (Chagrin Falls Branch Library) - Chagrin Falls, OH
100+
- 25 National Chemistry Weekend with America...**
Oct 25 - Oct 26 - Cincinnati Museum Center - Cincinnati
100+ people interested
- 26 Midland ACS Fall Scientific Meeting - Marvel...**
Sat 8 AM - The Conference Center at Sapphire Valley
100+ people interested
- 26 National Chemistry Week: Marvelous Metals**
Sat 3 PM - (Gates Mills Branch Library) - Gates Mills, OH
100+

Already planned your event?

Promote your NCW event on our Facebook events page!

Submit



Check for
local events
in your area!

View all Events

www.acs.org/ncw



Thank You!



NCW 2019 – October 20-26
Questions? Contact outreach@acs.org

MARVELOUS
METALS
OCTOBER 20-26, 2019



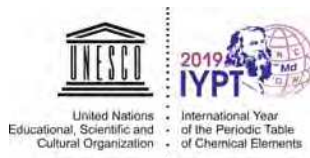
American Chemical Society



Celebrating the International Year of the Periodic Table of Chemical Elements (IYPT 2019)

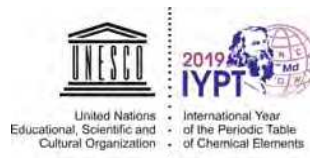
Patti Galvan
22 September 2019

IYPT 2019



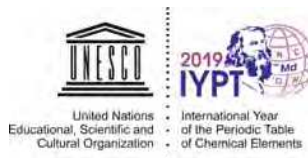
- 2019 is the 150th anniversary of the publication of Mendeleev's Periodic Table of Chemical Elements in 1869
- IYPT is a celebratory year designated by the United Nations
- IUPAC is the coordination hub for all IYPT events
- ACS is working with IUPAC and other societies on international engagement

What's So Special About the Periodic Table?



- Mendeleev's table predicted properties of undiscovered elements
- Final row is complete
- The table continues to evolve

What Tools are Available



- IYPT Resources

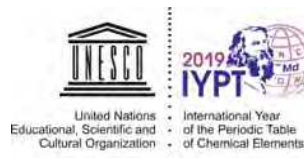
- www.acs.org/iypt

- **Register your event, get free press!**
 - Educational resources by age group
 - Links to interactive tables from around the web
 - Fun facts and videos

- Email: iypt@acs.org

- Send us your questions
 - Get IYPT graphics

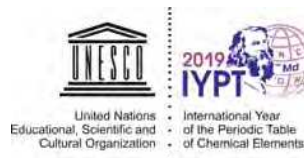
What's Already Planned



- IYPT Merchandise

- ACS Online Store: Periodic Table Goods, Element Pins
- IYPT Calendar
- IYPT Periodic Table Pins
- IYPT Periodic Table Wallet Cards
- IYPT Member-get-a-member blanket
- IYPT Cupcake Mix

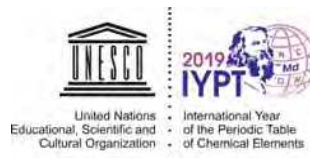
What's Already Planned



- Recurring Events

- Tuesday Trivia Twitter posts
- Monthly history posts on ACS Axial
- Social Media graphics released by ACS Axial
- C&EN articles

What's Already Happened



- First Quarter

- Jan 29: ACS and IUPAC Opening Ceremony, Livestreamed from Paris
- Feb 11: IUPAC symposium “Women and the Periodic Table of Elements”
- Feb 12: ACS and IUPAC Global Women’s Breakfast
- Feb 16 -17: AAAS Family Science Days
- Feb 26 - 27: Special IYPT Program in a Box
- Feb 28: Capitol Hill Briefing and Reception

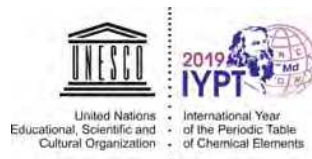
What's Already Happened



- Spring National Meeting

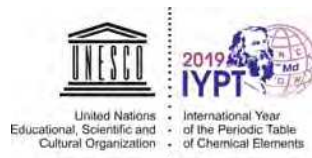
- #IYPT2019 Social Media Wall
- Periodic Table giveaways at the ACS Booth
- HIST Talks on IYPT
- Mar 30: CCA Presidential Outreach Event
- Mar 31: Celebratory IAC Reception
- Mar 31: Student Awards Ceremony theme
- Apr 1: CCA Outreach Workshop: IYPT and CCEW
- Apr 2: National Awards Ceremony/Banquet theme
- Apr 2: C&EN IYPT Trivia Night

What's Already Happened



- Fall National Meeting
 - Periodic Table lanyard giveaways at the ACS Information Booths
 - CCA Presidential Outreach Event
 - Grady-Stack Award for Interpreting Chemistry for the Public awarded to Sir Martyn Poliakoff and the Periodic Table of Videos: From Test Tube to YouTube
 - Symposium: 150 Years of the Periodic Table, HIST Division
- IAC Reception: Celebrating IYPT 2019
- C&EN and ACS on Campus present Periodic Table Bingo

What's Already Happened



- ACS and Government

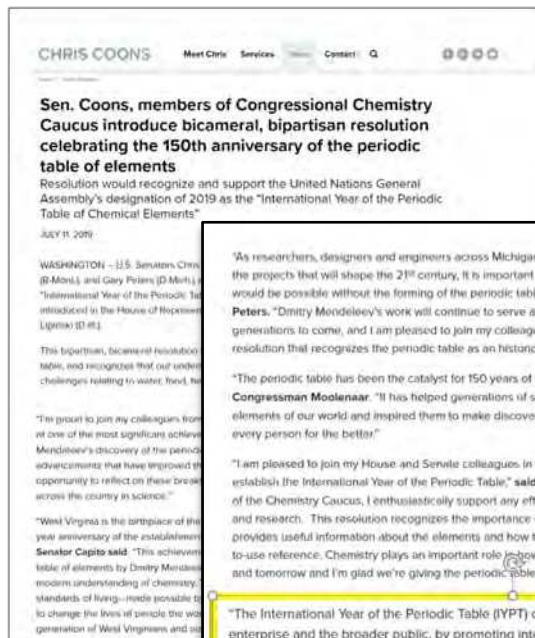
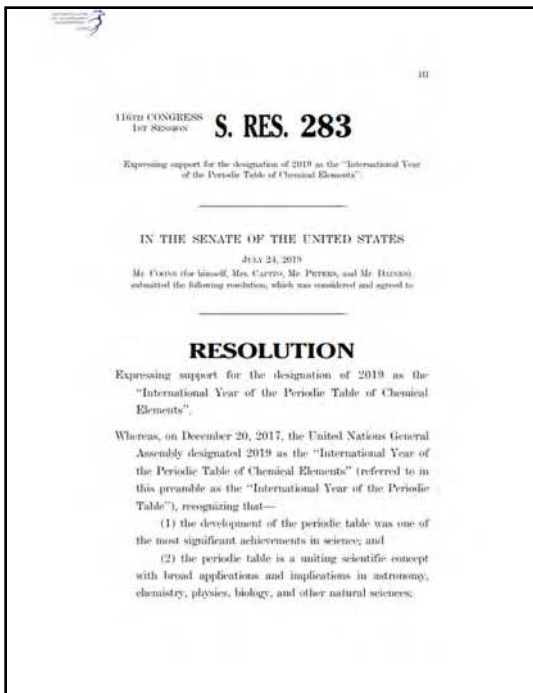
- Capitol Hill receptions and briefings
- State resolutions from South Carolina, Massachusetts, and Puerto Rico
- July 24: Senate resolution unanimously passed!
- House resolution in the works, voting after August Recess
- ACS & Battelle Joint Congressional Briefing and

Reception, Elements and National Labs, October 23, 2019

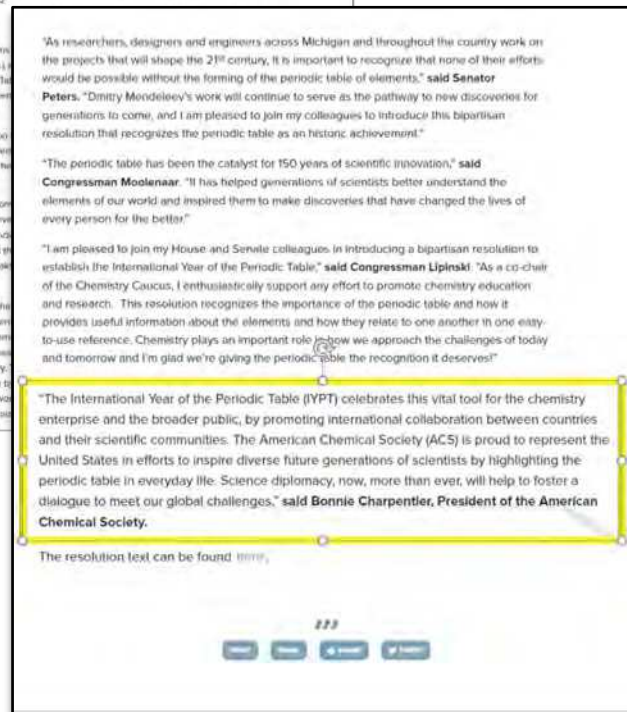
- ACS & NSF: IYPT Colloquium “Perspectives in Chemistry: 150 Years of the Periodic Table” at National Academies, November 2019



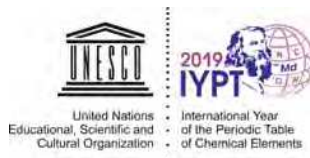
IYPT Resolutions: U.S. Senate



ACS
Chemistry for Life®



What Are Others Doing?



- **HIST Division**

- “The particular item I wanted to report is **searchable online map of places associated with the developers of the periodic table and with the chemical elements**. Each entry contains links to further information about the person, place, or event described. The map is called Places of the Periodic Table”
- https://www.google.com/maps/d/viewer?mid=1Xey19Nt9afpdL6wc1ysM_ZNhKQpQ5ilv&ll=28.563083397360725%2C-38.502264702109414&z=2

- **Western Michigan Local Section**

- “Our local section of the ACS is organizing an event in October to make the **World's Largest Periodic Table** in honor of National Chemistry Week and IYPT2019. Details on the event can be found our local section website and Facebook page.”
- <https://www.facebook.com/events/2261489874120479/>
- <https://westernmichigan.sites.acs.org/>

What Are Others Doing?

- **California Local Section**
 - National Historic Chemical Landmark rededication in honor of the discovery of more than a dozen elements at Lawrence Berkeley National Lab (LBNL)
 - 150 guests attended ceremony and reception which included hands-on science experiments.
 - Attendees included:
 - Yumi Nakagawa, LHS Advisory Council Chair
 - Korey Carter, LBNL
 - David Seaborg (Son of the late Glenn Seaborg)
 - Jim Postma, Chair of ACS CA Local Section
 - Attila Pavlath, ACS Past President



What Can I Do?



- Tweet or post about chemistry using #IYPT2019
- Host social event(s) celebrating IYPT 2019
- Connect your chemistry programming to the United Nations Sustainable Development Goals
- Organize event(s) in your community specifically to improve public awareness of chemistry's contributions to sustainability
- Organize hands-on science outreach event(s) in your community

- **Participate in National Chemistry Week**



How Will YOU Celebrate IYPT 2019?

www.acs.org/iypt

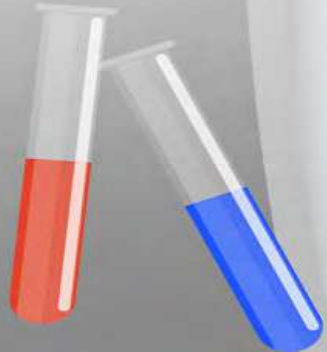
#IYPT2019

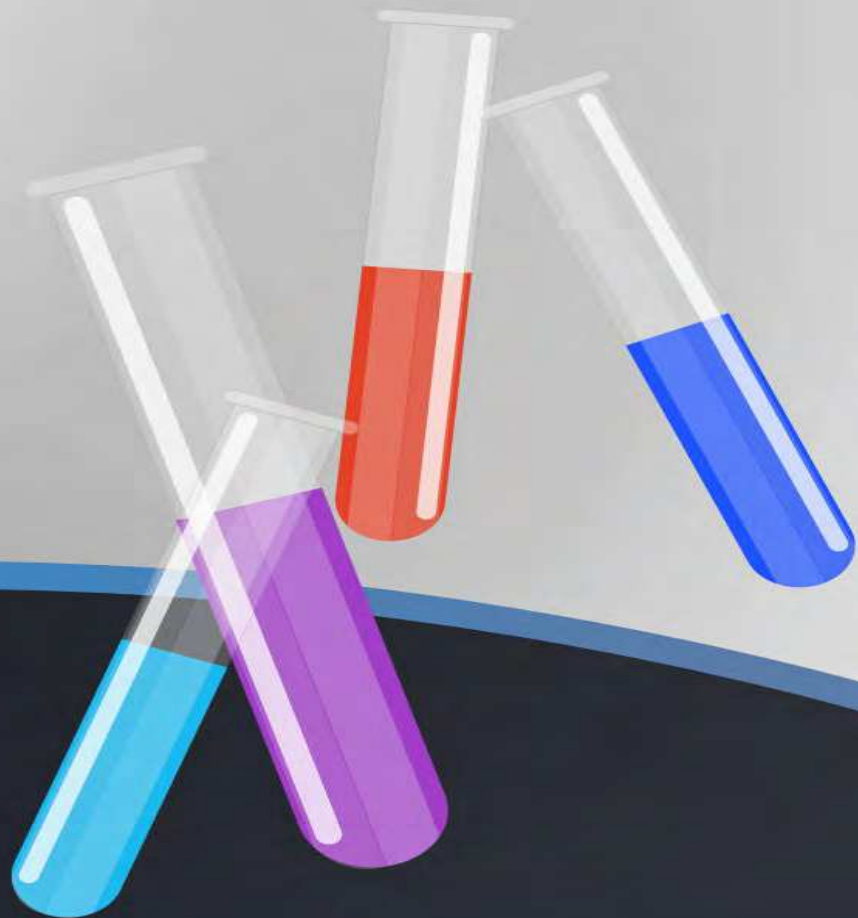
iypt@acs.org

Emily Belle
Sciencenter
Ithaca, NY

Sciencenter

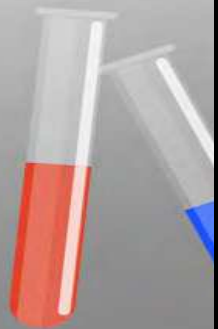
Ithaca, New York





Chemsations!

Chemistry-based Partnerships





Program Sustainability

Red Green Reaction

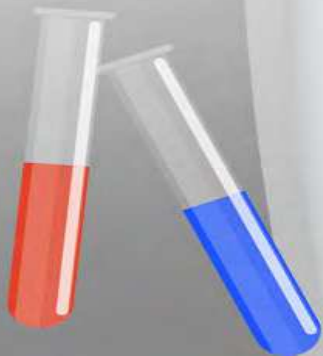
NARRATOR: Magicians can make colors appear and disappear, and so can a chemist.

DEMONSTRATOR: Watch the liquid in this bottle. Do you think I can make it change color? *(Wait for audience response. Pick up the bottle of yellow solution and swirl it gently until the liquid turns orange or reddish.)* What color is it now? *(Audience: red!)* Right! Now it's red. Do you think I can change it again? *(Wait for mixed audience response. Shake the bottle vigorously up and down until the liquid turns green.)* What color is it now? *(Audience: Green!)* Yes, it's green!

NARRATOR: This bottle contains a dye called indigo carmine, which reacts with the oxygen that's in the air to cause the color to change. When we swirl the bottle like this *(demonstrates swirling motion)* a small amount of oxygen reacts with the indigo carmine to slowly change it from yellow to red. When the bottle is shaken *(demonstrates shaking motion)*, more oxygen mixes with the liquid and it causes the red to change to green.

(Then place the bottle in a visible location.) Keep an eye on that bottle and let us know if anything happens during the show. *(After a few minutes, the liquid should become red and then yellow again. When an audience member notices, swirl or shake the bottle again.)*

When the bottle is not shaken, sugar, or dextrose, in the solution reacts with the indigo carmine to slowly change it back to yellow and release the oxygen so the reaction can take place all over again. Eventually the dextrose gets used up and the reverse chemical reaction can no longer take place. *(Note to demonstrators: This last section can be explained later when the color changes back and the audience notices.)*



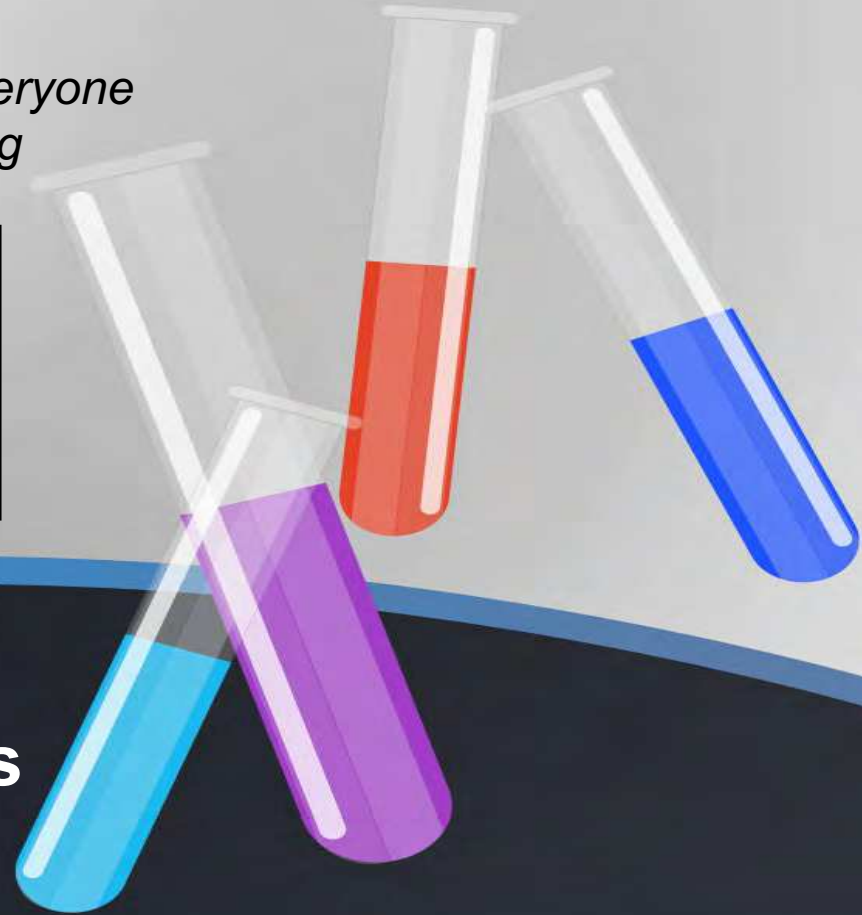
Accessibility

Expanding the opportunities for everyone to engage with science by removing barriers



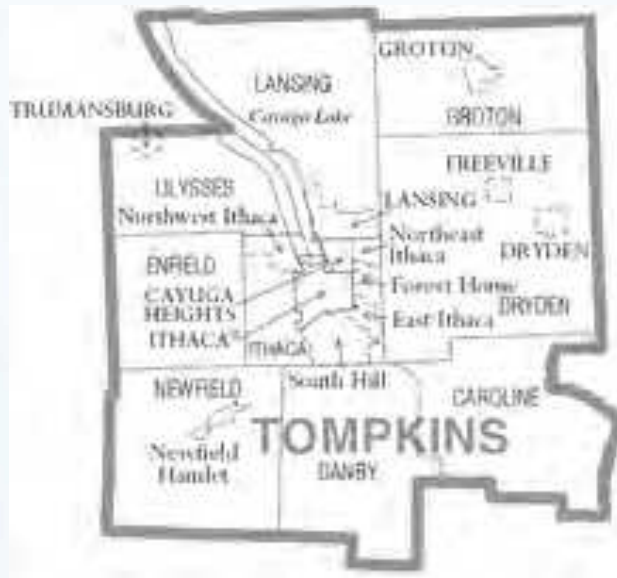
Family Science Nights

Chemistry-themed Outreach





Upstate New York: Tompkins, Schuyler and Tioga Counties





Partnering with Underserved Schools

Enfield Elementary Family Science Night

Thursday, October 3
6:30 - 7:30 p.m.



*Chemistry hands-on activities with the
Sciencenter!*



*Enter a raffle to win a family membership
to the Sciencenter!*

 **Sciencenter**
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FRANKENSTEIN²⁰⁰

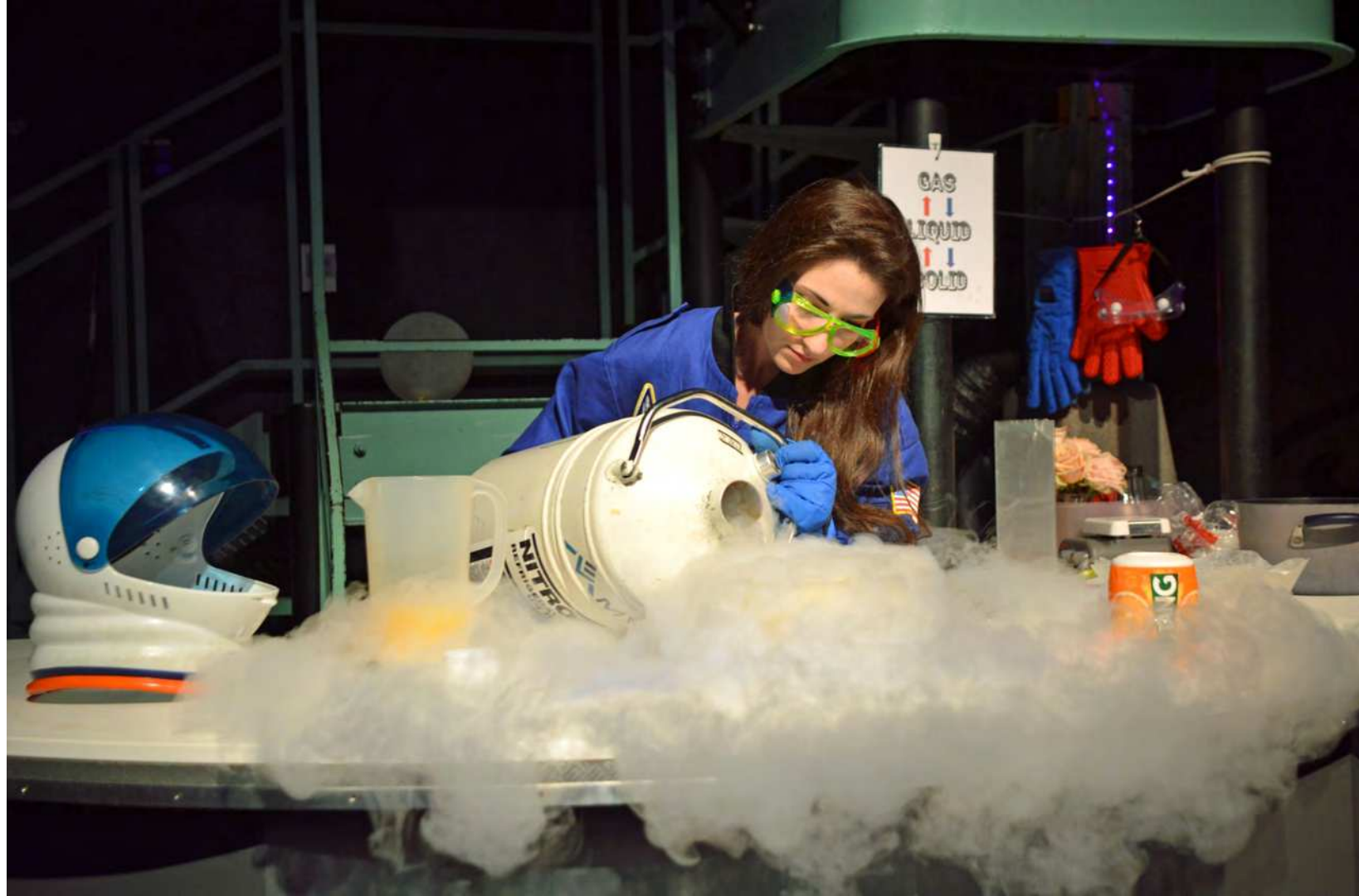


Soma Chatterji

Carnegie Science Center

Pittsburgh, PA

























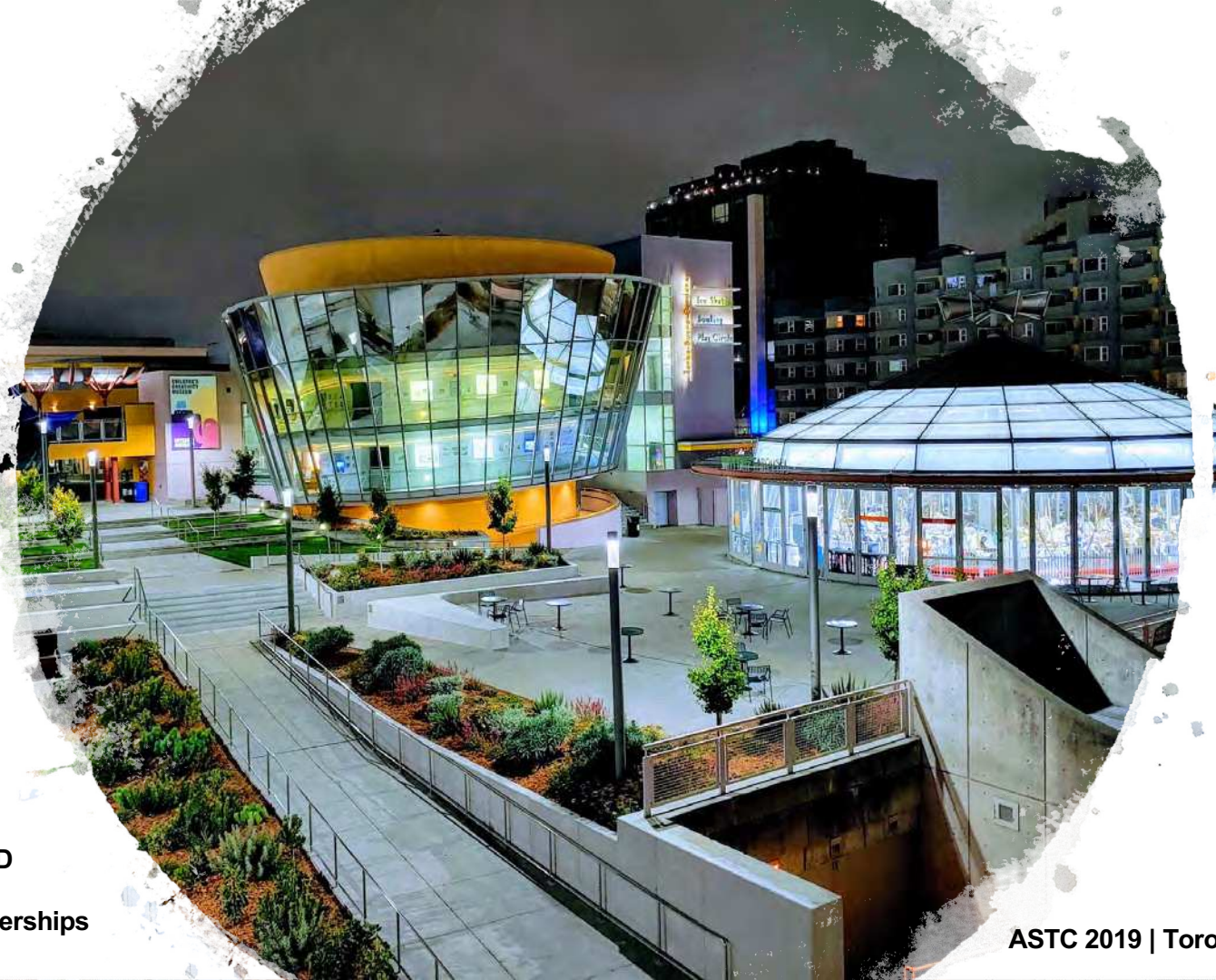
Darrell Porcello

Children's Creativity Museum

San Francisco, CA



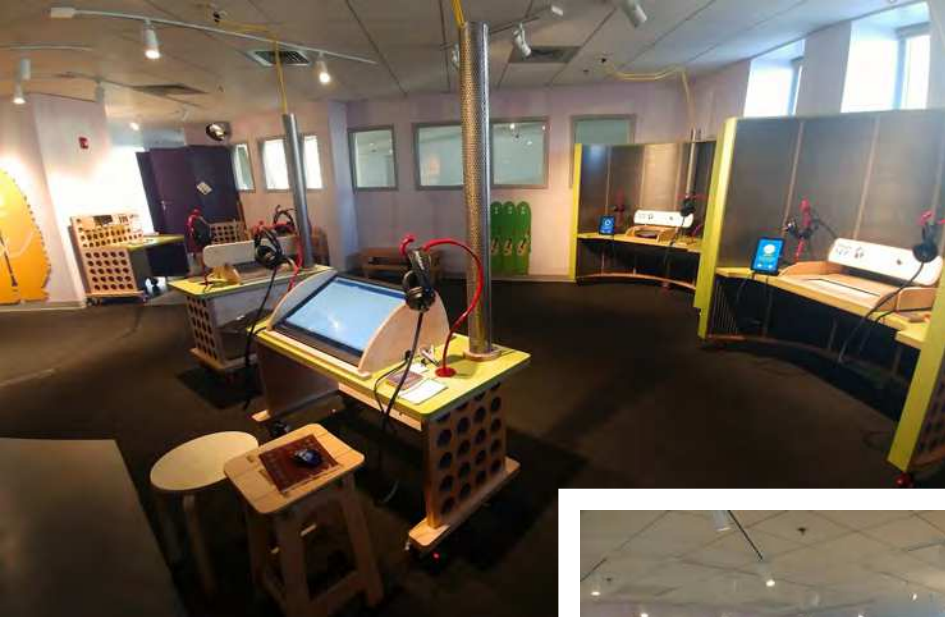
Darrell Porcello, PhD
Director of STEM
Networks and Partnerships



ASTC 2019 | Toronto, Canada

**To nurture
creativity and
collaboration in
all children and
families.**







Boom-Fizz: Sounds of Chemistry workshop



Rocket
Reactions



Boom-Fizz: **Sounds of Chemistry** workshop

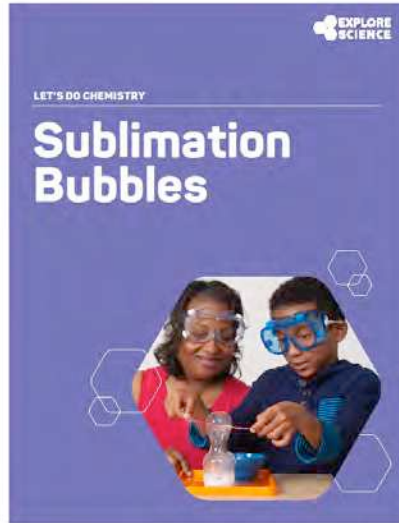


Fizzzzz!!!

**Sublimation
Bubbles**



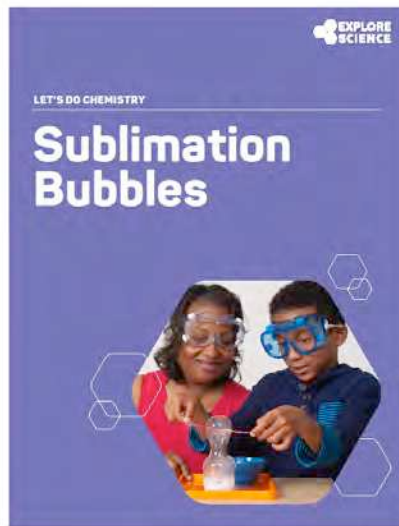
**Boom-Fizz
Workshop**



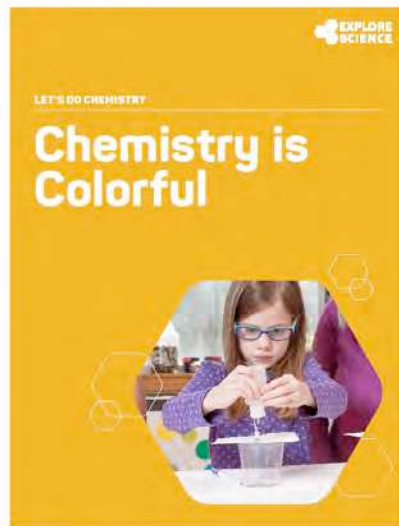
**Boom-Fizz
Workshop**



**Boom-Fizz
Workshop**



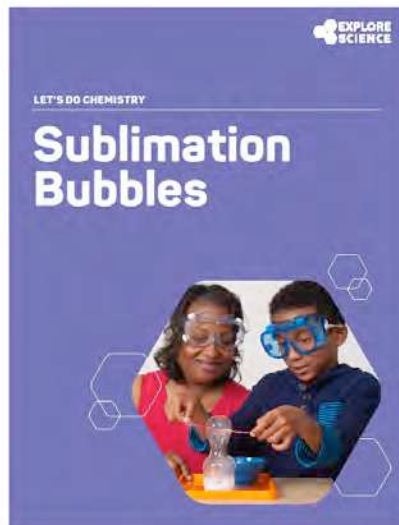
**Boom-Fizz
Workshop**



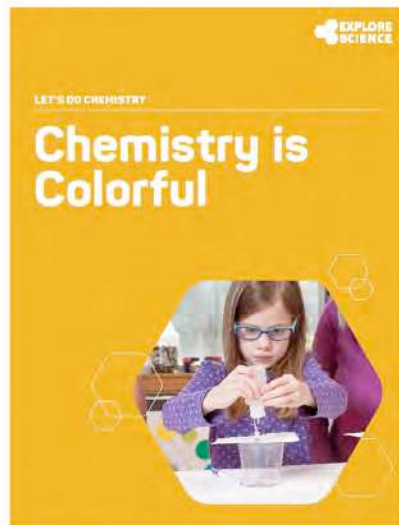
**Color Explosion
Workshop**



**Boom-Fizz
Workshop**



**Boom-Fizz
Workshop**

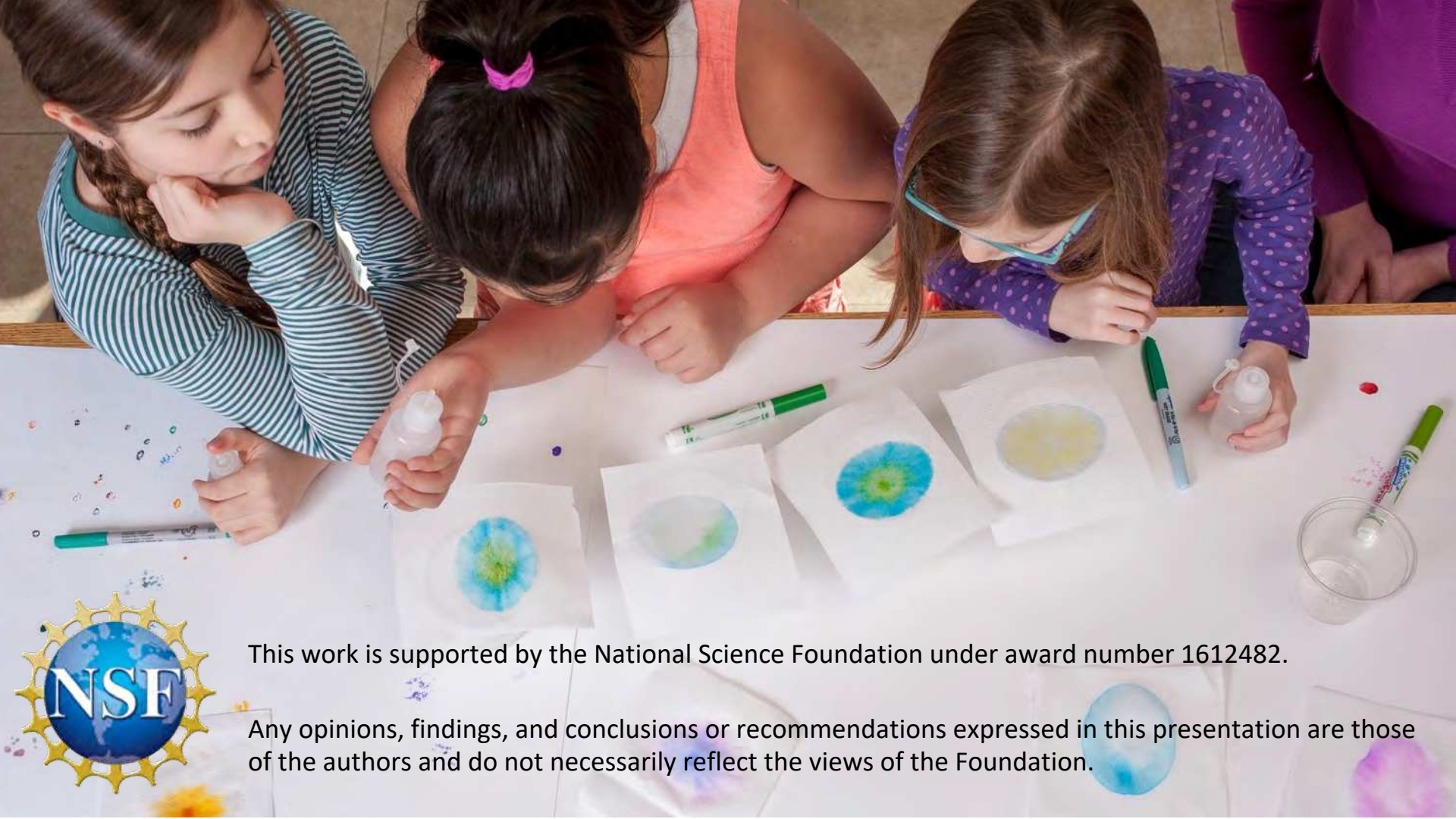


**Color Explosion
Workshop**



**???
Workshop**





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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.



Discussion

Questions

**Addressing fears about
chemicals and
chemistry ?**

Questions

**Getting support from
institution stakeholders
and decision makers for
chemistry ?**

Questions

Event Safety?

Questions

Special Training?

Questions

**Materials handling and
storage ?**