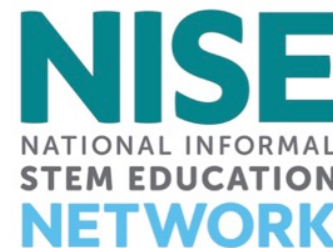


NISE Network Online Workshop

Explore Science: Let's Do Chemistry Kit & Celebrate
National Chemistry Week (October 21-27, 2018)!

Tuesday, September 11, 2018



Welcome! Today's presenters are:

Rae Ostman, Arizona State University

David Horwitz, American Chemical Society

David Sittenfeld, Museum of Science

Ali Jackson, Sciencenter



As we wait to get started with today's discussion, please:

- **Update your display name.** Include your first and last names, and institution or ACS local section
- **Introduce yourself!** Type your name and institution or ACS local section into the Chat Box
- **Questions?** Feel free to type your questions into the Chat Box at any time throughout the online workshop or use the raise your hand function in the participants list and we'll unmute your microphone

All workshops are recorded and archived online at <http://www.nisenet.org/event-type/online-workshop>



**Let's Do Chemistry Kit
& Celebrate National Chemistry Week
Online Workshop**

Overview

- Let's Do Chemistry Project Overview
- National Chemistry Week Resources
- Let's Do Chemistry Partner Events
- Let's Do Chemistry Kit & Resources
- Questions

NISE NATIONAL INFORMAL
STEM EDUCATION
NETWORK





EXPLORE SCIENCE
Let's Do Chemistry

NISE NATIONAL INFORMAL
STEM EDUCATION
NETWORK



ACS
Chemistry for Life®



EXPLORE SCIENCE
Let's Do Chemistry

NISE NATIONAL INFORMAL
STEM EDUCATION
NETWORK

National community of informal educators and scientists that supports learning about science, technology, engineering, and math (STEM) across the United States.



International professional society that empowers its members to advocate for chemistry, elevate their career potential, expand their networks, inspire future generations, and improve the scientific understanding of all people.

Project partners

Let's Do Chemistry is a **collaboration** of educators, chemists, science communicators, and researchers.



Project goals

The project aims to have a strategic impact on publics' attitudes toward chemistry, by increasing their:

- **interest** in chemistry,
- understanding and perception of its **relevance**, and
- feelings of **self-efficacy** with respect to it.





Leverage the Energy of National Chemistry Week and ACS Local Sections for your Let's Do Chemistry kit

David C. Horwitz, Program Manager

ACS Office of Science Outreach

D_Horwitz@acs.org



NCW Background

- Celebrated annually during the fourth week of October
- National Chemistry Week (NCW) unites ACS local sections, student chapters, technical divisions, businesses, schools, and science enthusiasts 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.



Are you planning a chemistry event during National Chemistry Week, October 21-27?



NCW Background

- Kit Recipients from NISE Net – Your greatest NCW resource is your ACS Local Section NCW Coordinator!
- NCW 2017
 - 81% of local sections participated
 - 163,750 issues of the *Celebrating Chemistry* were distributed
 - 77% of participating local sections ordered and distributed NCW swag
- NCW 2018 (as of 9/4/18)
 - 156 of 185 ACS local sections have an official NCW Coordinator
 - Expecting local sections to interact with more than 100k event attendees



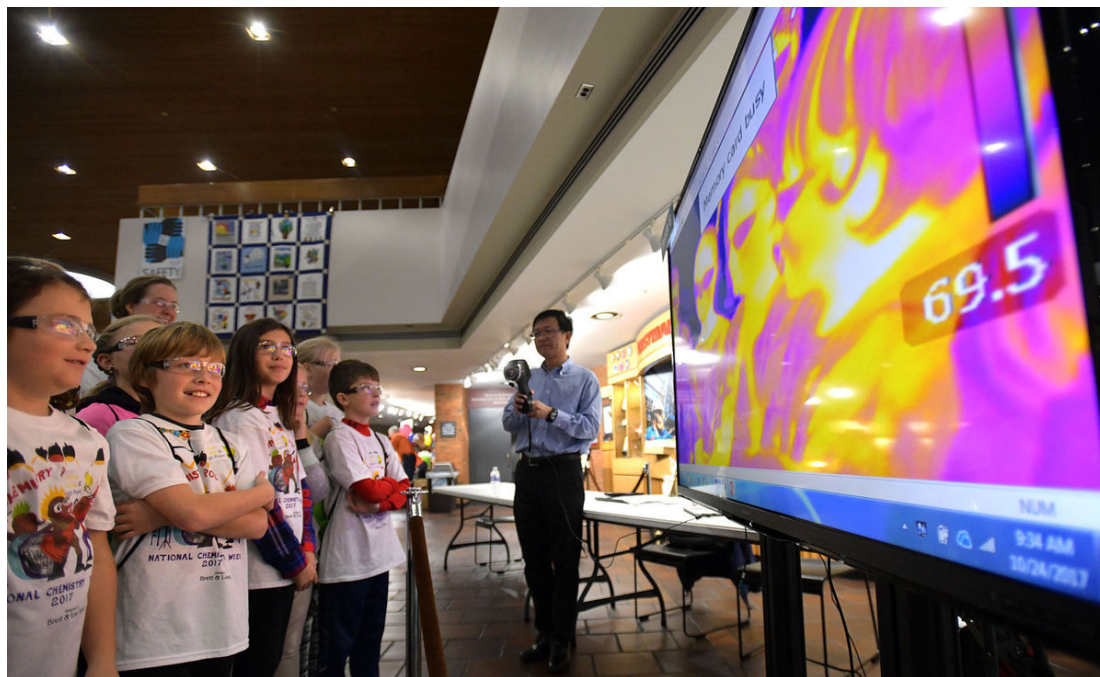
NCW Background



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 Background



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

NCW Background



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

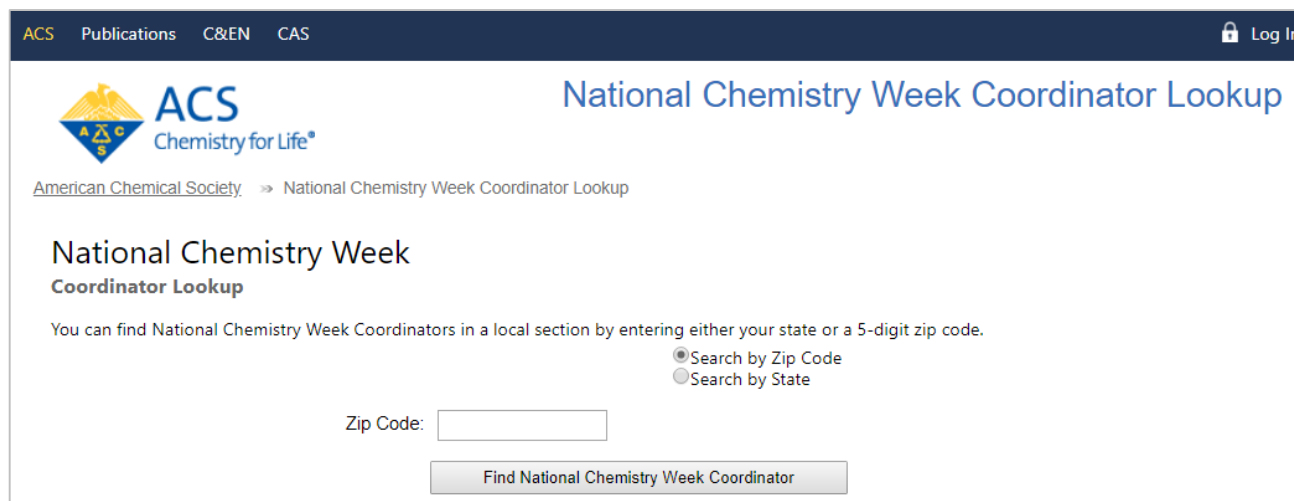
NCW Background



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

- Contact your Local Section NCW Coordinator today!
 - www.ncwlookup.acs.org
- If you would like a personal introduction, contact outreach@acs.org.



The screenshot shows the ACS National Chemistry Week Coordinator Lookup page. At the top, there is a navigation bar with links for ACS, Publications, C&EN, and CAS, along with a Log In button. The main header features the ACS logo and the title "National Chemistry Week Coordinator Lookup". Below this, a breadcrumb trail reads "American Chemical Society >> National Chemistry Week Coordinator Lookup". The section is titled "National Chemistry Week Coordinator Lookup". A message states: "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 for "Search by Zip Code" (selected) and "Search by State". A text input field for "Zip Code:" is provided. A button labeled "Find National Chemistry Week Coordinator" is at the bottom.

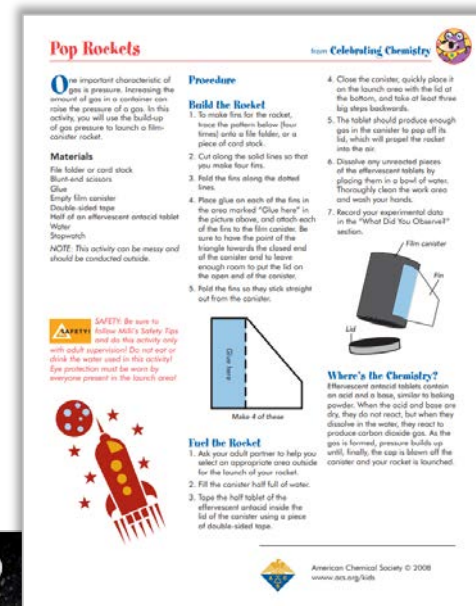


NCW Resources

- Educational Resources
 - Science Safety Guidelines
 - Articles and activities (categorized by grade level)
 - Webinars
 - Videos



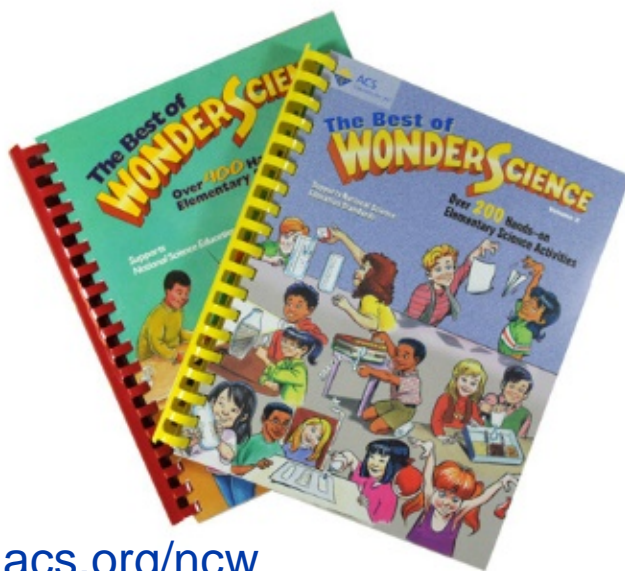
www.acs.org/ncw



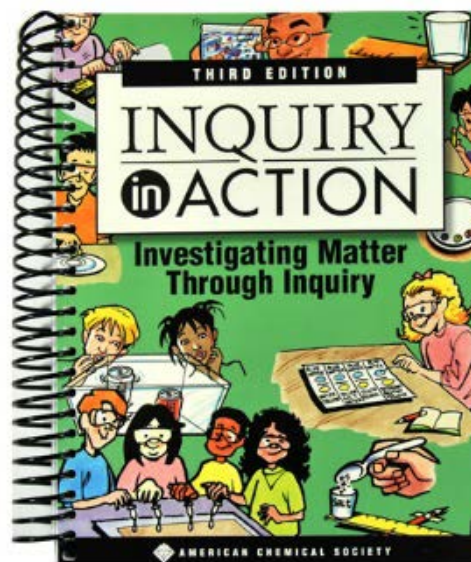
**NATIONAL
CHEMISTRY
WEEK**

NCW Resources

- Other ACS Educational Resources (not NCW themed)
 - The Best of WonderScience - over 600 hands-on activities
 - Print copy available for purchase in ACS Online Store
 - Inquiry in Action (www.inquiryinaction.org)
 - Free digital copy available online
 - Print copy available for purchase in ACS Online Store

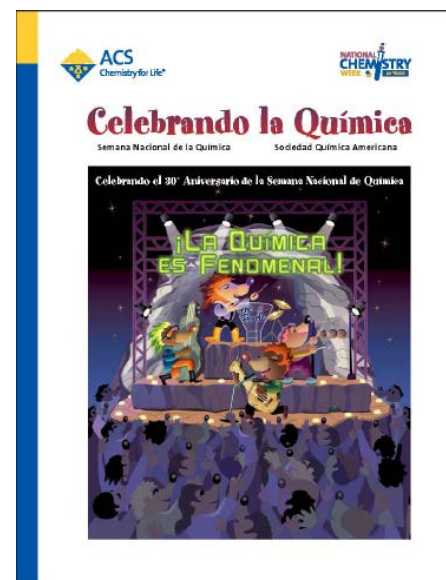
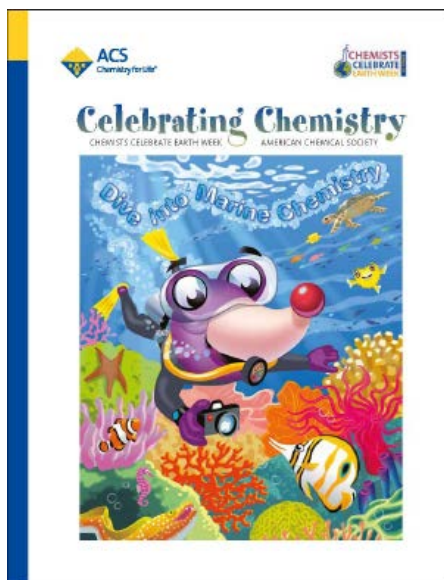
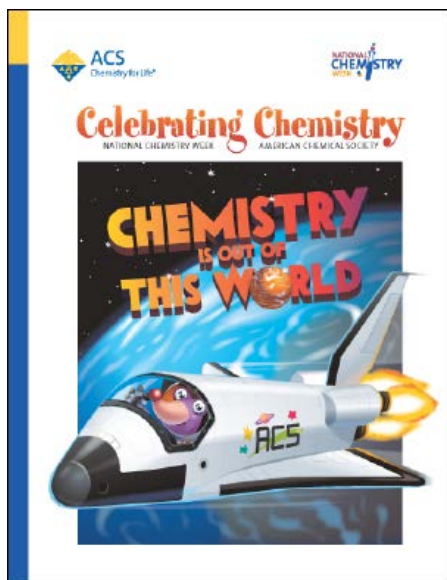


www.acs.org/ncw



NCW Resources

- Digital *Celebrating Chemistry*
 - In English and Spanish
 - Past editions available



www.acs.org/ncw

NCW Resources

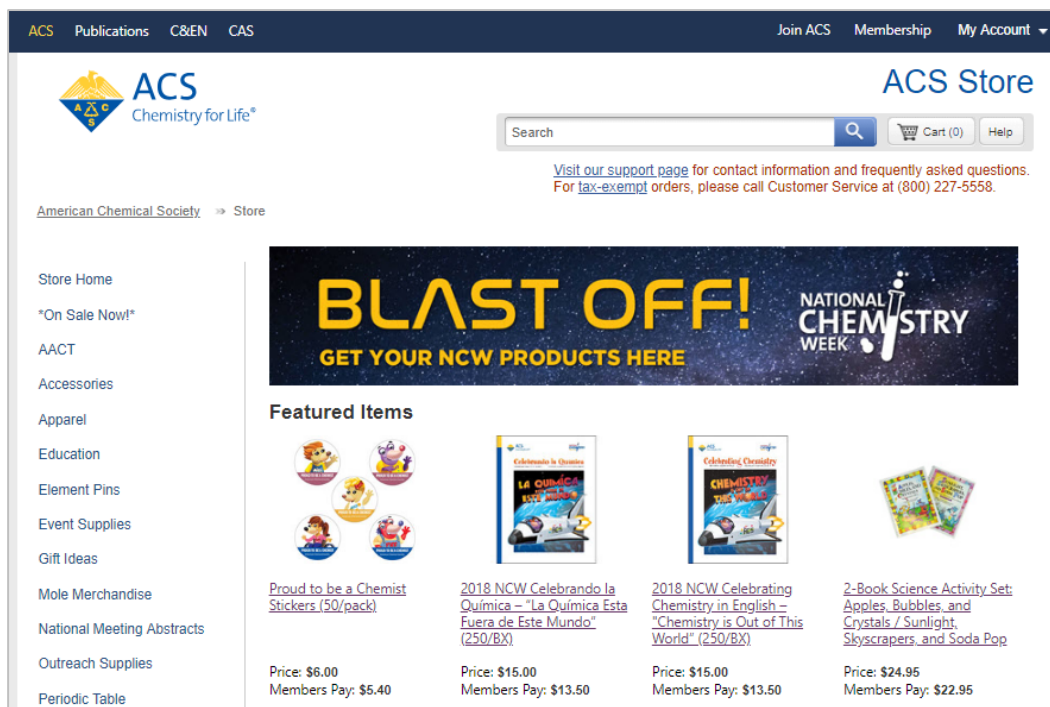
- Illustrated Poem Contest
 - Work with your ACS local section to host a contest
 - National prizes - \$300 for first-place and \$150 for second-place winners
 - Suggestion - use table at NCW event for writing and illustrating poems



www.acs.org/ncw

NCW Resources

- Promotional Items
 - Stickers, tattoos, pencils, balloons, bags available in ACS Online Store
 - Given to local sections for free or at discounted price



The screenshot shows the ACS Store website with a navigation bar at the top containing links to ACS, Publications, C&EN, CAS, Join ACS, Membership, and My Account. The main header features the ACS logo and the text "ACS Store". Below the header is a search bar and a link to the support page. The main content area is titled "BLAST OFF! GET YOUR NCW PRODUCTS HERE" and "NATIONAL CHEMISTRY WEEK". It features a sidebar with links to Store Home, "On Sale Now!", AACT, Accessories, Apparel, Education, Element Pins, Event Supplies, Gift Ideas, Mole Merchandise, National Meeting Abstracts, Outreach Supplies, and Periodic Table. The featured items section displays four products:

Product	Price	Members Pay
Proud to be a Chemist Stickers (50/pack)	\$6.00	\$5.40
2018 NCW Celebrando la Química - "La Química Esta Fuera de Este Mundo" (250/BX)	\$15.00	\$13.50
2018 NCW Celebrating Chemistry in English - "Chemistry is Out of This World" (250/BX)	\$15.00	\$13.50
2-Book Science Activity Set: Apples, Bubbles, and Crystals / Sunlight, Skyscrapers, and Soda Pop	\$24.95	\$22.95

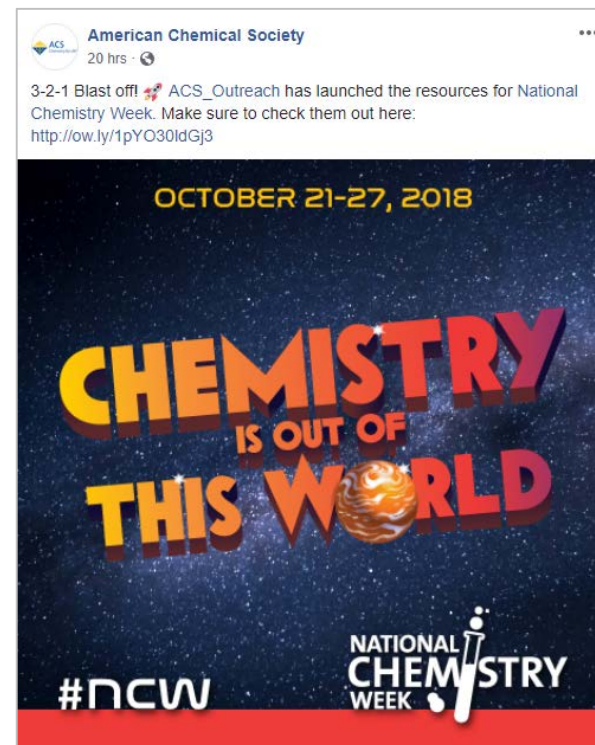


NCW Resources

- Graphics
 - NCW 2018 Branding Kit - unify your content with the theme or general celebration with backgrounds, flyers, fonts, logos, artwork, social media images, and web banners
- Social Media
 - #NCW
 - #CelebratingChemistry
 - Twitter - @ACS_NCW
 - Facebook - National Chemistry Week



www.acs.org/ncw




Thank You!

NCW 2018 – October 21-27

Questions? Contact outreach@acs.org

CHEMISTRY
IS OUT OF
THIS WORLD

NATIONAL
CHEMISTRY
WEEK 

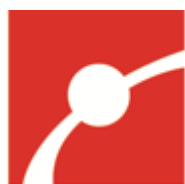
Let's Do Chemistry Partner Events





ACS
Chemistry for Life®

Northeastern Section of the AMERICAN CHEMICAL SOCIETY



Museum of Science®



BOSTON
CHILDREN'S
MUSEUM



Symposium at 2019 ACS National Meeting in Orlando, Florida!

New Frontier (Invited)(Oral)				<ul style="list-style-type: none"> PMSE POLY 	application and STEM into the Chemistry classroom will provid... Read more
State of the Art: Diversity & Inclusion in Chemistry Education (Invited) (Oral)	Oral	Invited	<ul style="list-style-type: none"> Patrick Daubenmire Catherine Middlecamp 	<ul style="list-style-type: none"> PROF CEI 	Diversity and inclusion are certainly not new frontiers in education. Addressing these areas with ap... Read more
Strategies Promoting Success of Two-Year College Students (Oral)	Students as Informal Educators: Student use of NISE Net Explore Science: Let's do Chemistry Kits (Oral) A major goal of the American Chemical Society's participation in the International Year of the Periodic Table of Chemical Elements (IYPT 2019) is to more broadly communicate the value of chemistry around the world. As student volunteers are critical to planning and executing informal science education events, both in the United States and abroad, providing these students with evidence-based tools and techniques to help inform and improve their communication skills is an important strategy element for improving informal chemistry communication more broadly. This half-day symposium aims to highlight the design-based research framework of the Explore Science: Let's do Chemistry Kits; the effective use of these physical kits by student groups; and the effective use of the digital aspects of the kits by student groups.				Nearly half of all undergraduate students enroll in a two-year college and many STEM students take t... Read more
Students as Informal Educators: Student use of NISE Net Explore Science: Let's do Chemistry Kits (Oral)					A major goal of the American Chemical Society's participation in the International Year of the Per... Read more
Successful Student Chapters (Poster)					
Teaching Space Chemistry (Oral)					Space Chemistry includes a wide range of our discipline, covering many of its fields, for example ge... Read more
Teaching the Carbon Cycle (Invited)(Oral)	Oral	Invited	<ul style="list-style-type: none"> Christopher Brigham 		The carbon cycle is perhaps the most important biogeochemical cycle. It affects all spheres of life,... Read more
Theres an App for That (Oral)	Oral	Contributed	<ul style="list-style-type: none"> Elvin Aleman 		How are you using technology to teach

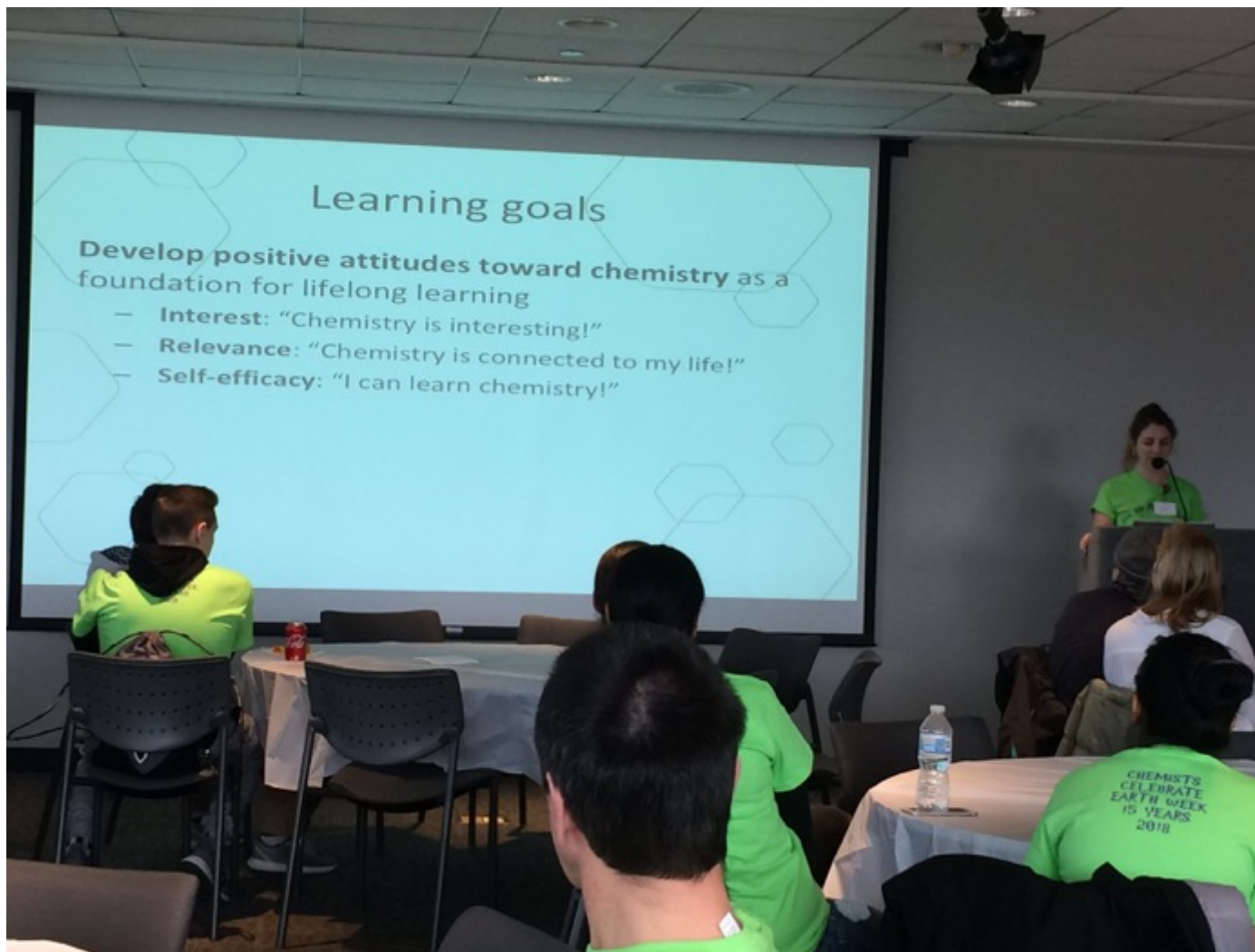




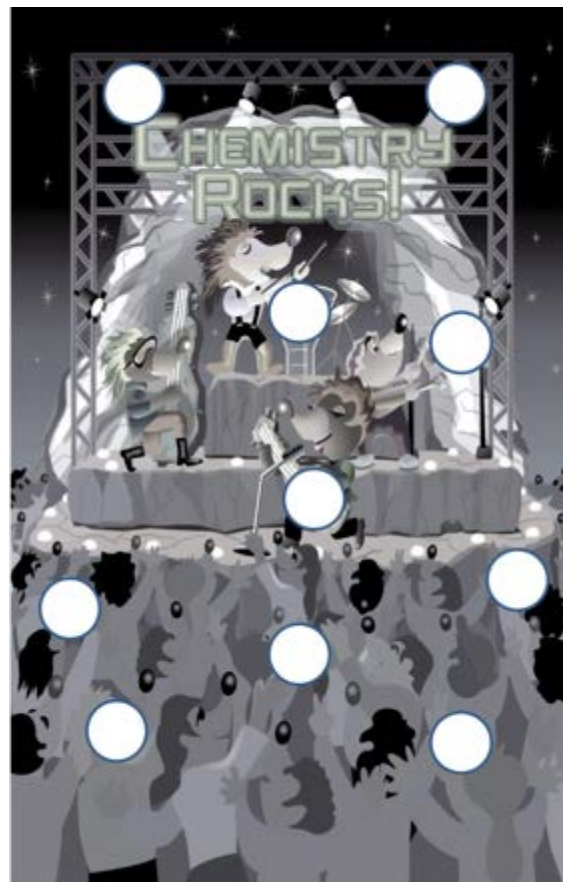
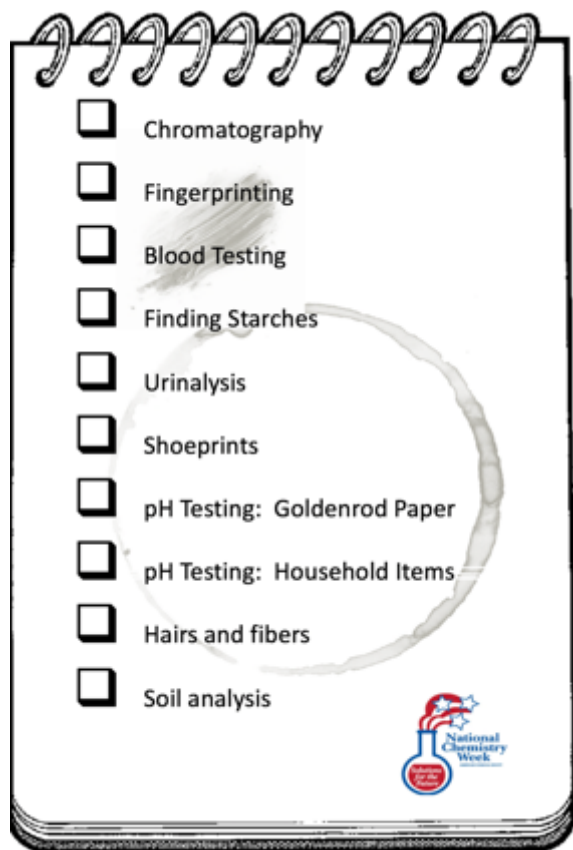
Preparing Facilitators



Preparing Facilitators



Connecting to the Yearly Theme



Connecting to the Yearly Theme



Connecting to the Yearly Theme

Chemistry is Out of This World:

Dry Ice on Mars

Space scientists discovered dry ice on Mars by closely observing the planet's changing temperature and atmosphere.

Dry ice is also found on Mars! Each Martian winter, a large amount of carbon dioxide in the atmosphere undergoes a process called *deposition*, changing directly from a gas to a solid. This solid carbon dioxide, or dry ice, covers the water-ice polar caps in each hemisphere. Scientists are still trying to understand how this dry ice reaches the ground—does it fall like snow, or form like frost on a window? When the weather becomes warmer, the dry ice sublimates, just like in our activity, and rejoins the atmosphere as carbon dioxide gas.

Just as every person has a different fingerprint, every chemical element absorbs and emits light differently. Scientists analyze the colors and brightness of light reflected off of planets (and stars!) to learn more about the chemicals that light interacted with. In the 1940s, scientists studied infrared light from the surface of Mars, and noticed the spectrum “fingerprint” for carbon dioxide. A different group of scientists was able to discover the planet’s typical temperature range by measuring thermal energy reflected from the Martian surface. This temperature range includes all the right conditions for dry ice to form and sublimate with the seasons.



Scientists discovered dry ice on Mars using chemistry!

LET'S DO CHEMISTRY: Sublimation Bubbles

EXPLORE
SCIENCE

EXPLORING THE UNIVERSE

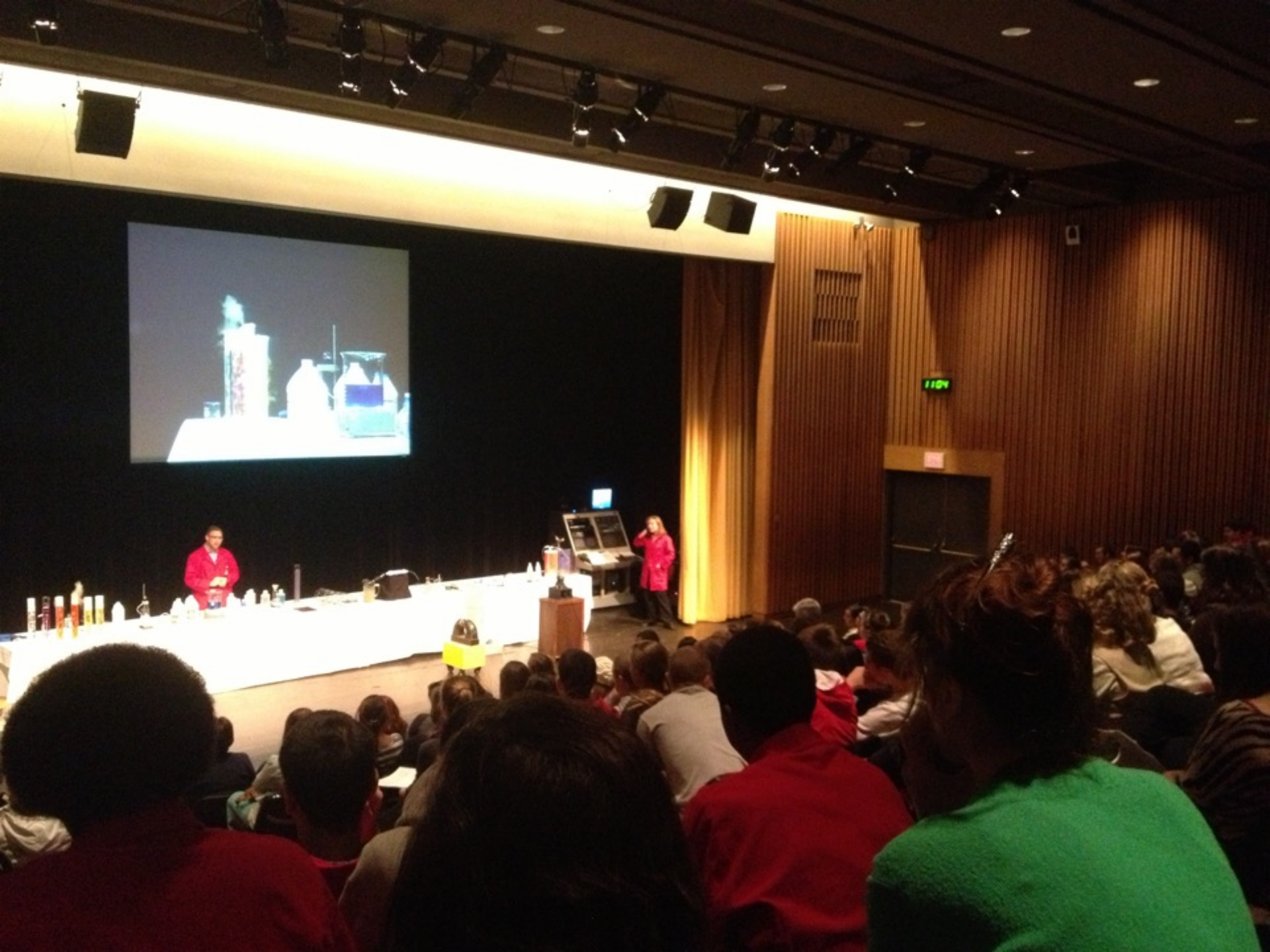
Ice Orbs

What lies below the surface of an icy moon?



EXPLORE SCIENCE
Earth & Space







Atlas
PYROTECHNOLOGY
101
www.atlaspyro.com



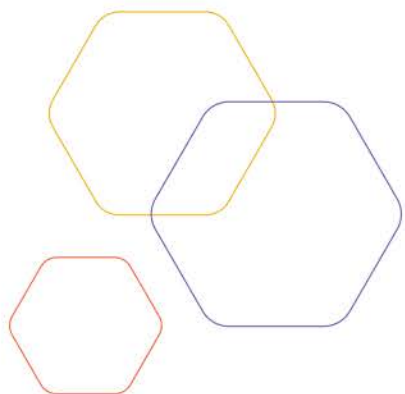
Thank you!



NISE
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STEM EDUCATION
NETWORK


EXPLORE SCIENCE
Let's Do Chemistry





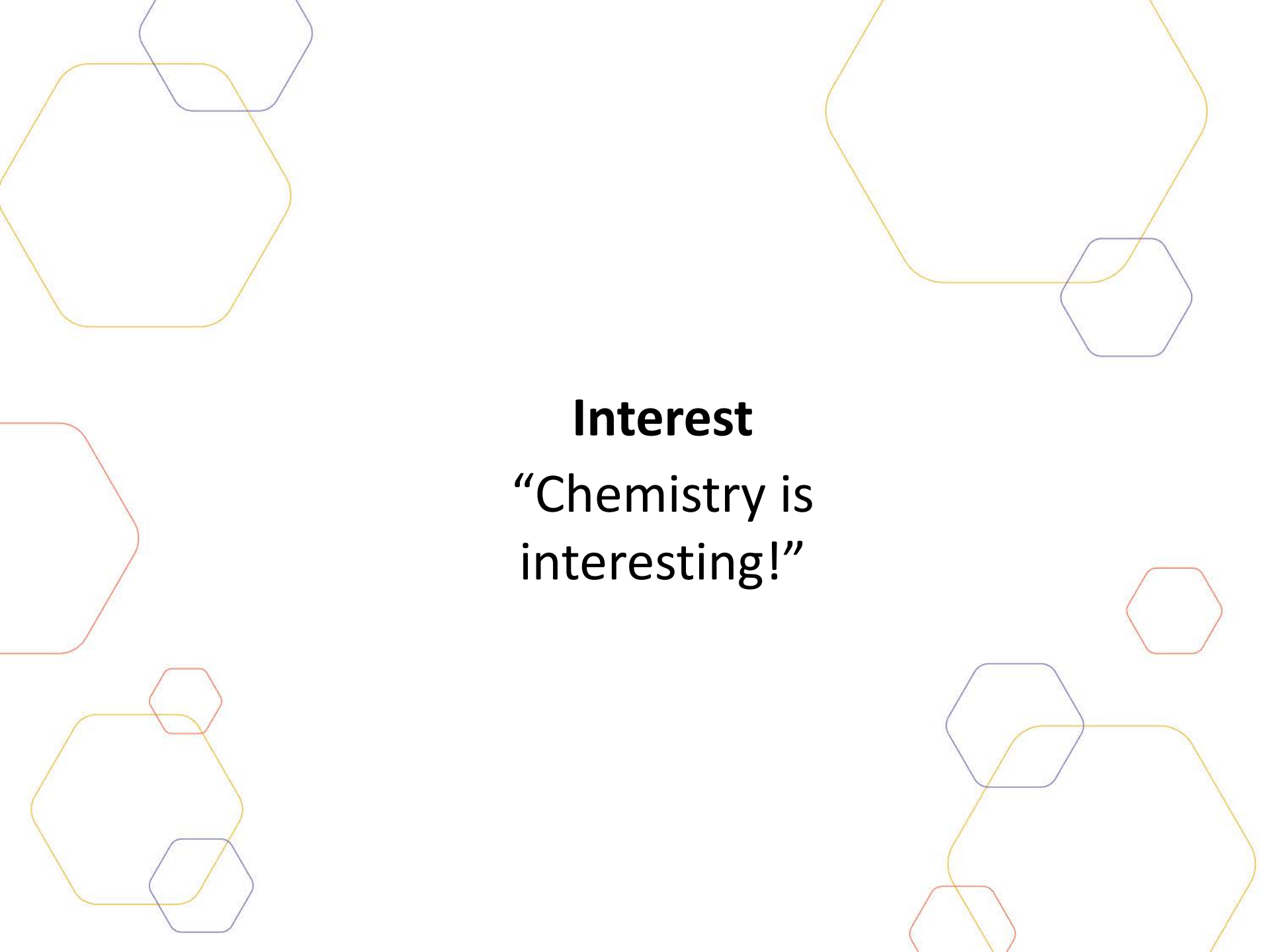
Let's Do Chemistry Kit & Resources

www.nisenet.org/chemistry-kit

Learning Goals

Develop **positive attitudes** toward learning chemistry

- **Interest:** “Chemistry is interesting!”
- **Relevance:** “Chemistry is connected to my life!”
- **Self-efficacy:** “I can learn chemistry!”

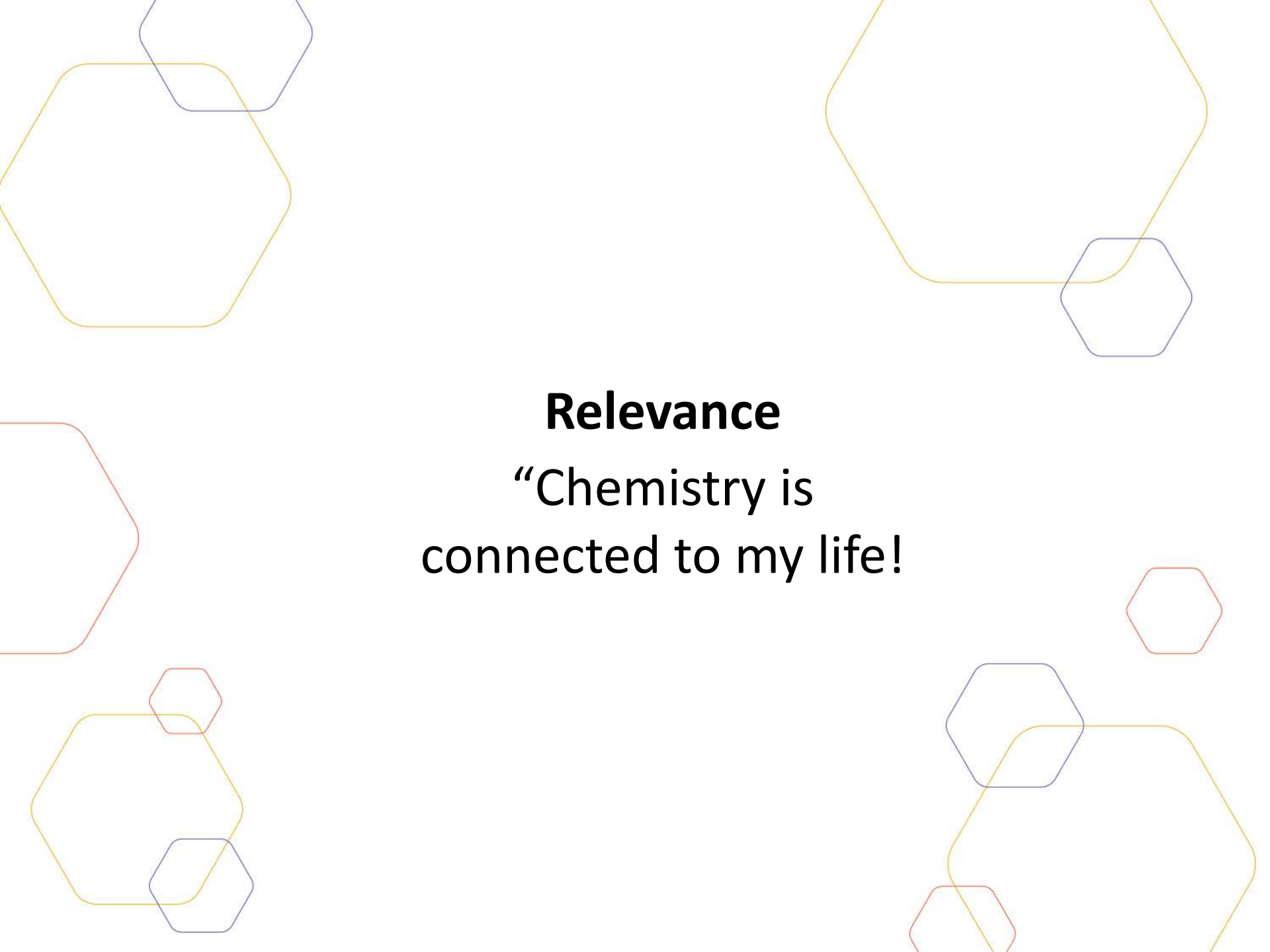
The background of the slide is decorated with several hexagonal outlines in yellow, blue, and red. Some hexagons are large and partially cut off by the edges, while others are smaller and fully visible. They are scattered across the slide, creating a geometric pattern.

Interest
“Chemistry is
interesting!”

The left side of the image features a white background decorated with several overlapping hexagons. These hexagons are outlined in thin lines of yellow, purple, red, and blue. Some hexagons are larger and more prominent, while others are smaller and partially obscured by the larger ones.

Chemistry is Colorful

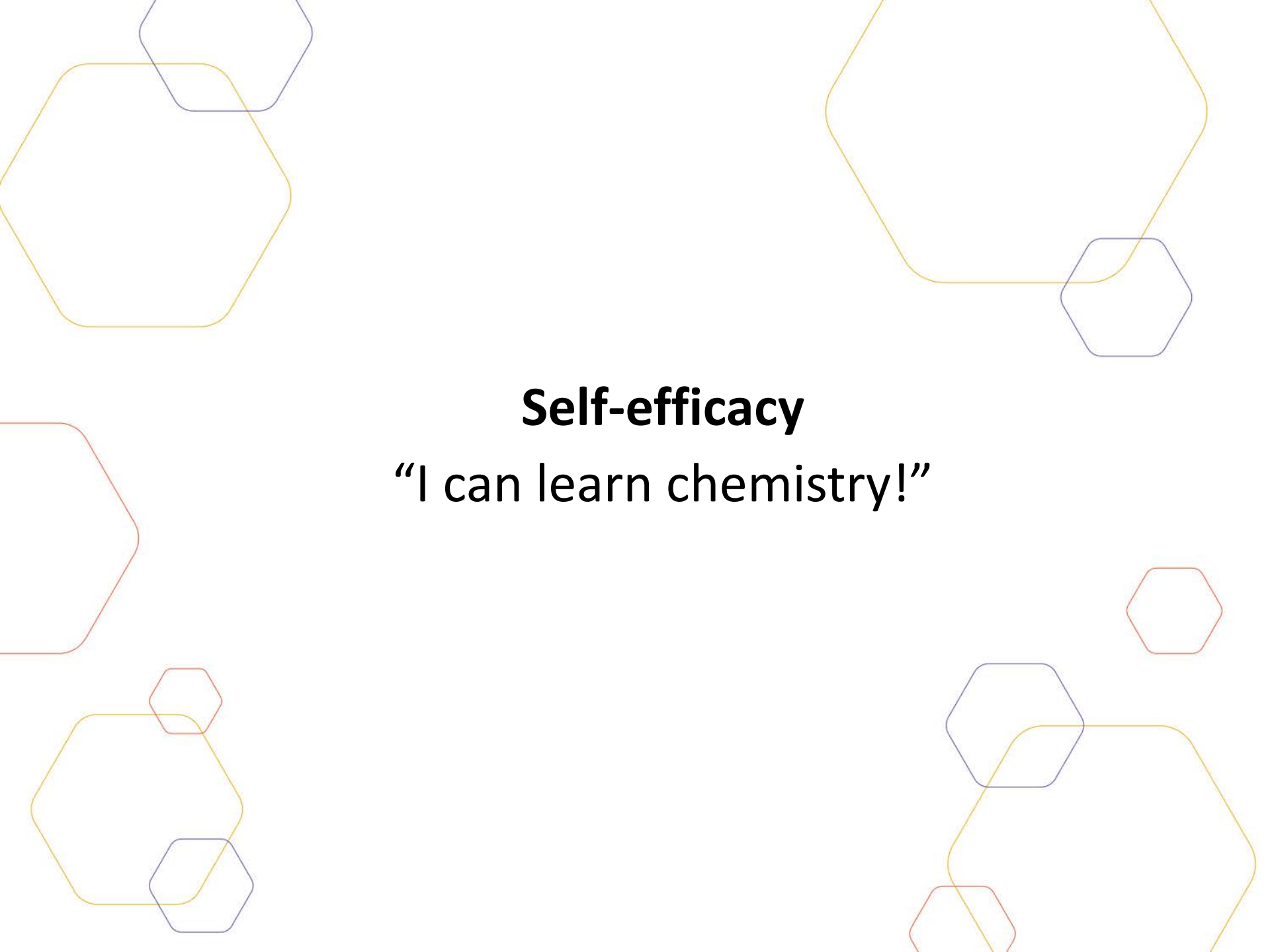


The background of the slide is decorated with several hexagonal outlines in yellow, blue, and red. Some hexagons are large and partially cut off by the edges, while others are smaller and fully visible. They are scattered across the slide, creating a geometric pattern.

Relevance
“Chemistry is
connected to my life!”

What's in the Water?



The background of the slide is decorated with several hexagonal outlines in yellow, blue, and red. These hexagons are of various sizes and are arranged in a way that they appear to be floating or overlapping, creating a geometric pattern around the central text.

Self-efficacy

“I can learn chemistry!”

Nature of Dye



Let's Do Chemistry!

More about...

Fun

Confidence

Excitement

Concrete connections

Exploring together

Offering guidance

Asking questions

But it's still **all about chemistry!** And you have an important role as a guide.

Less about...

Facts

Comprehensive knowledge

Equations

Abstract ideas

Explaining to someone

Showing the right way

Providing answers

Kit Resources



www.nisenet.org/chemistry-kit

Activity Materials



LET'S DO CHEMISTRY

Nature of Dye



LET'S DO CHEMISTRY Nature of Dye Facilitator Guide

ACTIVITY LEARNING GOALS

- Learners will develop positive attitudes toward learning and science.
- Learners will increase their feelings of interest and engagement through exploration and observations of phenomena.
 - Learners will increase their understanding of the applications and uses of chemistry and science.
 - Learners will increase their sense of self-efficacy through interaction with real tools and materials.

- Learners will explore chemistry concepts, tools, and materials.
- Chemists use tools to discover and make new materials.
 - People shape the development and use of new materials.

FACILITATION STRATEGIES

Try to encourage **interest** and **self-efficacy** through exploration and observation of phenomena. Ask participants to predict, observe, and experiment with the dye. What was their favorite color?

You can help make connections (**relevance**) by asking questions. Ask participants to predict, observe, and experiment with the dye. Discuss with visitors what they know about dyes and foods, and what they think about labeling materials. More about where the color comes from. Ask if the colors they might be wearing.

MATERIALS

- Cochineal bugs (dried)
- Soda ash (sodium carbonate) solution
- Vinegar solution

LET'S DO CHEMISTRY

Nature of Dye

Prepare a dye

Place two pieces of cochineal bug parts into the mortar. Crush the bug into a fine powder using the pestle. What does it look like?

Use the water dropper bottle to add three or four drops to the mortar and mix the solution using the pestle. How does it change?



Change the color

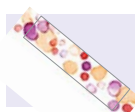
Use the pipette at your station to transfer one drop of your bug mixture (cochineal dye) from the mortar dish into each section of the 3-part petri dish.

Use the vinegar dropper bottle to add one drop onto the cochineal dye in one of the petri dish sections. What changes do you notice?

Now, use the soda ash dropper bottle to add one drop onto a different cochineal dye section. What changes do you notice here?

Test and experiment

Test the differences in the three dyes using strips of pH paper. How do the different dyes compare? Experiment by mixing the three dyes. You can retest the pH of your new mixture.



Let's keep exploring! Make a cochineal bookmark to take home! Dip a strip of watercolor paper into your dye samples to transfer the color. Or try using the pipette to add colors to the paper. How many shades of reds, oranges, and purples can you make?

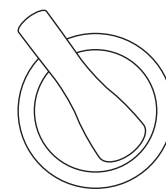


What makes me red?



What makes me orange?

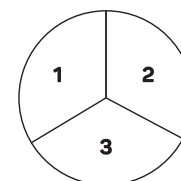
How many colors can you make?



Mortar & Pestle

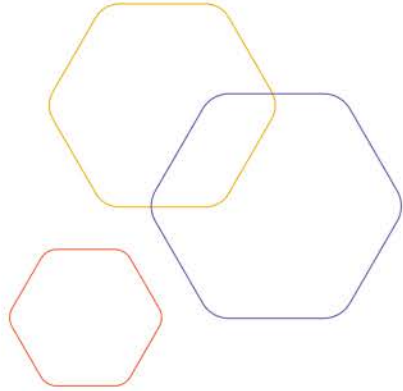


Pipette



Petri Dish





Advance Preparation & Safety

Advance Preparation

Advance preparation
might include...

...“Open Me First” packet

...event planning

...communicating with
collaborators

...reviewing videos and doing
the activities

...dry ice, water, set-up,
labeling tools and materials



Safety

Safe practices might include...

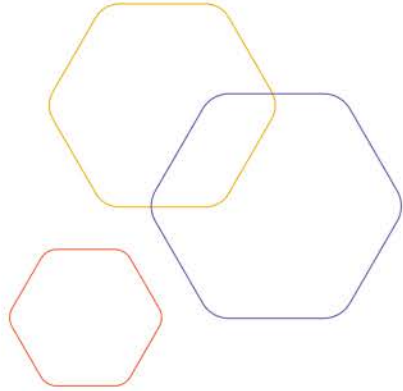
...labels and SDS for all materials

....goggles or gloves (PPE)

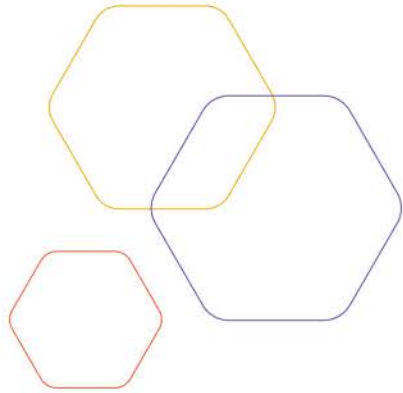
...keeping chemistry materials
away from mouth, eyes, skin

...disposing of materials properly





Reporting & Evaluation



Questions?



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STEM EDUCATION
NETWORK



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Funded by the National Science Foundation under Award No. 1612482. Any opinions, findings, and conclusions or recommendations are those of the authors and do not necessarily reflect the views of the Foundation.

Upcoming Online Workshops

Learn More About the 2019 Explore Science: Earth & Space Toolkit

Tuesday, September 18, 2018

2pm-3pm Eastern / 11am-12pm Pacific

Celebrate the Moon, Our Nearest Neighbor in Space

Tuesday, October 9, 2018

2pm-3pm Eastern / 11am-12pm Pacific

Deepening and Extending Family Engagement and Learning Through Interactive Exhibits and Facilitated Hands-on Activities

Tuesday, October 23, 2018

2pm-3pm Eastern / 11am-12pm Pacific



NISE
NETWORK

ONLINE
WORKSHOPS

Learn more at: nisenet.org/events



EXPLORE SCIENCE Earth & Space

Applications Now Open!

**Explore Science: Earth & Space 2019 toolkit applications
are due November 1, 2018**



<http://www.nisenet.org/earthspacekit-apply>

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Thank You

