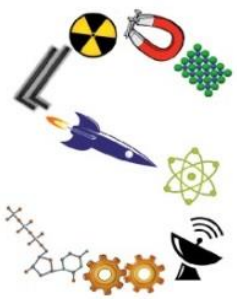
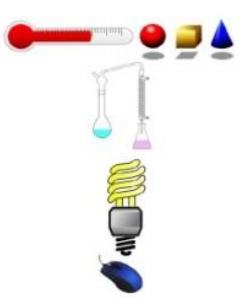







STEM: Volunteer Training

Engaging Middle School Students

August 13, 2015

Erin Twamley
Education Project Manager
Department of Energy

Nimisha Ghosh Roy
Network Manager
National Girls Collaborative Project

Rabiah Mayas, Ph.D.
Director of Science and Integrated Strategies
Museum of Science and Industry Chicago

Agenda

Overview of STEM Training

Key Outcomes of STEM Learning in Out-of-School

Strategies for STEM Engagement

- ❑ Crafting Your Message
- ❑ Engaging your Middle School Audience

Resources for Getting Started

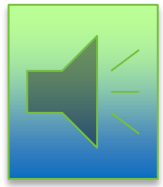
- ❑ Finding Volunteer Opportunities
- ❑ Training Resources

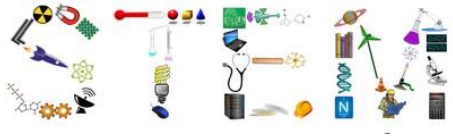
Question and Answer

You are on mute!

Use your webinar bar to fill out poll, send a chat or send in a question.

Please tell us via chat if you cannot see or hear.





Poll: Have you done a STEM volunteer activity or event prior to today's training?

Setting the STEM Volunteer Context

- **Vision:** 1,000,000 hours of Federal STEM Volunteer Service
- **Need:** Training and resources to facilitate with STEM engagement
- **Goal:** Establish Quarterly Virtual Training Series

Training Leads

Nimisha Gosh Roy

Network Manager

National Girls Collaborative Project

- The National Girls Collaborative Project (www.ngcproject.org) brings together organizations that are committed to girls in STEM.
- NGCP has 31 Collaboratives, serving 39 states.
- 4,038 programs on The Connectory
- 550+ STEM Professionals in the FabFems Role Model Directory

Rabiah Mayas, Ph.D.

Director of Science and Integrated Strategies

Museum of Science and Industry Chicago

- MSI vision is to inspire and motivate children to achieve their full potential in science, technology, engineering and medicine.
- 1.4M visitors each year; 330,000 on field trips
- STEM Professionals programs – Jr. Science Cafes, Science Works!, and Scientists @ Work – reach 10,000+ youth each year

Why Girls and STEM?

- Girls and boys do not display a significant difference in their *abilities* in math and science.
- Differences exist between girls and boys in *confidence* and *interest* in STEM.
- Women continue to be underrepresented in STEM at college and workforce level, especially in engineering, computer science, and physical sciences.
- STEM is an equity issue.

NGCP Resource: **State of Girls and Women in STEM**

Negative stereotypes about girls and women in STEM persist

- Role models can counter negative stereotypes
- Encouraging **growth mindset** can protect girls and women from the influence of negative stereotypes about girls and women and STEM

Disparity in STEM: Snapshot Chicago

Demographic	Chicago Public Schools[1]	Chicago[2]	U.S.[3]	U.S. STEM Workforce[4]
White/Caucasian (not Hispanic or Latino)	9%	45%	63%	70%
Black, African-American	39%	33%	13%	6%
Hispanic or Latino	46%	29%	17%	6%
Female	54%	51%	51%	26%

1) Chicago Public Schools, 2014
2) United States Census Bureau, 2014 data
3) United States Census Bureau, 2013 data
4) *Disparities in STEM Employment by Sex, Race, and Hispanic Origin* (2013), United States Census Bureau

STEM Learning in Out-of-School

- **Strand 1:** Experience **excitement, interest, and motivation** to learn about phenomena in the natural and physical world.
- **Strand 2:** Come to generate, understand, remember, and use **concepts, explanations, arguments, models, and facts** related to science.
- **Strand 3:** Manipulate, test, explore, predict, question, observe, and **make sense of the natural and physical world.**
- **Strand 4:** Reflect on **science as a way of knowing**; on processes, concepts, and institutions of science; and on their own process of learning about phenomena.
- **Strand 5:** Participate in **scientific activities and learning practices with others**, using scientific language and tools.
- **Strand 6:** Think about themselves as science learners and **develop an identity** as someone who knows about, uses, and sometimes contributes to science.

National Research Council. (2009). *Learning Science in Informal Environments: People, Places, and Pursuits.* Council of the National Academies

5 Key Areas of Support

1. **Crafting your message**
2. **Engaging your audience**
3. Preparing your session
4. Nonverbal communication
5. Navigating tricky situations

1. Crafting your message
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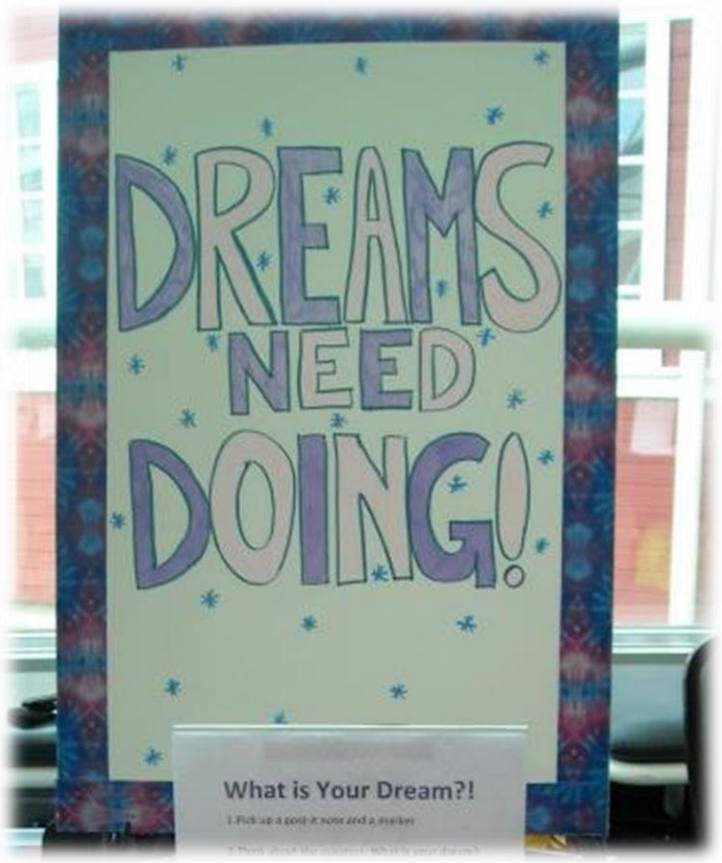
1. Crafting Your Message

- Map out your first 60 seconds
- Identify to 1-2 key takeaways
- Define lay-friendly ways to describe:
  - **The What**: key problems/questions
  - **The How**: processes to find answers/solutions
  - **The Why:** why it matters (and to whom)
- Select real-world examples, WOW facts, and personal context relevant to your audience.

Example: Sharing about You

- Keep it personal. Talk about hobbies, family, etc.
- Share your academic and career path.
- Use kid-friendly language.
- Show how engineers can change the world.
- Be passionate.



Learn more about this tip:
http://techbridgegirls.org/rolemodelsmatter/tool/sharing-about-you/

1. Crafting your message
2. Engaging your audience
3. Preparing your session
4. Nonverbal communication
5. Navigating tricky situations

2. Engaging Your Audience

- Ask open-ended questions with multiple answers
  - *What do you think about….?*
  - *When is the last time you…?*
  - *How might you investigate…?*

- Acknowledge all answers, including incorrect ones
  - *That's a good guess!*
  - *That's close! In fact….*
- Consider trivia or multiple choice questions to jump start discussions

2. Engaging Your Audience (Cont'd)

- Pause occasionally for understanding
  - Reiterate a point or key takeaway
  - Ask for any questions
- Try some appropriate humor
- Use accessible, age-appropriate language
- Distill content while keeping it accurate

Example: Do Icebreakers!

Icebreakers allow you to:

- Get youth warmed up and feeling more comfortable with you.
- Introduce new scientific topics, vocabulary, or STEM careers.
- Check for background knowledge on a particular topic.

Learn more about this tip:
http://techbridgegirls.org/rolemodelsmatter/tool/breaking-the-ice/

Example: Provide specific Feedback

- Youth confidence and performance improves in response to specific, positive feedback on things they can control—such as effort, strategies, and behaviors

- Avoid statements such as, “You are really good at this!”

- Example (Focused on Behavior):

  “I love the way you and Kate worked together to solve that problem.”

Poll: Where are you looking for STEM volunteer opportunities?

Volunteer Opportunities

VOLUNTEER WITH THE SMITHSONIAN IN WASHINGTON DC

Inspire | Discover | Create | Engage

We are in search of friendly, outgoing volunteers who will engage with visitors and help them plan memorable and exciting experiences so that they can discover all that the Smithsonian has to offer.

Join us as a Smithsonian Visitor Information Specialist and help us inspire & engage our visitors!

Learn more & get started!

Contact Abbey Earich at EarichA@si.edu or 202.633.5260

Volunteer: STEM Mentoring Café Series

- Seek Federal and local STEM Professionals for 2 hr speed networking events with middle school students at museums
- Email us at STEMED@energy.gov to volunteer

ASTC	Federal Mentors	Date
***Anchorage Museum Anchorage, AK**	Various	October 27, 2015
***Intrepid Sea, Air, and Space Museum New York City, NY**	NASA Goddard Space Center/Brookhaven National Laboratory	November 14 or 28 2015
***Lawrence Hall of Science Berkley, CA**	Lawrence Berkley National Laboratory	December 2015
***Children's Museum of Houston Houston, TX**	NASA Johnson Space Center	January 2016
***Denver Museum of Nature and Science Denver, CO**	National Renewable Energy Technology Laboratory	February 2016
***National Museum of Nuclear Science and History Albuquerque, NM**	Sandia National Laboratory	March 2016
***Smithsonian Institution Washington, DC**	DOE, NSF, NASA	April 2016

Volunteer Resources

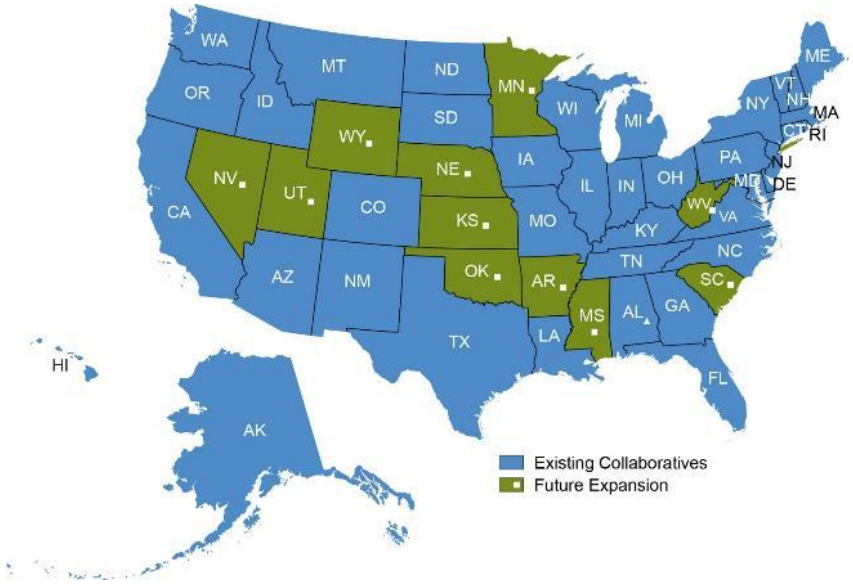
The FabFems Project is an international, online, searchable directory of women STEM professionals interested in outreach to girls.

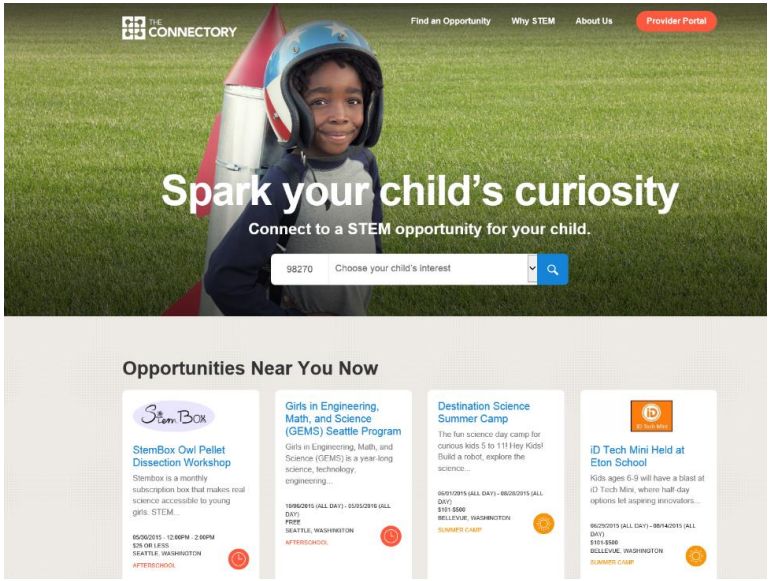
Audience:

- Role Models
- Girl-Serving Programs
- Parents and Girls

www.fabfems.org

Volunteer Resources: NGCP Collaboratives & The Connectory





http://www.ngcproject.org

Network of 31 Collaboratives, organizations and individuals engaged in pursuing supporting youth/girls in STEM

http://www.theconnectory.org/

Largest and most comprehensive directory of STEM opportunities and programs

Poll: What training resources do you need to be successful?

Training Resources

Techbridge Role Models Matter

http://techbridgegirls.org/rolemodelsmatter

Online Toolkit Topics Include:

- Breaking the Ice
- Sharing About You
- STEM Messaging
- Technobabble
- Crowd Control
- Choosing a STEM Activity
- Engineering Design Process
- Career Exploration
- The Art of Questioning
- Giving Girls Feedback
- Reflection – Making Meaning

Training Resource

SciGirls Seven: How to Engage Girls in STEM

http://scigirlsconnect.org/page/scigirls-seven

Additional Resources

AAAS
ADVANCING SCIENCE, SERVING SOCIETY

- Communication tools
- Leshner Leadership Institute
- Conference videos
- National engagement opportunities

NISE network
NANOSCALE INFORMAL SCIENCE EDUCATION

- Hands-on activities
- Science Café guides
- K-12 lesson plans

Alan Alda Center for Communicating Science
AT STONY BROOK UNIVERSITY

- Courses and workshops
- Improv for scientists

caise | center for advancement of informal science education

- Whitepapers on public science engagement
- Evaluation studies of science engagement programs

Questions and Contact Us

Email us: STEMED@energy.gov

Tweet and Facebook with us:
#WomenInSTEM
#STEMCafes

Find this training and presentation on our website at:
http://www.energy.gov/diversity/services/stem-education