Engaging Effectively with K-12 Students

Professional Development Series
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Why?

What do you think of when you think of a scientist?

techbridge
Inspire a girl to change the world.

- 5-year study funded by the National Science Foundation
- Role Models Matter curriculum
- Focused on girls in STEM—but relevant for engaging with youth from all backgrounds and across academic disciplines
- Findings and resources at techbridgegirls.org

Today's Session

- **Workshop components of effective K-12 student engagement:**
    - Ice breakers
    - Personal stories
    - Interactive activity
    - Reflection

- **Tips for facilitation**
- **Now what?**

Ice Breaker Time!

Ice Breakers Can:

- Make students and role models more comfortable.

- Introduce new topics, vocabulary, or academic disciplines and careers.

- Check for background knowledge.

Personal Stories

Tips for Sharing a Personal Story

- Make it personal.
- Use plain language (avoid jargon).
- Share your academic or career path from youth to now. How did you afford it?
- What did it take to become a...?
- Share how you overcame obstacles.

Example 1 *Engineer*

Example 2 *Musicians*

Example 3 *Nobel Prize winner*

Practice Your Personal Story

- Go beyond the What, When, and Where.
- Get to the **Why** and **How**.

Think-Pair-Share: What would you include in your personal story?
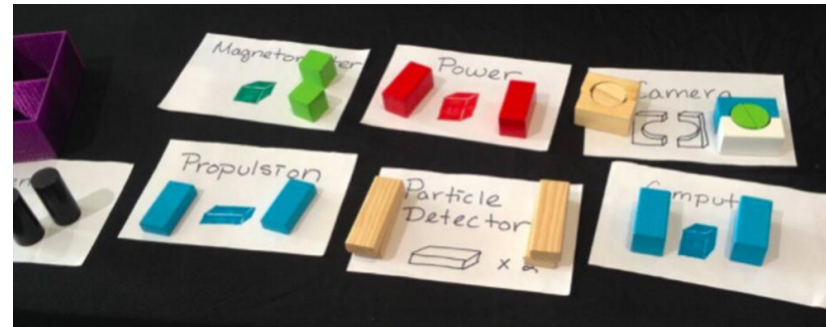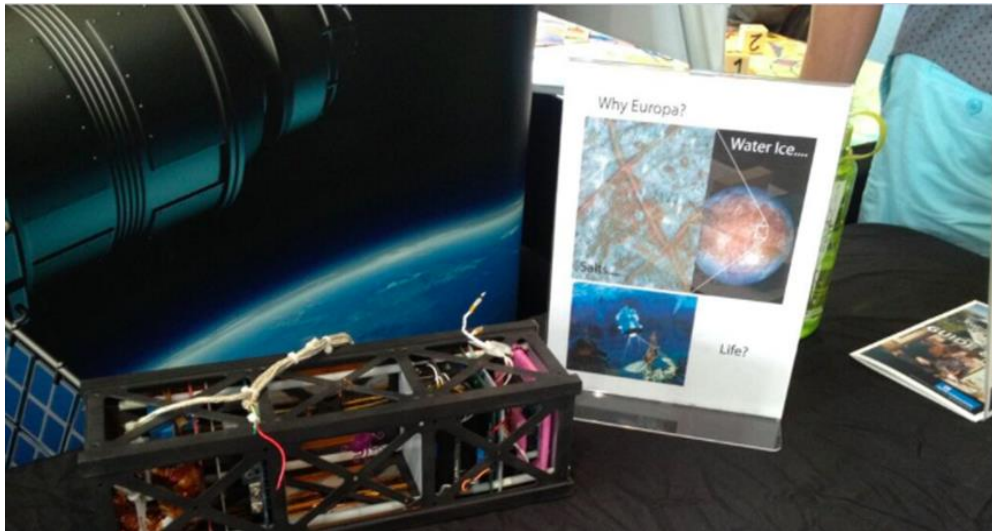
Interactive Activity

Planning an Interactive Activity

- Make it as **hands-on** or **interactive** as possible
- Make it engaging and participatory.
- Try to give every student something to do.
- Make it inquiry-based: solve a problem.
- Pick something you're passionate about.

Examples of Interactive Activities

Cubesat Activity

Examples of Interactive Activities

Media Literacy Activities (from the *New York Times*)

Essay 2: I usually eat cold lunch

At lunchtime I usually eat cold lunch. My mother packs me a sandwich, a drink, fruit, and a treat. When I get in the lunchroom I find an empty table and sit there, and eat my lunch. My friends come and sit down with me. I open my lunch and start to eat. First I eat my sandwich then I open my drink, then eat my fruit and last but not least my treat. After that I sit quietly until I am dismissed. When I am I go into to the bathroom and clean my teeth because I have braces.

When I am done with that I go outside and put my lunchbox away and go find my friends. We usually play four square or play on the play ground. If we are not on the playground or on the four square ground we are on the field playing tag, kickball, or soccer. I really like to play soccer and my friends do too.

Human child

ChatGPT

Chatbot or Fourth Grader?

One of these posts was from a genuine Facebook page that supports feminism, and the other was part of an influence campaign. Can you guess which post is from a fake page?
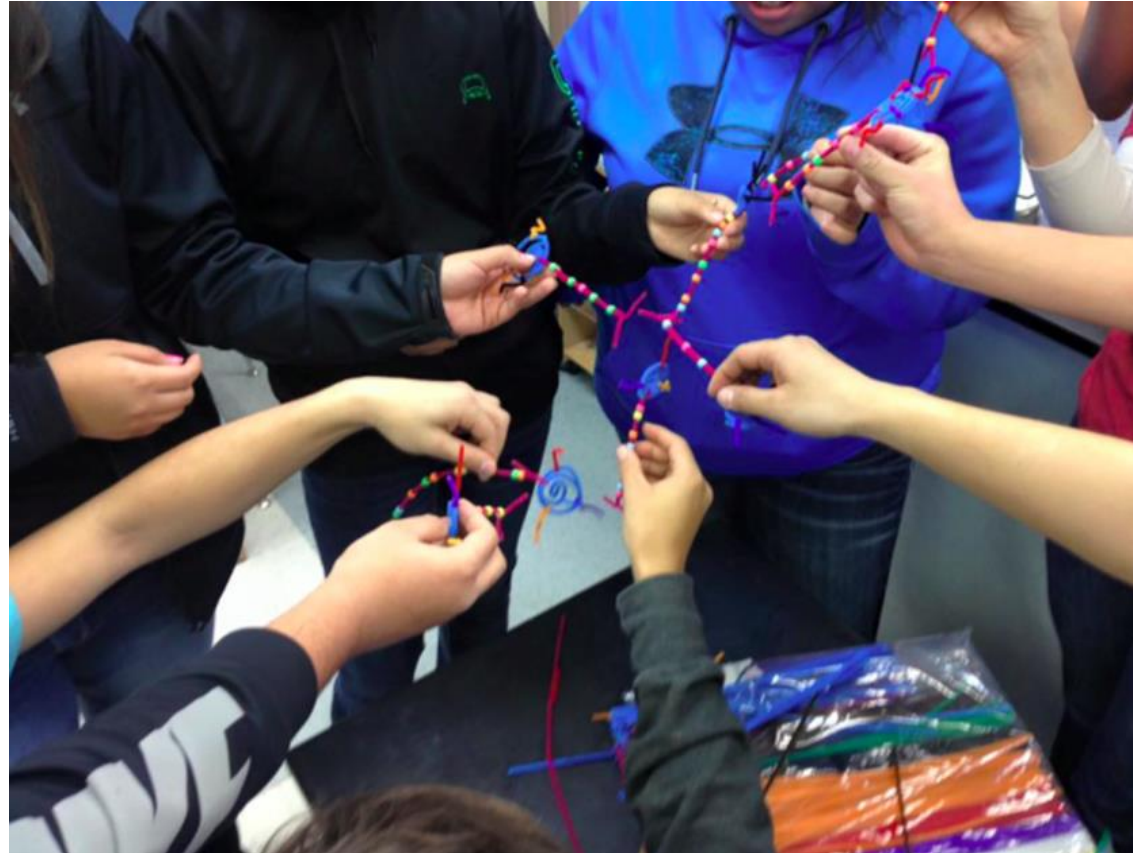
Girls make rules and you follow them. If you don't like them you live. End of the story.

RULES FOR DATING MY DAUGHTER
1. I DON'T MAKE THE RULES
2. YOU DON'T MAKE THE RULES
3. SHE MAKES THE RULES
4. HER BODY, HER RULES

Feminist Father

27   8 Shares

"my boyfriend thinks i should.."
"my boyfriend doesn't like it when i.."
"my boyfriend doesn't want me to speak to.."

Dump Him

GIF

8.4K   341 Comments 5.8K Shares

Which post was generated by Russian disinformation operatives?

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Examples of Interactive Activities

Build a Brain Cell

Workshop Your Activity Ideas

For support planning or practicing an activity idea, contact Kit Smith (kit.smith@umontana.edu).

Reflection

Reflection

Creates opportunities for students to reflect on the activity, and how it relates to:
- Their lives
- Your field
- Other disciplines

These connections should be made throughout the activity.

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Facilitation Pointers

The Big Idea

What is the **one concept** or **big idea** about my research, scholarship, or career that I want students to remember?

Props or Hooks

- Supplies or other artifacts from your research or other work
- Has a purpose that enhances your visit
- Big enough to see and not too fragile

Engaging Quieter Students
(and engaging students on Zoom)

- Think-pair-share
- Wait time/think time
- Thumbs up/down
- Give time to write down responses before sharing (or chat cascade in Zoom)

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The Art of Questioning

- Ask open-ended questions.
- Give students time after posing a question (count to 10).
- Ask higher-level questions to encourage higher-level thinking.

  What changes would you recommend to improve your design?

  What would happen if…?

  How would this scenario change if..?

  What do you see as other possible outcomes?

  What are other real-world applications of this?

Giving Feedback

- Be positive but not false.
- Be specific. Don't just say "Good job."
- Provide feedback throughout the activity.

I really like how you…
I saw you were using a lot of effort when…
This is really interesting because…
You were the only group that tried it this way

Reflection

Can someone share something that they learned in today's workshop or found particularly helpful?

What's Next?
Upcoming K-12 Engagement Opportunities

We Are Montana in the Classroom

UM role models (faculty, post-docs, graduate students, staff) bring:

- Passion for higher education and their research, academic field, or career

- A fun, interactive visit plan

We Are Montana in the Classroom provides:

- Travel

- Coordination

- Support with visit planning

- Post-visit survey

spectrUM Discovery Area

UM's hands-on science center located at the Missoula Public Library with additional locations at:

- EmPower Place at Missoula Food Bank
- Summer programs in the Bitterroot Valley and on the Flathead Reservation
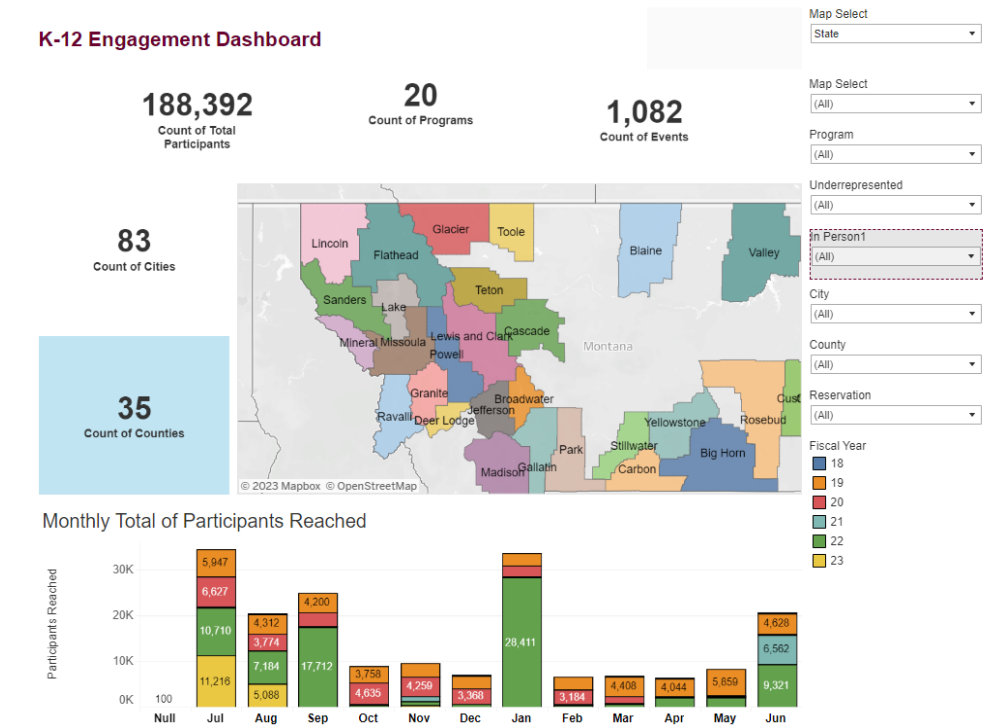- Science on Wheels visits across Montana

Connect with public and K-12 audiences:

- Open hours at the Discovery Bench
- Field trip and camp groups
- Family Science Nights

Share Your Impact

UM K-12 Engagement Dashboard

- Helps share the story of UM's K-12 engagement with the campus and external communities

- Opt-in; all UM programs and departments invited to participate

- Located at Office of Institutional Research > Metrics > Student Support Metrics > K-12 Engagement

- Contact Nathalie Wolfram (nathalie.wolfram@umontana.edu)

Thank You