

University of Massachusetts Boston

## ScholarWorks at UMass Boston

---

Office of Community Partnerships Posters

Office of Community Partnerships

---

4-2-2014

### This is Your Brain on Civically-Engaged Chemistry

Hannah Sevian

University of Massachusetts Boston, [hannah.sevian@umb.edu](mailto:hannah.sevian@umb.edu)

Follow this and additional works at: [https://scholarworks.umb.edu/ocp\\_posters](https://scholarworks.umb.edu/ocp_posters)



Part of the [Civic and Community Engagement Commons](#), and the [Science and Mathematics Education Commons](#)

---

#### Recommended Citation

Sevian, Hannah, "This is Your Brain on Civically-Engaged Chemistry" (2014). *Office of Community Partnerships Posters*. 262.

[https://scholarworks.umb.edu/ocp\\_posters/262](https://scholarworks.umb.edu/ocp_posters/262)

This Presentation is brought to you for free and open access by the Office of Community Partnerships at ScholarWorks at UMass Boston. It has been accepted for inclusion in Office of Community Partnerships Posters by an authorized administrator of ScholarWorks at UMass Boston. For more information, please contact [scholarworks@umb.edu](mailto:scholarworks@umb.edu).

## Summary

This Freshman Seminar course for Chemistry majors is designed to introduce students to the college experience as well as to foster an interest in chemistry. The science of learning chemistry is the integrating theme. In Fall 2013, Professor Sevia customized the curriculum by linking her undergraduates with students at the Dever-McCormack School. Undergraduates apply basic chemistry concepts they learn in class to content-focused outreach activities in K-8 science classrooms. This course is part of the Civic Engagement Scholars Initiative (CESI), a three-semester UMass Boston program designed to support faculty with integrating community engagement into undergraduate courses.

## Partnership Goals

- 1) Develop mutual goals and collaborate with science teachers at Dever-McCormack K- 8 School;
- 2) Perform three 10-minute skits for 8<sup>th</sup> graders;
- 3) Visit classrooms to help 8<sup>th</sup> grade students understand chemistry assignments;
- 4) Foster investment by freshman seminar students in community activity to help kids learn chemistry;
- 5) Identify engaging ways to involve freshman seminar students in learning about relationships between effective teaching and productive learning of science and chemistry.

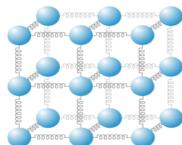


UMass Boston students performed a chemistry demonstrations show linked to the chemistry unit 8<sup>th</sup> graders were studying in Mr. Grymonpre's science class.

## The Skits

**If I Was an Atom:** A participatory musical and riddle explores how solids move through the application of the Kinetic Molecular Theory.

Using the diagram, 8<sup>th</sup> graders are asked to explain how many atoms are shown, and to list 3 ways atoms can move in a solid.



A 3-dimensional representation of an atom in a solid.

**Slime Design:** Audience participants make predictions and engage in guided physical dramatizations to investigate which of three substances will make slime when added to the mix.

**Slime Design**

Polyvinylalcohol (PVA) Describe what this represents. What are the circles? What are the lines?

What is a "mer"?

What does "viscous" mean?

Chemical A - MAKES A BOND BETWEEN ENDS Does Chemical A make the PVA more viscous? Why or why not?

Chemical B - MAKES BONDS IN THE MIDDLE Does Chemical B make the PVA more viscous? Why or why not?

Chemical C - BREAKS BONDS Does Chemical C make the PVA more viscous? Why or why not?

Which one made the PVA into slime? If you had to explain to a 5<sup>th</sup> grader how "crosslinking" makes a polymer more viscous, what would you say?



Students leading Bouncemania in Mr. Grymonpre's 8<sup>th</sup> grade science class.

**Bouncemania:** A pair of balls contest each other in this lighthearted investigation of "bounceability" and molecular structure.

## Civic Learning Objectives

- Gain knowledge about how people learn chemistry, such as how chemists think about chemistry and strategies for becoming a more effective learner of chemistry.
- Apply effective instructional approaches by teaching younger students chemistry, observing these students; and interpreting observations by applying knowledge of how people learn chemistry.
- Recognize commonalities among effective teaching strategies in various contexts.

## Results/Impacts

### Enhanced student learning:

- Development of visualization skills needed for representing chemical structures;
- Knowledge of effective vs. ineffective methods of teaching chemistry;
- Deepened understanding of how they (individually) learn chemistry.

### Additional Outcomes:

- The experience motivated freshman students to serve as lunch buddies for 7<sup>th</sup> and 8<sup>th</sup> graders.
- Seven students continued as volunteers in spring semester to mentor and coach 8<sup>th</sup> graders to perform skits for 3<sup>rd</sup>-5<sup>th</sup> graders.
- Exposes 8<sup>th</sup> graders to role models pursuing science education.
- CESI funds leveraged additional \$500 for 8<sup>th</sup> grade teacher through American Chemical Society's Science Coaches Program.

### UMass Boston Student Reflections:

*"As the eighth grade class oohed and awed at the magic...I answered each question that those little minds stormed up with ease."* - Student

*"I know the feeling of uncertainty quite well. All throughout high school I wondered whether or not I would make it to college...I hope to in the future encourage and guide other students on a path to college."* - Susana Ruiz

## Partners and Resources

Plays are copyrighted by the **Fusion Science Theater** and were written by Holly Walter Kerby.

Kris Grymonpre, 8th Grade Science Teacher,  
Dever-McCormack School

