4-2-2014

This is Your Brain on Civically-Engaged Chemistry

Hannah Sevian
University of Massachusetts Boston, hannah.sevian@umb.edu

This is Your Brain on Civically-Engaged Chemistry

Hannah Sevian, Associate Professor of Chemistry, College of Science and Mathematics

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 Sevian 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

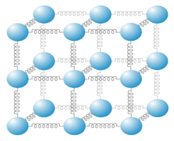
1) Develop mutual goals and collaborate with science teachers at Dever-McCormack K- 8 School;
2) Perform three 10-minute skits for 8th graders;
3) Visit classrooms to help 8th grade students understand chemistry assignments;
4) Foster investment by freshman seminar students in community activity to help 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 8th graders were studying in Mr. Grymonpre's science class.

The Skits

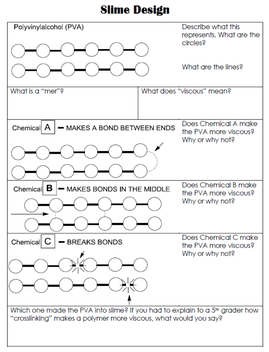
If I Was an Atom: A participatory musical and riddle explores how solids move through the application of the Kinetic Molecular Theory.

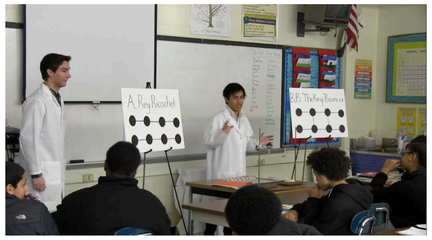
Using the diagram, 8th graders are asked to explain how many atoms are shown, and to list 3 ways atoms can move in a solid.



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.





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

Students leading Bouncemania in Mr. Grymonpre's 8th grade science class.

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 7th and 8th graders.
- Seven students continued as volunteers in spring semester to mentor and coach 8th graders to perform skits for 3rd-5th graders.
- Exposes 8th graders to role models pursuing science education.
- CESI funds leveraged additional $500 for 8th 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