

[2015-2016 Year in Review & New Exciting Opportunities for 2016-2017](#)

Outreach Organizations reached out to in Fall 2015-Spring 2016:

1. iPraxis Education Works Duckrey School - Nov 24, 2015
2. iPraxis Wissahickon Elementary School Science Fair - Dec 18, 2015
3. Future Cities Competition - Jan 30, 2016
4. ECP Architects and Engineers Night – Wells Fargo Center - Feb 8, 2016
5. ECP Engineer’s Week at North Penn High School - Feb 26, 2016
6. Creation Station with SHPE – Esperanza College - Feb 27, 2016
7. Science Fair at Oak Park Elementary School with Drexel and Merck - March 3, 2016
8. ECP East Norriton MS Event - March 19, 2016
9. ECP Philadelphia Science Festival - April 30, 2016
10. ACLAMO Family Center After School - May 12, 2016

The 2015-2016 year was a great year for K-12 outreach for the American Institute of Chemical Engineers Delaware Valley Section (AICHE-DVS). The section decided to increase their outreach involvement on the excitement and attraction behind chemical engineering to student groups in Philadelphia and the surrounding suburbs. With a help of a grant from the National AICHE for experiment supplies and increased volunteer hours from members, the group was able to participate in ten different outreach events throughout the area.

AICHE-DVS partnered with a few local groups to assist in the outreach – iPraxis, Future Cities, Engineers’ Club of Philadelphia, Society of Hispanic Professional Engineers, Merck, and the AICHE Drexel chapter. The schools AICHE-DVS assisted were Duckrey Elementary School in Philadelphia, Wissahickon Elementary School in Philadelphia, North Penn High School in Lansdale, Oak Park Elementary School in Lansdale, East Norriton Middle School in Norristown, Esperanza College in North Philadelphia, and ACLAMO Family Center after-school in Norristown. Other events included the middle school regional Future Cities competition at Archbishop Carroll High School, Architect’s and Engineer’s Night at the Sixers game at Wells Fargo Center, and Philadelphia Science Festival at Penn’s Landing.

AICHE-DVS K-12 outreach group came together to structure a variety of hand-on engineering experience to increase exposure to chemical engineering and beyond. The four experiments covering different subsections in chemical engineering include the following:

Hands-on Activity #1: Carbon Captured Chalk Experiment

Goal: The premise of this experiment is to help students identify the means to sequester carbon dioxide. A double substitution reaction is used by chemical engineers to help relieve the burden of carbon dioxide on our atmosphere by trapping emissions in benign products, such as chalk.

Two solutions of soluble salt (Sodium bicarbonate and Calcium chloride) are mixed and undergo a double substitution reaction. As a result, table salt (sodium chloride) and chalk (calcium carbonate) are formed. Students will begin to understand the importance of carbon sequestration technology, define heats of solutions and further grasp the concept of solubility.



Hands-on Activity #2: Slime Experiment

Goal: This exciting experiment seeks to introduce the concept of polymer formation through the cross linking of glue with borax to form slime.

Students are introduced to how the order of experiment design plays a critical role in the final outcome of the product. For instance, what happens when you add too much borax to the glue solution? Or what happens when you add the borax too quickly to the glue solution? When do you color your slime with food coloring? What is cross-linking? What is a polymer?



Hands-on Activity #3: Homemade Ice Cream Experiment

Goal: This delicious experiment is a hands-on engineering classic whereby students get to explore the concept of freezing point of depression through the use of rock salt to lower the freezing point of ice. The lower temperatures formed is then applied to freeze delicious liquid cream into ice cream.

Students get to explore the creative side of engineering through a mixture of food coloring in their plain liquid cream and the application of rock salt in everyday life for temperature control? Why is rock salt applied to driveways and bridges when it is about to snow heavily? What causes the temperature of ice to drop below freezing when rock salt is added? In addition to this experiment, the concept of heat transfer is introduced through convection, conduction and radiation.



Hands-on Activity #4: Lip Gloss Experiment

Goal: The goal of this experiment is to excite the young minds to consider how chemical engineering extends to consumer products such as lip-gloss. This engaging hands-on experiment gets the young minds thinking about how cosmetics and consumer products are carefully analyzed and thought through to ensure that its chemical properties are safe, stable and appeal to the general public. For example, no one wants to use a lip gloss that is too hard or too oily. This why lip gloss calls for some sort of oil or butter with the help of emollients to moisturize and soften the skin. On the other hand, beeswax is introduced to avoid having lip gloss that is too runny at room temperature. Students get to explore that the perfect lip gloss means getting the right ratio of emollients to waxes.

The concept of emulsifiers, like Vitamin E, to change the properties of one ingredient so that they become microscopic droplets inside the other is also introduced.



Do you have interest in extending your passion for chemical engineering to our young, budding future engineers? AIChE DVS is looking for more volunteers and partners. [Sign up and see how you can get involved TODAY!](#)

If you would like to assist at a future outreach event, please fill out this online form here:

<http://goo.gl/forms/eEde0jZZ3oUzkunh2>

Note: Filling out the form does not commit you to any events. The AIChE DVS outreach committee is trying to gather information for future outreach events and volunteers. We are always looking to partner with other STEM/ Engineering groups, schools (K-12) and organizations to increase the number of events we can reach out to and further influence future engineers. If your group would like to partner with us, please email Ted Heron (theodore.heron@gmail.com).