

WEDNESDAY MORNING PROGRAM

Time	SC450	SC457	SL2020	SL2035	SL2040	SL2050	CL 1008	CL 2008	CL 2010	CL 1010	SC215	SC213	SC214	SC212	MS112	
8:30	EL01	HSL02	HSL04	APL01							HSP04	HSP03	HSW01	HSW02	HSW03	
8:45					EL11	HSP01										
9:00																
9:15											HSP04					
9:30																
9:45								CP03	HSP05	CP01	CP02				APW01	HSL01
10:00																
10:15							HSL10						HSW05			
10:30						EL02				EP01						
10:45	HSL05	HSL07	HSL06					HSP07	CP04		HSP06	HSP06			APW02	
11:00																
11:15																

Conference Strands	
Blended / Flipped Learning	Miscellaneous
Chemistry Demonstrations	Misconceptions in Chemistry
Chemistry in Context	Modeling
Forensic Chemistry	Next Generation Science Standards (NGSS)
Informal Learning / Learning through Play	Technology (online learning or in the classroom)
Inquiry Practices (POGIL, PBL, etc.)	Writing and Literacy in Chemistry
Laboratory Instruction	

Code	Population	Code	Presentation Type
AP	Advanced Placement	C	Computer Lab Workshop
C	College	L	Laboratory
E	Everyone	P	Presentation
HS	High School	W	Workshop

WEDNESDAY MORNING

APL01: AP Chemistry Inquiry and Forensic Laboratory Manual

Jesse Bernstein, Jeffrey Bracken and Paul Price
Miami Country Day School
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Here is an AP lab workshop that will satisfy virtually all of your desires; over forty-five inquiry and forensic based lab activities that parallel those now recommended (or required) by the College Board. The available manual contains detailed teacher notes, pictures of setups and sample data and calculations. All experiments have been correlated to a primary learning objective(s) and science practices as outlined in the College Board Curriculum Framework for AP Chemistry.

Time: 8:30:00 AM - 11:15:00AM **Location:** SL 2035
Strand: Forensic Chemistry

APW01: Flinn Scientific Resources Prepare Students for AP Chemistry Success

Jillian Saddler
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Join Flinn Scientific as we share resources and strategies to help students succeed on the AP Chemistry exam. Discover the benefits of preparing students for the first day of class with FlinnPREP™: a new online review of foundational chemistry concepts. You'll also learn how easy it is to teach the integrated learning objectives and applied science skills students need using Flinn's AP Chemistry Kits. Your students will also appreciate the advantage of practicing Flinn's free-response questions.

Time: 9:30:00 AM - 10:15:00 AM **Location:** SC 212
Strand: Miscellaneous

APW02: Visualizing Chemistry

Jamie Flint
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With the AP chemistry test going toward more diagrams. I will go over handouts, activities and test questions that I've added to my classes to better prepare my students. Getting students to visualize what is going on the molecular level can help address misconceptions they might have. These can be used or modified in all levels of chemistry.

Time: 10:30:00 AM - 11:15:00 AM **Location:** SC 212
Strand: Modeling

CP01: Rocks, Minerals, and Chemistry

Donna Mullenax and Catherine MacGowan
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Geology and chemistry are two subjects not often taught together. Recently, a geochemistry course was taught for upper-level chemistry majors. Students were required to use material from introductory chemistry in a discipline that most had never experienced. Applications of chemistry knowledge and laboratory skills were put to the test. This session will address what we did in the class, what was observed, and potential changes in the introductory chemistry sequence.

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 2010
Strand: Chemistry in Context

CP02: The Determination of Mg(OH)₂ in Milk of Magnesia Using a Conductometric Titration

Dave Haas, Xiaoping Sun, Brittany Argento,
Samantha McWilliams and Shubha Malla
University of Charleston
davidhaas@ucwv.edu

A novel conductometric titration is used for the determination of magnesium hydroxide in Milk of Magnesia™. The sample was reacted with hydrochloric acid added using a drip technique with a standard buret. Conductivity vs, time was observed on a computer, and the equivalence point determined from a change in slope of the titration curve. Results from 5 labs were close to 400 mg reported on the product label. As a bonus, the milky sample solution turns crystal clear at the equivalence point!

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 1010
Strand: Chemistry in Context

CP03: How to Flip Safely: Implementing a Blended Course Format in General Chemistry

Lisa Hibbard
Spelman College
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Blended courses combine the best of both face-to-face and online learning strategies by integrating online content delivery with structured classroom sessions that focus on student-centered activities. In this session, college general chemistry instructors will be introduced to platforms for online content delivery, best practices for reinforcing comprehension both during and after class, and share assessment strategies.

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 1008
Strand: Blended / Flipped Learning

CP04: Student Centered Active Learning at Rice

Carrie Obenland, John Hutchinson, Kristi Kincaid,
Lesa Tran, and Ashlyn Munson
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Student Centered Active Learning at Rice was implemented in the two semester General Chemistry course in 2012 at Rice University. A combination of small student group activities and Socratic dialog was used to provide constant active engagement and guided inquiry. Student perceptions and performance were collected through surveys, exam scores, and the Chemistry Concept Reasoning test. Analysis of student data, as influenced by the additional active learning, will be presented in detail.

Time: 10:30:00 AM - 11:15:00 AM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

EL01: Super Chemistry Connections

Al Hazari
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In this presentation for K-16 teachers and professors, participants will do exciting hands-on chemistry activities. These are from the Institute for Chemical Education's guidebooks entitled, "Super Science Connections" and "Fun with Chemistry" (Volumes 1 and 2). **Prepaid Workshop.**

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 450
Strand: Laboratory Instruction

EL02: Demonstrations Using (Mostly) Household Items

Dean Campbell, Felicia Staiger, Joshua Peterson
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Various demonstrations have been adapted toward using household items as part of continuing efforts to make chemistry more accessible to the public. For example, the "blue bottle" demonstration has long been used to illustrate principles of kinetics and redox reactions. A variation on this classic demonstration will be presented that uses food items. Another demonstration will show the production of magnetic iron compounds from iron supplement tablets.

Time: 10:30:00 AM - 10:45:00 AM **Location:** SL 2040
Strand: Chemistry Demonstrations

EL11: Visual Electrochemistry: Laboratory Exercises to Understand Electron Flow

Candace Goodman John Amend
MicroLab
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Electrochemistry is probably one of the most difficult topics to teach in general chemistry, but its applicability is widespread (metabolism, technology, energy, etc.) Therefore, it is vital that this topic be explained in a way students can comprehend. This workshop highlights equipment designed to easily and visually demonstrate important fundamentals of electrochemistry, including the electron flow, electrochemical potential and the Nernst equation. We start with a visual demonstration, then move into qualitative comparisons and quantitative data.

Time: 8:30:00 AM - 9:15:00 AM **Location:** SL 2050
Strand: Laboratory Instruction

EP01: The Chemistry of Meteor Surfaces

Heather Abbott-Lyon and Victoria Humak
Kennesaw State University
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The Abbott-Lyon laboratory studies reactions that occur on the surface of meteoritic minerals like schreibersite. Understanding this surface chemistry and performing experiments requires knowledge of basic chemistry concepts that are typically discussed in AP/IB high school and introductory college chemistry courses. Progress toward developing classroom materials to help students address the Next Generation Science Standard SC6 will be presented.

Time: 10:30:00 AM - 10:45:00 AM **Location:** CL 2010
Strand: Chemistry in Context

HSL01: Teaching Chemistry with Food

Sunil Malapati and Sharon W. Kreamer
Clarke University
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The workshop will provide the participants with hands-on activities, demonstrations, discovery-based lessons, and small experiments focusing on chemical transformations using food. Basic chemical concepts such as pH, color, nature of heat & energy will be explored in addition to cutting-edge molecular gastronomy techniques exciting faculty and students alike. Participants will take home classroom and laboratory activities that have been tested and can be plugged into their courses. **Prepaid Workshop.**

Time: 8:30:00 AM - 11:15:00 AM **Location:** MS 112
Strand: Chemistry in Context

HSL02: Introduction to Vernier Technology for Chemistry

Elaine Nam
Vernier Software & Technology
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If you're new to data collection with Vernier, or would like a basic refresher, this workshop is for you. Join us for hands-on practice using LabQuest 2— a popular stand-alone data-collection device. Rotate through stations to conduct a selection of experiments from our three lab books, Chemistry with Vernier, Advanced Chemistry with Vernier, and Investigating Chemistry through Inquiry using the pH Sensor, Drop Counter, Temperature Probe, Gas Pressure Sensor, Conductivity Probe, and Colorimeter.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 457
Strand: Technology (online learning or in the classroom)

HSL04: Hydrogen-powered Soda Bottle Rockets

Steve Sogo
Laguna Beach High School
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Participants in this workshop will learn how to launch soda-bottle rockets using a mixture of hydrogen and oxygen gases. This lab activity is intended for high school chemistry students and introductory college students. The lab includes the concepts of stoichiometry, chemical energetics, activation energies, catalysis, and gas laws. Ignition of the rockets is achieved using a home-made aluminum foil electronic igniter. When launched, the bottles can fly 40-50 feet into the air.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SL 2020
Strand: Laboratory Instruction

HSL05: Chemistry for your Chromebooks, Computers and Tablets

Tom Loschiavo
PASCO scientific
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PASCO's award winning SPARKvue software supports data acquisition and analysis on all of your BYOD devices. Explore the SPARKvue learning environment that allows students to create displays, select and make measurements, and share results. Get a hands-on experience with SPARKvue software and the Advanced Chemistry Sensor, which measures pH, pressure, temperature and conductivity, to explore gas laws, acids-bases, stoichiometry and more.

Time: 10:30:00 AM - 11:15:00 AM **Location:** SC 450
Strand: Laboratory Instruction

HSL06: Chemistry, LEGO and Density: A Great Combination

Tom Kuntzleman
Spring Arbor University
tkuntzle@arbor.edu

Simple materials can be used to make a toy called a "Density Bottle". This toy illustrates the concept of density in a unique way. Upon shaking the bottle, some plastic pieces within the bottle float, while others sink. After a while, the pieces that at first sank begin to float. Conversely, the pieces that at first floated begin to sink. Different plastics, including LEGO pieces, can be used in the bottle. How to make Density Bottles and the chemistry behind how they work will be described.

Time: 10:30:00 AM - 11:15:00 AM **Location:** SL 2020
Strand: Laboratory Instruction

HSL07: Explore Vernier Wireless Sensors and Technology for iPad and Chromebook

Melissa Hill
Vernier Software & Technology
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In this workshop, experience Graphical Analysis on iPad, Chromebook, and Android tablets for hands-on, collaborative science with Vernier sensors and data sharing technology. Visualize scientific concepts wirelessly with Go Wireless Temp, Go Wireless pH, and use Go Wireless Link to connect one of our many existing sensors with a compatible Bluetooth Smart Ready mobile device. This workshop is appropriate for high school and college level instructors.

Time: 10:30:00 AM - 11:15:00 AM **Location:** SC 457
Strand: Technology (online learning or in the classroom)

HSL10: Mini Electrolysis of Sodium Sulphate(IV) Micro Electrolysis of Copper(II) Chloride

John Eix
Upper Canada College - Retired
jeix@sympatico.ca

Two oldies but goodies will be presented using a minimum materials in a safe and responsible way. Even though these may be familiar to you, you have never seen them done this way. This session honours two giants in Science Education; Irwin Talesnick and Bob Worley.

Time: 9:30:00 AM - 11:15:00 AM **Location:** SL 2050
Strand: Chemistry Demonstrations

HSP01: The Year We "Flipped Out" in Chemistry!

Wendy Doherty, Mary Buchanan, Marissa Peck
Marissa Peck
Redwood High School
dosho94947@yahoo.com

During this presentation, we will collectively "reminisce" about our first year of flipped teaching in Chemistry classes at two very different high schools. Our successes, failures, lessons learned and future plans will be discussed. Was it practical? Was it efficient? Were we able to "learn 'em some Chemistry" more effectively (or not?). Specific examples of how this methodology was utilized will be discussed, including management of flipped instruction through use of the Moodle platform.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 1008
Strand: Blended / Flipped Learning

HSP03: The Alabama Science in Motion Program, A Mode for Chemistry Laboratory Delivery

Jennifer Cox, Candace Golliver and Paul Norgaard
Alabama State University
Jennifercox@alasu.edu

A brief history of the Alabama Science in Motion program and ideas for starting a similar mobile program in your state. Science in Motion serves all public high schools in the state of Alabama providing teacher training, chemicals and lab equipment to enhance the chemistry classroom on a weekly basis.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 1010
Strand: Laboratory Instruction

HSP04: What is POGIL?

Kristin Plessel
University of Wisconsin - Rock County
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You've seen it in the exhibit hall. You've seen it on books and workshop titles. What is POGIL? In this session we will define POGIL, talk about the origins of The POGIL Project and discuss the resources available to help you bring POGIL to your classroom. While this session will help you understand what POGIL is, we recommend the Introduction to POGIL session for those hoping to implement POGIL in their classroom.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP05: Chemistry Matters! An Instructional Chemistry series from GPB

Wes McCoy and David Drabik
Georgia Public Broadcasting
wdmccoy@mindspring.com

This new Chemistry instructional program is based on revised Georgia Performance Standards, highlighting NGSS Science and Engineering Practices and Crosscutting Concepts. The program is designed to be viewed on portable digital devices, including both teacher laptops and student phones. Each unit will feature formative assessments, labs, career interviews, performance tasks and engineering challenges. Units are arranged in playlists which will include "A Closer Look" segments designed to both remediate and extend learning.

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 2008
Strand: Next Generation Science Standards (NGSS)

HSP06: The Impact of Student Presentations - How to debrief students after laboratory experiments to improve content understanding.

Kevin Kopack
Lane Tech College Prep High School
yogtofu@gmail.com

This presentation will demonstrate how to implement student presentations in order to assess students' understanding of laboratory assignments. This session will highlight how student led summaries of laboratory experiences cement understanding and improve public speaking/presentation skills. This learning strategy may be used for all chemistry concepts. The target audience for this presentation are high school teachers.

Time: 10:30:00 AM - 11:15:00 AM **Location:** CL 1010
Strand: Laboratory Instruction

HSP07: Teaching a Flipped Chemistry Course with Limited Internet Access

Donald Storer
Southern State Community College
dstorer@sccc.edu

A flipped introductory chemistry course which is accessible to students with limited internet access will be described. The interactive course lessons can be accessed by three different methods. These interactive video lectures, with follow-up questions, are incorporated into SoftChalk which allows the lessons to be interactive and viewed in a browser without internet. Clickers are used to compare formative with summative assessment. Blended/flipped learning for high school or college audience.

Time: 10:30:00 AM - 11:15:00 AM **Location:** CL 1008
Strand: Blended / Flipped Learning

HSW01: Simple Use of Scientific Models in High School Chemistry and Physical Science

Kelly Ramey
Tennessee Tech University
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Chemistry knowledge is especially difficult for students based on the interplay between the submicroscopic (atoms and molecules) and the macroscopic (observable) views. This is compounded by the use of symbolism and a representational view of Chemistry concepts, such as our use of symbols and models. This session will highlight simple activities that can be used in your classroom to help students understand the use of models and visualize matter as they connect these three views.

Time: 8:30:00 AM - 9:15:00 AM **Location:** SC 213
Strand: Modeling

HSW02: Using the Next Generation Science Standards in Chemistry Classes

Cece Schwennsen, Regis Goode, Steve Long, and Ethan Sullivan
The Cate School
cschwennsen@gmail.com

In this presentation, we will focus on using NGSS in the high school chemistry classroom. We will provide examples for integration of the three dimensions in the classroom. For science and engineering practices we will show investigations, modeling techniques, experimental design, question asking, and data analysis. For cross-cutting concepts, we will focus on patterns and system models. We will look at the disciplinary core ideas and show how chemistry relates to these ideas.

Time: 8:30:00 AM – 9:15:00 AM **Location:** SC 214
Strand: Next Generation Science Standards (NGSS)

HSW03: Teaching Chemical Reactions through a Variety of Modalities

Michael Mury, Barbara Sitzman, Regis Goode, and Steve Long
American Chemical Society
m_mury@acs.org

One of the central topics in a high school chemistry course is chemical reactions. From writing equations, balancing equations, predicting products to using equations to determine equilibrium changes and thermodynamic changes, this topic plays a vital role in students' understanding of chemistry. This presentation will review reaction representations and provide instruction examples for each of the perspectives. Teachers will practice activities that present reactions in a variety of modalities.

Time: 8:30:00 AM - 9:15:00 AM **Location:** SC 212
Strand: Miscellaneous

HSW04: Interactive Review Strategies

Josephine Parlagreco and Kathleen Dubuke
Mephram High School
parlafam@aol.com

Interactive, self correcting review strategies for individual topics and end of year review will be presented. We will be utilizing various stations with activities to demonstrate how you can engage your students. You will create hands on activities that will result in cooperative learning opportunities. You will make and take examples of the different manipulatives.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 215
Strand: Inquiry Practices

HSW05: A Coherent Approach to Energy in High School Chemistry

Larry Dukerich, Ray Howanski and Erica Posthuma-Adams
American Modeling Teachers Association
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In the approach developed in Modeling Instruction in high school chemistry, students are not confronted with a bewildering array of different "forms of energy." Instead they learn that there is only one kind of energy but many ways it can be stored and transferred. Students learn tools to qualitatively represent energy interactions between system and surroundings. In this workshop participants will learn about this conceptual introduction to the study of energy.

Time: 9:30:00 AM - 11:15:00 AM **Location:** SC 213
Strand: Modeling

HSW06: Collaborative and Inquiry-Based Learning in the Chemistry Classroom

Jennifer Huelin
J. Clarke Richardson Collegiate
jenhuelin@hotmail.com

This workshop is geared towards any teachers interested in learning more about how to incorporate collaborative and inquiry-based learning into their chemistry classes. We will discuss strategies for implementation and explore ways to engage students in rich and open-ended tasks. These strategies will focus on improving your student's ability to think critically by using techniques that allow students to evaluate information more effectively.

Time: 10:30:00 AM - 11:15:00 AM **Location:** SC 215
Strand: Inquiry Practices

WEDNESDAY AFTERNOON PROGRAM

Time	SC450	SC457	SL2020	SL2035	SL2040	CL 1008	CL 2008	CL 2010	CL 1010	SC215	SC213	SC214	SC212	MS112						
2:30	HSL09	APL02	EL12	HSL12	HSL11	HSP08	HSP09	APP01	EP02	HSW09	HSW08	HSW07	EW01	HSL08						
2:45																				
3:00																				
3:15																				
3:30			APL03			HSL13		HSP52	HSP10	APP02		HSP12			HSW11		HSW10			
3:45																				
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4:30																				
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HS	High School	W	Workshop

WEDNESDAY AFTERNOON

APL02: Inquiry based AP Chemistry Experiments with Vernier – Spectroscopy

Jack Randall
Vernier Software & Technology
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If you teach AP Chemistry, participate in this spectroscopy workshop featuring our SpectroVis Plus Spectrophotometer. Conduct inquiry-based chemistry investigations from our lab book Vernier Chemistry Investigations for Use with AP Chemistry in this, hands-on workshop using LabQuest 2 and Logger Pro software.

Time: 2:30:00 PM - 3:15:00 PM **Location:** SC 457
Strand: Technology (online learning or in the classroom)

APL03: Inquiry based AP Chemistry Experiments with Vernier- Unknown Analysis

Jack Randall
Vernier Software & Technology
aharr@vernier.com

If you teach AP Chemistry, you won't want to miss this workshop. In this hands-on session, you will gain practice in conducting inquiry-based chemistry investigations from our lab book Vernier Chemistry Investigations for Use with AP Chemistry using sensors and instruments with our LabQuest 2 and Logger Pro software. The workshop will feature an investigation exploring properties of substances using sensors.

Time: 3:30:00 PM - 5:15:00 PM **Location:** SC 457
Strand: Technology (online learning or in the classroom)

APP01: How Modeling Engages Students in the Seven Science Practices Outlined by the College Board

Erica Posthuma-Adams
University High School of Indiana
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This session provides an overview of Modeling Instruction and outlines how it aligns with the seven science practices of AP Chemistry. M.I. offers a robust, research-based set of materials to engage students in the act of "doing" science. Students learn to develop, evaluate, and modify models based on data and observations they collect from simple experiments. In this approach students are expected to represent their ideas in a variety of ways and question each other while defending their ideas

Time: 2:30:00 PM - 3:15:00 PM **Location:** CL 2010
Strand: Modeling

APP02: Introducing a Culture of Modeling to Enhance Conceptual Understanding in Chemistry Courses

Amanda Edwards
Walton High School
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A well accepted research-based method for improving student understanding and the ability to apply abstract concepts, such as those presented in chemistry, is through the use of conceptual modeling. This presentation will help pre-AP and AP teachers discover how to introduce and use the concept of modeling in their classroom instruction.

Time: 3:30:00 PM - 4:15:00 PM **Location:** CL 2010
Strand: Modeling

APP03: Representations, Models, and Particulate Drawings.... Oh My!"

Kathy Kitmann
Mercy High School
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Science Practice 1 in the AP Chemistry curriculum states: "The student can use representations and models to communicate scientific phenomena and solve scientific problems." The presenter will share some activities that she has used with her students to increase their skills in this area.

Time: 4:30:00 PM - 5:15:00 PM **Location:** CL 2010
Strand: Modeling

EL12: Exploring Our World with Light: Affordable Spectrophotometry

Candace Goodman John Amend
MicroLab
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As humans, our fundamental sense for observing and evaluating the world around us is vision. Vision requires light to reflect off the surface of or emit from the molecules that surround us. But what is light? How do you explain this complex topic to your students? In this workshop, we will show how you can use an inexpensive handheld spectrophotometer, cell phone camera, and powerful software created by NIH to help your students visualize and create absorbance, fluorescence, and atomic spectra.

Time: 2:30:00 PM – 3:15:00 PM **Location:** SL 2020
Strand: Laboratory Instruction

EP02: The Lost Elements – The Periodic Table’s Shadow Side

Mary Virginia Orna
The College of New Rochelle
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This talk highlights a book that has collected the spurious or false discoveries of the chemical elements as a shadow side to Mary Elvira Weeks’ The Discovery of the Elements. Unique in the history of science, it contains many lessons for current research and for students of the history of science. Such a book, with all of the false starts, retractions, stubborn positions, inadvertent errors, often intimately bound up with the discovery of the true elements, has never been published before.

Time: 2:30:00 PM - 3:15:00 PM **Location:** CL 1010
Strand: Writing and Literacy in Chemistry

EP03: Laboratory experiments and activities for the 21st century

David Katz
Educator and Consultant
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It is time to replace those measurement and density-for-the-sake-of density experiments with more meaningful laboratory experiments. Lab experiments should go beyond the “so what” experiments and touch on some real chemistry and/or state-of-the-art experiences. It is time to modify the lab experience and also go into into the classroom in the form of small scale and microscale activities and even to incorporate them into exams.

Time: 4:30:00 PM - 5:15:00 PM **Location:** CL 2008
Strand: Laboratory Instruction

EW01: Modeling the Activity and Specificity of DNA Restriction Enzymes: The “Cut” of “Cut & Paste” DNA Modification

Glen Meades and Kimberly Linenberger
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Enzymes that cleave DNA strands at predetermined locations based on the nucleic acid sequence are called restriction endonucleases. These proteins function as the rudimentary immune system for organisms such as bacteria and are commonly referred to as “molecular scissors.” Researchers utilize these molecular machines to manipulate DNA sequences, allowing, for example, human insulin to be produced in bacteria, or to tag proteins with fluorescent molecules allowing visualization in the body.

Time: 2:30:00 PM - 5:15:00 PM **Location:** SC 212
Strand: Modeling

HSL08: Fighting With Food, Counteracting Chemical Toxicants

Susan Hershberger
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Central to student’s lives is the environment and foods they eat.. “Fighting with Food: Battling Chemical Toxicity with Good Nutrition” features hands-on inquiry based readings and laboratory activities for high school chemistry students that engage students with both the science of their environment and nutrition. The laboratory session features sodium alginate modeling the chemistry of metal ions colorful fruits allowing study of acid, base and oxidation reduction chemical reactions.

Time: 2:30:00 PM - 4:15:00 PM **Location:** MS 112
Strand: Chemistry in Context

HSL09: Exciting Gas Law Experiments that you never thought could done will be introduced as demonstrations and HANDS-ON activities.

Irwin Talesnick
Queen's University
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This session is for classes in High School and 1st year college & university. With simple equipment we will do DEMOS & HANDS-ON experiments that lead to Boyle's, Charles' Law, Dalton's Law of Partial Pressures, Quantitative Measurement of Vapor Pressure, the effect of Temperature on Vapor Pressure, Vapor Pressure as a property of liquids and an Understanding of Avogadro's Hypothesis. You will enjoy the expts here & in your classes back home. DISKS with complete handouts will be given to you.

Time: 2:30:00 PM - 5:15:00 PM **Location:** SC 450
Strand: Next Generation Science Standards (NGSS)

HSL11: Glow-in-the-dark Chemistry

Brian Rohrig
Ohio State university
brianrohrig@icloud.com

Don't be left in the dark. Discover a plethora of new demos and activities involving light sticks, light bulbs, black lights, lasers, and much more. Each activity performed involves easy set-up and low cost, and will definitely captivate your students. Topics such as fluorescence, light, color, and much more will be covered. All participants receive a bound manual, a black light, laser, and many other materials. Great for any high school classroom, but easily adaptable to other grades as well.
Prepaid Workshop.

Time: 2:30:00 PM - 5:15:00 PM **Location:** SL 2040
Strand: Chemistry Demonstrations

HSL12: Mini-Labware and Shrinky Dink Earrings

Melissa Jones and Meg Young
Retired
mdjchem@yahoo.com

Two pairs of earrings will be made. One pair will be made from mini-labware and will be filled with liquids that demonstrate solubility and density. The second pair will be made from Shrinky Dink material. They will observe what happens when this thermoplastic is heated and cooled. These activities are designed to be taken back to the classroom to promote interest in solution and polymer chemistry. **Prepaid Workshop.**

Time: 2:30:00 PM - 4:15:00 PM **Location:** SL 2035
Strand: Laboratory Instruction

HSL13: "Simple"ly the Best Demos

Bette Bridges
Bridgewater-Raynham Regional High School (retired)
babridges@comcast.net

Enhance your chemistry class with these easy to set-up/take-down one concept demos using everyday materials. These demos can be used in any chemistry class of any level.

Time: 3:30:00 PM - 5:15:00 PM **Location:** SL 2020
Strand: Chemistry Demonstrations

HSL14: Flinn Scientific Presents Exploring Chemistry™ - Connecting Content through Experiments

Jillian Saddler
Flinn Scientific Inc.
jsaddler@flinnsci.com

Join us as we present interactive activities and demonstrations that showcase the features and benefits of our Exploring Chemistry™ line of kits! We will highlight integrated lab and learning activities for some of the major topics in your chemistry curriculum! These are the experiments, demonstrations, and POGIL™ activities that ensure students will really understand the concepts and get a glimpse of the underlying simplicity and beauty of chemistry!

Time: 4:30:00 PM - 5:15:00 PM **Location:** SL 2035
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP02: Agricultural Applications of Chemistry

Jeffrey Bracken
Westerville North High School
BrackenJ@wcohs.org

Our science department has established large scale indoor hydroponics, aquaponics, and outdoor raised bed gardens, composting, and vermicomposting projects that allow our students to connect the chemistry concepts that underlie each of these real world examples. We grow over 500 basil plants, 250 heads of lettuce, 15,000 carrots, and 1,000 sunflowers to provide inspirational opportunities for our school and community.

Time: 4:30:00 PM - 5:15:00 PM **Location:** CL 1010
Strand: Chemistry in Context

HSP08: Blended Hybrid Learning: An Opportunity to Enhance Student Engagement And Performance

Mark Mojesky
Danville High School
mark.mojesky@danville.kyschools.us

Most teachers would like to see enthusiasm, perseverance, curiosity, and success in their classroom. The question remains how teachers and students alike attain these lofty goals but vital goals. This model for student engagement called Blended Hybrid Learning can spring board students into action. The aim is to create originality and the need for self expression, deeper understanding, and on-stage assessment. This approach may also move a diverse class beyond the pass/fail dichotomies.

Time: 2:30:00 PM - 3:15:00 PM **Location:** CL 1008
Strand: Blended / Flipped Learning

HSP09: Using Forensic Science to teach Chemistry

Jordan Tidrick
North Cobb High School
Jordan.tidrick@gmail.com

As more and more police procedural dramas make their way to television, forensic science continues to be a popular topic for high school students. This presentation will look at different forensic science topics and the chemistry content that can be taught from that topic. Forensic topics will include controlled substances, firearm & toolmarks, latent prints, questions documents, & DNA analysis. This presentation will be primarily focused on high school chemistry content.

Time: 2:30:00 PM - 3:15:00 PM **Location:** CL 2008
Strand: Forensic Chemistry

HSP10: Putting the liberal arts chemistry laboratory in context

Brad Fahlman, Patrick Daubenmire, Anne Bentley, John Kirk,
Katie Purvis Roberts, Michael Mury,
Jennifer Tripp, and Lallie McKenzie
Central Michigan University
fahlm1b@cmich.edu

Chemistry in Context has been a leader in helping students understand how chemistry impacts their lives and society. The laboratory manual that accompanies the 8th edition of the text continues this tradition with 34 experiments designed to teach basic laboratory techniques and scientific principles in the context of wider societal issues. This presentation will explain the pedagogical aims and provide specific examples from the new edition of the Chemistry in Context laboratory manual.

Time: 3:30:00 PM - 4:15:00 PM **Location:** CL 2008
Strand: Chemistry in Context

HSP12: Literature Connections in Chemistry

Stephan Graham
Arrupe Jesuit High School
sgraham@arrupemail.org

Paving cross-curricular avenues with chemistry allows students to see chemistry outside the laboratory. Literature is rich with opportunities to make connections between the sciences and the arts. This presentation will explore short stories, poems and novels that portray the intimate aspects of chemistry.

Time: 3:30:00 PM - 4:15:00 PM **Location:** CL 1010
Strand: Writing and Literacy in Chemistry

HSP13: Sparking Curiosity

Ramsey Musallam
Sacred Heart Cathedral

Sparking student curiosity around a chemistry topic doesn't always have to be done using an exciting classroom demonstration or perplexing video clip. Although such mediums can be useful in stimulating student questioning around chemistry phenomena, sometimes simple adjustments to the way in which information is presented can be can make all the difference. During this session participants will be exposed to a variety of research-based strategies to help elicit student questioning and and spark authentic student curiosity around a certain topic or idea.

Time: 4:30:00 PM - 5:15:00 PM **Location:** CL 1008
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP52: The Atomic Dashboard- Using Technology to Build Student Understanding of the Structure, Properties, and Changes of Matter in the HS Classroom.

Doug Ragan
Hudsonville High School
dragan@hpseagles.net

The Atomic Dashboard is one of a number of software products developed by Bitwixt Software Systems as tools for improving students' ability to "see" and understand chemistry. The products run on Windows, Macs & iPads and are Physics-based, interactive, 3D atomic and molecular models that provide a wide array of visual and engaging teaching tools that help facilitate students' understanding of the structure and properties of matter. Come see how I use this amazing product in my classroom.

Time: 3:30:00 PM - 3:45:00 PM **Location:** CL 1008
Strand: Technology (online learning or in the classroom)

HSW07: Write Your Way to Success: Grant Writing Strategies for Your and Your Chemistry Students

Kenetia Thompson and Karen Kaleuati
American Chemical Society
k_thompson2@acs.org

As school budgets becoming leaner, we as teachers are being required to do more with less. Grants are a wonderful way to overcome budgetary restrictions. Obtaining grant funding can be a challenging. This is a challenge that can be met through the process of proper planning, thorough preparation, and unwavering persistence.

Time: 2:30:00 PM - 3:15:00 PM **Location:** SC 214
Strand: Miscellaneous

HSW08: Connecting Nanoscale Science and Engineering to Chemistry Curriculum in Grades 6-12

Joyce Allen and Dr. Nancy Healy
National Nanotechnology Infrastructure Network
Georgia Institute of Technology
nancy.healy@mirc.gatech.edu

Nanoscale science and engineering (NSE) is a truly interdisciplinary endeavor in that it combines engineering, chemistry, physics, physical science, and biology. Workforce needs of NSE are estimated to be 2 million worldwide by 2015 with another 5 million in support positions. Teachers will play an important role in this workforce development issue. The Georgia Institute of Technology's National Nanotechnology Infrastructure Network (NNIN) site has been developing and implementing a professional development program in NSE education for science teachers. The primary focus of our program has been to help teachers understand how nanotechnology can fit into a standards-based science curriculum. This session will share with teachers a variety of lessons that connect NSE to chemistry standards. Teachers attending session will be given access to all lessons that are shared.

Time: 2:30:00 PM - 5:15:00 PM **Location:** SC 213
Strand: Next Generation Science Standards (NGSS)

HSW09: Periodic Trends: a new Inquiry-Based Activity

Ann Baxley
Walton High School
ann.baxley@cobbk12.org

You will create inquiry-based models of periodic tables that easily show four different periodic trends: atomic radius, ionic radius, ionization energy, and electronegativity. The models involve drawing "circles" or "energy bars" that are proportional to the actual values. Take this activity back to your high-school students, and they will be actively involved in creating their own visual representations.

Time: 2:30:00 PM - 3:15:00 PM **Location:** SC 215
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSW10: Chemical Formula & Amino Acids

John Garrett and Dr. Deborah Carlisle
LAB-AIDS
jgarrett@lab-aids.com

What is the difference between subscripts and coefficients? What does "balancing" a chemical equation mean? Many students have trouble with these fundamental concepts in chemistry. If a student does not fully understand the chemical formula, then moles, reactions, and stoichiometry are hopelessly confusing. Join us for some elegant, intuitive, and well-differentiated lessons that allow students of all levels to master the chemical formula and thereby move confidently into a deeper understanding.

Time: 3:30:00 PM - 4:15:00 PM **Location:** SC 214
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSW11: Developing an Inquiry-Based Organic Chemistry Elective for High Schoolers

Gilana Reiss
Master Teacher, Math for America
Chemistry Teacher and Research Coordinator
Hunter College High School
greiss@hccs.hunter.cuny.edu

In this workshop, a model for teaching Organic Chemistry to high school students will be presented. The course being shared employs a guided inquiry approach to aid students constructing their own understanding of course material. Activities that integrate the use of model sets with POGIL methods are used in lieu of traditional labs. This workshop is for teachers looking to start an inquiry-based Organic elective at their school or for those seeking a different approach to teaching this course.

Time: 3:30:00 PM - 5:15:00 PM **Location:** SC 215
Strand: Inquiry Practices (POGIL, PBL, etc.)

THURSDAY MORNING PROGRAM

Time	SC450	SC457	SL2020	SL2035	SL2040	CL1008	CL2008	CL1010	SC215	SC213	SC214	SC212	CL1007	MS112
8:30	CL01	APL04	EL05	APL05	EL04	HSP16	HSP15	APP04	HSW25	HSW12	HSW15	HSW13	EC01	HSL15
8:45														
9:00														
9:15														
9:30														
9:45						HSP57		CP05						
10:00														
10:15										HSW16				
10:30														
10:45		CL02	HSL16		EL08	HSP20	HSP19							
11:00														
11:15														

Conference Strands	
Blended / Flipped Learning	Miscellaneous
Chemistry Demonstrations	Misconceptions in Chemistry
Chemistry in Context	Modeling
Forensic Chemistry	Next Generation Science Standards (NGSS)
Informal Learning / Learning through Play	Technology (online learning or in the classroom)
Inquiry Practices (POGIL, PBL, etc.)	Writing and Literacy in Chemistry
Laboratory Instruction	

Code	Population	Code	Presentation Type
AP	Advanced Placement	C	Computer Lab Workshop
C	College	L	Laboratory
E	Everyone	P	Presentation
HS	High School	W	Workshop

THURSDAY MORNING

APL04: AP Chemistry: The POGIL Approach to Labs Using Probeware

Tom Loschiavo
PASCO scientific
loschiavo@pasco.com

The POGIL approach allows you to turn a traditional activity into a guided-inquiry laboratory experiment. With PASCO's SPARKvue data acquisition and analysis software, explore a guided-inquiry lab that is designed to address AP Chemistry learning objectives. Perform a titration experiment and discover how students can meet AP lab requirements while gaining a deeper understanding of the required content.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 457
Strand: Laboratory Instruction

APL05: Overcoming Misconceptions - pH, pKa, and Half-Titrations

Greg Dodd
George Washington High School
gbdodd@gmail.com

Question 2 from the 2014 AP Chemistry Exam (3.99/10) indicates that students have misconceptions about Acids and Bases (from Big Idea 3). The question asked students to demonstrate / their understanding of the relationship between pH and pKa, conjugate acids and bases, concentration of these conjugates during a titration, the appropriate choice of an indicator, and the relationship between pKa and Ka. In this session, participants will explore the inquiry lab "Why Should I Half-Titrate?"

Time: 8:30:00 AM - 10:15:00 AM **Location:** SL 2035
Strand: Misconceptions in Chemistry

APP04: Teaching Electrochemistry Effectively

Paul Price
Trinity Valley School
pricep@trinityvalleyschool.org

Electrochemistry is a topic that has the potential to provide a capstone experience to students. Unfortunately, its placement in textbooks coupled with time constraints in instruction can lead to teaching this important topic in a whirlwind manner with little student understanding. Come learn effective strategies and demonstrations that foster deep, connected learning of voltaic cells appropriate for AP and IB chemistry.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 1010
Strand: Misconceptions in Chemistry

CL01: Designing a Distance Learning chemistry lab curriculum using Carolina Investigations

Mark Meszaros
Carolina Biological Supply Company
mark.meszaros@carolina.com

Help your online students learn the same critical science process skills as your classroom students. Carolina has transformed the hands-on labs you have used for years into distance learning labs that are reliable, safe, and affordable. Experience for yourself, during this hands-on workshop, how your students will easily learn the necessary lab skills and reinforce key concepts using Carolina Distance Learning kits.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 450
Strand: Laboratory Instruction

CL02: Spectrometry for Your Computer or Tablet

Tom Loschiavo
PASCO
loschiavo@pasco.com

Use the PASCO Spectrometer + Spectrometry software to intuitively perform experiments including light source emission studies, determination of the concentration of unknown solutions using Beer's law, and rates of reactions. The New PASCO device is a full visible spectrum spectrometer and fluorometer designed for your chemistry labs and the intuitive Spectrometry software allows you wirelessly connect to a computer or tablet.

Time: 10:30:00 AM - 11:15:00 AM **Location:** SC 457
Strand: Laboratory Instruction

CP05: Student Identification of Problem Topics in General Chemistry

Michelle Herridge
Missouri State University
Herridge00@live.missouristate.edu

Eliciting students' beliefs regarding difficulty of subject matter in general chemistry can be used to develop effective instructional tools. I present the results of both qualitative and quantitative studies conducted in the general chemistry courses at a large, comprehensive Midwestern university. A survey of students was conducted to determine student perceptions of topic difficulty. I will then present emergent themes from the qualitative data that will help better explain student choices.

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 1010
Strand: Misconceptions in Chemistry

EC01: Flipping with EDpuzzle

Stephanie O'Brien
Stony Brook University
m.stephanie.obrien@gmail.com

Have you flipped your classroom? How do you know if your students are really watching your videos? With EDpuzzle.com you can track which students are watching your videos and monitor their progress before they enter the class. Learn how to create your own videos, edit videos, create questions, comments and add audio notes for your videos within EDpuzzle.com a free website for students and teachers.

Time: 8:30:00 AM - 10:15:00 AM **Location:** CL 1007
Strand: Blended / Flipped Learning

EL04: Chemical Principles Visualized

David Katz
Educator and Consultant
dakatz45@msn.com

Chemistry classes should include some active participation and should not be "chalk talks". Demonstrations/activities can be as simple as passing element samples around the lecture hall, but should not be too complex. Active demonstrations should be easy to set-up, safe, and should focus on specific chemical principles. This presentation will use demonstrations such as density effects, intermolecular forces, and salting effects.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SL 2040
Strand: Chemistry Demonstrations

EL05: Microscale activities from around the world Part 1- Techniques and Quantitative chemistry

Bob Worley
CLEAPSS, Brunel University Science Park, UK
bobworley4@gmail.com

Microscale chemistry is known for reducing cost and increasing safety but now, other benefits are emerging such as improved classroom management. This 105-minute workshop will be carried out by yourselves with a few demonstrations, to introduce you to the techniques and quantitative procedures that can be done on the small scale. There will obviously be some overlap with part 2. See <http://tinyurl.com/m79fd8w>.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SL 2020
Strand: Laboratory Instruction

EL08: Discrepant Event Symposium- Part 1

Andrew Cherkas, Pat Funk, David Katz, John Eix, Penny Sconzo,
Brian Rohrig, Al Hazari, and Peter Bloch
Retired
cherkas@sympatico.ca

How to demonstrate to effectively engage students to think. What you predict is not what is observed. Look carefully and obtain the explanation. The white and grey block, what colour will phenolphthalein turn on adding a base, how does water come out of a tube with three holes? Predict, observe, explain. There is much thinking to come before the explanation. The demonstrations have multi uses.

Time: 10:30:00 AM - 11:30:00 AM **Location:** SL 2040
Strand: Chemistry Demonstrations

HSL15: Food Chemistry: What's in the Store?

Kathleen Holley, Trey Seastrunk, Yumi Khair, Maggie Lewiecki,
Jennifer Murray, and Arzoo Patel
M. B. Lamar High School
kkholley@yahoo.com

How about a chemistry field trip that includes conducting experiments? In a location available to just about every chemistry class? We have developed a set of experiments and activities designed to be carried out onsite at a local grocery store using only materials available in the store. Topics covered include chemistry of nutrients, shelf life, antioxidants, dyes and pigments, texture, and stereochemistry in foods. Come and try some of the experiments with us!

Time: 8:30:00 AM - 10:15:00 AM **Location:** MS 112
Strand: Chemistry in Context

HSL16: Simple distillation and separations

Diana Mason
University of North Texas
dmason@unt.edu

This laboratory practical features two methods for separation of solutions: distillation (physical) and salting (chemical) of commonly available aqueous solutions. Each process can be completed within 5 minutes.

Time: 10:30:00 AM - 11:15:00 AM **Location:** SL 2020
Strand: Laboratory Instruction

HSP15: Using PBL to teach high school chemistry

Kristen Powell and Sarah Eales
Peachtree Ridge High School/Kennesaw University
kristen_powell@gwinnett.k12.ga.us

Come see how a group of high school teachers use project-based learning in the chemistry classroom. Topics will include how to find time to create projects by blended learning, how to keep students engaged in the project, and how to assess student learning.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP16: Create an Interactive Chemistry Classroom Through BYOD

Bluky Ng
Appleby College
bng@appleby.on.ca

Having trouble when all of your students are bringing different types of devices to the classroom, iPad, laptops, smartphones, etc.? Is there any programs that would be compatible with all of these devices? How can you best use these devices in a chemistry classroom? Ideas and experience in creating an interactive chemistry classroom will be shared.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 1008
Strand: Technology (online learning or in the classroom)

HSP19: Recycled 3D Molecules

Marissa Peck, and Mary Buchanan
Redwood High School
hackworth@redwood.org

This presentation describes our experiences with a PBL molecular modeling activity using recycled or repurposed materials. Students create models of organic molecules near and dear to the human condition (cocaine, chocolate, nicotine, capsaicin). The culminating event is a computer based presentation, during which students clearly communicate the connections between molecular shape and structure to specific molecular properties. Lesson plans, rubrics, and actual molecular examples will be provided.

Time: 10:30:00 AM - 11:15:00 AM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP20: Combining animations with science and chemistry to better reach the public

Jon Perry and Christopher Parsons
Stated Clearly, Center for Chemical Evolution
jon@statedclearly.com

There are three major barriers to learning about chemistry and science generally: it is perceived to be either too complicated, boring or irrelevant, or threatening to personal beliefs. Stated Clearly experiments with ways to overcome these barriers by creating short animations. These demonstrate principles as they are taught, and are free of jargon. They constantly reference applications. Programs are as friendly as possible, and caution is exercised not to overstate any scientific conclusions.

Time: 10:30:00 AM - 11:15:00 AM **Location:** CL 1008
Strand: Technology (online learning or in the classroom)

HSP57: Stoichiometry: Multi-tiered Approaches to Learning

Harvey Gendreau Bette Bridges
Laboratory Safety Institute
hgendreau1@comcast.net

Stoichiometry is a stumbling block to learning chemistry. HS students vary in their ability to conceptualize this basic construct, they come to us with a variety of math skills & ability to understand theoretical concepts. The authors (over 70 years of HS chemistry experience) present some of their ideas, the usual approaches & some unusual ones (including a UNIQUE one that EVERY student can learn in less than 5 minutes) on teaching stoichiometry. We will also examine the advantages and disadvantages of each method.

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL1008
Strand: Miscellaneous

HSW12: Using Modeling Activities in the High School Chemistry Class

Cece Schwensen, Steven Long, Bonnie Bloom, Ethan Sullivan
The Cate School
cshwensen@gmail.com

In this presentation examples of modeling activities that a high school teacher can use to help students further their understanding of chemistry concepts will be shown. Presenters will describe several different activities and participants will complete the activities. Modeling activities including drawing/picturing, analogies, and differing representations will be shared. Topics covered will include molecular structure, reactions, kinetic molecular theory, concentration, and solutions.

Time: 8:30:00 AM - 9:15:00 AM **Location:** SC 213
Strand: Modeling

HSW13: Advancing Scientific Literacy with Inquiry Lesson Plans Using ChemMatters magazine

Marta Gmurczyk Susan Cooper, Steven Long,
Kathleen Chesmel, Kathleen Mary Cooper, Lisa Culberson,
Stacey Haas, and Patrice Pages
American Chemical Society
m_gmurczyk@acs.org

The team of teachers will share the best practices of incorporating reading, writing and learning strategies into the chemistry curriculum and lead the development of inquiry lesson plans that are aligned with the NGSS and CCSS and are based on successful past ChemMatters articles. In the second part of the workshop, participants will engage in building their own lesson plans designed to teach high-level literacy skills and promote critical and analytical thinking skills.

Time: 8:30:00 AM - 11:15:00 AM **Location:** SC 212
Strand: Writing and Literacy in Chemistry

HSW15: ChemSource, the NGSS, and the Particle Nature of Matter

Mary Virginia Orna Patricia Smith
The College of New Rochelle
maryvirginiaorna@gmail.com

In this workshop participants will identify, adapt, & develop classroom-ready templates & lesson plans allied with the Next Generation Science Standards by selecting basic material from the ChemSource module, Basic Chemical Reactions, and utilizing the NGSS performance expectations for each grade level constructed by blending ideas from STEM practices (Inquiry), Disciplinary Core Ideas, and Crosscutting Concepts. The templates will focus on the introduction of the particle nature of matter. **Prepaid Workshop.**

Time: 8:30:00 AM - 11:15:00 AM **Location:** SC 214
Strand: Next Generation Science Standards (NGSS)

HSW16: Developing a Particle Model to Account for the Behavior of Gases

Larry Dukerich, Erica Posthuma-Adams, and Ray Howanski
AMTA
ldukerich@mac.com

To study the behavior of gases, Modeling Instruction encourages students to develop a particle model to account for the observed regularities in the behavior of gases, promotes the use of proportional reasoning to predict the effects of a change in one variable on another, and helps students make the distinction between a theory and a law. In this workshop teachers will play the role of students attempting to explain observed P-V, P-n and P-T regularities using a particle model of a gas.

Time: 9:30:00 AM - 11:15:00 AM **Location:** SC 213
Strand: Modeling

HSW25: Facilitating POGIL - Improving Group Function

Laura Trout
The POGIL Project
troutl@lancastercountryday.org

When you use cooperative groups in your classroom are students working as a team, or simply as individuals sitting at the same table? In this session we will explore what makes cooperative groups really work as a team. How can the teacher in a classroom encourage behaviors that will lead to group synergy?

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 215
Strand: Inquiry Practices

THURSDAY AFTERNOON PROGRAM

Time	SC450	SC457	SL2020	SL2035	SL2040	CL1008	CL2008	CL1010	SC213	SC214	SC212	CL1007	MS112	
2:30	APL06	HSL21	HSL20	CL03	HSL18	HSP21	HSP23	HSP22	HSW18	HSW19	CP06	HSC01	HSL19	
2:45							HSP24							
3:00							HSP25							
3:15														
3:30							HSP27	HSP29	HSP28	HSW21	HSP32			HSW20
3:45							HSP30							
4:00					HSP31									
4:15														
4:30				CL04	EL09	CP07	HSP33	CP08	HSW22					
4:45							HSP34							
5:00							CP09			HSP35				
5:15						HSP36								

Conference Strands	
Blended / Flipped Learning	Miscellaneous
Chemistry Demonstrations	Misconceptions in Chemistry
Chemistry in Context	Modeling
Forensic Chemistry	Next Generation Science Standards (NGSS)
Informal Learning / Learning through Play	Technology (online learning or in the classroom)
Inquiry Practices (POGIL, PBL, etc.)	Writing and Literacy in Chemistry
Laboratory Instruction	

Code	Population	Code	Presentation Type
AP	Advanced Placement	C	Computer Lab Workshop
C	College	L	Laboratory
E	Everyone	P	Presentation
HS	High School	W	Workshop

THURSDAY AFTERNOON

APL06: Building Inquiry in AP Chemistry Labs

Jen Black
Carolina Biological Supply Company
jen.black@carolina.com

Struggling to bring inquiry to your AP Chemistry labs? Carolina's new AP Chemistry kits help students develop essential chemistry practices, understand core chemistry concepts, and learn chemistry through inquiry per the College Board curriculum. Experience three different activities in this hands-on workshop. Free handouts and door prizes.

Time: 2:30:00 PM - 4:15:00 PM **Location:** SC 450
Strand: Laboratory Instruction

CL03: Misconceptions in Chemistry

Al Hazari
University of Tennessee, Knoxville
ahazari@utk.edu

Students develop their own understanding of how nature works. These pre-concepts are brought to school and teachers have to reflect on them for better instruction. In addition, there are school-made misconceptions which originate from inappropriate curriculum and instructional materials. This presentation aims to help grades 6-16 teachers and professors diagnose and cure students' misconceptions. **Prepaid Workshop.**

Time: 2:30:00 PM - 4:15:00 PM **Location:** SL 2035
Strand: Misconceptions in Chemistry

CL04: Genie of Catalysis

Regina R ffler and Dr. Georg Job
Job Foundation, University of Hamburg
Regina.Rueffler@job-stiftung.de

It is not that catalysis is a purely academic curriculum content but it accompanies us in everyday life such as the catalytic converters in vehicles. It even takes place in our bodies because the myriad of metabolic processes that sustain life is catalyzed by enzymes. But who would now be better suited to introduce this fascinating branch of kinetics than the „genie of catalysis“ himself. Meet him at this presentation and let him explain with the help of numerous experiments how catalysis works.

Time: 4:30:00 PM - 5:15:00 PM **Location:** SL 2035
Strand: Chemistry Demonstrations

CP06: Chemistry in Context: A transformative philosophy for liberal arts chemistry courses

Brad Fahlman, Patrick Daubenmire, John Kirk, Anne Bentley,
Katie Purvis Roberts, and Michael Mury
Central Michigan University
falm1b@cmich.edu

For over twenty years, Chemistry in Context has been primarily used in non-majors chemistry courses at the collegiate level. . As we approach the 25th anniversary of this ground-breaking text, we look to incorporate new contexts and methodologies of instruction in order to relate chemistry to today's students. We will share how the textbook will become more electronic, along with sharing newer contexts as we work to ensure students become more chemistry literate in real-world settings.

Time: 2:30:00 PM - 3:15:00 PM **Location:** SC 212
Strand: Chemistry in Context

CP07: Attaining Chemistry Faculty Diversity: A Case Study at a Public, Four-Year Liberal Arts College

David Pursell and Patrice Bell
Georgia Gwinnett College
dpursell@ggc.edu

Colleges strive for diversity. Georgia Gwinnett College is well poised to teach and mentor its diverse student body (31% of Black/African American, 14.4% Hispanic, 9.1% Asian, 36.8% White) with an equally diverse faculty of 27 full-time chemists (all with Ph.D.'s, 48% female, 28% Black/African American, 16% Asian, 2 disabled military veterans). This presentation will discuss how GGC attained chemistry faculty diversity since its first chemistry faculty hire in 2007 to the present.

Time: 4:30:00 PM - 4:45:00 PM **Location:** CL 1008
Strand: Miscellaneous

CP08: Promoting the writing process while teaching scientific writing in an analytical laboratory course

Andrea Carter
East Carolina University
carteran@ecu.edu

In lab courses, students craft situated writing by maintaining lab notebooks and writing journal-style reports. However, students can struggle with the specifics of the disciplinary genre. We must introduce explicit instruction on scientific writing and the peer review process, as well as support and scaffold the writing processes. We will discuss incorporating these aspects without consuming valuable class time. Furthermore, reflections from instructors and students will be shared.

Time: 4:30:00 PM - 5:15:00 PM **Location:** CL 1010
Strand: Writing and Literacy in Chemistry

CP09: Commit to Study: A Student Contract for Success

Jeffrey Paradis
Sacramento State University
jparadis@csus.edu

A revised introductory chemistry course that directly imbeds rigorous study skills instruction into the course structure without sacrificing content will be discussed. Significant components include instruction on note taking and exam corrections. The study skills component is presented to the student in the framework of a "Commit to Study" contract which will be discussed in detail. Preliminary data concerning the impact of these changes will be discussed.

Time: 5:00:00 PM - 5:15:00 PM **Location:** CL 1008
Strand: Miscellaneous

EL09: Discrepant Event Symposium- Part 2

Andrew Cherkas, Pat Funk, David Katz, John Eix, Penny Sconzo,
Brian Rohrig, Al Hazari, and Peter Bloch
Retired
cherkas@sympatico.ca

How to demonstrate to effectively engage students to think. What you predict is not what is observed. Look carefully and obtain the explanation. The white and grey block, what colour will phenolphthalein turn on adding a base, how does water come out of a tube with three holes? Predict, observe, explain. There is much thinking to come before the explanation. The demonstrations have multi uses.

Time: 4:30:00 PM - 5:30:00 PM **Location:** SL 2040
Strand: Chemistry Demonstrations

HSC01: Working with and Writing for PhET

Erica Peddi
Campbell High School
erica.peddi@cobbk12.org

Allowing the abstract to become concrete is one of the important goals of a pHET simulation. There are multiple ways for a student to demonstrate knowledge within one of these simulations. Teachers can differentiate where needed and scaffold along the way. Teachers are also able to vet lessons that are already there, modify them, and use in their class or write their own. Experience this process and go home ready to start the school year with a workable product that you'll happily use!

Time: 2:30:00 PM - 4:15:00 PM **Location:** CL 1007
Strand: Technology (online learning or in the classroom)

HSL18: Using the Classic Demonstration to Engage Students in Science Talk

Matthew Miller
South Dakota State University
matt.miller@sdstate.edu

Demonstrations are a classical method for engaging students in the classroom. We will demonstrate the use of specific activities to stimulate science talk in the classroom. One dimension of the next generation science standards, the practices, require students to communicate their thoughts by asking questions, engaging in argument, and obtaining, evaluating and communicating information. Talking science through demonstrations is a great way to practice these vital practices for students.

Time: 2:30:00 PM - 4:15:00 PM **Location:** SL 2040
Strand: Chemistry Demonstrations

HSL19: Forensic Chemistry: Killer Cuppa Joe

Nusret Hisim
Walkersville High School
nusret.hisim@fcps.org

Coffee is recovered from a crime scene by forensic investigators. The coffee is suspected to be poisoned. Participants will use absorption spectroscopy to determine 4 things. Is the coffee poisoned? What is the nature of the poison? What is the concentration of the poison? Is there enough poison per dose to kill? Spectrometers will be used to look at the tainted coffee and Beer's law will be used to analyze the sample.

Time: 2:30:00 PM - 4:15:00 PM **Location:** MS 112
Strand: Forensic Chemistry

HSL20: Lab activities designed for inquiry and discussion

Deanna Cullen
Whitehall High School
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Participants will experience “ready to use” inquiry activities from the Journal of Chemical Education (JCE) and Chemical Education Xchange (www.ChemEdX.org). Collecting evidence, addressing common misconceptions and encouraging student discourse will be highlighted in the lab.

Time: 2:30:00 PM - 4:15:00 PM **Location:** SL 2020
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSL21: Mix it Up!

Brian Rohrig
Ohio State University
brianrohrig@icloud.com

Participants will perform a number of activities designed to teach about mixtures using readily available, low cost materials. An inquiry approach will be emphasized. Topics discussed will be at a high school level, but easily adaptable to other grades. Discover new and innovative ways to teach about solutions, suspensions, colloids, polarity, detergents and acids/bases. The use of polymers to teach mixtures will also be included. Participants will receive a manual and supplies.
Prepaid Workshop.

Time: 2:30:00 PM - 5:15:00 PM **Location:** SC 457
Strand: Laboratory Instruction

HSP21: #molympics 2015

Doug Ragan Kristin Gregory
Hudsonville High School
dragan@hpseagles.net

If you haven't heard about #molympics, then come see what it's all about and join the fun! Try your hand at one of the events (stopper tower) and experience for yourself how learning about the mole can be challenging and fun while reinforcing your students' skills in measurement and estimation. Even if you haven't mentioned moles by Mole Day, its okay, your students will love it (and learn it). Register your high school chemistry classes to join this global event on Mole Day for #molympics 2015.

Time: 2:30:00 PM - 3:15:00 PM **Location:** CL 1008
Strand: Miscellaneous

HSP22: Integrating Literacy Techniques Without Sacrificing Content

Kelly Ramey
Tennessee Tech University
kramey@tntech.edu

Many science teachers are pressured to increase literacy instruction in their classrooms in light of the new Common Core State Standards. With limited class time, it is important to use high leverage practices that both address content and increase student skill in the literacy standards. This session will explore some activities and related ways of assessing student learning that will meet both content requirements and literacy requirements.

Time: 2:30:00 PM - 3:15:00 PM **Location:** CL 1010
Strand: Writing and Literacy in Chemistry

HSP23: What's the Solution? Addressing misconceptions about the dissolution of ionic compounds

Michael Geyer
Sycamore High School
geyer@sycomoreschools.org

Although the process of dissolving compounds in water is one of the most studied areas of chemistry misconceptions, little attention is given to the dissolution of ionic compounds in water. This activity, developed with Target Inquiry at Miami University, challenges students' ideas about this process by examining the macroscopic, symbolic and particulate views. Major misconceptions are challenged as students build scientifically accurate models of dissolution and solution behavior on their own.

Time: 2:30:00 PM - 2:45:00 PM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

**HSP24: Balancing in a Particulate Way:
Addressing misconceptions in quantity
relationships in stoichiometry**

Stephanie Kimberlin
Live Oaks Career Technical Campus
kimberls@greatoaks.com

Chemistry students hold multiple misconceptions in stoichiometry related to limiting reactants, subscripts and coefficients, and interpreting chemical equations. "Balancing in a Particulate Way" is an activity that was developed and piloted through Target Inquiry at Miami University. The activity provides discrepant events using the particulate nature of matter and relates them to symbolic representations of chemical equations. The activity with teacher insights will be presented.

Time: 2:45:00 PM - 3:00:00 PM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

**HSP25: Gases and collisions: Combating
misconceptions concerning gas properties**

Kyle Jones
Fairfield High School
jones_k@fairfieldcityschools.com

Students hold many misconceptions concerning gas properties and kinetic molecular theory. This activity, developed through Target Inquiry at Miami University, will address several of these misconceptions by connecting macroscopic observations, mathematical variables, and particulate level models. This is accomplished by using a laboratory investigation in combination with a computer simulation. The activity, teacher guide, and student responses will be presented.

Time: 3:00:00 PM - 3:15:00 PM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

**HSP27: Rice Excellence in Secondary Science
Teaching**

Carrie Obenland Carolyn Nichol, Amber Szymczyk,
and John Hutchinson
Rice University
carrieo@rice.edu

The Rice Excellence in Secondary Science Teaching program delivers professional development to high school teachers. The chemistry program began in 2007. A weeklong summer workshop is followed by two semesters of weekly evening meetings. An understanding of constructivist learning and focus on active engagement of students drives the pedagogical approaches modeled to teachers. The program provides curriculum tied to state standards, promotes teacher leadership, and improves student performance.

Time: 3:30:00 PM - 4:15:00 PM **Location:** CL 1008
Strand: Miscellaneous

**HSP28: Promoting Scientific Writing in the
Chemistry Classroom**

Micah Porter Kyle Nackers
Collins Hill High School
micahleigh943@gmail.com

Come learn multiple strategies for promoting scientific literacy in the classroom and how to teach students to use evidence to support their ideas. Activities include the use of formative assessment probes, analyzing scientific articles, and providing students with the skills to explain scientific phenomenon.

Time: 3:30:00 PM - 4:15:00 PM **Location:** CL 1010
Strand: Writing and Literacy in Chemistry

HSP29: The Nuclear World around Us!

Theresa Worley
Valley View High School
vvtworley@mdeca.org

There are few instructional tools available to teach nuclear reactions. This inquiry activity, developed in Target Inquiry at Miami University, helps students visualize and write alpha, beta, and gamma decay. Students investigate the patterns within the radioactive decay series of Uranium-238 to combat misconceptions about different types of radiation and the different characteristics of radioactive decay reactions. The activity and teacher reflections will be presented.

Time: 3:30:00 PM - 3:45:00 PM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP30: Legos as a Tool to Introduce the Particulate Level of Matter in Chemistry

Chad Husting
Sycamore High School
hustingc@sycamoreschools.org

Chemistry often addresses the macroscale and symbolic but de-emphasize the particulate. An activity, developed in Target Inquiry at Miami University, introduces students to the particulate level that scaffolds the macroscopic, symbolic and particulate levels using discrepant events and Legos as models. A description of this activity will be presented as well as teacher reflections and examples of student work.

Time: 3:45:00 PM - 4:00:00 PM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP31: More Is Less: Periodicity

Barbara Hall
Centerville High School
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When students memorize periodicity trends such as in atomic and ionic radii, they do not employ the theory and conceptual reasoning as to why elements get smaller moving across a period. Students have difficulty with the concept of electron shielding and size of an atom versus its ion. In this activity developed through Target Inquiry at Miami university students use particulate level models to strengthen conceptual relationships. The activity and teacher insights will be presented.

Time: 4:00:00 PM - 4:15:00 PM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP32: How some high school chemistry teachers are incorporating engineering in their classes.

Sarah Boesdorfer
University of Northern Iowa
sarah.boesdorfer@uni.edu

When people think about engineering the term “build” is often used. For chemistry teachers this perception of engineering makes incorporating engineering content and practices a difficult task. Last year high school chemistry teachers worked together to expand their understanding of engineering and design activities for their classrooms to teach or assess chemistry along with engineering. This presentation will describe how the teachers came to envision including engineering in their classrooms.

Time: 4:00:00 PM - 4:15:00 PM **Location:** SC 214
Strand: Next Generation Science Standards (NGSS)

HSP33: Hess’s Law (1st Law of Thermodynamics)- Do we get it? Does anybody really get it?

Margie Treon
Versailles High School
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Students often have difficulty with the concept of heat transfer and its meaning. Through a guided inquiry activity, developed as part of Target Inquiry at Miami University, students discover the mathematical relationships that describe the energy changes during chemical reactions. The activity along with teacher insights and student work will be presented.

Time: 4:30:00 PM - 4:45:00 PM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP34: Classification of Matter: An introductory activity for learning through a particulate lens

Amanda Vilardo
Sycamore High School
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Many students carry misconceptions about the classification of matter based on their previous interpretations of compounds, particles, atoms, molecules, coefficients, and subscripts. These critical ideas are addressed in an inquiry based activity, developed in Target Inquiry at Miami University, where students build and classify particulate models of matter. The activity, a student guide, and a comprehensive teacher guide will be provided.

Time: 4:45:00 PM - 5:00:00 PM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP35: You Can See The Future With Reactions: A Guided Inquiry Activity to Help Students Understand Reactions and Classifications

Brett Becker
Madeira High School
bbecker@madeiracityschools.org

The symbolic level, macroscopic level, and particulate level all converge as students are introduced to chemical reactions, introducing numerous challenges to the development on understanding. A teacher-developed activity was designed through Target Inquiry at Miami University to combat these challenges and help students identify patterns within reactions. Details about the activity, teacher observations, and reflections as well as examples of student outcomes will be presented.

Time: 5:00:00 PM - 5:15:00 PM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP36: Learning solution concentration through agriculture

Morgan Aultman
Ansonia High School
morgan.aultman@ansoniam.k12.oh.us

When teaching any difficult and abstract subject, context can improve student engagement and student success. As part of Target Inquiry at Miami University, an agriculturally centered chemistry activity on solution concentration incorporating the particulate level as well as rigorous calculations has been developed and tested. Student materials, teaching tips, and sample student results will be presented.

Time: 5:15:00 PM - 5:30:00 PM **Location:** CL 2008
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSW18: What Does a Chemistry Course That is Centered on Models and Modeling Look Like?

Brenda Royce and Raymond Howanski
University High School, Fresno, CA
brendar@csufresno.edu

Model development and use is central to the scientific process, and provides students with a framework for recognizing and working with key principles of how nature works. New NGSS standards require students to be able to make and use models of nature. This presentation will describe a pedagogical and conceptual rationale for a model-based storyline for high school chemistry utilizing the Modeling Instruction pedagogy and how it fits into PCB and BCP sequences.

Time: 2:30:00 PM - 3:15:00 PM **Location:** SC 213
Strand: Modeling

HSW19: Science and Engineering Practices in the Chemistry Curriculum

Michael Mury, Ethan Sullivan, Bonnie Bloom, Pam Diaz, and Cece Schwennsen
American Chemical Society
m_mury@acs.org

The Next Generation Science Standards (NGSS) focus on providing students with science process skills along with conceptual knowledge and engineering skills in grades K-12. In this presentation, we will focus on the engineering and scientific practices and discuss how to use the pieces within the high school chemistry curriculum. We will provide examples of how to integrate the practices in the classroom and provide ideas for increasing students' skill sets in these areas.

Time: 2:30:00 PM - 3:15:00 PM **Location:** SC 214
Strand: Next Generation Science Standards (NGSS)

HSW20: Chemical Reactions

Deborah Carlisle and John Garrett
LAB_AIDS
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In this activity from the Natural Approach to Chemistry program, participants investigate representative examples of major reaction types, including single- and double-replacement, precipitation, oxidation-reduction, and more. The written directions model safe laboratory procedure, and the analysis questions explore applications of these reactions in the chemistry of the human body and the environment.

Time: 3:30:00 PM - 5:15:00 PM **Location:** SC 212
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSW21: Managing scientific discourse in the modeling classroom.

Carlos Montero and Erica Posthuma-Adams
University School at NSU
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In the modeling classroom, students are confronted with experimental evidence and asked to seek explanations for their observations at the particle level. This is followed by the exchange of their views in a whole class discussion where students argue amongst themselves under the teacher's guidance. Discourse culminates in class consensus and the development of an appropriate chemical model. This workshop will give participants the opportunity to learn how to effectively manage this process.

Time: 3:30:00 PM - 5:15:00 PM **Location:** SC 213
Strand: Modeling

HSW22: Reviewing and Creating Assessments for NGSS

Michael Mury, Cece Schwennsen, Ethan Sullivan, Steve Long, and Barbara Sitzman
American Chemical Society
m_mury@acs.org

With the release and implementation of the next generation science standards, assessment is key in understanding students grasp of the 3 dimensions of the concepts. In this workshop we will share examples of assessment questions generated for certain performance expectations at the high school level. We will also share guidelines created by Project 2061 at AAAS for creating assessments that truly measure student performance.

Time: 4:30:00 PM - 5:15:00 PM **Location:** SC 214
Strand: Next Generation Science Standards (NGSS)

FRIDAY MORNING PROGRAM

Time	SC450	SC457	SL2020	SL2035	SL2040	CL 1008	CL 2008	CL 2010	CL 1010	SC215	SC213	SC214	SC212	CL 1007	MS112	MS108								
8:30	APL07	HSL23	EL06	CL07	HSL22	HSP37	APP05	HSP38	EP04	HSW30	EW03	HSW24	EW02	HSC02		HSW33								
8:45																								
9:00																								
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9:30								HSP39			HSP40			CP10										
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10:15											APP06													
10:30																								
10:45			HSL24			HSP41		HSP42	HSP43		HSP18				HSW23									
11:00					EL10																			
11:15								HSP44																
11:30																								

Conference Strands

Blended / Flipped Learning	Miscellaneous
Chemistry Demonstrations	Misconceptions in Chemistry
Chemistry in Context	Modeling
Forensic Chemistry	Next Generation Science Standards (NGSS)
Informal Learning / Learning through Play	Technology (online learning or in the classroom)
Inquiry Practices (POGIL, PBL, etc.)	Writing and Literacy in Chemistry
Laboratory Instruction	

Code	Population	Code	Presentation Type
AP	Advanced Placement	C	Computer Lab Workshop
C	College	L	Laboratory
E	Everyone	P	Presentation
HS	High School	W	Workshop

FRIDAY MORNING

APL07: Overcoming Misconceptions in Electrochemistry - Let's Build A Battery!

Greg Dodd
George Washington High School
gbdodd@gmail.com

Lack of success on a Part 2 question can mean the difference between 4 and 5 on the AP exam. Giving students inquiry-based lab opportunities that can help students overcome misconceptions is one approach that can improve test results. Question #3 from the 2014 AP Chemistry Exam (mean score 3.33/10), which dealt directly with electrochemical cells, highlighted student misconceptions in Electrochemistry, an integral part of Big Idea 3.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 450
Strand: Misconceptions in Chemistry

APP05: Lessons Learned from the 2015 AP Chemistry Examination (George Hague Jr. Memorial AP Chemistry Symposium)

Roger Kugel, Jamie Benigna, and Paul Price
University of Cincinnati
kugelrr@ucmail.uc.edu

Participants will examine the results of the 2014 AP Chemistry Exam with the Chief Reader for AP Chemistry. The exam topics and questions that students found most challenging will be identified and discussed. Participants will also compare these areas with AP Chemistry topics that were most challenging to their students. Participants will be aided in creating individual strategies for implementing best practices in their classrooms to address challenging topics from the course and exam.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 2008
Strand: Miscellaneous

APP06: An Open Forum with the College Board (George Hague Jr. Memorial AP Chemistry Symposium)

Paul Price, Roger Kugel, and Jamie Benigna
Trinity Valley School
pricep@trinityvalleyschool.org

Join the Chief Reader for AP Chemistry and members of the AP Chemistry Test Development Committee for a group discussion to answer your questions and provide content and pedagogical strategies for improving student success on the AP Chemistry exam.

Time: 9:30:00 AM - 11:15:00 AM **Location:** CL 2008
Strand: Miscellaneous

CL07: The Vitamin C Lab - Designed for Home or Traditional Lab Setting

Sharron Jenkins
Georgia Gwinnett College
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We propose a series of creative and engaging discovery-based chemistry labs that re-enforce basic math/algebra skills and delivers chemistry content applicable to everyday life. The labs are designed using "household chemicals" and can be carried out in a traditional lab setting or assigned as home labs. The objective of this presentation is to share a few of our home-based chemistry labs and have instructors perform our vitamin C lab, which incorporates essential math skills used in chemistry.

Time: 8:30:00 AM - 11:15:00 AM **Location:** SL 2035
Strand: Laboratory Instruction

CP10: Writing Across the Chemistry Curriculum- Using Collaborative Evaluation to Increase the Effectiveness of Writing Instruction in Laboratory Courses

Erin Saitta
University of Central Florida
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Faculty from Chemistry, Writing Across the Curriculum, and the Faculty Center collaborated to determine the effectiveness of writing assignments in an inquiry-based lab. This prompted a modification of writing objectives and the realignment of course assignments. Lab report assignments now integrate science writing strategies with writing to learn strategies to include invention, revision, and peer-review. Logistics of the collaboration and details of the revised assignments will be discussed.

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 1010
Strand: Writing and Literacy in Chemistry

EL06: Microscale activities from around the world Part 2- Developing interpretative and inquiry activities

Bob Worley
CLEAPSS, Brunel University Science Park, UK
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This 105-minute workshop considers further how microscale activities can enhance the interpretation of chemical processes at the nano-level and shows how once a technique is learnt, students can carry out inquiry-based activities. There is also consideration of how the processes tie in with some of recent developments in educational psychology. Participants can do part 2 without doing part 1 but As one participant said "In a little, you can see a lot". See <http://tinyurl.com/m79fd8w>.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SL 2020
Strand: Laboratory Instruction

EL10: Generations Symposium

Andrew Cherkas, David Katz, Pat Funk, Brian Rohrig,
and John Eix
Retired
cherkas@sympatico.ca

Dedicated to those who inspired us to teach chemistry. What is your story and your favourite demo? This is an opportunity for less experienced presenters to present with an experienced presenter. A variety of chemical demonstrations with safety considerations, where and how to use the demos in the classroom.

Time: 10:30:00 AM – 11:30:00 AM **Location:** SL 2040
Strand: Chemistry Demonstrations

EP04: Adapting the Good, the Bad, and the Ugly Labs for your Classroom

Sarah Kong
Central Ohio Technical College
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It's time to plan your labs for the year; you look at your material and have two main thoughts, "These are terrible!" And "These are amazing but won't work in my classroom!" What do you do next? This session will discuss the basics of rewriting not only labs that need a lot of improvement but also those that are excellent and need to be tweaked for your classroom.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 1010
Strand: Writing and Literacy in Chemistry

EW02: Conceptual Understanding of Enzyme Kinetics and Inhibition: An Active Learning Inquiry Activity

Glen Meades and Kimberly Linenberger
Kennesaw State University
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The purpose of this workshop is to exhibit a hands-on laboratory exercise that will reinforce students' knowledge about the biochemistry fundamentals enzyme kinetics and inhibition. Many biochemistry modeling labs require expensive equipment or extensive backgrounds, or sacrifice accurate representations for ease of implementation, possibly creating as many misconceptions as they clarify. Students are able to take an active role in learning by participating in the model of enzymatic function.

Time: 8:30:00 AM - 11:15:00 AM **Location:** SC 212
Strand: Modeling

EW03: Tech Talks: Integrating Technology with Instruction

Cheree Vaughn, Yolanda Payton, Erica Peddi,
and Rebecca Cordeiro
Paulding County High School
chereevaughn05@gmail.com

BYOD for this session, specifically Android or Apple devices. A team of presenters will demonstrate various apps and tools for the 21st century Chemistry classroom. These tools are not all subject specific. Focus is on free apps for immediate implementation, and troubleshooting alternatives when technology fails. You do not have to be a technology expert to use it effectively. Time will be designated to create your own lessons using some of your favorites from the session.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 213
Strand: Technology (online learning or in the classroom)

HSC02: Beyond the Octet Rule: Developing an Explanatory Model of Bonding and Periodicity

Brenda Royce
University High School
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Electron organization in the atom is central to understanding bonding and periodic trends in properties. Modeling Instruction offers a unique analogous model of electrons in the atom from an analysis of ionization energies that allows students to explain bonding and periodic behavior. This model is more robust than the usual energy level rings, yet is conceptually more concrete than a quantum orbital model.

Time: 8:30:00 AM - 10:15:00 AM **Location:** CL 1007
Strand: Modeling

HSL22: Meaningful Classroom Demonstrations

Penney Sconzo
The Westminster Schools
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Do NOT waste a demonstration! Many students are visual learners. A good demonstration can lead to that ah-ha moment when something clicks for a student and they gain ownership of the concept being explored. Demonstrations should be so much more than entertainment; it should relate to the chemistry content, help students picture what is occurring at the microscopic level, simulate discussion, and lead to a better understanding of the chemistry. Be prepared to participate in the presentation!

Time: 8:30:00 AM - 10:15:00 AM **Location:** SL 2040
Strand: Chemistry Demonstrations

HSL23: Integrating the 3-dimensions of NGSS into the Chemistry Classroom

Michael Heinz
Downers Grove North High School (Community High School District 99)
mheinz@csd99.org

Designing lessons that address all 3 strands of NGSS is difficult. In this session we will look at lesson planning that includes the Science and Engineering Practices, Disciplinary Core Ideas, and Cross-Cutting Concepts. The specific lessons that will be addressed will include stoichiometry, gas laws, and kinetics. Understanding by design will be the specific curriculum building format that will be used to help process this lesson planning session.

Time: 8:30:00 AM - 11:15:00 AM **Location:** SC 457
Strand: Next Generation Science Standards (NGSS)

HSL24: PBL in the Chemistry Classroom

Lindsay Whiteman
Sprayberry High School - Cobb County
Lindsay_L_Garcia@yahoo.com

This session will delve into why one should incorporate problem or project based learning into the chemistry classroom in order to increase engagement and drive the scientific habit of mind, including means for implementation. Also presented will be examples, resources for finding projects, and how to create your own. We will take a walk through an example PBL with a mini-lab, discuss possible prompts, and means for assessment.

Time: 10:30:00 AM - 11:15:00 AM **Location:** SL 2020
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSP18: Using Technology in the high school chemistry classroom

Sarah Eales
Peachtree Ridge High School, Kennesaw State University
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Innovative use of technology can have a positive impact on student learning, from smart response systems to gopro video cameras are easy to use in the chemistry classroom and can keep students engaged while also given the teacher the opportunity to address student misconceptions.

Time: 10:30:00 AM - 11:15:00 AM **Location:** SC 213
Strand: Technology (online learning or in the classroom)

HSP37: Captivate Students Interests Beyond the Classroom with Chemistry

Karen Kaleuati
American Chemical Society
k_kaleuati@acs.org

Students become more interested in science/STEM activities when they join a science club. The ACS ChemClub program, for 10 years, has provided—at no cost to schools—fun, valuable resources, hands-on activities, and opportunities for community outreach. Participants will learn about the program, experience a ChemClub meeting (including a couple hands-on activities), and take home a copy of the resources.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 1008
Strand: Informal Learning / Learning through Play

HSP38: Energy Bar Charts - a Conceptual Tool to Describe Energy Storage and Transfer

Larry Dukerich
American Modeling Teachers Association
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Energy is considered an indispensable tool for describing and understanding the world around us. Yet students graduate from high school unable to use energy to describe or explain everyday chemical phenomena. In this presentation I will show how Modeling Instruction provides students with a powerful conceptual tool (Energy Bar Charts) to describe energy storage within a system and transfers between system and surroundings during physical and chemical change.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 1010
Strand: Modeling

HSP39: Having fun in the chemistry classroom - The creation of a classroom role-playing game for reactions and stoichiometry

Andrew Adams
Douglas County High School
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This presentation will address the creation of a classroom role-playing game for a unit devoted towards chemical reactions and stoichiometry. The presentation will detail how the presenter has implemented a fun and engaging culture that allows lessons to be student-paced while still allowing room for inquiry and discovery. In addition, the use of a story-like setting allows for the demonstration of some everyday applications of chemistry. This is suited for high school teachers.

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 1008
Strand: Informal Learning / Learning through Play

HSP40: Are there particles smaller than an atom?

Laura Slocum
Heathwood Hall Episcopal School
slocuml@heathwood.org

In this presentation, I will share how the Modeling Curriculum has students “step into the shoes of the scientists” that made these discoveries and share their findings with their colleagues (classmates). This does not come until Unit 10 in the Modeling Curriculum, so I will also share about why and how this is placed here and not earlier in the course. Handouts on my requirements for students’ research and presentation, as well as a grading rubric will also be shared.

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 2010
Strand: Modeling

HSP41: Chemophilately: Chemists and chemistry on postage stamps

Harry Herzer
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There are several thousand stamps that depict a chemical topic or a chemist. Some contain subjects that can be related to chemistry, e.g. the Graf Zepellin and the study of hydrogen. Some stamps contain errors which add to the delight of those who “know better” One need not have these stamps in their collection as good examples can be found on the internet. A simple way to add interest to presentations - or have students search them out on the internet.

Time: 10:30:00 AM - 11:15:00 AM **Location:** CL 1008
Strand: Informal Learning / Learning through Play

HSP42: Creating Models Using Whiteboards: Particle Diagrams, Discussion Strategies, Visible Thinking

Martha Milam Karen Pompeo, Candice Mohabir,
and Stefanie Easterwood
East Coweta High School
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Drawing particle diagrams is fundamental for a clear understanding of chemistry. As students draw submicroscopic pictures (rather than macroscopic) they develop models of how chemistry happens. Working in groups, students illustrate their ideas on whiteboards. This collaborative process makes student thinking visible and aids in clarifying misconceptions. Various presentation techniques and questioning strategies lead students to their own discovery of traditional chemistry concepts.

Time: 10:30:00 AM - 11:15:00 AM **Location:** CL 2010
Strand: Modeling

HSP43: Science Notebooking Activities for Chemistry

Kelly Ramey
Tennessee Tech University
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Science Notebooking is an authentic practice that is becoming increasingly popular in K-12 classrooms, particularly in science content. In this session, you will be presented with many ideas across the topics of Chemistry for using notebooks for everyday activities, including laboratory exercises, note-taking, formative assessment, and group exercises.

Time: 10:30:00 AM - 11:15:00 AM **Location:** CL 1010
Strand: Miscellaneous

HSP44: An Excellent Pairing: Modeling Instruction and the PCB Sequence. The Story of How It Works for Ridley School District

Raymond Howanski
Ridley School District
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Ridley School District has simultaneously changed to a PCB sequence and adopted the use of modeling instruction. Science teachers have participated in workshops together to provide a more integrated science experience for students. These changes have facilitated a more coherent treatment of energy as students experience their science courses. They have also allowed teachers and students to leverage carefully sequenced learning activities within and between science courses.

Time: 11:15:00 AM - 11:30:00 AM **Location:** CL 2010
Strand: Modeling

HSW23: Put a BANG in Your Presentations!

Harvey Gendreau Bette Bridges
Laboratory Safety Institute
hgendreau1@comcast.net

During this hands-on make-&-take workshop we will be making a piezo igniter and a PVC sock cannon to help elucidate combustion reactions and other topics in chemistry. **Prepaid Workshop.**

Time: 10:00:00 AM - 11:30:00 AM **Location:** MS 112
Strand: Chemistry Demonstrations

HSW24: ChemEd X Professional Learning Community

Deanna Cullen
Journal of Chemical Education
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The Chemical Education Xchange web site is designed to be a collaborative space for high school chemistry teachers and to provide them with high quality resources. We are looking for teachers of all experience levels to take the lead in developing standards based materials to publish on the ChemEd X site. This workshop is designed to provide an overview of the materials already available and develop a community of teachers dedicated to designing materials based upon best practice. Participants should expect to leave with a plan for continued collaborative work with continued support from ChemEd X staff.

Time: 8:30:00 AM - 11:15:00 AM **Location:** SC 214
Strand: Technology (online learning or in the classroom)

HSW30: Introduction to POGIL

Laura Trout
The POGIL Project
troutl@lancastercountryday.org

This session is designed for those with limited or no previous exposure to POGIL. Participants will have the opportunity to engage in POGIL activities, observe facilitation strategies firsthand, learn about POGIL classroom implementation, and discuss common barriers to implementation. **Prepaid Workshop.**

Time: 8:30:00 AM - 11:15:00 AM **Location:** SC 215
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSW33: Lab Tricks and Safety Tips

Meg Young and Melissa Jones
University of Texas Arlington
meg_young@hotmail.com

Two veteran teachers will share ways to set-up labs quickly and safely.

Time: 8:30:00 AM - 10:15:00 AM **Location:** MS 108
Strand: Laboratory Instruction

FRIDAY AFTERNOON PROGRAM

Time	SC457	SL2020	SL2040	CL 1008	CL 2008	CL 2010	CL 1010	SC215	SC213	SC214	SC212	CL 1007	MS112	MS108	
2:30	HSL27	HSL26	HSL25	CP11	HSP47	HSP46	HSP45	APW05	HSW29	HSW27	HSW28	HSC03	CL05	HSW26	
2:45															
3:00															
3:15															
3:30			CP12	HSP50	EP05	HSP48									
3:45															
4:00				CP14		CP13									
4:15															
4:30						HSP51									
4:45					CP16		EP07				HSW31				
5:00															
5:15				HSP52											
5:30															

Conference Strands	
 Blended / Flipped Learning	 Miscellaneous
 Chemistry Demonstrations	 Misconceptions in Chemistry
 Chemistry in Context	 Modeling
 Forensic Chemistry	 Next Generation Science Standards (NGSS)
 Informal Learning / Learning through Play	 Technology (online learning or in the classroom)
 Inquiry Practices (POGIL, PBL, etc.)	 Writing and Literacy in Chemistry
 Laboratory Instruction	

Code	Population	Code	Presentation Type
AP	Advanced Placement	C	Computer Lab Workshop
C	College	L	Laboratory
E	Everyone	P	Presentation
HS	High School	W	Workshop

FRIDAY AFTERNOON

APW04: Acids, bases, buffers, titrations, what do I do?

Jamie Flint
Spring Woods High School
flintchem@gmail.com

Students seem to struggle when it comes to acids, bases, buffers and titrations. They do not know what they have in the beaker, once they figure it out, they don't know how to proceed. I will be going over some strategies that I've started to use in my classroom to help my students know what to do next.

Time: 3:30:00 PM - 4:15:00 PM **Location:** SC 212
Strand: Misconceptions in Chemistry

APW05: Teaching AP Chemistry with POGIL

Laura Trout
The POGIL Project
troutl@lancastercountryday.org

In the past year, two resources have been endorsed by The POGIL Project to support the AP Chemistry curriculum. One is a book of POGIL activities published by Flinn Scientific, the other is a collection of guided inquiry labs published by PASCO. In this session we will look at several of these resources (samples provided) and discuss how POGIL pedagogy supports the science practices in the AP Chemistry Curriculum Framework. Some knowledge of POGIL pedagogy is desirable for this session.

Time: 2:30:00 PM - 4:15:00 PM **Location:** SC 215
Strand: Inquiry Practices (POGIL, PBL, etc.)

CL05: Perovskite Solar Panels: A Multidisciplinary Experiment in Solar Energy

Shelby Hatch, Sameer Patwardhan, and Duyen Cao
Northwestern University
slhatch@u.northwestern.edu

We provide an easy and cheap way to fabricate perovskite solar cells in an undergraduate laboratory environment. These solar cells can be connected to create solar panels and drive electronic devices, such as light emitting diodes. This multidisciplinary experiment introduces basic concepts concerning solar cell fabrication and solar panel assembly in a unified experiment that only requires inexpensive equipment and materials.

Time: 2:30:00 PM - 5:15:00 PM **Location:** MS 112
Strand: Laboratory Instruction

CP11: Developing Spatial Reasoning in General Chemistry Students

Deborah Carlisle
University of Massachusetts Amherst
dcarlisle@educ.umass.edu

The study of chemistry requires the understanding and use of spatial relationships, which are challenging for many students. This workshop shares a model for the teaching and learning of spatial skills based on a semester long study. Our results show that spatial skills can be successfully enhanced through the use of relevant guided activities designed to improve student understanding of external representations. Participants will have the opportunity to explore and perform several activities.

Time: 2:30:00 PM - 3:15:00 PM **Location:** CL 1008
Strand: Miscellaneous

CP12: Pop Quizzes – are student attendance and grades increased?

Christine Hermann
Radford University
chermann@radford.edu

During the 2014-2015 academic year, I instituted pop quizzes into the Organic Chemistry class. In previous academic years, there were some classes in which the attendance was about half the class. With the threat of pop quizzes, the attendance has increased dramatically. Average grade comparisons within the class will also be discussed.

Time: 3:30:00 PM - 3:45:00 PM **Location:** CL 1008
Strand: Miscellaneous

CP13: Qualitative/Quantitative Analysis of Artificial Food Dyes: A UV/VIS course-embedded research experience for Principles of Chemistry at GGC

Ian Krouse, S.M. Mwongela, G. Giles, M.S. Morton, S. H. Park,
D.G. Sauder and B.C Shepler
Georgia Gwinnett College
ikrouse@ggc.edu

The majority of STEM degrees granted in the USG system require the equivalent of two Principles of Chemistry courses. Two undergraduate research experiences (UREs) were introduced in 2011 connected by the theme of spectrophotometric identification of food dyes. Although food dye measurements are discussed extensively in the literature, such projects are rare for the open access institution-wide scale of this URE. Results and long-term effects will be the focus of discussion.

Time: 4:00:00 PM - 4:15:00 PM **Location:** CL 1010
Strand: Chemistry in Context

CP14: Can computerized molecular models replace handheld models for teaching the spatial reasoning skills necessary for success in the chemistry curriculum?

Derek Behmke, Julia Parades, Michael Morton, and Ian Krouse
Georgia Gwinnett College
dbehmke@ggc.edu

In the chemistry curriculum students encounter topics, such as chirality, which require an understanding of molecular spatial relationships. Traditionally understanding of molecular spatial relationships is aided by the manipulation of handheld molecular models. This study seeks to ascertain whether 21st century students, who are submerged in a culture that revolves around mobile technology, can gain similar or superior spatial reasoning skills by manipulating computerized molecular models.

Time: 4:00:00 PM - 4:15:00 PM **Location:** CL 2008
Strand: Technology (online learning or in the classroom)

CP16: Home-Based Chemistry Labs for an Online General Chemistry Course

Sharron Jenkins
Georgia Gwinnett College
sjenkin2@ggc.edu

We propose a series of creative and engaging discovery-based chemistry labs that re-enforce basic math/algebra skills and delivers chemistry content applicable to everyday life. The labs are designed using "household chemicals" and can be carried out in a traditional lab setting or assigned as home labs. The objective of this presentation is to share a few of our home-based chemistry labs and have instructors perform our vitamin C lab, which incorporates essential math skills used in chemistry.

Time: 4:30:00 PM - 5:15:00 PM **Location:** CL 2008
Strand: Technology (online learning or in the classroom)

Strand: Inquiry Practices (POGIL, PBL, etc.)

EP05: Chemistry Card Sorting

Kristin Plessel
University of Wisconsin-Rock County
kristin.plessel@uwc.edu

A small group of instructors have teamed up with MSOE to develop card sets designed for sorting activities in a cooperative classroom. Two sets of decks have been developed: one that centers on introductory/general chemistry topics and a second which is better suited for an introductory organic class (i.e. for nursing chemistry). Descriptions of the decks, including the vast array of learning goals that could be addressed using these tools, and activities will be included.

Time: 3:30:00 PM - 4:15:00 PM **Location:** CL 2010
Strand: Inquiry Practices

EP07: Fashion, Pharmaceuticals, Food, and Fun: The Chemical History of Color

Mary Virginia Orna
The College of New Rochelle
maryvirginiaorna@gmail.com

Color has been an exciting and enjoyable part of human life ever since the color-sensitive eye evolved over a million years ago. However, the junction between color and chemistry, and color and history, is of more recent origin. This talk traces the history of color usage as a chemical endeavor from the earliest records to the present day focusing on the four major areas in the title, peppered with stories to help us understand the mystery of color as a universal experience and phenomenon.

Time: 4:30:00 PM - 5:15:00 PM **Location:** CL 1010
Strand: Chemistry in Context

HSC03: Flip your classroom step-by-step

Allison Tarvin
Harrison High School
allison.tarvin@cobbk12.org

Hear one high school teacher's experience of transitioning from a traditional to flipped model. Learn from the stumbles. See concrete examples of video lessons and post-video class time. Learn to plan and record a video, create a viewing guide, check post-video understanding, and plan for a more active class time. Leave with access to sample lessons, materials to introduce the model to parents and students, and templates for viewing guides and video backgrounds.

Time: 2:30:00 PM - 4:15:00 PM **Location:** CL 1007
Strand: Blended / Flipped Learning

HSL25: Flame Gel: How chemistry is used in the special effects industry to safely light stunt persons on fire

Tom Kuntzleman
Spring Arbor University
tkuntzle@arbor.edu

To safely light themselves on fire when filming action movie scenes, stunt persons use gels comprised of super absorbent polymers and water. Several chemical concepts are at work in this special effects trick, including reaction enthalpy and heat capacity. These gels are easy to make and can be used in a variety of interesting experiments in chemistry classes. How to safely carry out this trick (on a very small scale) will be demonstrated, and possible classroom experiments will be discussed.

Time: 2:30:00 PM - 2:45:00 PM **Location:** SL 2040
Strand: Chemistry Demonstrations

HSL26: Inquiry Problem Based Laboratory Experiments

Jesse Bernstein, Jeffrey Bracken and Paul Price
Miami Country Day School
bernsteinj@miamicountryday.org

Here's a lab manual that expects students to think before they experiment! No more "What is the right answer" questions. Our lab manual is NOT a cookbook. This workshop allows you to experience a number of labs. In addition, the manual, available for purchase, contains detailed teacher notes, setup pictures, and a fully editable manual on cd.

Time: 2:30:00 PM - 5:15:00 PM **Location:** SL 2020
Strand: Laboratory Instruction

HSL27: Engineering activities for high school chemistry

Sarah Boesdorfer
University of Northern Iowa
sarah.boesdorfer@uni.edu

NGSS includes performance expectations specific to engineering design content are expected to be part of every high school science course including chemistry and performance expectations that integrate engineering with science content. In this laboratory workshop, ideas and suggestions for teaching engineering and engineering design will be presented. Participants will have the opportunity to try classroom-tested engineering activities developed for high school chemistry.

Time: 2:30:00 PM - 5:15:00 PM **Location:** SC 457
Strand: Next Generation Science Standards (NGSS)

HSL28: Teaching Combustion in the High School Classroom

Brian Rohrig
Ohio state University
brianrohrig@icloud.com

Each participant will perform a number of activities that will demonstrate combustion in a way that is safe, low cost, and guaranteed to hold your students' attention. Topics include: different types of fire, chemistry of the flame, how fire extinguishers work, reaction rate, stages of a typical house fire, flashpoint, backdraft, arson detection and investigation, explosives, flares, fireworks, and much more. Each participant will receive a bound manual of all activities presented. **Prepaid Workshop.**

Time: 2:45:00 PM - 5:30:00 PM **Location:** SL 2040
Strand: Chemistry Demonstrations

HSP45: Better Living Through Chemistry....Gone Bad?

Wendy Doherty, Mary Buchanan, and Marissa Peck
Marissa Peck
Redwood High School
dosh094947@yahoo.com

This presentation describes our experiences with a problem based learning activity for high school Chemistry students. The goal of the activity is for students to research the problems associated with widely distributed consumable products that are rarely recycled and/or cause an environmental hazard. A student generated community education campaign is the culminating event of the project. Lesson plan specifics, rubrics, timelines and specific examples of student work will be provided.

Time: 2:30:00 PM - 3:15:00 PM **Location:** CL 1010
Strand: Chemistry in Context

HSP46: Evidence and arguments for using inquiry

Deanna Cullen
Whitehall High School
dcullen@jce.acs.org

This veteran teacher just used the modeling chemistry curriculum for the first time. I will share the highs and lows of the experience along with some activity ideas with tips for helping students use evidence to explain chemistry concepts and make connections between topics.

Time: 2:30:00 PM - 3:15:00 PM **Location:** CL 2010
Strand: Modeling

HSP47: Adventures in Implementing a Quality Dual-Credit Chemistry Program

Donald Storer and Andrea Harpen
Southern State Community College
dstorer@sscc.edu

The use of both online and face-to-face delivery of course materials by both the high school teacher and the professor for a dual-credit course will be described. A different approach from previous years was taken regarding lab; allowing the college-level course to be taught entirely at the high school by loaning equipment to the school to permit college-level experiments to be performed. Issues with technology, scheduling, and the response of the students will be discussed. For HS and college.

Time: 2:30:00 PM - 3:15:00 PM **Location:** CL 2008
Strand: Technology (online learning or in the classroom)

HSP48: Fighting with food, counteracting environmental toxicants

Susan Hershberger
Miami University
hershbs@miamioh.edu

Central to student's lives is the environment and foods they eat. "Fighting with Food: Battling Chemical Toxicity with Good Nutrition" features hands-on inquiry based readings and laboratory activities for high school chemistry students on both the science of their environment and food. Chemistry standards include the chemistry of ionic chemical substances modeled with calcium salts and fruit caviar and anthocyanins as models of both acid, base chemistry and oxidation reduction reactions.

Time: 3:30:00 PM - 3:45:00 PM **Location:** CL 1010
Strand: Chemistry in Context

HSP49: Group Intelligence: a classroom MP3 activity demonstrating concepts in chemical evolution

Christopher Parsons, Martha Grover, and Ariel Fristoe
Georgia Tech, Center for Chemical Evolution
christopher.parsons@chemistry.gatech.edu

Group Intelligence is a 20-minute activity designed to introduce students to molecular behaviors like self-assembly. Students will walk, run, form patterns and solve spatial problems together; they follow instructions from a single audio file. For example, students are asked to line up in a particular order of boy/girl, and then asked to match their line with another oppositely organized line. This mimics the recognition between base pairs in RNA and DNA.

Time: 3:30:00 PM - 4:15:00 PM **Location:** SC 214
Strand: Informal Learning / Learning through Play

HSP50: Cognitive science, memorization, concepts, and chemistry

Eric Nelson
Fairfax County Public Schools (retired), co-author of
WWNorton's text "Calculations In Chemistry"
EANelson@ChemReview.Net

"Working memory" (WM) is where the brain solves problems. In recent research, cognitive science has proven that WM can hold large amounts of well memorized, but only a few bits not memorized, data. Meaning? Students must work to move initial facts and algorithms into long-term memory. "Spaced overlearning" outside of class helps. Then, during class, "interleaved practice" and guided inquiry build conceptual frameworks and "fluency." Learn why science supports the "cognitive-based flip."

Time: 3:30:00 PM - 3:45:00 PM **Location:** CL 2008
Strand: Technology (online learning or in the classroom)

HSP51: The Photon Game

Steve Sogo
Laguna Beach High School
ssogo@lbusd.org

The photon game engages students in a friendly competition to be the first to "collect" photons of red, orange, yellow, green, blue, violet, and ultraviolet colors. The game is played in student pairs with paper, colored pencils, and small markers to represent electrons in a quantized energy well. This exercise is an effective means at exploring the interplay between light and electronic states in an atom.

Time: 4:30:00 PM - 4:45:00 PM **Location:** CL 2010
Strand: Inquiry Practices

HSW26: Using Tie Dye to teach Chemistry

Micah Porter and Andrew Cherkas
Collins Hill High School
micahleigh943@gmail.com

This workshop will cover chemistry concepts as they apply to tie dye including principles of acids, bases, and solutions. Each participant will make one tie dye t-shirt to keep during the workshop. Additional tie dyed items can be purchased at the workshop. **Prepaid Workshop.**

Time: 2:30:00 PM - 5:15:00 PM **Location:** MS 108
Strand: Chemistry in Context

HSW27: Setting the Stage in the Chemistry Classroom: using role play to enhance retention

Rebekah Cordeiro
Westlake High School
rebekah.cordeiro@gmail.com

This presentation will include audience movement and participation in acting out scenarios to enhance retention in bonding and nomenclature, net ionic equations, bond enthalpy, kinetic molecular theory, gas laws, equilibrium, acid/base chemistry, and dissolution. Audience members will have an opportunity to develop role-playing activities while participating in role-playing activities developed by presenter.

Time: 2:30:00 PM - 3:15:00 PM **Location:** SC 214
Strand: Informal Learning / Learning through Play

HSW28: Teaching the Metric System for Meaning and Understanding

Sally Mitchell
East Syracuse Minoa Central High School
sbmitchell2@gmail.com

Teachers have never been taught how to teach the metric system, it was assumed that they knew how. Many teach the metric system by dimensional analysis. This workshop will expose teachers to a new way to introduce the metric system to their students using sound mathematical principles. Teachers will leave this workshop with a new understanding of the prefixes used in the metric system.

Time: 2:30:00 PM - 3:15:00 PM **Location:** SC 212
Strand: Misconceptions in Chemistry

HSW29: Before, Change, After: A Modeling Approach to Stoichiometry

Ellena Bethea, Laura Slocum, and Brenda Royce
Millbrook School
ellena.bethea@gmail.com

Stoichiometry is an essential part of describing and understanding the relationship between reactants and products in a chemical reaction. However, students often find this challenging, and seek refuge in algorithmic calculations driven by unit cancellation. This workshop offers a conceptual approach to stoichiometry that utilizes multiple representations of the reaction at three key stages to keep problem solving and answers in the context of the balanced chemical equation.

Time: 2:30:00 PM - 4:15:00 PM **Location:** SC 213
Strand: Modeling

HSW31: Which element am I? Active learning to study the order inside the Periodic Table and trends in periodic properties

Margarita Pérez-González
Instituto Tecnológico y de Estudios Superiores de Monterrey -
Campus Querétaro
mperezg@itesm.mx

A class activity is presented as an innovative way to teach high school students. The use of specially designed infographics allows students to become elements. First, they find out which element corresponds to the infographic they chose and locate themselves inside the classroom as if they were "inside" a huge periodic table. Afterwards, differences on metals and non-metals, group and period concepts are constructed. Finally, periodic trends (atomic radius, electronegativity) are discovered.

Time: 4:30:00 PM - 5:15:00 PM **Location:** SC 214
Strand: Informal Learning / Learning through Play

SATURDAY MORNING PROGRAM

Time	SC450	SC457	SL2020	SL2035	SL2040	CL1008	CL2008	CL2010	CL1010	SC215	SC213	SC214	CL1007	MS112
8:30	HSL03	HSL30	HSL32	HSL29	HSL31	HSP55	EP08	HSP53	HSP54	HSW14	HSW32	HSW34	HSC04	HSL33
8:45														
9:00														
9:15														
9:30														
9:45						EP09	EP10	HSP56	CP18					
10:00														
10:15														

Conference Strands	
Blended / Flipped Learning	Miscellaneous
Chemistry Demonstrations	Misconceptions in Chemistry
Chemistry in Context	Modeling
Forensic Chemistry	Next Generation Science Standards (NGSS)
Informal Learning / Learning through Play	Technology (online learning or in the classroom)
Inquiry Practices (POGIL, PBL, etc.)	Writing and Literacy in Chemistry
Laboratory Instruction	

Code	Population	Code	Presentation Type
AP	Advanced Placement	C	Computer Lab Workshop
C	College	L	Laboratory
E	Everyone	P	Presentation
HS	High School	W	Workshop

SATURDAY MORNING

CP18: Saponification, Data Collection and the Scientific Method

Neville Forlemu, Simon Mwangela, Leonard Anagho,
and Kevin O'Halloran
Georgia Gwinnett College
nforlemu@ggc.edu

Data collection and quantitative reasoning are two critical skills for students working towards an allied health career. To augment these skills, we introduced a saponification-based research project in the GOB course at GGC. The objective was to synthesize soap, perform a multi-week data collection and analysis in graphical and written format. The project is intended to improve the said skills and enhance overall learning in their program. Data of student achievement and observations from study will

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 1010
Strand: Chemistry in Context

EP08: What can a Materials Safety Data Sheet do for you?

Bob Worley
CLEAPSS Brunel University Science Park, UK
bobworley4@gmail.com

Suppliers of chemicals to schools have a legal requirement to inform teachers and technicians about the hazards of chemicals using an MSDS sheet. They are freely available world-wide to you, employers, school governors and concerned/interested parents. Information from them will be demanded if there is an incident. This presentation (with videos) will focus on how useful this published material is for teachers and the problems and fears they have caused, gained from experience in the UK.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 2008
Strand: Laboratory Instruction

EP09: Missing Electrons and Rolling Spheres

John Eix
Upper Canada College - Retired
jeix@sympatico.ca

John will show how to involve students in creating energy level diagrams without resorting to Bohr. The lessons actively involve the students in creating models and evaluating them with experimental data. He will also show how a small magnet and steel spheres can help students understand the concept of relative mass.

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 1008
Strand: Modeling

EP10: Nanotechnology experiments for general chemistry laboratory classes

David Katz
Educator and consultant
dakatz45@msn.com

This author has utilized several low-cost nanotechnology experiments and demonstrations into the non-major and general chemistry laboratory that were modified from procedures developed at the Materials Research Science and Engineering Center (MRSEC) at the University of Wisconsin-Madison. These experiments include preparing and exploring liquid crystals, aqueous ferrofluid, nitinol metal, LEDs, and a microcrystalline titanium dioxide solar cell.

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 2008
Strand: Laboratory Instruction

HSC04: The ChemVlab Project: Free online contextualized activities in Stoichiometry, Thermochemistry, Equilibrium and Acid/Base Chemistry

David Yaron, Michael Karabinos, and Jodi Davenport
Carnegie Mellon University
yaron@cmu.edu

Attendees will gain hands on experience with eight high school classroom activities developed by WestEd and the Chemcollective. Available at: <http://chemvlab.org>, the activities support instruction by allowing students to practice and apply their knowledge to real world contexts, while receiving immediate feedback and online tutoring. Each activity includes a virtual lab experiment and in all activities, the chemical concepts are tied to inquiry science practices.

Time: 8:30:00 AM - 10:15:00 AM **Location:** CL 1007
Strand: Technology (online learning or in the classroom)

HSL03: Getting More out of a demonstration or lab: Where can a Demo be Used?

Andrew Cherkas
Retired
cherkas@sympatico.ca

A demonstration is often used for only one concept, when in fact it may be used for more than one area of study. If one uses a demonstration in more than one unit, students can learn that chemistry is not a set of individual units but a continuous strand that connects many concepts. Several demonstrations will be shown in this way.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 450
Strand: Chemistry Demonstrations

HSL29: Using Micro-scale Investigations in Chemistry Classes

Cece Schwennsen, Regis Goode, Bonnie Bloom, and Pam Diaz
The Cate School
cschwennsen@gmail.com

In the current academic culture, teachers must ensure that students understand these concepts but must accomplish these goals with fewer resources. Micro-scale labs allow students to conduct meaningful scientific investigations while producing less waste. In this presentation, teachers will describe several micro-scale investigations including double displacement/precipitate reactions and titration. Participants will have the opportunity to complete the investigations.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SL 2035
Strand: Laboratory Instruction

HSL30: The Invention of Air and the Connection of Concepts

Brett Criswell and Rebecca Mortensen
University of Kentucky
brett.criswell@gmail.com

To meet the vision laid out in the NGSS we may need to think outside the box – or look inside a book. This session will explore Steven Johnson’s *The Invention of Air*. It discusses crosscutting concepts (systems), disciplinary core ideas (structure of matter), and science practices (developing models). Ideas from the book that can be used to connect different concepts in chemistry will be discussed. It will also engage participants in several activities that are tied to the content of the book.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 457
Strand: Next Generation Science Standards (NGSS)

HSL31: A Classification of Demonstrations for Senior chemistry

Peter Bloch
Northern SS (retired)
pbloch@teksavvy.com

Chemistry demonstrations are a good way to make the curriculum engaging. In conjunction with laboratory activities and classroom discussions, demonstrations can help bridge the gap between theory and application. In my experience, demonstrations can be grouped into three main types or categories. These can be a helpful framework for planning which demos to use. Demos related to each of these types will be shown.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SL 2040
Strand: Chemistry Demonstrations

HSL32: Win-Win: Competition and Cooperation in Inquiry-Based Labs

Steve Sogo
Laguna Beach High School
ssogo@lbusd.org

Four engaging lab activities will be presented that promote student discovery and decision-making. Two of these labs engage students in a competition in which students who discover/invent effective methods closely guard their secrets. The other two labs promote cooperation between student groups--students enrich their understanding by discussing results with others. The labs presented will be: Mini-Hindenburs, The Volume is Right!, Less than Zero, and Alien Blood.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SL 2020
Strand: Laboratory Instruction

HSL33: Exploring Chemical Reactions: Bringing Chemistry to Life

Sharon Geyer and Micaela Ferreira
Pomfret School
sgeyer@pomfretschool.org

Chemical reactions are the most exciting part of chemistry class. Learn a hands-on and student-centered approach to sharing reactions with your students. During this session, teachers can conduct the reactions in each station, watch the instructional videos, and practice the demos for both the whole-class activity and the “demo test”. We look forward to sharing one of our favorite units of the year with fellow ChemEders; including instructions for the lab stations, demos, and demo test.

Time: 8:30:00 AM - 10:15:00 AM **Location:** MS 112
Strand: Laboratory Instruction

HSP53: Choice Changes Progress and Perception

Erica Peddi
Campbell High School
erica.peddi@cobbk12.org

Using differentiation within a mastery learning cycle allows for greater student success within the chemistry classroom. Students who have typically been less engaged have shown that they care about the work that they are doing and will embrace the challenge. There is more time in the class for the teacher to facilitate and work through problems and provide tutorial for struggling students as well as enriching assignments for students who want to go beyond what is taught in the classroom.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 2010
Strand: Miscellaneous

HSP54: Alkynes of Organic Ideas

Yvonne Clifford
Jacob Hespeler Secondary School (Cambridge, ON, Canada)
cliffordm@golden.net

Join me for a novel approach to teaching the predictably difficult subject of organic chemistry. Learn how high school students can achieve great success in learning both the nomenclature and reactions in organic chemistry. I am a chemistry teacher in my twentieth year and am especially interested in kinesthetic learning. With this approach students don't regurgitate the material but rather learn the organic chemistry needed for the next level of education through a variety of demonstrations,

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 1010
Strand: Chemistry in Context

HSP55: Teaching Chemistry with Modeling Instruction

Ben Meacham
Lake Crystal Wellcome Memorial High School
bmeacham@isd2071.k12.mn.us

This presentation will focus on sharing my experiences using Modeling Instruction in my high school chemistry classes over the past 3 years. As Modeling Instruction has increased in popularity over the past decade in physics, using this pedagogical approach in the chemistry class has started to become popular as well. The presentation will include information on what Modeling Instruction is, what it looks like, its benefits, and my general experiences.

Time: 8:30:00 AM - 9:15:00 AM **Location:** CL 1008
Strand: Modeling

HSP56: AACT: Resources and Opportunities

Emily Bones and Adam Boyd
AACT
E_Bones@acs.org

Emily Bones and Adam Boyd from the American Association of Chemistry Teachers (AACT) will provide an overview of the teaching resources available through AACT, highlight upcoming professional development opportunities, and take your suggestions and questions. Learn how AACT can save you time and connect you with other teachers of chemistry across the country.

Time: 9:30:00 AM - 10:15:00 AM **Location:** CL 2010
Strand: Miscellaneous

HSW14: POGIL Facilitation - Improving student process skills

Kristin Plessel

University of Wisconsin - Rock County
kristin.plessel@uwc.edu

In this session, intermediate and advanced POGIL classroom facilitators will have an opportunity to experience and consider effective tools for improving students' process skills. We will identify methods to raise students' buy-in for the use of process skills, implement strategies to teach students to identify process skills, and enable students to reflect on their group's use of process skills. Time will be provided for participants to share their own best practices.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 215
Strand: Inquiry Practices (POGIL, PBL, etc.)

HSW32: Stability and Change: Developing a Model of Equilibrium Processes

Brenda Royce, Larry Dukerich, and Carlos Monteros
University High School
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Stability and change are cross-cutting concepts to all disciplines in science. In chemistry these concepts can be seen in the study of the nature of equilibrium for both physical and chemical changes. Yet students often misunderstand equilibrium. In this workshop a model of the equilibrium process is developed using a simple game that can be applied to various systems, making the equilibrium state, rates of competing processes, and standard rate graphs more meaningful to students.

Time: 8:30:00 AM - 10:15:00 AM **Location:** SC 213
Strand: Modeling

HSW34: A Chemistry Story to Promote Argumentation in Science Classrooms

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A key goal in contemporary science education is the ability to engage in evidence-based reasoning in relation to both scientific and socio-scientific issues. Often such issues emerge in complex situations that demand the skills to articulate the difference between, for example, evidence and claim, as well as the ability to evaluate the credibility of evidence using a set of criteria such as accuracy and plausibility of the evidence. We developed a set of activities to integrate the promotion of such skills and to provide teachers some example guidelines for structuring the lessons in ways that would support evidence-based reasoning to take place. Furthermore, each activity was situated in a narrative where the students would see the broader social and cultural relevance of the chemistry topic

covered. In this session, one example of these activities will be reviewed in detail. The main purposes of this activity are (a) to provide a context for the students to generate arguments about the behaviour of gases using evidence; and (b) to consider the evidence for the gas laws, the constant pressure vessels (balloon) and the constant volume vessels (crystal ball). For the activity, the students is expected to work in small groups to complete writing frame which is designed to structure their written arguments..

Time: 8:30:00 AM - 10:15:00 AM

Location: SC 214

Strand: Inquiry Practices (POGIL, PBL, etc.)