PROFESSIONAL DEVELOPMENT

General Sessions (K-12)

Ironclad Chemistry – From Supernovae to the Red Mountain Iron Ore

Scott Brande, Associate Professor, UAB Department of Chemistry

The iron mines and metal production furnaces of Red Mountain in the vicinity of Birmingham, Alabama are products of chemical knowledge and Civil War era backbreaking industry. But the origin of our iron ore goes much further back in time, to the geological Silurian Period, about 435 million years ago. A broader view of iron takes us out to the red planet Mars, meteorites and asteroids, and interstellar gas clouds from supernovae of stars. In this session, we'll take this journey about iron, and you'll take home a free sample of the ore.

Uses of Radioactive Isotopes in Pharmacy

Jonathan Burns, Assistant Professor, UAB Department of Chemistry

Radioisotopes are a class of unstable atoms, which undergo radioactive decay to form a stable atom. As a part of the radioactive decay, radiation is emitted in the form of particles and photons. By considering several different properties, i.e., the chemical behavior (element), the rate of decay (half-life), and the type of radiation emitted (decay mode), an appropriate radioisotope can be selected for a variety of applications including those in medicine and pharmacy. This presentation will provide an overview of radioisotopes and their applications in medicine and pharmacy.

Ask the Professor

Joe March, Professor, University of Alabama at Birmingham Department of Chemistry
Morgan Ponder, Professor, Samford University Department of Chemistry and Biochemistry
Kevin Shaughnessy, Professor and Director of Undergraduate Studies, University of Alabama Department of Chemistry & Biochemistry
Jordan Harshman, Assistant Professor, Auburn University Department of Chemistry and Biochemistry
Kate Hayden, Assistant Professor, Birmingham-Southern College Department of Chemistry and Physics

Ever wonder how you could improve your teaching practice to better prepare your students for freshman chemistry at the college level? Or do you wonder how teaching chemistry in a conceptual way will impact students when they reach university? Come hear straight from the professors themselves!

FoodMASTER: Cooking with Chemistry

Tandy L Dolin Petrov, Science Educator and Lead Teacher, Dupuy Alternative School, Birmingham City Schools; University of Alabama at Birmingham Community OutReach and Development (CORD)

The kitchen is all about CHEMISTRY! From how we store, prepare, and handle food, the FoodMASTER lessons teach scholars and educators the essential elements of our favorite meals. More than just another educational program, the FoodMASTER initiative enriches how we apply basic math and science skills while exploring the foundations of chemistry phenomena. You get to eat, taste, and observe the science that fuels our daily meals. Grab your lab coat and put on an apron for this hour of food-based experiments. You will have fun investigating some of your favorite foods and even make a tasty treat that is good for you, too!

Southern Research Demo Show

Kathryn Lanier, STEM Education Outreach Director, Southern Research
Liz Johnson, STEM Education Specialist, Southern Research

Fire, ice, and science to entice! We heat things up in the first half of our science show with the basics of chemical reactions. We explore exothermic and combustion reactions and discuss energy transformation with fire experiments and elephant toothpaste. Then we cool it down in the second half as we investigate the properties of liquid nitrogen and its effect on phases of matter. We end the show with a big bang and our love of science will rain down on you!

Changing an Atom

Kristi Williams, Science Teacher, Leeds High School

Do your students have a hard time remembering how to calculate atomic mass and charge given numbers of subatomic particles? Do they get lost in the cloud of protons, neutrons, and electrons? Come learn about a resource that is FUN and will help your students straighten out their subatomic particles. This resource is available for FREE to high school teachers through their Alabama Science in Motion (ASIM) Chemistry Specialist.

Proficiency Scales in the Chemistry Classroom

Rachel Poe, AP and General Chemistry Teacher, Oxford High School

Help your students take ownership of their learning by implementing proficiency scales in your classroom. Come see how measuring student learning through formative assessment and feedback is enhanced by measurement topics, standards referenced grading, and proficiency scales.

The Science of Sloss Furnaces

Ty Malugani, Education Coordinator, Sloss Furnaces

Learn about how chemistry played a role in the iron-making process at Sloss Furnaces, and about the Sloss Metal Arts Program which pours iron in a similar way today. This session will also go into the historical importance of Sloss Furnaces and the impact the iron-making industry had on the Birmingham area.

Developing a particle model of matter using Modeling Instruction

Christopher Manor, Chemistry Modeling Instructor, Independence High School

This session is designed to introduce the Modeling Instruction methodology in Chemistry. Modeling Instruction (MI) was intentionally developed to correct many weaknesses of the lecture-demonstration method of instruction. MI in Chemistry is centered around a series particle models of increasing complexity in which students will continually ask themselves three questions:

1. How do I view matter?
2. How does matter behave?
3. What is the role of energy in the changes I observe?

The strategies and activities specifically used during this session will focus on students developing a particle model of matter based on evidence.

Proportional Reasoning to Describe (Qualitative and Quantitative) Gas Behavior Using Modeling Instruction

Christopher Manor, Chemistry Modeling Instructor, Independence High School

This session is designed to introduce the Modeling Instruction methodology in Chemistry. Modeling Instruction (MI) was intentionally developed to correct many weaknesses of the lecture-demonstration method of instruction. MI in Chemistry is centered around a series particle models of increasing complexity in which students will continually ask themselves three questions:

1. How do I view matter?
2. How does matter behave?
3. What is the role of energy in the changes I observe?

The strategies and activities specifically used during this session will focus on students using proportional reasoning to describe (qualitatively and quantitatively) the behavior of gases.

Teaching Physical Science, Chemistry, and AP Chemistry in the Digital Realm

Kelly Reaves, Jenny Firth, Lea Swift; Chemistry Department; Homewood High School

Teaching during the 2020-2021 school year proved to be difficult for most educators and the 2021-2022 year is shaping up to be equally challenging. In this session you will hear from three science teachers who were tasked with concurrently teaching hybrid, virtual and in person classes. Come to this session to learn more about the technology and activities used as well as ways to help keep students involved and connected whether physically or virtually in the classroom.

Particulate Diagrams in AP Chemistry

Lisa McGaw, Chemistry Consultant

Do your students have difficulty understanding and interpreting particulate diagrams? If you answered “yes” then this session is for you! Come to this session and actively participate in a series of rotation stations targeted on particulate diagrams. Particulate diagrams appear often on the AP Chemistry exam for a wide array of topics and maybe this type of approach will make these items more accessible for your students.

Acids, Bases and Buffers in AP Chemistry

Lisa McGaw, Chemistry Consultant

Acids, bases, and buffers – oh my! Are your students ever confused about "what is in the beaker?" and how to approach problems involving weak acids and bases? In this session you will experience a time-tested approach to solving acid, base and buffer problems. Providing a tool for student success will help to simplify these challenging questions.

Colorful and Sweet Chemistry

Dr. Al Hazari, retired Professor of Chemistry, University of Tennessee, Knoxville

Color is used all the time and in many ways in chemistry. You will use color to figure out what a substance is, to tell when it has changed, and to determine its strength. In addition, you will learn about chemistry's sweet side as you investigate certain properties of candy.

REasons for Geographic and Racial Differences in Stroke (REGARDS)

George Howard, Distinguished Professor, UAB Dept of Biostatistics & School of Public Health

Ever wonder more about that statistics course you were required to take? Ever wonder how social and economic characteristics of neighborhoods impact important factors in health, including cardiovascular disease, stroke, and mortality? Then this session is for you! This session will also involve a look at the importance of math education and the types of careers available with a focus on mathematics to study science.

The AMSTI/ASIM Program: An Overview

Dr. Amy Fowler Murphy, NBCT, AMSTI Science Coordinator & Secondary Science Administrator, Alabama State Department of Education

This workshop is designed to provide an overview of the Alabama Math, Science, and Technology Initiative (AMSTI) and its high school science component, the Alabama Science in Motion (ASIM) program. The vision of AMSTI is to become known as Alabama's STEM educator talent development system. Our mission is to support Alabama educators and students in learning STEM through doing STEM. We support schools by providing professional learning, educator support, and instructional materials.