

**2014 Ad Astra**  
**Chemistry Advanced Placement Summer Institute**  
**for Experienced AP Teachers**  
**July 21-24, 2014**

**Institute Overview**

The AP Chemistry institute is designed to assist AP teachers in building the foundations for success in teaching AP Chemistry. An emphasis will be placed on the new curriculum framework, its implementation in your classroom, and the new exam. Time will be allowed for best practices and for sharing ideas. Laboratory investigations will be incorporated with the discussion of the theory, with special emphasis on student-inquiry labs.

**Consultant Background**

Dr. John Gelder has been teaching in the introductory chemistry program at Oklahoma State University for over 30 years. He has been involved with the AP Chemistry program and the College Board since 1988. From 1989 to 1992 he developed and taught AP Chemistry By Satellite to rural and urban high schools around the United States. John was an AP Reader from 1989 until 2005. From 2002 – 2005 he served as Chief Faculty Consultant for AP Chemistry. John returned to the Reading in 2009 as an Exam Leader. In 2006 and 2007 John served on the College Board AP Chemistry Curriculum Alignment Commission. This group was responsible for developing the content outline for the redesigned AP Chemistry course. In 2010 John was appointed to AP Chemistry Test Development Committee. In 2012 John attended three AP Chemistry Professional Development Workshops. These workshops provided training and materials focusing on the new AP Chemistry framework and curriculum and the use of inquiry in the classroom. Throughout his teaching career John has integrated computers into his teaching. In 2002 he and Dr. Michael Abraham from the University of Oklahoma received an NSF grant to develop a series of particulate level animations and the corresponding guided and open-inquiry activities. The MoLE project web site (<http://genchem1.chem.okstate.edu/CCLI/Startup.html>) provides teacher access to all the animations and activities. Along with Mike Abraham at the University of Oklahoma and Tom Greenbowe at Iowa State University, John is working on a new technology project (<http://genchem1.chem.okstate.edu/BDA/Topics.php>) that provides activities before class, during class and after class using a learning cycle design to help student better understand introductory chemistry content. Participants will have access to an APSI web site that includes homework assignments (with answers), sample examinations (with answers) and additional activities that can be incorporated into the classroom.

**Institute Topics**

The summer institute will discuss topics important for the current AP chemistry course and provide insight into changes in the new AP Chemistry curriculum. Topics to be covered will focus on content, based on my experience as a Reader, that most students have difficulty understanding. These topics include:

Periodicity and Atomic Structure  
Bonding and Molecular Structure  
Reactions  
Thermodynamics  
Aqueous Equilibrium  
Chemical Kinetics

## Electrochemistry

Teachers will use guided inquiry activities during the non-laboratory portion of the summer institute as exemplars of how to incorporate inquiry into the classroom. Teachers will use these activities to help acquire a more fundamental understanding of the topics listed above. Many of the problems that have appeared on recent AP examinations that have challenged students will be discussed. The 2014 AP Chemistry exam will also be covered in detail.

In laboratory there will be a mixture of hands-on experiments and particulate level computer based experiments to further support the topics listed above. During the hands-on laboratory portion teachers will have access to graphing calculators and probe-ware for data collections and analysis. Experiments will be selected from the recommended experiments listed in AP Chemistry Course Description, and many will utilize an inquiry format. Several experiments should reflect the anticipated changes in the redesign. Laboratory experiments will cover equilibrium, thermodynamics, kinetics and electrochemistry.

Prior to the APSI participating teachers will be expected to access a web site to provide input into the content that should be discussed and to also complete a number of online activities. These explorations will provide important prior knowledge to help determine the content to be covered in the APSI. The address of the web site will be e-mailed to the participants at least two weeks before the APSI. (Please be sure the e-mail that you provide is one you will check throughout the summer.)

### **What participants should bring:**

- Proper laboratory attire, i.e. goggles , apron or lab coat , closed-toe shoes
- TI graphing calculator (one will be provided if you do not have one)
- AP Chemistry course syllabus, favorite activities that you use in your classroom that you would like to share

### **Graduate Credit Option**

Participants may also earn three graduate education hours for any of the AP Summer Institutes from Washburn University for a reduced tuition rate the successful completion of an academic assignment.

### **Additional Information**

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