

2021 Advanced Placement® Chemistry

About the AP® Chemistry Summer Institute

The focus of the instructional time will be on three of the major essay topics – kinetics, equilibrium (gaseous, acid-base, and limited solubility), and thermodynamics - as they relate to the new AP curriculum. Because this workshop will be conducted remotely, an examination of labs will require using videos, computer simulations, and data analysis. Time permitting, secondary topics such as bonding, solutions, and lab procedures will also be covered. Successful strategies for covering the topics and for preparing the students for the AP Exam will be the underlying theme for the week. While this course is especially geared to help teachers get their program started, there is plenty for experienced teachers to do as well. With the major revisions to the chemistry curriculum, part of the week will be spent discussing these changes. Participants will be given access to resources for both their AP program as well as first-year chemistry courses. Through this workshop, teachers will strengthen their own professional skills and learn techniques to help students prepare and connect with college.

Course Takeaways:

- Learners will plan for implementing an AP Chemistry course, creating a year-long syllabus outlining topics to be covered as well a laboratory schedule.
- Learners will demonstrate an understanding of the AP Chemistry concepts, as well as appropriate teaching and assessment strategies, by developing a unit plan with corresponding lesson plans.
- Learners will gain experience in setting up and performing the required laboratories.
- Learners will become familiar with the administration and evaluation of the AP Chemistry exam, developing and scoring free response items.
- Learners will become more familiar with requirements and changes regarding the new AP Chemistry curriculum.

Tentative Agenda

Monday (6/14)

8:30 – 9:00	Login to eLearning Commons
9:00 – 10:15	Introductions / Overview of Workshop Objectives / Needs of the Teachers Discuss Timeline – out early on Friday if HW gets done each night Feedback from Teachers about Virtual Teaching – pros & cons Lack of Labs – How we’re getting around that Overview of the Green Crystal Lab – show column & titration graph
10:15 – 10:30	Morning Break
10:30 – 11:45	Reason for moving to a fall registration Kinetics – misconceptions / strategies for teaching Breakout session – answering questions on worksheet about kinetics Large group – summary of results of questions
11:45 – 12:45	Lunch
12:45 – 2:00	Kinetics video – Get teacher feedback Are there other Ted-Ed videos that you use? Other useful videos? Look at data on Appendix J3 – lab interpretation Breakout session – work on Kinetics worksheet
2:15 – 2:30	Afternoon Break
2:30 – 4:00	Gas Equilibrium – Misconceptions Breakout session – Discuss Strategies for Teaching / Do worksheet Discussion of the FeSCN Equilibrium lab 9pp. 146 – 156)
HW -	1) Read over the Green Crystal Lab – highlight possible sources of error – (15 minutes)

(Sample data will be handed out tomorrow)

2) Do Lesson #7 – FRQ from 2016 Q#1– pp. 55 – 56 (10 minutes)

3) More FRQs – pp. 167 – 171 (15 minutes)

Tuesday (6/15)

- 9:00 – 10:15 Discussion of HW / From last night's HW, look at student responses – p. 71
Breakout session – using Green Crystal data, do calculations for the synthesis of the crystals as well as the percent hydrate part of the lab
Breakout session - Science Practices – Lesson #3 pp. 22 – 25
[Use the Sample Exam Questions – CED – pp. 219 – 226]
- 10:15 – 10:30 Morning Break
- 10:30 – 11:45 Looking at the Units in the AP Course – breakdown of the parts
Course Units – p. 51
Pacing Guide – pp. 251 – 255 Need to move FAST through content!!!
Discussion – need for a strong Chem I course / Importance of doing labs
Strategy for Success – using AP students as tutors for 1st year chemistry students
Feedback from veterans – Planning Reports – Lesson #10 – useful??
Lesson #4 – pp. 29 – 32 – go over errors
Discussion of Equity & Access policy of College Board
- 11:45 – 12:45 Lunch
- 12:45 – 2:00 Discussion – Thermochemistry & Thermodynamics – misconceptions
Breakout session – Strategies for teaching / Answer questions on worksheet
Large group – conclusions / comments
- 2:15 – 2:30 Afternoon Break
- 2:30 – 4:00 Discussion of the AP Grading Process
What do you know about the latest form of the Exam?
Answer questions on p.176, then look at answers – p. 177
Lab Simulation – Heat of Rxn
Explain set-up / show equipment / provide sample data
Breakout session - Do calculations
Large group – discuss possible sources of error
- HW - Watch Percent Copper Lab – Do Calculations (45 minutes)

Wednesday (6/16)

- 9:00 – 10:15 Comments about the Percent Copper Lab
Do you have that equipment available?
Green Crystal Lab – Options for the Hydrate part of the lab
- Explanation of the Redox titration
- sources for column & resin
Breakout session – do calculations for redox titration
Common Mistakes as seen by an AP Reader on the AP Exam
- 10:15 – 10:30 Morning Break
- 10:30 – 11:45 Breakout session - Lesson #15 – IMF & FRQ – Scoring Student Responses – pp. 121 – 126
P. 128 – Are you familiar with these websites? Comments – pros & cons
Large group – how successful were you in scoring the student responses?
Discussion – Lesson #1 – pp. 12 – 15 – Teaching for Understanding
Exactly how well-defined are your goals for your students?
Breakout session – Green Crystal calculations - % Fe & %K
Breakout session – Final Green Crystal calculations – Emp. Formula of Crystal / % Yield
Large group – wrap-up of Green Crystal Lab / When to use this lab
- 11:45 – 12:45 Lunch
- 12:45 – 2:00 Acid-Base Equilibrium - Part I – misconceptions
Breakout session – work on problem set / question sheet
Large group – discussion of worksheet & question sheet
- 2:15 – 2:30 Afternoon Break
- 2:30 – 4:00 Acid-Base Equilibrium - Part II – misconceptions
Difficulty w/ buffers; w/ salt hydrolysis problems
Using acid-base indicators to introduce the H.H. equation

Breakout session – work on problem set / question sheet
Large group – discussion of worksheet & question sheet

- HW - 1) Watch video of Iodine Clock Rxn – Do Calculations (30 minutes)
2) FRQ #1 – from 2017 – pp.180 – 184 (15 minutes)

Thursday (6/17)

- 9:00 – 10:15 Tips for doing the Iodine Clock Rxn
Review of FRQ #1 – 2017 – one that I graded
Breakout session – Lesson #19 – Types of Assessments – pp. 185 – 187
Large group – sharing of effective strategies
- 10:15 – 10:30 Morning Break
- 10:30 – 11:45 Acid-Base Equilibrium Part III – misconceptions / strategies
- titrations / interpreting graphs
- diprotic acids and calculations
- titration of a solid unknown acid
Breakout session – work on Problem Set
- 11:45 – 12:45 Lunch
- 12:45 – 2:00 Limited Solubility & K_{sp} – misconceptions
Breakout session – work on question sheet / problem set
Discussion - AP Audit
Access to Question Bank – p. 200 - input from veterans
- 2:15 – 2:30 Afternoon Break
- 2:30 – 4:00 Mini-lesson – quick way to ID shapes of compounds / ions
Directions for small group assignment – Instructional Approaches
Lesson #11 – pp. 91 – 94
Breakout session – Choose a major unit, then develop strategies
Prepare to share tomorrow

Friday (6/18)

- 9:00 – 10:15 Discussion – PES Folder / Types of Spectroscopy
Group sharing of unit – 15 minutes each (2 groups)
Quick discussion of the Crystal Violet Lab – pseudo first order reaction
In Lab Manual – Investigation #11
What exactly are “Guided Inquiry” Labs?
- 10:15 – 10:30 Morning Break
- 10:30 – 11:45 Group sharing – 15 minutes each (2 groups)
Discussion of Personal Progress Checks – input from veterans
Breakout session – looking at PP Checks
- 11:45 – 12:45 Lunch
- 12:45 – 2:00 Test-taking Strategies from an AP Reader
Discussion – AP Community / Navigating AP Central – pp. 237 - 240
How to be more Successful as an AP Teacher

What to bring:

Items you should have access to during the week include:

- A laptop computer/ tablet
- A calculator
- Stable and reliable internet connection
- A favorite activity, a demonstration, a lab exercise, or a simulation.

Instructor:

Mike Arim. During his teaching career which spans over 40 years, Mike Arim has taught all levels of physics and biology, although his focus for the past three decades has been AP and Honors Chemistry. He has taught in both public and private school as well as at the university level (UNC-Charlotte). Mike has served as an AP Table Leader & Reader as well as a College Board Consultant since the early 90's. He earned his degrees at the University of North Carolina in Chapel Hill (B.A., B.S., and MAT) and he is a National Board Certified Teacher. Among his awards are the American Chemical Society's (ACS) Outstanding H.S. Chemistry Teacher for the Southeast Region, the Time-Warner Cable Star Teacher Award, the Spratt Excellence in Teaching Award, and the Outstanding Science Teacher Governor's Award. In 2015, he was selected by College Board to conduct a week-long workshop for chemistry teachers in China. Mike conducts workshops – weeklong Summer Institutes, 1-day and 2-days - throughout the USA.

