ADVANCED PLACEMENT CLASSES

ADVANCED PLACEMENT CHEMISTRY AB

Annual Course—Grades 10–12

Prerequisites: Concurrent enrollment in Algebra 2 AB or equivalent. Previous completion of a college-preparatory science course is recommended.

36-14-03 AP CHEM A
36-14-04 AP CHEM B

Course Description

Advanced Placement Chemistry is designed for students who have high ability in math and who seek training for future work in science. AP Chemistry, equivalent to a first-year college chemistry course, is for students who have successfully completed high school chemistry or its equivalent. Students study a college-level textbook and do college-level laboratory work. This course should be taught by a teacher who has completed an undergraduate major program in chemistry. Emphasis is placed on chemical calculations and mathematical formulation of principles. College chemistry or lab science credit may be granted to individual students on the basis of their score on the Advanced Placement Examination. **AP Chemistry AB meets the Grades 9-12 District physical science requirement. It also meets one year of the University of California *'d'* entrance requirement for laboratory science.**

Instructional Units and Pacing Plans

INSTRUCTIONAL UNITS	*SUGGESTED WEEKS	
Atomic Theory and Atomic Structure	3	3
Chemical Bonding	4	5
Nuclear Chemistry	1	1
Gases	2	3
Liquids and Gases	2	2
Solutions	2	2
Reaction Types	5	5
Stoichiometry	2	4
Equilibrium	4	4
Kinetics	2	3
Thermodynamics	3	4
Descriptive Chemistry	2	2
Total	***32 year-round**	***38 traditional**

* Suggested weeks are to be used as an estimate only. Advanced Placement teachers should refer to the most recent Advanced Placement Course Description for Chemistry (*Acorn Book*) for a detailed description of the course objectives, performance skills, and topics (instructional units) which will be covered on the Advanced Placement Examination. The *Acorn Book* is published by the College Board (Advanced Placement Program, P.O. Box 6670, Princeton, NJ 08541-6670). The course description is also available on the College Board Website, www.collegeboard.com. The AP Chemistry Test is normally given during the second or third week in May.

Representative Performance Outcomes and Skills

In accordance with their individual capacity, students will grow in the ability to:

- Demonstrate process skills of scientific thinking: observing, communicating, comparing, ordering, categorizing, relating, inferring, and applying.
- Demonstrate skills in the areas of speaking, listening, writing, reading, graphing, mapping skills, and mathematics.
- Handle safely the equipment and materials common to chemistry laboratory.
- Evaluate the contributions of science and technology and their relevance to improving our daily lives in preparation for the future.
- Establish the relevance of science and its applications to careers and real-life situations.
- Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests collect data, analyze relationships, and display data.*
- Identify and communicate sources of unavoidable experimental error.*
- Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.*
- Formulate explanations by using logic and evidence.*
- Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions.*
- Distinguish between hypothesis and theory as scientific terms.*
- Recognize the usefulness and limitations of models and theories as scientific representations of reality.*
- Read and interpret topographic and geologic maps.*
- Analyze the locations, sequences, or time intervals that are characteristic of natural phenomena (e.g., relative ages of rocks, locations of planets over time, and succession of species in an ecosystem).*
- Recognize the issues of statistical variability and the need for controlled tests.*
- Recognize the cumulative nature of scientific evidence.*
- Analyze situations and solve problems that require combining and applying concepts from more than one area of science.*
- Investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of issues include irradiation of food, cloning of animals by somatic cell nuclear transfer, choice of energy sources, and land and water use decisions in California.*
- Know that when an observation does not agree with an accepted scientific theory, the observation is sometimes mistaken or fraudulent (e.g., the Piltdown Man fossil or unidentified flying objects) and that the theory is sometimes wrong (e.g., the Ptolemaic model of the movement of the Sun, Moon, and planets).*
- Investigate a societal issue by researching literature, analyzing data and communicating findings and discuss possible future outcomes.
- Demonstrate interconnections between the many disciplines of science.
- Demonstrate the interdisciplinary connections between science and other curricular fields.

Assessments

Instruction in our district is assessment-driven. The Framework states "that effective science programs include continual assessment of student's knowledge and understanding, with appropriate adjustments being made during the academic year (p.11)."[1] Assessments can be on demand or over a long period of time. The District Periodic Assessments and STAR State Testing play a significant role in Student Assessments.

The chart below, adapted from *A Guide for Teaching and Learning*, NRC (2000), gives some examples of on demand and over time assessment.

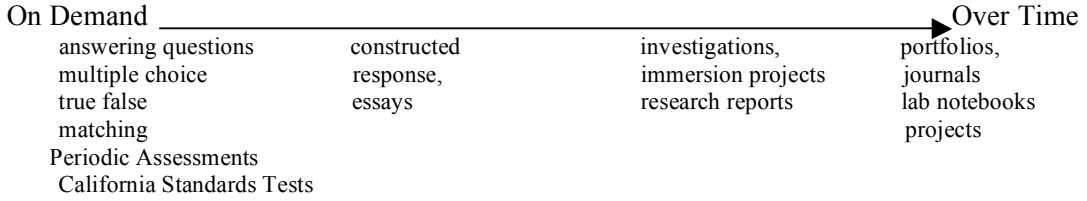

Chart 1 - Assessment Examples

Texts/Materials

- Advanced Placement Course Description for Chemistry (*Acorn Book)*
- *Science Framework for California Public Schools*
- District Authorized AP Textbooks and ancillary materials:
    - McDougal Littell, *Chemistry*, 7th Ed. Zumdahl, et al. 2007
    - Pearson/Prentice Hall, *Chemistry: The Central Science*, 10 Ed. Brown, et al. 2006
    - Peoples Education/Wiley, *Chemistry: Matter and Its Changes*, 4th Ed. Brady, et al. 2004
    - Thomson Learning/ Brooks- Cole, *Chemistry: Principles and Reactions*, Updated 5th Ed. Masterton, Hurley 2006
    - Thomson Learning/ Brooks- Cole, *Chemistry and Chemical Reactivity*, 6th Ed. Kotz, et al. 2006
- *Science Safety Handbook for California Public Schools*
- Appropriate science laboratory materials