ADVANCED PLACEMENT CLASSES

ADVANCED PLACEMENT PHYSICS AB
Annual Course—Grades 11–12
Prerequisite: If the student is preparing for the AP "B" Physics Exam, Trigonometry or Algebra 2AB is recommended. If the student is preparing for the AP "C" Physics Exam, at least concurrent enrollment in Calculus AB is recommended.

36-15-05 AP PHYSICS A
36-15-06 AP PHYSICS B

Course Description
This course is designed as either a second course for those who have completed a year of physics or as a first course for high achieving students. Two different advanced placement courses exist and both are offered by LAUSD high schools. The "B" course prepares students for the AP Physics "B" exam, and the "C" course prepares students for the AP Physics "C" exam. The Physics "B" course covers all of the major topics in physics and is intended for students who do not intend to major in science at the university; whereas the Physics "C" course covers in depth only the two areas of mechanics and electricity, and magnetism. The "C" course is designed for students who intend to major in science at the university. The complete and up-to-date descriptions of these courses are to be found in the current "Acorn book" *Advanced Placement Course Description Physics* (Physics "B", Physics "C"), published annually by The College Board. Upon successful completion of the College Board Advanced Placement Examination, students may be able to receive credit for college-level courses at many universities. **AP Physics 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
A complete list of topics covered in the AP Physics "B" and "C" Courses is to be found in the most recent edition of the College Board Publication Acorn Book, which can be purchased from The College Board, Advanced Placement Program, CN6670, Princeton, NJ 08541. The course description is also available on the College Board Website, www.collegeboard.com. These are updated annually. The topics generally covered in the two courses are: **AP Physics "B" Course AP Physics "C" Course** Straight-Line and Straight-Line and Two-Dimensional Kinematics Two-Dimensional Kinematics Dynamics and Dynamics and Newton's Laws of Motion Newton's Laws of Motion Momentum Momentum Work and Energy Work and Energy Universal Gravitation Universal Gravitation Thermodynamics Statics Waves Rotational Motion Electrostatics Oscillations Simple Circuits Electrostatics Magnetism Circuits Light Propagation Magnetism Geometrical Optics Electromagnetic Induction Acoustics Electrodynamics Quantum Mechanics These topics must be completed by mid-April to prepare for the Advanced Placement examination.

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.

On Demand →			Over Time
answering questions multiple choice true false matching Periodic Assessments California Standards Tests	constructed response, essays	investigations, immersion projects research reports	portfolios, journals lab notebooks projects

Chart 1 - Assessment Examples

Texts/Materials

- Advanced Placement Course Description for Physics B and/or C (*Acorn Book)*
- *Science Framework for California Public Schools*
- District Authorized AP Textbooks and ancillary materials:
    - Glencoe/McGraw-Hill, *College Physics*, 2nd Ed. Giambattista, et al. 2007
    - Pearson/Prentice Hall, *Physics: Principles with Applications*, 6th Ed. Giancoli 2005
    - Pearson/Prentice Hall, *Physics*, 6th Ed. Wilson, et al. 2007
    - Pearson/Prentice Hall, *Physics*, 3rd Ed. Walker 2007
    - Thomson Learning/ Brooks- Cole, *College Physics*, 7th Ed. Serway 2006
    - AP Physics - Calculus
    - Peoples Education/Wiley, *Fundamentals of Physics*, 7th Ed. Halliday, et al. 2005
- *Science Safety Handbook for California Public Schools*
- Appropriate science laboratory materials