# LIFE SCIENCE ELECTIVES—HIGH SCHOOL

| | |
|---|---|
| **Plant and Soil Science AB** | **Annual Course—Grades 9-12**<br>**All students in Grades 9-11 must have concurrent enrollment in a science course which is assessed by the California State Contents Standards Test to participate in this science elective.** |
| **Course Code Number and Abbreviation** | **24-01-05 Pl Soil Sc A**<br>**24-01-06 Pl Soil Sc B** |
| **Course Description** | The major purpose of this course is to develop skills in identifying the physical, chemical, and biological characteristics of soil as a medium for plant growth. Physiology, anatomy, taxonomy of plants, and principles of conservation are also emphasized. Field studies, laboratory activities, and both short- and long-term investigations allow students to collect data, analyze, and interpret results. Students increase their understanding of the basic biological principles as they pertain to botanical studies, skills in observation, experimentation, interpretation, and problem-solving. **Plant and Soil Science AB meets the Grades 9–12 District life science requirement. It also meets one year of the University of California '*d*' entrance requirement for laboratory science.** |
| **Instructional Units/Pacing Plans** | **Instructional Units** — ***Suggested Weeks**: year-round / traditional<br>Introduction to Plant and Soil Science — 3 / 3<br>Soil Genesis — 4 / 5<br>Physical, Chemical, and Biological Properties of Soil — 4 / 5<br>Soil Fertility and Plant Nutrition — 4 / 5<br>Soil and Water Conservation — 4 / 4<br>Anatomy, Physiology, and Taxonomy of Plants — 4 / 5<br>Evolution of Plants — 4 / 4<br>Ecological Distribution of Plants — 3 / 4<br>Modern Approaches to Plant and Soil Studies — 2 / 3<br>**Total — 32 year-round / 38 traditional**<br>* Suggested weeks are to be used as an estimate only. Pacing will depend on how State Content Standards and the Literacy and Mathematics Initiatives are embedded. |

| | |
|---|---|
| **California Language Arts Content Standards** | The following standard from *English-Language Arts Content Standards for California Public Schools* will be measured on State assessments:<br><br>• Use clear research questions and suitable research methods (e.g., library, electronic media, personal interview) to elicit and present evidence from primary and secondary sources. |
| **Investigation and Experimentation** | *In accordance with their individual capacity, students will grow in the ability to:*<br>• Demonstrate process skills of scientific thinking: observing, communicating, comparing, ordering, categorizing, relating, inferring, and applying.<br><br>• Demonstrate skills in the area of speaking, listening, writing, reading, graphing, mapping and mathematics.<br><br>• Evaluate the contributions of science and technology and their relevance to improving our daily lives in preparation for the future.<br><br>• Establish the relevance of science and its applications to careers and real-life situations.<br><br>• Describe the importance of plants to the global ecosystem.<br><br>• Describe the origin and techniques of basic plant taxonomy.<br><br>• Explain how to analyze soils to determine physical and chemical properties.<br><br>• Describe accepted practices in plant nutrition and investigate methods of soil and water conservation.<br><br>• Describe and evaluate both biological and chemical measures used to control plant pests and diseases.<br><br>• Compare and contrast both natural and commercial methods of plant propagation.<br><br>• Describe bio-engineering and selective breeding techniques for development of new varieties.<br><br>• Describe factors that influence the distribution of plants.<br><br>• Explain the relationship of structure to function in various forms of plant life. |

| | |
|---|---|
| | • Compare the relationship of ecology to conservation and agriculture.<br><br>• Describe the economic and sociological importance of plants to human populations.<br><br>• 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.*<br><br>• Identify and communicate sources of unavoidable experimental error.*<br><br>• Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.*<br><br>• Formulate explanations by using logic and evidence.*<br><br>• Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions .*<br><br>• Distinguish between hypothesis and theory as scientific terms.*<br><br>• Recognize the usefulness and limitations of models and theories as scientific representations of reality.*<br><br>• Analyze the locations, sequences, or time intervals that are characteristic of natural phenomena (e.g., relative ages of rocks, locations of planets over time, chemical reaction rates, and succession of species in an ecosystem).*<br><br>• Recognize the issues of statistical variability and the need for controlled tests.*<br><br>• Recognize the cumulative nature of scientific evidence.*<br><br>• Analyze situations and solve problems that require combining and applying concepts from more than one area of science.*<br><br>• 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<br><br>the theory is sometimes wrong (e.g., the Ptolemaic model of the movement of the Sun, Moon, and planets).*<br><br>• Investigate a societal issue by researching literature, analyzing data and communicating findings and discuss possible future outcomes.<br><br>• Demonstrate interconnections between the many disciplines of science.<br><br>• Demonstrate the interdisciplinary connections between science and other curricular fields.<br><br>**Note:** *Asterisked items are Science Investigation and Experimentation Standards for the State of California.* |