DOES NOT MEET GRADUATION REQUIREMENT ELECTIVES—HIGH SCHOOL

Vertebrate Physiology	**Semester Course—Grades 11-12** **No Prerequisite**
Course Code Number and Abbreviation	**36-10-03 Vert Physio**
Course Description	The major purpose of this course is to study the comparative anatomy and physiology of the seven classes of vertebrates: Agnatha, Chondrichthyes, Osteichthyes, Amphibia, Reptilia, Aves, and Mammalia. Working in conjunction with local zoos, students research topics utilizing zoo staff, print resources, laboratory investigations, animal observations, computer technology and the Internet. **Vertebrate Physiology does not meet District science graduation requirements. It may be used as an elective. It does meet one semester of the University of California *'g'* admission requirement elective course.**
Instructional Units and Pacing Plans	**Instructional Units** — ***Suggested Weeks** Introduction to Vertebrates — 3 — 3 Vertebrate Taxonomy and Phylogeny — 4 — 5 Early Vertebrate Morphogenesis — 4 — 5 Systems of the Body — 5 — 6 **Total** — ***16 year-round** — ***19 traditional** * 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 Standard	The following standard from *English-Language Arts Content Standards for California Public Schools* will be measured on State assessments: • 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.

Representative Performance Objectives	*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 area of speaking, listening, writing, reading, graphing, mapping and mathematics. • 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.* • 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).* • 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. **Note:** *Asterisked items are Science Investigation and Experimentation Standards for the State of California.*
Representative Content Objectives	*In accordance with their individual capacity, students will grow in the ability to:* • Compare and contrast the vertebrate body plans of the seven classes of vertebrates. • Describe the development, structure and function of the different body systems of vertebrates. • Explain embryological development and differentiation of vertebrates. • Design a branching diagram (cladogram) showing probable evolutionary relationships among the vertebrates. • Analyze current issues in bioethics as they apply to zoological research. • Analyze structural and functional adaptations to animals' habitats. • Explain how comparative embryology, DNA comparisons, and evidence from the fossil record show probable evolutionary relationships.