LIFE SCIENCE ELECTIVES—HIGH SCHOOL

Natural History of Marine Mammals AB	**Annual Course—Grade 12** **Prerequisites: Marine Biology, Physical Oceanography, or Permission of Instructor**
Course Code Number	**36-06-17 Nat Hist Marine A** **36-06-18 Nat Hist Marine B**
Course Description	The major purpose of this course is to expand the students' knowledge of the ocean by pursuing an in-depth study of marine mammals, primarily seals and sea lions. Students will have the opportunity to observe animals brought into the Marine Mammal Care Center at Fort MacArthur. Students will compile statistics about on-going treatment and observe trained professionals and volunteers as they rehabilitate stranded mammals. The coursework builds on the academic concepts learned in Marine Biology and Physical Oceanography but in greater depth. Additionally, students are expected to form opinions that lead to scientific questions and hypotheses, and to accept or reject them based on research and investigation. Increased emphasis is placed on human exploitation of the ocean and the global impact of human activities, especially when those activities affect marine mammals. Students will discuss problems from a global perspective and integrate issues from economic and sociological standpoints as well as from an ecological basis. In doing so they will formulate possible solutions to challenges facing the global ecology. **Natural History of Marine Mammals AB meets the District life science requirement for graduation. It also meets one year of the University of California *'g'* requirement for an elective course.**
Instructional Units/Pacing Plans	**Instructional Units** — ***Suggested Weeks** Adaptations to the Marine Environment: 3 – 4 Evolution: 4 – 5 Distribution: 3 – 4 Ecology and Predation: 8 – 8 Mating and Breeding: 7 – 8 Social Behavior: 5 – 6 Human Impact: 2 – 3 **Total**: ***32 year-round** – ***38 traditional** * Suggested weeks are to be used as an estimate only. Pacing will depend upon how the State Content Standards and the Literacy and

	Mathematics Initiatives are embedded in the curriculum.
California Language Arts Content Standards	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:* • Describe the basic principles relating to the natural history of marine

	mammals, especially seals and sea lions. • Describe the interrelationships between pinnipeds, biological and physical components of the ecosystem, and humans. • Research professional opportunities in the Marine Sciences or in the care of marine mammals. • Describe how to provide service to the marine science community through community service activities. • Mentor other students including their peers, CBI students, ESL students, and younger students. • Research current topics in science by reviewing articles appearing in current journals and publications. • Interpret data and make appropriate conclusions based on technologies such as computers in the analysis and graphical presentation of the data collected in investigations and field studies.