

"D" REQUIREMENT ELECTIVES

MARINE BIOLOGY AB

Annual Course—Grades 9–12 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..

- 36-06-03 MARINE BIO A**
- 36-16-04 MARINE BIO B**

Course Description

The major purpose of this course is to study the specific biological adaptations and interrelationships of organisms within the oceans of the world. Ocean resources, biotic factors and cycles, abiotic factors and cycles within the marine biome, and the natural history of marine organisms will be studied. **Marine Biology 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 and Pacing Plans

INSTRUCTIONAL UNITS	*SUGGESTED WEEKS	
The Evolution of the Ocean	3	3
Maintaining Homeostasis in Seawater	3	4
Abiotic and Biotic Cycles in the Marine Environment	3	4
Dynamics of the Ocean Environment	3	4
Plants and Animals of the Sea	6	6
Ecological Relationships in the Sea	4	4
Reproductive Patterns in Marine Life	4	5
Effects of the World Ocean upon Terrestrial Biomes	3	4
Pollution and Ocean Resources	3	4
Total	*32	*38
	year-round	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.

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

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- 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)." 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.

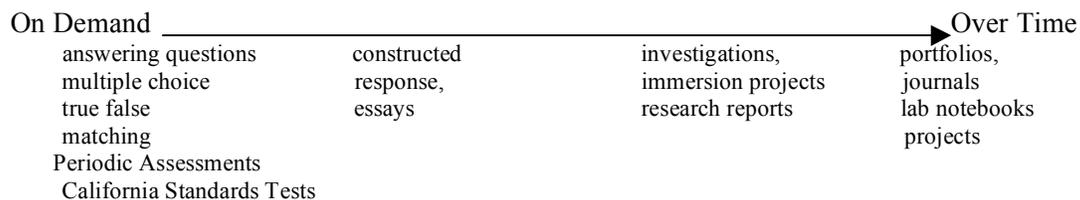


Chart 1 - Assessment Examples

Texts/Materials

- *Science Framework for California Public Schools*
- Appropriate Textbooks and ancillary materials:

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- Amsco, *Marine Science: Marine Biology and Oceanography*, 2nd Ed. Greene 2004
- Current Publishing, Corp., *Life on an Ocean Planet*, Alexander, et al. 2006
- Glencoe/McGraw-Hill, *Fundamentals of Oceanography*, 5th ed. Sveerdrup, et al. 2006
- *Science Safety Handbook for California Public Schools*
- Appropriate science laboratory materials