

Marine Biology

Course No. SCI 312

CEDARS Course Code: 03005

Certificated Teacher: _____

Grading: A, B, C, NC

Credit .5 / semester; 1.0 total Meets the _____ District High School Graduation Requirement for Science or Elective credit

Prerequisites: none

Texts: The Marine Biology Coloring Book (T. Niesen, Harper Resource)(2000)

Additional Resources: Port Townsend Marine Science Center; *kahnacademy.org*: biology topics

Course Description: The course offers activities for the purpose of enriching a student's skills in the scientific world. **An average course score of 70% is required to pass the course and earn credit. Student must take the End-of-Course Exam in Biology at the completion of the course.**

Materials Needed: Scientific Journal/spiral notebook, Internet Access

Essential Learnings for Biology/Life Science:

LS1 Processes Within Cells

LS2 Maintenance and Stability of Populations

LS3 Mechanisms of Evolution

EALR 1: Systems

Core Content: *Predictability and Feedback*

In prior grades students learned how to simplify and analyze complex situations by thinking about them as systems. In grades 9-12 students learn to construct more sophisticated system models, including the concept of feedback. Students are expected to determine whether or not systems analysis will be helpful in a given situation and if so, to describe the system, including subsystems, boundaries, flows, and feedbacks. The next step is to use the system as a dynamic model to predict changes. Students are also expected to recognize that even the most sophisticated models may not accurately predict how the real world functions. This deep understanding of systems and ability to use systems analysis is an essential tool both for scientific inquiry and for technological design.

EALR 2: Inquiry

Core Content: *Conducting Analyses and Thinking Logically*

In prior grades students learned to revise questions so they can be answered scientifically. In grades 9-12 students extend and refine their understanding of the nature of inquiry and their ability to formulate questions, propose hypotheses, and design, conduct, and report on investigations. Refinement includes an increased understanding of the kinds of questions that scientists ask and how the results reflect the research methods and the criteria that scientific arguments are judged by. Increased abilities include competence in using mathematics, a closer connection between student-planned investigations and existing knowledge, improvements in communication and collaboration, and participation in a community of learners.

EALR 3: Application

Core Content: *Science, Technology, and Society*

In prior grades students learn to work with other members of a team to apply the full process of technological design and relevant science concepts to solve problems. In grades 9-12 students apply what they have learned to address societal issues and cultural differences. Students learn that science and technology are interdependent, that science and technology influence society, and that society influences science and technology. Students continue to increase their abilities to work with other students and to use mathematics and information technologies (when available) to solve problems. They transfer insights from

those increased abilities when considering local, regional, and global issues. These insights and capabilities will help prepare students to solve societal and personal problems in future years.

EALR 4: Life Science

LS1 Core Content: Structures and Functions of Living Organisms; *Processes Within Cells*

In prior grades students learned that all living systems are composed of cells which make up tissues, organs, and organ systems. In grades 9-11 students learn that cells have complex molecules and structures that enable them to carry out life functions such as photosynthesis and respiration and pass on their characteristics to future generations. Information for producing proteins and reproduction is coded in DNA and organized into genes in chromosomes. This elegant yet complex set of processes explains how life forms replicate themselves with slight changes that make adaptations to changing conditions possible over long periods of time. These processes that occur within living cells help students understand the commonalities among the diverse living forms that populate Earth today.

LS1 Core Content: Ecosystems; *Maintenance and Stability of Populations*

In prior grades students learned to apply key concepts about ecosystems to understand the interactions among organisms and the nonliving environment. In grades 9-11 students learn about the factors that foster or limit growth of populations within ecosystems and that help to maintain the health of the ecosystem overall. Organisms participate in the cycles of matter and flow of energy to survive and reproduce. Given abundant resources, populations can increase at rapid rates. But living and nonliving factors limit growth, resulting in ecosystems that can remain stable for long periods of time. Understanding the factors that affect populations is important for many societal issues, from decisions about protecting endangered species to questions about how to meet the resource needs of civilization while maintaining the health and sustainability of Earth's ecosystems.

LS3 Core Content: Biological Evolution; *Mechanisms of Evolution*

In prior grades students learned how the traits of organisms are passed on through the transfer of genetic information during reproduction. In grades 9-11 students learn about the factors that underlie biological evolution: variability of offspring, population growth, a finite supply of resources, and natural selection. Both the fossil record and analyses of DNA have made it possible to better understand the causes of variability and to determine how the many species alive today are related. Evolution is the major framework that explains the amazing diversity of life on our planet and guides the work of the life sciences.

Course Objectives:

To earn credit for this course, the student will demonstrate mastery of the following:

Ocean Currents and Global Weather	Sound Production in the Sea
Tidal Patterns	Phytoplankton
Tide pools, Salty Marshes and Tidal Flats	Life Cycles of Algae
Sandy Beaches and Subtidal Soft Bottoms	Reproduction in Marine Organisms:
Kelp Beds	cnidarians, marine worms, mollusks,
Coral Reefs	crustaceans, echinoderms
Photic Zone	Reproductions in Bony Fishes
Midwater realm	Gray Whale Migration
Deep-sea Bottom, Vents	Symbiosis: mutualism & parasitism
Marine Birds	Interspecies Competition
Marine Mammals	Defense Mechanisms
Coloration in Fish & Invertebrates	Feeding
Bioluminescence	Tools for Studying the Ocean

COURSE GRADE REQUIREMENTS

Scores:

| Grade / % range |
|------------------------|------------------------|------------------------|------------------------|
| A+ 98-100% | B+ 87-89% | C+ 77-79% | |
| A 94-97% | B 84-86% | C 74-76% | NC: Below 70% |
| A- 90-93% | B- 80-83% | C- 70-73% | |

1. Progress and course assignment completion will be evaluated monthly by the teacher.
2. Complete assignments given in class at a minimum average 70% grade level
3. Complete and score 70% minimum average on assessments given in class or conference
4. Maintain weekly timesheets showing a minimum of 5 hours per week (adjusted for holidays)

EXTRA CREDIT / ALTERNATE ASSIGNMENTS

1. Additional readings, research and documented experiments supported with data
2. Outside science projects may substitute for class assignments, by the teacher's discretion

STUDENT / PARENT SIGNATURE

DATE

TEACHER SIGNATURE

DATE