

Treasure Coast Science Scope and Sequence 2012-2013

Course: Marine Science I Honors

Course Code: 2002510

Quarter: 4

Topic(s) of Study: Human and Nature’s Impact on Marine Resources

Bodies of Knowledge: Nature of Science

Standard(s): 1: The Practice of Science, 2: The Characteristics of Scientific Knowledge, 3: The Roles of Theories, Laws, Hypotheses and Models, 4: Science and Society, 6: Earth Structures, 14: Organization and Development of Living Organisms, 15: Diversity and Evolution of Living Things, 16: Heredity and Reproduction, 17: Interdependence

Essential Questions: What is the ecological, commercial and aesthetic value of marine plants and animals? How can each person help to save the world’s oceans? How do scientists design an investigation to answer a scientific question and communicate their findings?

[Concept Map\(s\): Click here](#)

[Syllabus: Click here](#)

[Resources: Click here](#)

[CCSS Literacy Standards: Click here](#)

NGSSS	OUTLINE OF CONTENT (CONCEPT/SKILLS)	TARGETS
<p>SC.912.E.6.6 Analyze past, present, and potential future consequences to the environment resulting from various energy production technologies. Cognitive Complexity: High</p> <p>SC.912.L.14.6 Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health. Cognitive Complexity: High</p> <p>SC.912.L.15.13 Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success. Cognitive Complexity: Moderate</p> <p>SC.912.L.16.10 Evaluate the impact of biotechnology on the</p>	<p>I Marine Species and Human Interaction</p> <p>II Ocean Sediments as Economic Resources</p> <p>III Biological Resources: Algae, Fish, and Marine Mammals</p> <p>IV Limits on Marine Productivity</p> <p>V Global Habitat Destruction and Pollutants</p> <p>VI Marine Resources A. Renewable B. Nonrenewable</p> <p>VII Coastal Management and Conservation Efforts (positive and negative consequences)</p>	<ul style="list-style-type: none"> • Identify the factors that increase or decrease population sizes and analyze changes in animal population. (I, V) • Explain the challenges of life in the sea. (I, V) • List and explain the impact of alien species on various marine environments. (I, V) • Determine how invasive species can result in biodiversity loss. (I,V, VII) • Discuss how human affect marine ecosystems both positively and negatively. (I, II) • Make predictions about changes in food webs that result from natural disruptions and human activities. (I, V) • Design a method for cleaning up oil spills. (I, V) • Explain the concept of over-fishing and the effect it has on global economics. (I, IV, V, VI) • List the role of aquaculture in meeting the world’s marine food needs. (I, IV, VI) • Identify the various types of food items provided by marine environment. (II, VI) • Describe biologically important processes for life in the sea. (III)

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<p>individual, society and the environment, including medical and ethical issues. Cognitive Complexity: High</p> <p>SC.912.L.17.11 Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests. Cognitive Complexity: High</p> <p>SC.912.L.17.16 Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution. Cognitive Complexity: High</p> <p>SC.912.L.17.17 Assess the effectiveness of innovative methods of protecting the environment. Cognitive Complexity: High</p> <p>SC.912.L.17.18 Describe how human population size and resource use relate to environmental quality. Cognitive Complexity: Moderate</p> <p>SC.912.N.1.1 Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following: Cognitive Complexity: High</p> <ol style="list-style-type: none"> 1. pose questions about the natural world, 2. conduct systematic observations, 3. examine books and other 	<ul style="list-style-type: none"> • Discuss the factors that determine how selected countries depend on the marine environment for food. (III, IV, VI) • List the major marine food species and their global location. (III, VI) • Explain the economic importance of marine algae, plants, and fish. (III, IV) • List and describe the nonliving resources from the oceans. (IV, VI) • List the effects of pollution on the marine environment (e.g., oil, sewage, synthetic chemicals, heavy metals, thermal, solid and radioactive waste). (V) • Describe the importance of the Endangered Species Act and give examples of Florida species that are listed under the Act. (VII) • List and discuss the species that are threatened and endangered. (VII) • List and describe attempts that are being pursued to enhance and conserve various marine environments. (VII) • Use scientific data to design new Marine Protected Area (MPAs). (VII) • Define a scientific problem or question based on the specific body of knowledge correlated to the Marine Science I Honors course. (I-X) • Recognize that scientists who make contributions to scientific knowledge come from all kinds of backgrounds and possess varied talents, interests, and goals. (I-X) • Explain why models are used in science to observe processes that happen too slowly, too quickly, or are too small or vast for direct observation. (I-X) • Describe scientific knowledge's impact on societal decisions. (I-X)
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sources of information to see what is already known,

4. review what is known in light of empirical evidence,
5. plan investigations,
6. use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),
7. pose answers, explanations, or descriptions of events,
8. generate explanations that explicate or describe natural phenomena (inferences),
9. use appropriate evidence and reasoning to justify these explanations to others,
10. communicate results of scientific investigations, and
11. evaluate the merits of the explanations produced by others.

Cognitive Complexity: High

SC.912.N.2.5 Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.

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<p>Cognitive Complexity: High</p> <p>SC.912.N.3.5 Describe the function of models in science, and identify the wide range of models used in science. Cognitive Complexity: Moderate</p> <p>SC.912.N.4.1 Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making. Cognitive Complexity: Moderate</p> <p>SC.912.N.4.2 Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental. Cognitive Complexity: High</p> <p>MA.912.S.1.2 Determine appropriate and consistent standards of measurement for the data to be collected in a survey or experiment. Cognitive Complexity: Moderate</p> <p>MA.912.S.3.2: Collect, organize, and analyze data sets, determine the best format for the data and present visual summaries from the following: bar graphs, line graphs, stem and leaf plots, circle graphs, histograms, box and whisker plots, scatter plots and cumulative frequency (ogive) graphs. Cognitive Complexity: High</p>		
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