

PRODUCTIVE PLANKTON:

Alabama Course of Study – SCIENCE:

5th:

6.) Compare effects of gravitational force on Earth, on the moon, and within space.
• Explaining how air resistance affects falling objects

9.) Describe the relationship of populations within a habitat to various communities and ecosystems.

- Describing the relationship between food chains and food webs
- Describing symbiotic relationships

6th:

5.) Describe layers of the oceanic hydrosphere, including the pelagic zone, benthic zone, abyssal zone, and intertidal zone.

7.) Describe Earth's biomes.

7th:

1.) Describe characteristics common to living things, including growth and development, reproduction, cellular organization, use of energy, exchange of gases, and response to the environment.

4.) Describe organisms in the six-kingdom classification system by their characteristics.

- Recognizing genus and species as components of a scientific name
- Identifying contributions of Aristotle and Linnaeus to the early history of taxonomy

5.) Identify major differences between plants and animals, including internal structures, external structures, methods of locomotion, methods of reproduction, and stages of development.

- Describing the processes of photosynthesis and cellular respiration

7.) Describe biotic and abiotic factors in the environment.

Examples:

- biotic-plants, animals;

- abiotic-climate, water, soil

- Classifying organisms as autotrophs or heterotrophs
- Arranging the sequence of energy flow in an ecosystem through food webs, food chains, and energy pyramids

9-12th:

Marine Biology:

1.) Select appropriate equipment for scientific field investigations in marine environments.

- Identifying patterns and relationships determined from collected data
- Solving for unknown quantities by manipulating variables

7.) Identify patterns and interrelationships among producers, consumers, scavengers, and decomposers in a marine ecosystem.

8.) Describe characteristics of marine plant and algae divisions.

- Describing commercial, economical, and medicinal values of marine plants and algae

9.) Arrange various forms of marine life from most simple to most complex.

- Identifying characteristics of ocean-drifting organisms

Examples: phytoplankton, zooplankton

- Describing adaptations in the marine environment

10.) Describe the anatomy and physiology of representative aquatic organisms.

- Identifying different aquatic species using dichotomous keys

11.) Describe positive and negative effects of human influence on marine environments.

Examples:

- positive-reef restoration, protection of endangered species;
- negative-pollution, overfishing

Biology:

13.) Trace the flow of energy as it decreases through the trophic levels from producers to the quaternary level in food chains, food webs, and energy pyramids.

- Contrasting autotrophs and heterotrophs

Environmental:

8.) Identify major contaminants in water resulting from natural phenomena, homes, industry, and agriculture.

- Describing the eutrophication of water by industrial effluents and agricultural runoffs
- Classifying sources of water pollution as point and nonpoint

12.) Identify positive and negative effects of human activities on biodiversity.

- Identifying endangered and extinct species locally, regionally, and worldwide
- Identifying causes for species extinction locally, regionally, and worldwide

OCEAN LITERACY: ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

1 The Earth has one big ocean with many features.

a The ocean is the dominant physical feature on our planet Earth – covering approximately 70% of the planet's surface.

e Most of Earth's water (97%) is in the ocean.

3 The ocean is a major influence on weather and climate.

e The ocean dominates Earth's carbon cycle. Half the primary productivity on Earth takes place in the sunlit layers of the ocean and the ocean absorbs roughly half of all carbon dioxide added to the atmosphere.

4 The ocean makes Earth habitable.

a Most of the oxygen in the atmosphere originally came from the activities of photosynthetic organisms in the ocean.

5 The ocean supports a great diversity of life and ecosystems.

b Most life in the ocean exists as microbes. Microbes are the most important primary producers in the ocean. Not only are they the most abundant life form in the ocean, they have extremely fast growth rates and life cycles.

6 The ocean and humans are inextricably interconnected.

a The ocean affects every human life. It supplies freshwater (most rain comes from the ocean) and nearly all Earth's oxygen. It moderated the Earth's climate, influences our weather, and affects human health.