

RESEARCH VESSEL/BOAT EXCURSION:

Alabama Course of Study – SCIENCE:

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.
- 5.) Identify major differences between plants and animals, including internal structures, external structures, methods of locomotion, methods of reproduction, and stages of development.
- 7.) Describe biotic and abiotic factors in the environment.
 - Classifying organisms as autotrophs or heterotrophs

9-12th:

Marine Biology:

- 2.) Differentiate among freshwater, brackish water, and saltwater.
- 4.) Recognize interactions between the atmosphere and the ocean.
 - Describing how waves, ocean currents, and tides are generated
- 5.) Discuss physical and chemical properties of saltwater.
Examples:
 - physical-turbidity, temperature, density;
 - chemical-salinity, pH, dissolved gases
- 6.) Describe components of major marine ecosystems, including estuaries, coral reefs, benthic communities, and open-ocean communities.
- 7.) Identify patterns and interrelationships among producers, consumers, scavengers, and decomposers in a marine ecosystem.
- 9.) Arrange various forms of marine life from most simple to most complex.
 - Identifying characteristics of ocean-drifting organismsExamples: phytoplankton, zooplankton
 - Identifying characteristics of marine invertebrates
 - Identifying characteristics of marine vertebrates
 - Describing adaptations in the marine environment
- 10.) Describe the anatomy and physiology of representative aquatic organisms.
- 11.) Describe positive and negative effects of human influence on marine environments.

Geology:

3.) Explain natural phenomena that shape the surface of Earth, including rock cycles, plate motions and interactions, erosion and deposition, volcanism, earthquakes, weathering, and tides.

9.) Describe the movement and storage of water in terms of watersheds, rainfall, surface runoff, aquifers, and surface water reservoirs.

- Identifying major regional and national watersheds

Environmental:

7.) Identify reasons coastal waters serve as an important resource.

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

Zoology:

4.) Use taxonomic groupings to differentiate the structure and physiology of invertebrates with dichotomous keys.

- Identifying examples and characteristics of Porifera
- Identifying examples and characteristics of Cnidaria
- Identifying examples and characteristics of Mollusca
- Identifying examples and characteristics of worms, including Platyhelminthes, Nematoda, and Annelida
- Identifying examples, characteristics, and life cycles of Arthropoda
- Identifying examples and characteristics of Echinodermata

5.) Use taxonomic groupings to differentiate structure and physiology of vertebrates with dichotomous keys.

- Identifying examples and characteristics of the three classes of fish
- Identifying examples and characteristics of Amphibia
- Identifying examples and characteristics of Reptilia
- Identifying examples and characteristics of Aves
- Identifying examples and characteristics of Mammalia

6.) Identify factors used to distinguish species, including behavioral differences and reproductive isolation.

8.) Differentiate among organisms that are threatened, endangered, and extinct.

OCEAN LITERACY: ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS:**1 The Earth has one big ocean with many features.**

g The ocean is connected to major lakes, watersheds and waterways because all major watersheds on Earth drain to the ocean.

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.

c Some major groups are found exclusively in the ocean. The diversity of major groups of organisms is much greater in the ocean than on land.

d Ocean biology provides many unique examples of life cycles, adaptations, and important relationships among organisms (symbiosis, predator-prey dynamics and energy transfer) that do not occur on land.

i Estuaries provide important and productive nursery areas for many marine and aquatic species

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.

b From the ocean we get foods, medicines, and mineral and energy resources. In addition, it provides jobs, supports our nation's economy, serves as a highway for transportation of goods and people, and plays a role in national security.