Alabama CTE

Marine Science (2019)

Introduction to Marine Science 1	1	Obtain and communicate information to demonstrate understanding of the structure and function of the abiotic and biotic factors in various marine ecosystems 6A
	2	Develop and use models to describe the cycling of matter (e.g. carbon, nitrogen, water) & flow of energy (e.g. food chains, food webs, biomass pyramids, 10% law) between abiotic & biotic factors in marine ecosystems. 7
Where Rivers meet the Sea: Estuaries & Watersheds 2	1	Design and carry out an experiment to determine if a body of water is fresh, brackish or salt and what effect the salinity would have on aquatic life. 1
	2	Formulate an evidence-based explanation to describe the causes & effects of physical features of seawater (e.g. turbidity, temperature, density) 5
	4	Obtain, evaluate and communicate information to describe the structure, function and diversity of various marine ecosystems (e.g. estuaries, coral reefs, benthic communities, open ocean communities). 6
	3	Formulate an evidence-based explanation to describe the causes and effects of chemical features of seawater (e.g. salinity, pH, dissolved gases) 5A
	5	Engage in argument from evidence to describe how human activity may affect marine ecosystems positively (e.g. reef restoration, protection of endangered species) & negatively (e.g. pollution, overfishing, habitat destruction) 12
Intertidal Zone and Tides/Waves 3	1	Obtain, evaluate & communicate information to explain how energy flow is related to the way waves, ocean currents & tides are generated. 4
	2	Continued from previous Unit... 6
	3	Continued from previous Unit... 12
Salt Marshes, Mangroves and Seagrasses 4	1	Continued from previous Unit.... 1
	2	Continued from previous Unit... 6
	3	Continued from previous Unit... 12

Continental Shelf: (coral reef and kelp forest)/ Open Ocean Ecosystem 5	**1** Develop and use climate models to determine the cause and effect relationship that exists between the atmosphere and the ocean (e.g. phytoplankton releasing oxygen into air, greenhouse gases like carbon increasing acidity of oceans, water currents, gyres, wind patterns) 3
	2 Continued from previous Unit... 4
	3 Continued from previous Unit... 5
	4 Continued from previous Unit... 6
	5 Continued from previous Unit... 12
Ocean Depths and Exploration 6	**1** Develop and use models to describe the structure and function of oceans, including topography of the ocean floor, plate tectonics and wave motion. 2
	2 Analyze and interpret data regarding geologic activity along plate boundaries and magnetic patterns in undersea rocks to explain the ages and movements of continental and oceanic crusts. 2A
	3 Use mathematical equations and diagrams to explain the relationship between depth and water pressure. 2B
	4 Continued from previous Unit... 6
	5 Continued from previous Unit... 12
	6 Obtain and evaluate information about historical marine expeditions (e.g. H.M.S. Beagle, H.M.S. Challenger I and II, Atlantis) and marine explorers (e.g. Cooke, Wilkes, Maury, Cousteau) to communicate how their findings challenged conventional thinking and allowed for academic advancements in oceanography. 13
	7 Design, build and test the ability of a submersibles structure (e.g. ROV-Remotely Operated Vehicle, AUV- Autonomous Underwater Vehicle) to collect various data for underwater exploration. 14
Introduction to Taxonomy, Plankton and Algae 7	**1** Obtain and communicate information to describe the structural and functional characteristics of marine plants and algae 8
	2 Obtain, evaluate and communicate information to explain how organisms are classified by physical characteristics, organized into levels of taxonomy and identified by binomial nomenclature (e.g. taxonomic classification, dichotomous keys) 9
	3 Develop and use models to demonstrate understanding of the structural and functional characteristics of ocean drifting organisms (e.g. phytoplankton, zooplankton) 9A

	4 **Obtain and communicate information to demonstrate an understanding of the structure and function of the anatomy and physiology of representative aquatic organisms.** 11
	5 **Continued from previous Unit...** 12
Marine Invertebrates 8	1 **Develop and use models to differentiate the physical structures and behavioral characteristics of the marine invertebrate phyla (e.g. Porifera, Cnidaria, Mollusca, Arthropoda, Echinodermata)** 9B
	2 **Continued from previous Unit...** 11
	3 **Develop and use dichotomous keys to compare and contrast different aquatic species** 11A
	4 **Continued from previous Unit...** 12
Marine Vertebrates-Fish 9	1 **Develop and use models to differentiate the physical structures and behavioral characteristics of the marine vertebrate classes (e.g. fishes, reptiles, birds, mammals)** 9C
	2 **Develop and use models to predict adaptations resulting from natural and artificial selection that may cause changes in populations over time (e.g. countershading, camouflage, fin shape, body shape, beak types)** 10
	3 **Continued from previous Unit...** 11
	4 **Continued from previous Unit...** 11A
	5 **Continued from previous Unit...** 12
Marine Reptiles, Birds and Mammals 10	1 **Continued from previous Unit...** 9C
	2 **Continued from previous Unit...** 10
	3 **Continued from previous Unit...** 11
	4 **Continued from previous Unit...** 11A
	5 **Continued from previous Unit...** 12