

Course Title:	Oceanography A
Unit 1 Big Idea:	Introduction to Marine Science
Essential Questions:	How do scientists gather and interpret information about the oceans?
Standards	
HSCE	B1.1B Evaluate the uncertainties or validity of scientific conclusions using an understanding of sources of measurement error, the challenges of controlling variables, accuracy of data analysis, logic of argument, logic of experimental design, and/or the dependence on underlying assumptions.
NGSS	HS_ETS1-1 Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
Assignment	Description
Unit readings, quizzes and unit test	Students read from the online textbook and are assessed via section quizzes and the chapter test
1-2	Lab activity: practice use of the Scientific Method
1.3	Interactive activity "Identifying Oceans & Continents
Unit Project	Graphing& analysis: What can data tell us?
Unit 2 Big Idea:	History of Marine Science
Essential Questions:	Throughout time, why have humans looked to the oceans and explored them? Is future ocean exploration necessary and important?
Standards	
NGSS	HS_ETS1-2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
Assignment	Description
Unit readings, quizzes and unit test	Students read from the online textbook and are assessed via section quizzes and the chapter test
2.1	Research opportunity: Ten Significant Events
2.2	Lab activity: Ocean Mapping
2.4	Reading Activity: GO?
Unit Project	Podcast: Is future ocean exploration necessary or important?
Unit 3 Big Idea:	The Origin of Life
Essential Questions:	How can we scientifically explain the existence of life on Earth?"
Standards	
HSCE	E5.3A-Explain how the solar system formed from a nebula of dust and gas in a spiral arm of the Milky Way Galaxy about 4.6 Ga (billion years ago). E5.3D Describe how index fossils can be used to determine time sequence.

NGSS	HS_ESS1-2 Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe. HS_LS4-1 Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.
Assignment	Description
Unit readings, quizzes and unit test	Students read from the online textbook and are assessed via section quizzes and the chapter test
3.1	Opinion writing: Do you think the Big Bang Theory is plausible?
Unit Project	Using a PowerPoint or Google Presentation and your voice, share the evidence that scientists use to support the Big Bang Theory and that life originated in the oceans.
Unit 4 Big Idea:	Energy of Life
Essential Questions:	How does energy flow in an Oceanic food web?
Standards	
HSCE	B2.1B-Explain how cells transform energy (ultimately obtained from the sun) from one form to another through the processes of photosynthesis and respiration. Identify the reactants and products in the general reaction of photosynthesis. B3.3A Use a food web to identify and distinguish producers, consumers, and decomposers and explain the transfer of energy through trophic levels.
NGSS	HS_LS2-5 Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere. HS_LS2-4 Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.
Assignment	Description
Unit readings, quizzes and unit test	Students read from the online textbook and are assessed via section quizzes and the chapter test
4.1	Writing assignment: What is life? Describe attributes of life that make it distinctive from other parts of the Earth system, such as minerals, water, or light.
Unit Project	Using MS Word/Google Document/ or Google Drawing show what will happen when an organism is added or removed from a specific ecosystem.
Unit 5 Big Idea:	Single-celled Organisms and Plant life
Essential Questions:	How can life be organized?
Standards	

HSCE	B5.2a Describe species as reproductively distinct groups of organisms that can be classified based on morphological, behavioral and molecular similarities.
Assignment	Description
Unit readings, quizzes and unit test	Students read from the online textbook and are assessed via section quizzes and the chapter test
5.1	Lab Activity: Understanding how to use a dichotomous key
5.4	Hands-on Activity: Searching for Algae in your Home
Unit Project	Using PPT or Google Presentation and Screenr create a video that shows how the levels of taxonomy organize living organisms.
Unit 6 Big Idea:	Ocean Invertebrates A
Essential Questions:	How do changes in small ecosystems impact larger environments?
Standards	
HSCE	B5.2a Describe species as reproductively distinct groups of organisms that can be classified based on morphological, behavioral and molecular similarities. E2.4B Explain how the impact of human activities on the environment (e.g., deforestation, air pollution, coral reef destruction) can be understood through the analysis of interactions between the four Earth systems
NGSS	HS_LS2-6 Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. HS_LS2-7 Design, evaluate and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
Assignment	Description
Unit readings, quizzes and unit test	Students read from the online textbook and are assessed via section quizzes and the chapter test
6.2	Interactive: Exploring a Coral Reef
Unit Project	Using a script and Vocaroo create a 2-minute podcast that informs others about the importance of Coral Reefs and the threat that they face.
Unit 7 Big Idea:	Ocean Invertebrates B
Essential Questions:	How can we responsibly make use of marine resources?
Standards	
HSCE	B5.2a Describe species as reproductively distinct groups of organisms that can be classified based on morphological, behavioral and molecular similarities.
NGSS	HS_LS2-4 Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.

Assignment	Description
Unit readings, quizzes and unit test	Students read from the online textbook and are assessed via section quizzes and the chapter test
7.1	Cataloging: Cephalopod Comparison
7.3	Persuasive essay: Shrimping & Tourism
7.4	Haiku: Thinking about Echinoderms
Unit Project	Using MS Word/ Google Doc/ Google Drawing or similar create a marketing poster of a new marine product that will appeal to humans.
Unit 8 Big Idea:	Ocean Vertebrates
Essential Questions:	How do we recognize variation in ocean creatures that appear very similar?
Standards	
HSCE	B5.2a Describe species as reproductively distinct groups of organisms that can be classified based on morphological, behavioral and molecular similarities. E2.4B Explain how the impact of human activities on the environment (e.g., deforestation, air pollution, coral reef destruction) can be understood through the analysis of interactions between the four Earth systems
NGSS	HS_LS-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. HS_LS-2 Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. HS_LS-8 Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.
Assignment	Description
Unit readings, quizzes and unit test	Students read from the online textbook and are assessed via section quizzes and the chapter test
8.1	Personal Reflection: Shark Tracker
8.3	Opinion essay: Is it beneficial to continue live tracking marine species?
8.5	Information writing: Share your favorite marine mammal
Unit Project	Using PPT or Google Presentation and Screenr (create a video) that discusses the evidence that an individual can use to determine the relationship between two organisms.