

# Wyoming Department of Education Required Virtual Education Course Syllabus

## BIG HORN COUNTY SCHOOL DISTRICT #1

Program Name	WYCA	Content Area	Science
Course ID	CASC80424	Grade Level	9-12
Course Name	Marine Science A	# of Credits	0.5
SCED Code	03005G0.5012	Curriculum Type	Connections Academy

### COURSE DESCRIPTION

*Have you ever wondered about the secrets of the deep, and how the creatures below the ocean's surface live and thrive? It is truly a new frontier of discovery, and in Marine Science, you will begin to understand a great deal more about the aquatic cycles, structures, and processes that generate and sustain life in the sea. Through the use of scientific inquiry, research, measurement, and problem solving, you will conduct various scientific procedures that will lead to an increased level of knowledge about Marine Science. You will also have the opportunity to use technology and laboratory instruments in an academic setting. By recognizing the inherent ethics and safety procedures necessary in advanced experiments, you will become progressively more confident in your abilities as a capable marine scientist.*

### WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK
HS-LS2-6	Evaluate the claims, evidence, and reasoning that the complex biotic and abiotic interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a modified ecosystem.
HS-ESS3-1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
HS-ETS1-5	Evaluate the validity and reliability of claims in a variety of materials.

### SCOPE AND SEQUENCE

UNIT OUTLINE	STANDARD#	OBJECTIVES
<p><b>Unit 1: About the Earth</b></p> <p>You may have heard that the earth's surface is about 70 percent water, which means there is over twice as much water as there is land covering the globe. In this unit, you will go beneath the surface to learn about how the earth and its oceans were created, how the structure of the earth impacts everything from the shape of the continents to tsunamis, and how the scientific method is applied to marine science.</p>	HS-ESS3-1	<ul style="list-style-type: none"> <li>Define marine science.</li> <li>Describe the development of oceans.</li> <li>Explain different movements in plate tectonics and their results.</li> <li>Discuss the scientific method.</li> <li>Differentiate between a hypothesis and a theory.</li> </ul>
<p><b>Unit 2: Water and the Environment</b></p> <p>Water is a unique and important resource on our planet. In this unit, you will discover the properties that make water so different from the other natural elements. Water's composition allows it to retain and release heat, playing a vital role in shaping the temperature of the air and land around it. You will explore how the world's oceans work with the wind and the atmosphere to define the climate on this planet we all share.</p>	HS-ESS3-1, HS-ETS1-5	<ul style="list-style-type: none"> <li>Describe the distinct qualities of water.</li> <li>Summarize the conditions that lead to climate change around lakes and oceans.</li> <li>Discuss the role of water currents and wind in shaping climate.</li> <li>Identify the sources of watersheds and the factors that influence them.</li> <li>Differentiate between a science and pseudoscience.</li> </ul>
<p><b>Unit 3: Tides</b></p> <p>Tides are an essential part of ocean life. You'll explore the causes of tides and why some tides rise higher than others. Tides also shape the land and water around them. In some cases, they erode sunny beaches, and in others, they form the brackish water of estuaries. Not only do tides define the organisms that inhabit the waters, but they also play a significant role in shaping the environment.</p>	HS-LS2-6	<ul style="list-style-type: none"> <li>Discuss oceanic and freshwater processes, such as tides and currents.</li> <li>Describe changes in ecosystems resulting from environmental shifts.</li> <li>Differentiate among freshwater, brackish, and saltwater ecosystems.</li> <li>Identify the biotic and abiotic elements of an ecosystem.</li> <li>Recognize the role of carbon and nutrient cycles in an aquatic environment</li> </ul>

<p><b>Unit 4: Water and Weather</b>  Every year, about 200 people are killed in floods in the United States. Floods are just one of the many ways in which key elements of the atmosphere, such as temperature and water, create severe weather patterns. This unit will explore the ways water, particularly ocean water, interacts with the atmosphere to create certain weather patterns and habitats for ocean life.</p>	<p>HS-ETS1-5, HS-ESS3-1</p>	<ul style="list-style-type: none"> <li>• Identify the levels of the earth’s atmosphere.</li> <li>• Explain the causes of severe weather.</li> <li>• Describe the behavior of gases in the ocean.</li> <li>• Discuss the significance of the water- and carbon cycles.</li> <li>• Cite evidence of climate change in the ocean</li> </ul>
<p><b>Unit 5: Energy in the Ocean</b>  Energy moves around the ocean in waves, and waves are subject to the laws of fluid dynamics. This set of laws defines how energy moves in and out of the water. Many factors determine the impact of energy on fluids, including the nature of the fluid or gas and the basic principles of physics, such as the law of conservation of energy. Waves are also shaped by their interactions with the environment and each other. So even when the seas look calm, there is a lot of action going on in the ocean.</p>	<p>HS-ETS1-5</p>	<ul style="list-style-type: none"> <li>• Discuss the basic principles of fluid dynamics.</li> <li>• Understand the role of hydrostatic pressure.</li> <li>• Explain the law of conservation of energy.</li> <li>• Identify the measurable properties of waves.</li> <li>• Recognize the impact of wave interactions.</li> </ul>
<p><b>Unit 6: Marine Science A Final Exam</b>  In this unit, you will review the information you learned throughout this course and take an exam to demonstrate your newly acquired knowledge.</p>		<ul style="list-style-type: none"> <li>• Review information acquired and mastered from this course.</li> <li>• Take a course exam based on material from this course.</li> </ul>