

Cornwall-Lebanon School District Curriculum Overview

Oceanography – 10th – 12th Grade

20 length of time in weeks	Concepts & Competencies	Common Assessments	Academic Standards (PA Core if applicable)
Unit 1 2	<p align="center"><u>Ocean Formation</u></p> <p>Students will visualize the scale of Earth's ocean by volume. Students will explain the sequence of events that lead to the formation of Earth's ocean. Students will demonstrate the concept of density stratification. Students will link density stratification to the outgassing of oceanic water.</p>	<ul style="list-style-type: none"> ➤ Unit 1 Test 1: Ocean Formation Unit Test 	<p>3.3.10.A7 3.3.10.A3</p>
Unit 2 3	<p align="center"><u>Oceanic Plate Tectonics</u></p> <p>Students will link geologic evidence to the existence of tectonic plates. Students will use scientific data to calculate the rate of tectonic plate motion. Students will use mantle convection to explain the process of seafloor spreading. Students will link the density of oceanic crust to the formation of features at subduction boundaries.</p>	<ul style="list-style-type: none"> ➤ Unit 2 Quiz 1: Plate Motion ➤ Unit 2 Test 1: Plate Tectonics Unit Test 	<p>3.3.10.A1 3.3.10.A3 3.3.12.A7</p>
Unit 3 4	<p align="center"><u>Ocean Topography</u></p> <p>Students will use bathymetry principles to map seafloor features. Students will interpret and analyze bathymetric maps. Students will construct seafloor profiles given a bathymetric map. Students will calculate seafloor depth using SONAR data. Students will use calculated seafloor depth data to construct seafloor topographic maps and identify key seafloor features.</p>	<ul style="list-style-type: none"> ➤ Unit 3 Quiz 1: Bathymetric Profiles ➤ Unit 3 Quiz 2: SONAR Calculations ➤ Unit 3 Test 1: Bathymetry & Seafloor Unit Test 	<p>3.3.10.A1 3.3.10.A3 3.3.10.A5 3.3.10.A7 3.3.12.A7</p>
Unit 4 2	<p align="center"><u>Seawater Properties</u></p> <p>Students will review the water cycle as it relates to ocean storage. Students will analyze the effects that changes in temperature and salinity have on seawater. Students will identify the thermocline, halocline, and pycnocline on ocean depth plots. Students will explore the effects of light penetration on oceanic organisms.</p>	<ul style="list-style-type: none"> ➤ Unit 4 Quiz 1: Seawater Properties, Thermocline, & Halocline ➤ Marking Period Exam 	<p>3.3.6.A4 3.2.7.A1 3.3.10.A5 3.3.10.A7 3.3.12.A7</p>

Unit 5 <div style="border: 1px solid red; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 5px auto;">2</div>	<p style="text-align: center;"><u>Thermohaline Circulation</u></p> <p>Students will determine the relationship between evaporation, precipitation, and seawater density. Students will link temperature and salinity changes as the driving force behind thermohaline circulation. Students will identify the major functions of the global conveyor belt.</p>	<ul style="list-style-type: none"> ➤ Unit 5 Quiz 1: Thermohaline Circulation ➤ Unit 5 Test 1: Global Conveyor Unit Test 	<p>3.3.8.A4 3.3.10.A6 3.3.10.A5 3.3.10.A4 3.3.12.A1 3.3.12.A7</p>
Unit 6 <div style="border: 1px solid red; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 5px auto;">2</div>	<p style="text-align: center;"><u>Global Wind Patterns & Surface Currents</u></p> <p>Students will compare and contrast the differential heating of various materials and link it to the formation of convection cells and wind patterns. Students will identify latitudinal differential heating on the formation of global convection cells. Students will connect global wind patterns to ocean surface currents. Students will explain how Ekman Transport and the Ekman Spiral result in the formation of ocean gyres.</p>	<ul style="list-style-type: none"> ➤ Unit 6 Quiz 1: Global Wind Patterns ➤ Unit 6 Test 1: Ocean Current Unit Test 	<p>3.3.8.A4 3.3.10.A6 3.3.10.A5 3.3.10.A4 3.3.12.A1 3.3.12.A7</p>
Unit 7 <div style="border: 1px solid red; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 5px auto;">2</div>	<p style="text-align: center;"><u>Tides</u></p> <p>Students will explain the cause of moon phases as they relate to the Moon's orbit around Earth. Students will connect mutual gravitation to the formation of tidal bulges on Earth's surface. Students will analyze the difference between spring and neap tides and their associated Moon orbital positions. Students will identify variations in daily tidal patterns. Students will predict the strength of storm surges based on tidal data.</p>	<ul style="list-style-type: none"> ➤ Unit 7 Quiz 1: Moon Phases ➤ Unit 7 Quiz 2: Tidal Patterns ➤ Unit 7 Test 1: Tides & Tidal Patterns Unit Test 	<p>3.3.7.A4 3.2.P.B5 3.3.12.A7</p>
Unit 8 <div style="border: 1px solid red; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 5px auto;">2</div>	<p style="text-align: center;"><u>Tsunamis</u></p> <p>Students will use historic accounts to describe the appearance of tsunami events. Students will compare and contrast different forms of tsunamigenic events. Students will calculate the average velocity of tsunami waves based on DART buoy data. Students will develop a plan to educate the public on tsunami preparedness.</p>	<ul style="list-style-type: none"> ➤ Unit 8 Quiz 1: Tsunamis ➤ Unit 8 Project 1: Tsunami Preparedness Flyer 	<p>3.3.7.A4 3.2.P.B5 3.3.12.A7</p>
Unit 9 <div style="border: 1px solid red; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 5px auto;">1</div>	<p style="text-align: center;"><u>Waves & Coastal Features</u></p> <p>Students will describe the factors that affect ocean wind wave development. Students will calculate wave base, wavelength, and wave height of ocean waves. Students will describe coastal protection features and their effect on longshore drift.</p>	<ul style="list-style-type: none"> ➤ Unit 9 Quiz 1: Ocean Waves & Longshore Drift ➤ Marking Period Exam #2 	<p>3.3.7.A4 3.2.P.B5 3.3.12.A7</p>