Groton Public Schools
Curriculum Map

INTRODUCTION

Mini Course Title: Marine Biology
Curriculum Area and Grade: Middle School Science Grade 8

Course Purpose:
The students will explore the habitats and ecosystems of saltwater environments. This will include building ecosystems in a saltwater aquarium to observe how the organisms interact.

Major Learning Goals and Understandings:
Student Learning Expectation(s): Students will learn about local saltwater ecosystems. Students will learn about food webs and interactions amongst organisms found locally.

6 Week Units	
1. Oceanic life size ranges.	2. Life cycles, adaptations, and important relationships among organisms in Long Island Sound.
3. Oceanic and Long Island Sound habitat diversity.	4. Abiotic factors.
5. Vertical zonation of the shores.	6. Importance of Estuaries.

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Part 1 - Unit/Theme/Concept			
Grade: 8	**Subject:** Science	**Course:** Marine Biology	**Length of Unit:** (# of weeks) 6

Common Core State Standards

CCSS, Literacy in History/Social Studies, Science, and Technical Subjects.

College and career readiness anchor standards for reading:

7. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.
10. Read and comprehend complex literary and informational texts independently and proficiently.

Reading standards for literacy in science and technical subjects 6-12:

2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
7. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table.)
10. By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

Supporting Standards:

Ocean Literacy: The Essential Principles of Ocean Sciences

Ocean Literacy Principle 5: The ocean supports a great diversity of life and ecosystems

a) Ocean life ranges in size from the smallest virus to the largest animal that has lived on Earth, the blue whale

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.

e) The ocean is three-dimensional, offering vast living space and diverse habitats from the surface through the water column to the seafloor. Most of the living space on Earth is in the ocean.

f) Ocean habitats are defined by environmental factors. Due to interactions of abiotic factors such as salinity, temperature, oxygen, pH, light, nutrients, pressure, substrate and circulation, ocean life is not evenly distributed temporally or spatially.

h) Tides, waves and predation cause vertical zonation patterns along the shore, influencing the distribution and diversity of organisms.

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

Connecticut State Standards

State Frameworks:Expected performances

C4: Describe how abiotic factors, such as temperature, water, and sunlight, affect the ability of plants to create their own food through photosynthesis.

C5: Explain how populations are affected by predator-prey relationships.

C6: Describe common food webs in different Connecticut ecosystems.

C11: Explain how human activity may impact water resources in Connecticut, such as ponds, rivers, and the Long Island Sound ecosystem.

Part 2 – Standards		
Key (GLE) Content Knowledge and Concepts/Skills		**Bloom's Taxonomy Levels** Creating, Evaluating, Analyzing, Applying, Understanding and Remembering
The students will know: ● Oceanic life ranges from microscopic organisms to the largest animals on Earth. ● How organisms in Long Island Sound interact, adapt, and progress throughout their life cycle. ● The diversity found in Long Island Sound. ● How abiotic factors affect organisms and habitats. ● How and why vertical zonation of the shores occurs. ● Why estuaries are important.	The students will be able to: 1.1 Comprehend and apply knowledge of, in creation of the mini-ecosystem, the large variation of life sizes that exist in the ocean. 2.1 Observe and analyze how organisms interact naturally. 2.2 Identify and analyze how organisms are adapted to live in Long Island Sound. 2.3 Compare and contrast the life cycles of various organisms. 2.4 Analyze the relationships amongst various organisms (mutualism, parasitism, and commensalism). 3.1 Compare and contrast various organisms in the Long Island Sound ecosystem and their associated niches (benthic vs. pelagic, sessile vs. mobile, range of water column that the organism resides in vs. intertidal). 4.1 Understanding the relationships between organisms, ecosystems, and the abiotic factors (pH, temperature, salinity, light, nutrients, pressure, oxygen levels, tidal fluctuations, waves, and other factors that may inhibit or support life). 5.1 Comprehend how and why specific components of vertical zonation occur in intertidal zones (predation, food availability/competition, desiccation adaptations, tidal fluctuations, and competition for space.) 6.1 Correlate estuaries, such as Long Island Sound, with the benefits that the organisms within them offer the human population, as well as the benefits that the habitats of Long Island Sound offer organisms.	Understand the biodiversity of Long Island Sound and be able to analyze the interrelationships of the life forms found in it.

Big Idea and Essential Questions

- **Big Idea:**

  The oceanic habitats of Long Island Sound support a great diversity of life and ecosystems.

- **Essential Questions:**

  What types of life and ecosystems do the oceanic habitats of Long Island Sound support?

Part 3 – Common Unit Assessments

Students will create a mini-ecosystem that is representative of Long Island Sound in a salt water aquarium.

Part 4 – Common/Assured Learning Experiences

Field trips to Bluff point to observe, seine, and collect organisms
The creation of a mini-ecosystem representative of Long Island Sound in saltwater aquarium

Part 5-Teacher Notes

http://www.coexploration.org/oceanliteracy/documents/OceanLitChart.pdf