

**Groton Public Schools
Curriculum Map**

INTRODUCTION

Course Title: Aquatic Science
Curriculum Area and Grade 6: Mini-course

Course Purpose:

The purpose of this mini-course is to ...

Provide grade 6 students with a background in aquatic/freshwater, science topics and issues while building their 21st century skills and proficiencies.

Major Learning Goals and Understandings:

Student Learning Expectation(s):

Students will: Differentiate between freshwater and marine ecosystems;
Identify the sun as the main energy source for AEs;
Assemble food chains for both pond and stream ecosystems
Identify common aquatic plants, invertebrates, vertebrates, and amphibians, as well as anadromous and catadromous species.
Diagnose the health of ponds and streams using water tests and sampling for indicator species.
Utilize various observation techniques to identify organisms.
Log and graph data using Excel.
Complete a field study of the pond and stream habitats adjacent to the school.
Journal their observations, findings, and conclusions.

21st Century Learning Expectation(s):

Students understand that the science process involves observing, proposing explanations and hypotheses, experimenting, and drawing conclusions. Additionally, they will apply these activities in their own field studies and investigations. Critical thinking, problem solving, higher level thinking skills, collaboration, creativity, and communication of findings will integral to the course.

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Units Trimester = 12 weeks	
1. Introduction to Freshwater Ecosystems	2. The needs of living things
3. Energy flow in ecosystems	4. Food webs
5. The nature of water	6. The habitats within a water body
7. Observing and collecting methods	8. Keeping a field journal
9. Water testing methods	10. Observation/collection of plants
11. Observation/collection of animals	12. Observation/collection of invertebrates
13. Observation/collection of human impacts	14. Production of case survey

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Unit 1			
Grade: 6	Subject: Science	Course: Aquatic Science	Length of Unit: 12 Weeks

Common Core State Standards
<p>CCSS.ELA-Literacy.RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.</p> <p>CCSS.ELA-Literacy.RST.6-8.9</p>

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Supporting Standards

CCSS.ELA-Literacy.RST.6-8.7

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).

CCSS.ELA-Literacy.RST.6-8.4

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6–8 texts and topics*.

Connecticut State Standards

6.2 — An ecosystem is composed of all the populations that are living in a certain space and the physical factors with which they interact.

Ecosystems are complex interactions among living things and the features of the environment they inhabit. The environmental (abiotic) features of an environment determine the living (biotic) things that can survive there. Environmental features include things such as soil, minerals, climate, water, sunlight, and wind.

Interactions among biotic and abiotic factors support the flow of energy and cycling of materials such as oxygen, carbon dioxide and nitrogen in ecosystems.

Soil is a mixture of materials that includes weathered rocks and decomposed organic material, as well as air and water. Soils vary from place to place. The composition of soils affects how air and water move through the soil, and this influences the varieties of plants that can grow in it.

Water is a mixture of materials that includes dissolved oxygen and minerals as well as suspended sediments and debris.

The quality and quantity of soil and water in an ecosystem affect the numbers and variety of plants and animals.

Plants and animals within an ecosystem interact in various ways as they compete for limited resources (e.g., food, water, living space). Relationships among organisms can be beneficial or harmful to one or both organisms.

Part 2 Unit 1 – Standards		
Key (GLE) Content Knowledge and Concepts/Skills		Bloom’s Taxonomy Levels
<p>The students will know:</p> <ul style="list-style-type: none"> ● The sun is the energy source for ecosystems ● Aquatic ecosystems are catch basins for human wastes ● The health of ecosystems can be inferred by the presence of certain indicator species ● How to perform basic chemical tests to determine levels nutrients and pollutants ● How to graph data using Excel ● How to interpret graphical data ● How to create a field journal, ● Produce a document describing the health and 	<p>The students will be able to:</p> <ul style="list-style-type: none"> ● Test water and soil conditions ● Collect indicator species of invertebrates ● Observe organisms both directly and indirectly using multiple senses ● Infer the health of ecosystems by the presence of indicator species ● Analyze quantitative information using Excel ● Identify human activities as major sources of environmental damage ● Create a document describing the pond and stream ecosystems as well as their relative health 	<p>Creating: Evaluating: Analyzing: Applying: Understanding: Remembering:</p> <p>Bloom’s Taxonomy Levels:</p> <ul style="list-style-type: none"> ● Create a field journal. ● Evaluate human impacts on environment. ● Analyze quantitative data.

wellbeing of the pond and stream.		
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Big Idea and Essential Questions

- **Big Idea:**
Human activities can adversely affect ecosystems and the organisms that live in them.
- **Essential Questions:**
What human activities cause harm to natural ecosystems?
How are organisms affected by human activities?

Part 3 – Common Unit Assessments

- Students will keep journals of all field research.
- Students will produce a case study document reporting on the health of local bodies of water.

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Part 4 – Common/Assured Learning Experiences

- Creation of a field journal.
- Production of a case study of the health of the body of water.

Part 5-Teacher Notes

Add resource links...

Aquatic Science

http://www.scuc.txed.net/webpages/mrudd/aquatic_science.cfm

Aquatic Science Adventure Camp

www.eardc.txstate.edu/camp.html

ASLO: Working in the Aquatic Sciences

www.aslo.org/career/aquaticcareer.html

Aquatic Science - Edline

teachersites.schoolworld.com/webpages/GSchwab/aquaticscience.cfm

Science Teachers Online - Nsta.org

www.nsta.org

Marine & Aquatic Science Literacy - Water Research Guide ...

researchguides.library.wisc.edu/content.php?pid=13502&sid...

Ms. Newton's site - Aquatic Science Lesson Plans

classroom.dickinsonisd.org/webs/.../aquatic_science_lesson_plans.ht...

