

LESSON PLAN 14

Title: Types of Marine Habitats (Part 2 of 4)

Content Area Subjects:

- Career and Educational Development, Science, Health and Physical Education, History, ELA, Math, Social Studies

Grade level(s): Grades 3-12+ (The Instructor could adapt portions of this lesson for lower grades; the computer exercise may require older students to be partnered with younger students, depending on the skills of the group)

Standard(s):

Maine Learning Results

- Career and Educational Development. Interpersonal Skills (A3.pre-k to diploma.a,c)
- ELA. Informational texts (A3.3.c); (A3.3.e); (A3.6.e); A3.9-diploma.b); Research (C1.3-5.a,c,d)(C1.6-8.g); (C1.9-diploma.a,c); Listening (E1.3-diploma.c); (E1. 9-diploma.a); Speaking (E2.3-8.d); (E2. 9-diploma.a)
- Health and Physical Education. Cooperative Skills (I1.pre-k to diploma.a-d); Responsible Behavior (I2.pre-k to diploma)
- Math. Data (B1.4-8.a,b); (B1.9-diploma); Measurement and Approximation (B1.4-diploma.a,b); (B1.9-diploma.a,b,c); (B2.3-6); (B2.7.1a, 1b); (B2.8-diploma.3)
- Science. Scientific Inquiry and Technological Design (B1.3-diploma.a); (B1.3-diploma.b); (B1.3-diploma.c); (B1.3-diploma.d); (C1.3-diploma.a)
- Social Studies. Taking Action Using Social Studies Knowledge and skills (A3.3-diploma)

Common Core:

- ELA. (V.3-12.6); (SL.3-12.1c); (SL.3-5.1); (L.3.5b);(L.3.5b)
- Science and Technology. (R.6-12.4); (R.7-12.4)

STEM Skills

Brief Description: The focus of this lesson will be the Rocky Shore Habitat. The use of the website at Bigelow will be an important resource for the students as they become familiar with marine habitats.

As students learn more about the habitat in which a species or organism lives, they will be considering many factors such as: What does the species need for shelter, water,

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space, food, and air? What helps the species survive here? Are there special things on the various species bodies or structure or things they can do that have allowed them to live here?

Lesson 22 will continue the habitat study

Adaptations for different age levels/abilities:

This lesson can be adapted for the age of the students.

Objectives/goals:

After completing this series of lessons, the students will be able to:

- identify other species (plant and animal) which exist in the marine habitat
- differentiate between marine habitats
- realize that the plants and animals are living in the water, air, and temperature that they feel during their field trip and understanding that the plants and animals have adapted to living in these conditions
- recognize some of the adaptations that various species use for survival in their habitat
- explain how the clam/other plants and animals get food and water
- demonstrate where and describe how a clam and other plants and animals stay safe
- participate in a “sampling” of species and substrate in a marine habitat
- begin to understand how the climate change affects the plants and animals in the marine habitat as the seasons change from spring to summer to fall to winter
- measure the tidal change over a period of time
- begin to understand the effects of temperature, salinity, tidal flow, wave action, wind, sun/light, and substrate to the organisms that live in the marine habitat
- begin to appreciate the interaction of species within the habitat
- continue to be given opportunities to understand the need to be good stewards of the environment

Time needed: One to several class periods can be spent with the Habitat lessons. If at all possible two shorter field trips or one longer day at a marine habitat should be scheduled. If a field trip is not possible or the Instructor wishes to set a “marine outdoor” tone before or after a field trip, use Lesson 16 to create the necessary atmosphere.

Background information:

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An information sheet for the Instructor has been developed for this series of lessons. The keywords are listed in each Habitat lesson for easy reference.

Keywords and phrases:

Physical habitats- sandy habitats, rocky habitats, muddy habitats, and water column

Biogenic habitats- salt marshes, eelgrass/sea grass beds, kelp beds, shellfish beds, and cold water corals

Habitat formed by human activity-invasive plant habitats and fouling communities

Zones of the Rocky: spray zone, upper intertidal zone, middle intertidal zone, lower intertidal zone, and subtidal zone

KEYWORDS AND PHRASES:

abiotic stresses, bathymetry (ba thim' a tree), biomass, biotic stresses, currents, dessication, diurnal tides, dunes, ecosystems, ecosystems in the Gulf of Maine, eelgrass bed, gravitational force, habitat, holdfast, intertidal, invasive species, kelp bed/forest, muddy bottom, neap tides, quadrat, rainfall, recruitment, rockweed bed, rocky bottom, rotation of the earth, salinity, salt marsh/pond, sandy bottom, semidiurnal tides, slope of the habitat (shore or rock), spring tides, stability of the substrate, substrate, subtidal, sunlight, temperature of air and water, the Gulf of Maine, tidal pool, tidal inundation, tidal height, tide, transect, wave action, wind

Materials Needed:

Computers for each student or group

Internet access

2 Rocky Shore worksheets (one worksheet is a review of navigating the site; one for summarizing the information found at the site)

The Procedure:

Introduction The Instructor will explain that there are several areas that can be called marine habitats. The areas have some similarities and some key differences. Today the students will be doing computer research on the Rocky Shore Habitat.

Key Questions

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The Instructor will do the activities that allow students to become more “aware” of their surroundings that are presented in Lesson 13. Lesson 14 is focuses on one major marine habitat – the Rocky Shore. Other habitats will be explored in Lesson 22.

Section 1

What are some common sights of the marine habitat?

What are some common sounds of the marine habitat?

Describe what can be felt at a marine habitat.

Describe what is smelled at a marine habitat.

Describe the marine habitat(s). Describe the marine habitat(s) that you visited.

Section II

Where does the clam live?

Where does the clam get food and water?

Where does the clam get shelter?

How does the clam stay safe?

What are some other species that exist in this marine habitat?

Where do they get shelter, food and water?

How do they stay safe?

Section III

What are physical habitats? Explain the difference between rocky, sandy, muddy, and water column habitats?

What are Biogenic habitats? Explain the difference between salt marshes, sea grass beds, kelp beds, shellfish beds, and cold-water corals

How have the plants and animals adapted to living where they live? (Hint to Instructor: Are there special coverings on their bodies or things they can do that have allowed them to survive in this habitat)

How do clams and some of the other species found in this habitat get shelter, food and water?

What would humans need to do in order to survive here?

What does it mean to participate in a “sampling” of a marine habitat? How can this information be used?

How will the plants and animals be affected by the change of seasons in this habitat?

What happens to the sea water level over a period of time?

How can we record this event?

How does the water level affect the plants and animals that live here?

How do temperature, salinity, wave action, wind, sun/light, and substrate affect the organisms that live in the marine habitat?

How do the plants and animals interact in the same habitat?

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How can we help to protect the plants and animals in this habitat? Why should we want the plants and animals to survive?

If the Instructor wishes to do more in depth instructional lessons on specific characteristics of the habitat, there are lessons on salinity, marine sampling, and dessication in the materials for Science Day Camp. The key questions for those sections are covered here:

Main Activity

Soon after the students have completed the Field Trip and the concluding activities following the trip, they should be ready to begin Lesson 14. This lesson will take them further into a study of the coastal habitat where many species of plants and animals live. In this lesson, the students will spend time learning about the Rocky Shore Habitat by researching the website that has been developed by The Bigelow Laboratory for Ocean Sciences in West Boothbay Harbor, Maine. The Rocky Shore habitat is home to a very diverse number of plants and animals, and a study of it provides a wealth of information. A worksheet has been developed that takes the students through the information presented at the website. Within the site itself, pictures and a glossary add to the learning opportunities.

The Instructor should make sure to provide each student with the two Rocky Shore Worksheets. Allow students to become familiar with the website and have them use the worksheet provided to review their ability to navigate the site. The other worksheet will allow them to get the main information from the website about the Rocky Shore. Make sure that each student or every two students have a computer and Internet connection.

Conclusion

After the students have finished their worksheets, the class could review the information as a group

Assessment/Follow Up/Extension Activity:

Have the students go back to the Bigelow site on another day and continue their research. A suggestion would be to have them look at the different species pictures they can find and to compile a listing of species and their characteristics.

The Instructor may wish to explore the other marine habitats. Lesson Plan 22 will provide that opportunity and the opportunity to do some research on sea level rise and land level subsidence. Information on land level can be found at

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<http://www.seagramt/umaine.edu/publications/outreach> -the second item in the list of 2010 publications.