Marine Biology
Independent Learning Packet #2

Student Name: ____________________
Teacher: _________________________
Period: _________________________
Marine Ecosystems

What is an ecosystem?
An ecosystem consists of both biotic (living) and abiotic (non-living) things that function together as a unit in nature. For example in a pond the fish, snail, plants are living parts and water, light, and rocks are nonliving parts of that environment. Aquatic/ marine ecosystems are located in areas that are either covered with water for part of the year or are completely under water all of the time. The differences among the ecosystems are in their location, amount of water, the plants, and animals that live there and whether the water is fresh, salt, or brackish. Ecosystems may be affected by manmade factors in the surrounding area, such as agriculture, forestry, urban development, and pollution runoff.

Abiotic Factors:
We know now that ecosystems consist of biotic and abiotic components. Most people understand how biotic factors like plants and animals impact an ecosystem, but don’t always consider the abiotic. In marine environments many abiotic factors influence the living organisms. For example plant growth in aquatic environments are affected by temperatures, sunlight, water depth, salinity, and wind/wave action. These factors are all part of an organism’s habitat. Too much or too little of a particular abiotic factor may influence an organism or prevent it from living in a certain environment.

Marine Ecosystems:
Marine ecosystems can be divided into three main groups; wetlands, coastal ecosystems, and ocean ecosystems. The wetlands include swamps and marshes, while coastal ecosystems include estuaries, beaches, and mud flats. Ocean ecosystems cover the oceans themselves, coral reefs and sea grass beds. Although the various ecosystems may seem very different and isolated from each other, they are all interrelated. For example, rivers in the Pocomoke River are brown in color from the surrounding bald cypress swamps. Those rivers carry detritus downstream where nutrients are dumped into estuaries of the Chesapeake Bay which will lead into the ocean. Many forms of wildlife utilize and depend on multiple ecosystems for survival for hunting, nesting, breeding, feeding, and more.
**Wetland Ecosystems:**

Wetlands are areas of land that are covered with water for at least part of the year, for any length of time from a week to the entire twelve months. Swamps and salt marshes are examples of salt water/brackish wetlands. Wetlands include plants such as grasses, shrubs, or trees and many types of wildlife like fish, frogs, turtles, snakes, birds, and mammals. Saltmarshes are typically characterized by grasses, such as salt meadow hay, and salt cordgrass, while swamps are characterized by trees like bald cypress and loblolly pine trees. There are also many threatened and endangered species of plants and animals that are dependent on wetlands like many species of bird.

**Coastal Ecosystems**

Coastal ecosystems are saltwater or brackish ecosystems along the coastlines of the East Coast, such as beaches, estuaries, mangroves, and bays. Brackish water occurs where freshwater and saltwater mix together, for example where a freshwater river empties into the ocean along the coast. Many kinds of saltwater fish, turtles, crabs, and shellfish (like oysters, clams, and mussels) live in coastal ecosystems. Even more animals use these ecosystems as nurseries, a place to have and raise their young. Birds like pelicans and seagulls may live in the trees in swamps and mangroves and eat fish from the water in estuaries and bays. Mammals such as foxes, raccoons, and deer also live in or near coastal ecosystems. Coastal ecosystems can also include maritime forests, meaning forests of the sea. These forests occur along the east coast near the ocean and are made up of mostly loblolly pine trees and other small hardwoods, like oaks, maples, and sassafras trees. These forests are home to mammals like squirrels, raccoons, deer, as well as other small creatures like amphibians, reptiles, insects, and birds.

**Ocean Ecosystems**

Ocean ecosystems are saltwater environments that are beyond the shoreline such as oceans, gulfs, and coral reefs. Plants in ocean ecosystems consist mainly of algae and sometimes in shallow areas, submerged sea grasses. There are many species of animals in ocean ecosystems such as sponges, corals, fish, shellfish, sea turtles, sharks, and marine mammals like dolphins and whales. In terms of biodiversity or variety of species in an area, coral reefs are as diverse as the rainforest.
## Marine Ecosystems Comprehension

### Task #1
Complete the table with pictures and information.

<table>
<thead>
<tr>
<th>Main Type of Ecosystem</th>
<th>Habitats within the Ecosystem</th>
<th>Types of Plants</th>
<th>Types of Animals</th>
<th>Potential Abiotic factors</th>
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</table>
1. All ecosystems must contain abiotic and biotic factors
   a. True
   b. False

2. Maritime forests fall under which main ecosystem group?
   a. Wetland Ecosystems
   b. Coastal Ecosystems
   c. Ocean Ecosystems

3. Marine ecosystems are all interrelated
   a. True
   b. False

4. Which of the following is not a biotic factor
   a. Grasses
   b. Loblolly pine
   c. Water
   d. Sea Turtle

5. Salt marsh falls under which of the main ecosystem groups?
   a. Wetland Ecosystems
   b. Coastal Ecosystems
   c. Ocean Ecosystems

6. Which of the following abiotic factors does not affect plant growth?
   a. Elevation
   b. Wave action
   c. Salinity
   d. Temperature

7. Rainforests are very biodiversity and are similar to which marine ecosystem?
   a. Mangrove
   b. Coral Reef
   c. Marsh
   d. all of the above

8. What is the main type of plant in the ocean?
   a. Sea grass
   b. Corals
   c. Algae
   d. Plankton

9. Which type of habitat do animals use as a nursery for young?
   a. Open ocean
   b. Swamp
   c. Maritime forest
   d. Estuaries

10. Wetlands must be covered in water all the time
    a. True
    b. False

11. Saltmarshes are characterized by which of the following?
    a. Grasses
    b. Trees
    c. Fish
    d. Mammals

12. Which of the following is not a reason to depend on multiple ecosystems?
    a. Feeding
    b. Sleeping
Marine Ecosystems Short Answer Questions
Task #3

Draw one or more of the ecosystems in the article above
Be sure to:
  - Title the drawing with the type(s)
  - Label biotic factors (plants, animals) and abiotic factors (salinity-fresh, salt, or mix, sediment, sunlight, water depth, wind or waves)