



Sandy Hook Interactive Herbarium  
Marine Academy of Science and Technology  
Highlands, New Jersey

# Welcome to the Sandy Hook Salt Marsh Learning Packet



Photograph Taken By: P.T., Sandy Hook Salt Marsh

The following pages are to be placed in order and cut down the vertical line in the center of the page. The booklet should be stapled together and separated for the teacher and student. The first 3 full pages (before being cut and including this one) are strictly for the instructor. The pages following are for the students to use during the lesson and for the teacher to reference and prep the material. Usage of the Sandy Hook Interactive Herbarium Website is key before starting any related lesson plans. Enjoy the Learning Packet!

-P.T.  
Creator of Salt Marsh Learning Packet

### Lesson Plan Aspects

**Overview:** Students will be able to learn about the different aspects of the Sandy Hook Salt Marsh while walking through the site or applying it to the in-school classroom. Students will be able to identify different parts of the Salt Marsh ecology for further use. Students will be evaluated on what they learned and studied at the closure of the material. Students will have the chance to learn with their peers and work as a group.

#### Objectives:

- Recognize the relationship of flora and fauna of the salt marsh
- Understand concepts of species relations
- Draw conclusions about what impact the Salt Marsh has on plants and its surrounding areas
- Name several salt marsh functions
- Recognize the specimens located in the Salt Marsh

#### New Jersey Common Core Science Standards:

- MS-LS2-1
- MS-LS2-2
- MS-LS2-3
- MS-LS2-4
- MS-LS2-5

**Disclaimer:** This lesson plan is intended for the middle school level use of grades 6 to 8, or whichever learning level can benefit from the informational activities. This lesson plan can be altered to fit to any classroom with the use of the Sandy Hook Interactive Herbarium website along with the use of the lesson plan on the site located on Sandy Hook, NJ.

### Background

Salt marshes help protect our estuaries from the impacts of nature and humans. The special grasses that grow in the marsh can tolerate flooding from salt water. These plants are effective storm buffers because they dissipate wave energy and soak up tidal surges. Salt marsh plants are also a defensive against the erosive power of tides because they have deep roots that hold soil in place. Salt marsh plants and mud also hold and trap pollutants and excess sediment, which helps to improve water quality.

When we develop an area along a waterway, effluents such as fertilizers, sewage, and storm drain runoff all enter the water. Left untreated or free-floating in the water, high levels of these nutrients cause eutrophication which causes an initial explosion of algal growth followed by decline in plant life and dissolved oxygen. Plants from the salt marsh help to handle pollutants in several ways. Marshes can take up and filter the pollutants while others settle into the soil strata and are chemically reduced over time. More are processed by bacterial action. When salt marshes are filled or lost, pollutants they could have rendered harmless remain in the water, free to move all over the water system and into the ocean. In addition to the great buffer zone and filtering capacity, the salt marsh is capable of absorbing and holding large quantities of water for use by wildlife in times of drought.

Much of this information is courtesy of the NJ Sea Grant Consortium, a valuable resource for marine information, especially related to the New Jersey area. Their sources include lesson plans as well as up to date factual information.



### Carrying Out the Lesson Plan

#### Materials:

- Pencils or Pens
- Colored Pencils, Crayons, Markers, etc.
- Paper
- Worksheets

#### Procedure

Please remind students that harming the flora and fauna of Sandy Hook is strictly PROHIBITED. The Sandy Hook Interactive Herbarium has a special permit to carry out its activities with the plants that does not apply to any other sources. Also, this activity is best completed during the warmer months if the instructor chooses to carry out the activity on Sandy Hook, NJ.

1. Distribute worksheets and start at location of Salt Marsh (bridge).
2. Walk through bridge and identify plants and talk about ecosystem of Salt Marsh.
3. Allow children to read facts about the different plants and try to identify what the plants are.
4. Have students either work alone or in small groups to see what they can find among the Salt Marsh.
5. To conclude, regroup all together and discuss findings and importance of ecosystems and preserving the environment.

The worksheets provided for the children are very self explanatory. In order for the process to run smoothly, the instructor should preview the information and complete the activity with the children. The activity promotes group work skills and exploration of different material, compared to what is taught in the typical science classroom. Meeting the objectives and goals for this activity (as explained before) is very important for the conclusion of the activity.

### Tips and Ideas for the Instructor

Once the lesson is finished for the day, have other ones planned as well. On the Sandy Hook Interactive Herbarium website, there are other plans that can be adaptable to any grade. If the plans are too easy or difficult for the grade level being taught, use them as inspiration to create new plans.

Some common activities on Sandy Hook include seining, beach walks, and tours of the history left behind by older generations. More information about different activities can be found on the Sandy Hook, New Jersey website as well as affiliated websites with the National Park Service.

Going to school at the Marine Academy of Science and Technology (M.A.S.T) has taught me many different valuable lessons about our environment. We are so lucky to have a national park, like Sandy Hook, for our personal use that is filled with so many different aspects to discover. Visitors of Sandy Hook can utilize the different historical aspects, while enjoying the beach at the same time. Use the beautiful park as a resource to create new lessons and activities for the students.



Photograph Taken By: P.T., Lot C

Name: \_\_\_\_\_

### What is a Salt Marsh?

Directions: Respond to the questions before completing the activities.

1. What is a Salt Marsh?
2. What is flora and fauna? What types do you think you will encounter? Do species help each other out to survive?
3. What impact does the Salt Marsh have on plants and its surrounding areas?
4. How does a Salt Marsh specifically function?
5. What types of plant specimens do you expect to see?

### Welcome to the Salt Marsh!

**The Salt Marsh** of Sandy Hook is a combination of various systems working together to support land, marine, and plant life all together. It is a constantly working ecosystem that benefits from its location and the preservation of its natural being. Salt marshes are considered coastal wetlands that are flooded and then eventually drained by salt water brought in by the tides. On Sandy Hook, the Salt Marshes are intertidal and extremely productive. The composition of the soil creates a muddy structure for critters to live and thrive. Because the salt marsh is frequently submerged by the tides, decomposing plant material can cause the growth of bacteria. This can be both beneficial and ecosystem altering for the marsh.

**The waters** in the Sandy Hook salt marsh become so clear; you can see the different sea life swimming around individually and in groups. Many of the critters in the salt marshes are detritus feeders, which means they feed on the dead parts and waste materials of animals. The marshes have specifically adapted vegetation that thrives in its circumstances and create a new environment for other species (both plant and animal).

**After you read about** the aspects of the Salt Marsh, list from your senses what you see, hear, touch, and smell.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

### Functions of a Salt Marsh

These intertidal habitats are essential for successful coastlines, and shoreline communities. The Sandy Hook Marshes are crucial to the culture of our area, and many individuals have not discovered their beautiful features yet. They are a fostering habitat and care taker for more than 75 percent of fisheries species, including shrimp, blue crab, and many finfish (As per NOAA, National Oceanic and Atmospheric Association).

Salt marshes also protect shorelines from erosion by altering wave action and trapping the important sediments that the coastline needs to flourish. They reduce flooding by slowing and absorbing rainwater. Their protection process improves the water quality by filtering runoff, and collecting the nutrients.

**Thought Question:** What is an example of a habitat system other than a Salt Marsh? Discuss in a group how species benefit from each other and their daily routines in that habitat.

---

---

---

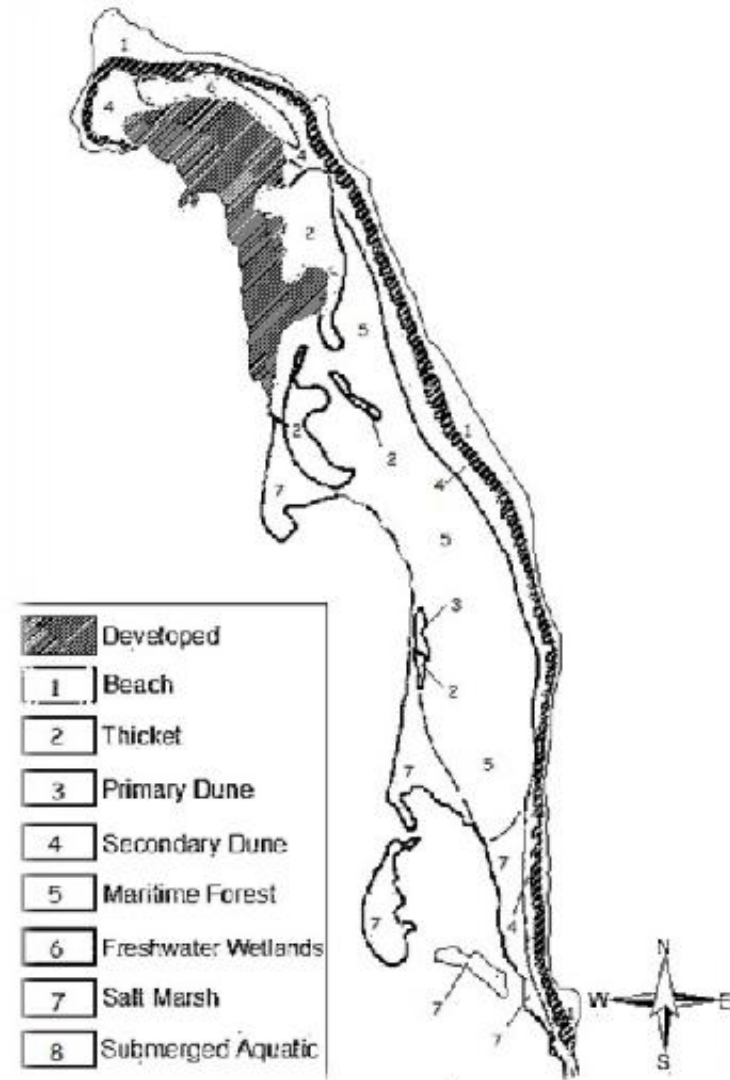
---



Photographs Taken By: P.T. of Horseshoe Cove

### Mapping the Sandy Hook Salt Marsh

Below is a visual depiction of Sandy Hook and the different zones. This image is taken from another set of lesson plans under the activities tab on the Herbarium Interactive Website. Use this map to aid in the activity process. Locate the Salt Marsh on the Map. Circle the area.

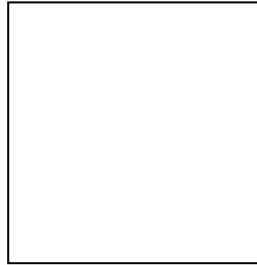


**Draw Salt Marsh Plant Life- Which plants can you find?**

**Sea Blite**



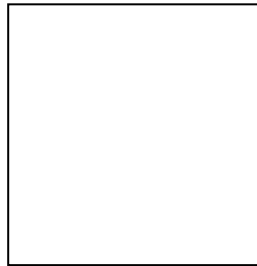
Fun Facts:  
-Used by the Native Americans  
- Late Summer have green flowers  
-Leaves alternate in shape



**Asparagus**



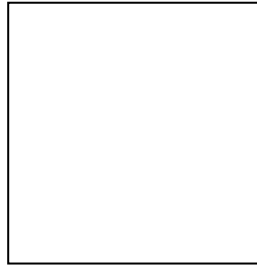
Fun Facts:  
-Develops red berries poisonous to humans  
- Used in medicine as source of potassium



**Sea Myrtle**



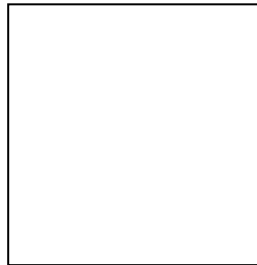
Fun Facts:  
-Can be more than 10 feet tall  
- High salt tolerance  
-Can live up to 50 years



**Marsh Spike Grass**



Fun Facts:  
-About 8 to 16 inches in height  
-Linear leaves that branch out opposite sides  
-Source of hay

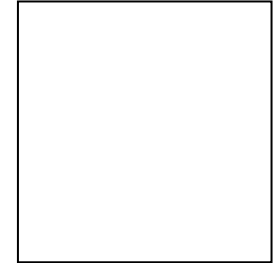


**Draw Salt Marsh Plant Life- Which Plants can you find?**

**Marsh Elder**



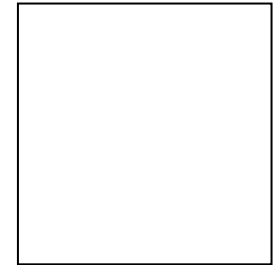
Fun Facts:  
-Reaches 3 to 8 feet in height  
-Yellow or white flowers when bloomed  
-Used as hedge



**Pickleweed**



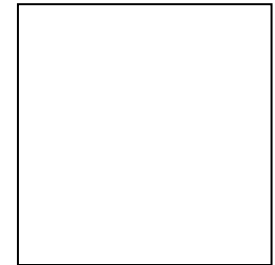
Fun Facts:  
-Thick, green stems with jade colored branches  
-Cannot grow in shade and requires moist soil



**Seaside Goldenrod**



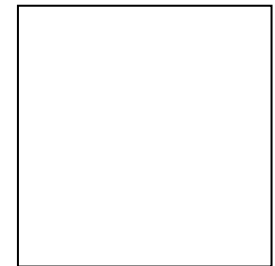
Fun Facts:  
-Large clusters of golden, yellow flowers  
- Leaves are dark green with a long and waxy look



**Saltmarsh Cordgrass**



Fun Facts:  
-Good tolerant of salt water  
-Tall version of plant found in major tidal flooding areas





### **Wrap-It-Up**

To wrap up the activity, teachers and students should re-group and discuss their findings. Students should have a better grasp at what the Salt Marsh is, and they should understand the initial objectives given in the lesson plan. Have students discuss their findings with each other and show what they have completed in the packet. Have students list information that they have gained from the discussion process in the area below. Write down facts, and depict plant life that was not seen (but may have been seen by other students). Use the Sandy Hook Interactive Herbarium Website for further information. Happy Learning!

### **Post-Activity**

Have students create a colorful poster either online or in person to represent their findings. Have them focus on the plant life they have found at the Salt Marsh. They can utilize the Herbarium website and outside sources to build upon their knowledge. Make sure they include the following:

- Background of Sandy Hook Salt Marsh
- Map Interpretation
- Minimum of 4 plant species
  - Images
  - Research
  - Drawing (can be labeled)
  - Are the plants native?
  - Are they edible
  - Are they used for medicinal purposes?
- Explanation of the Salt Marsh System
- Explanation of the pros and cons of the area and the Salt Marsh functions
- Works Cited with information used

Add more requirements to fit the in-class environment and tailor to the students' curriculum.

### **Conclusion**

This activity is very flexible and can be conjoined with other activities on the Sandy Hook Interactive Herbarium Website. Organizations like Girl Scouts and Boy Scouts can also adapt this activity towards an award or badge. It is very simple to alter the information and make it your own.