



## LESSON PLAN: ESTUARINE METAPHORS or HARBOR ESTUARY IN A BOX

### Overview:

Common objects will be used to suggest metaphors representing specific elements the NY/NJ Harbor Estuary.

### Objective:

Following completion of this lesson, students will be able to:

1. Define what makes an estuary and estuary
2. Be able to describe a number of features of estuaries
3. List several distinctive features of the NY/NJ Harbor Estuary and appreciate the value and importance the Estuary makes towards the economic well-being of the region.

### Grade Level:

5<sup>th</sup> - 12<sup>th</sup> grades

### Materials:

Container to hold the following objects: Whisk, small baby doll, toy ship, can of vegetable soup, box of animal crackers, toy bird, bird nest, magnifying glass, bar of soap, toy house, stack of play money, tube of toothpaste, plastic 6 pack ring, paint brush, toy trash can, beanie baby type toy of a zebra.

### Procedure:

Before beginning this activity, review what students know about estuaries and the NY/NJ Harbor Estuary Complex. Also be certain students understand the meaning of metaphor (a figure of speech in which an expression is used to refer to something that it does not literally denote in order to suggest a similarity).

This activity is also well suited to be used as an assessment tool following a lesson/field activity on estuaries and NY/NJ Harbor.

Hand out the items, one at a time, from your container to each student. Then ask each student to explain how their “item” relates to the Harbor Estuary. Possible answers for each item are listed at the end of this lesson plan. Allow students to “brainstorm” together if an individual student is struggling with his or her item.

### Items for Container with Possible Response:

Whisk (kitchen tool used in food preparation to mix ingredients):

Symbolizes of the mixing of fresh and salt water in the Estuary.

Sleeping Doll:

Symbolizes the use of the area as a safe, protected place or nesting ground by wildlife.

Infant Baby Doll:

Symbolizes the use of the area as a nursery and spawning ground for wildlife.

Model Ship:

Symbolizes the Estuary as a place of water transportation for shipping, tourism, recreation, Or commuter travel.

Vegetable Soup:

Symbolizes how the water of the Estuary is like a rich, nutritious soup with many small bits of plants suspended throughout. Also like soup, the water of the Estuary contains salt.

Animal Crackers:

Symbolizes the diversity of animals found in this area.

Bird Nest:

Symbolizes the use of the area as a nesting area and migratory stop-over for a great variety of birds.

Magnifying Glass:

Can symbolize the scientific research that goes on in the Estuary and/or the microscopic plants and animals (plankton) that are in the Estuary's waters.

Soap:

Symbolizes human efforts to clean the Harbor. Also that the estuary often acts as a trap for marine debris and other pollution like phosphates from soap that flows in from the ocean or rivers.

House:

The house symbolizes the fact that the Harbor Estuary provides a bountiful home for humans and wildlife providing adequate food, water, shelter and living space.

Play money:

Can symbolize the rich natural diversity of the area (recall that estuaries are among the richest, most productive ecosystems in the world) or, in, especially in the case of the Harbor Estuary, the huge economic contribution port commerce and shipping means to the region.

Toothpaste:

Symbolizes the many products we get from the sea. Toothpaste has an ingredient known as carrageen. Carrageen is a perennial algae or seaweed also known as Irish Moss or *Chondrus crispus*. It is used extensively in the food and pharmaceutical industries as an emulsifying and binding agent. Toothpaste, ice cream and whipped cream are just a few examples.

Six Pak Rings:

Symbolizes the hazard marine debris can have on local wildlife. Also that people must help keep the Estuary clean. One way is by properly disposing of trash. Six-pak rings should be cut up before disposing

**Paint Brush:**

Symbolizes the beauty the Estuary brings to the area.

**Trash Can:**

Symbolizes how the Estuary becomes a trap for trash from many sources (non-point source and watersheds). Also, importance of the disposal of waste.

**Toy Zebra or other zoo animal:**

Symbolizes the wide variety of goods that are shipped from overseas by containers. Large animals from distant lands like Africa are transported by ship in special containers.

### **Background:**

An estuary is a semi-enclosed coastal body of water where rivers (fresh water) meet the ocean (salt water). The estuary is a banquet of decaying plants, tiny floating plants and microscopic animals called plankton, and little fishes. Millions of sea animals get their start in life feeding on this banquet in the quiet waters of the estuary. They can find shelter in the calm waters of the salt marshes, beds of slender eelgrass, or wide mudflats.

Estuaries have very little wave action, offering calm refuge from the open ocean. Some animals, such as flounder, eels, and striped bass are visitors to our Harbor Estuary, using it as a safe haven for spawning. Small fishes (silversides, sticklebacks, mummichogs) and certain invertebrates (mud snails, oysters, clams) can spend their entire lives there. The calmness of the Estuary has also made it a great spot to locate a port, a place for ships to enter and be received.

The Native Americans knew this was an area of value, as did the area's first major European explorer, Henry Hudson. Since those early times, the Harbor Estuary continues to provide the area with a water link to the world, unparalleled natural areas and a fine place to live, work and play.

The NY/NJ Harbor Estuary has naturally deep, calm water and easy access to the Atlantic Ocean. The Port of NY/NJ is the largest working seaport on the east coast and 3rd largest in the United States. It makes a huge economic contribution to the area. According to a 2004 Rutgers University analysis, the Port of NY/NJ generated 122,550 direct full-time jobs for people living in the region and another 232,900 shipping-related full time jobs for people living in and around the metropolitan area. That translates into roughly 12.5 billion dollars in wages paid and about 6 billion dollars paid to state, local and federal taxes.

The Harbor's waterways provide a means of transportation not just for cargo but also for people. Cruise ships enter our Harbor taking passengers off to exotic vacation destinations. Ferry boats carry hundreds of commuters trying to get to work or home each day and help lesson the traffic on the already crowded roadways of the region.

The Harbor provides numerous and diverse recreational resources such as boating, fishing, sailing and kayaking. Tourism flows into the Harbor with popular sites such as Ellis Island, the Statue of Liberty, historic military places, and unique architecture along the waterfront. Multiple tour boat operators can be seen all around flaunting the area to tourists. Waterfront parks and pathways are popping up all along the Harbor allowing people to escape city streets and adorn the sites of the Harbor and what it has to offer.

The Harbor boasts a rich natural ecosystem. There is a constant misconception that the harbor is largely devoid of life. In reality, it supports a great variety of thriving aquatic species. While it is true the harbor has a past of misuse and abuse, efforts of determination have made a healthier, cleaner harbor. The Harbor ecosystem supports over 260 species of fish, birds, and other forms of wildlife providing permanent homes, temporary nesting or feeding grounds

The resources the Harbor provides have allowed the NY/NJ metropolitan area to grow into the major internationally known site it is today. The opportunities for this Harbor are endless and its resources are all essential in keeping life, including human life, in and around the Harbor alive.



**This lesson plan was developed by the Education Program at the New Jersey Sea Grant Consortium.**  
For complete program information contact the NJSGC at 732-872-1300 or [njseagrant.org](http://njseagrant.org)