



# K-12 Oysters in the Chesapeake Bay

## Grade Level:

Grade 1

## Teaching Time:

2-30 minute sessions

## Materials:

- 2-4 oyster shells per group\*
- At least one shucked oyster
- Chart paper

## Per Student

- ruler or standard unit of measure object, such as a Unifix cube, paper clip or penny
- blank paper (1 sheet)
- pencil and/or markers
- *Oysters on the Half Shell* activity sheet (p. 5)
- scissors
- glue
- various items described in Part 2 below

## \*Teacher Note:

Oyster shells have very sharp edges. Acquire shells that have been worn and have smooth edges to avoid injury.



## Oysters – The Tale of Two Shells

### Activity Summary

Students learn the anatomy of an oyster's shell and the role of the shells in protecting the oyster.

### Learning Objectives

Students will be able to:

- Label the exterior parts of the oyster.
- Explain the importance of the oyster shell in protecting the animal.

### Essential Question

What role do oyster shells play in protecting the oyster?

### Background Information

Oysters, a type of mollusk, are animals that have a soft body surrounded by two hard shells. They live in coastal waters like the Chesapeake Bay. Some oyster species live grouped together on oyster reefs.

Historically, oysters in North America have served many purposes for the inhabitants of coastal areas. Native Americans found oysters to be an abundant and reliable source of food, and they used the shells as

tools, weapons, ornaments and even currency. Today, oyster harvest and cultivation provide significant economic value to regional coastal communities.

In addition, oyster reefs provide habitat for other species, including some commercially important species. They filter the water and increase water clarity by extracting organic and inorganic particles from the water column. In turn, this increase in water clarity promotes the growth of submerged aquatic vegetation, which also provides habitat for other organisms.

However, the loss of oyster reefs in the United States during the past 200 years has been significant. Due to over-harvesting, increased sedimentation, pollution, invasive species and disease, the amount of oyster harvest has decreased dramatically—reducing income and jobs for workers in the oyster industry. But just as important, the loss has removed habitat for other animals and plants and decreased water quality in estuaries and coastal waters.

The NOAA Restoration Center is working to involve citizens and scientists in projects to restore this valuable resource and to understand more about the ecology of oysters, oyster reefs and their functions in coastal waters. For more information, visit <http://www.habitat.noaa.gov/>

### **Key Words**

**Bivalve** - An aquatic mollusk that has a compressed body enclosed within a hinged shell

**Filter** - A device that separates or removes matter

**Hinge** - The joining point of the two valves of a mollusk shell at the anterior end.

**Mollusk** - An invertebrate that has a soft unsegmented body and lives in aquatic habitats and often has a shell.

**Oyster** - Bivalve mollusk with rough irregular shell sometimes eaten as a delicacy and may be farmed for food or pearls

### **Engagement**

Give each student, or small group of students, two oyster shell halves to investigate for several minutes. Have the students draw and write, if appropriate, their observations on Student Response Sheet 1 (What Do I See?). Have the class share their observations and record on a class chart.

### **Exploration**

Part 1:

Tell the students an animal lives inside the oyster shells. Have them manipulate their two shells to determine how the two halves of the oyster shells work together to protect the animal. Have students share their ideas.

Part 2:

1. Show the students a live oyster. Either shuck it or have a pre-shucked oyster available.
2. Have the students observe and touch the mollusk. Note the softness of the mollusk's body. Ask the students if it would be easy for the mollusk to be injured or eaten by prey without a shell. Why or why not?
3. Ask the students to explain how the shell protects the oyster. Give each group some type of delicate item such as a Pringles potato chip.
4. Explain to the students that the item is delicate and can easily be eaten or destroyed.
5. Ask students how they might protect the chip from being eaten or destroyed.
6. Give the pairs or small groups of students various items (such as small milk cartons, cardboard, cotton balls, string, tape, etc.) and have them create a structure that would protect the chip if dropped.
7. Have them test their apparatus by dropping it from three feet in the air. Let them work to improve their structure if needed and repeat the tests.

**Explanation**

Part 1:

1. Explain to students that oysters are **mollusks** that live near coastal shores and that they are not only a source of food, but also help to **filter** water.
2. Explain that oysters have two shells that fit together and are called **bivalves** (bi means two). The two shells connect by a hinge. Have students compare and contrast each side of the oyster shell. Explain that the rough side is the **outer shell** and that the smooth side is **the inner shell**.
3. Discuss the properties of the shell. Include color, texture, and size. How do these properties help the oyster survive? The outside color (mottled grey) blends in with the bottom of the bay (camouflage). The rough texture on the outside gives plants and other animals a place to hook on to grow, adding more camouflage. The smooth texture on the inside is nice for the soft body of the oyster. The hinged shell allows the oyster to open to feed and to close up tight to protect itself. The oyster grows bigger, adding shell each year.
4. Have the students place a shell, outer shell up, on a blank piece of paper and trace the outer edge. Have students label it "outer shell,"
5. Ask the students to measure the height of the shell (measure height the "tall way") in whole numbers using a ruler, Unifix cubes, or a standard unit of measurement, such as paper clip or penny and record. Height is measured from the anterior to the posterior.
6. As a class, create a data chart with each oyster's height. Create a graph from the chart.

Part 2:

1. Send students on a gallery walk to observe each structure that they developed in the Exploration section of the lesson.
2. Ask volunteers to share their structure and process. Have them explain why they chose certain materials to make the structure, how the structure responded to their tests and what modifications they made the structure and why.

3. Relate their structure back to the structure of the oyster shell and compare/contrast parts of the oyster structure with the student made structures.
4. Discuss with the students any patterns they notice in the structures their classmates built. For example, all the students may have used a hard outer layer (milk cartons or other harder materials), soft inner layers for padding (tissue, pom-poms, etc.), and similar ways to keep the outer layer closed (tape, string, etc.)
5. Have student draw and label, if appropriate, their final structure using Student Response Sheet 2 (My Structure).

### **Extension**

1. In their journals, have students write and/or illustrate what they have learned about oysters.
2. Read, *Olly the Oyster Cleans the Bay* by Elaine Ann Allen, or another story describing how oysters filter water. Ask the students to write a story about an oyster and how it helps to clean the water and the bay.
3. Explain that oysters grow in groups (reefs) and once they mature, they do not move. Have students explain the benefits of being a free-swimming and sessile (stationery) organisms.
4. Make a paper oyster (see p. 5).

### **Evaluation**

Formative:

1. Class discussions and participation

Summative:

1. Student Response Sheet 1 (What Do I See?)
2. Student Response Sheet 2 (My Structure)

## Education Standards

<b>Three Dimensional Learning</b>		
<b>Disciplinary Core Idea(s)</b>	<p><b>1-LS1.A Structure and Function</b> All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)</p>	<p><b>How Standard is Addressed</b> Students learn about the external body parts of oysters and their functions.</p>
<b>Science/Engineering Practice</b>	<p><b>Constructing Explanations and Designing Solutions</b> Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <ul style="list-style-type: none"> <li>• Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1)</li> </ul>	<p>Students learn about the structure of the oyster and how the shell protects the mollusk inside the shell. Students then apply that information to constructing a structure to protect a soft object.</p>
<b>Cross – Cutting Concepts</b>	<p><b>Structure and Function</b> The shape and stability of structures of natural and designed objects are related to the function(s).</p>	<p>Students learn about the external body parts of oysters and their functions. They apply the same concepts to constructing a structure to protect a delicate object.</p>
<b>Common Core Standards</b>		
<b>Ties to Common Core</b>	<p><b>SL1-1b</b> Build on others’ talk in conversations by responding to the comments of others through multiple exchanges</p> <p><b>SL1.1c</b> Ask questions to clear up any confusion about the topics and texts under discussion.</p>	<p>Students discuss the construction of their structures, respond to questions about the structures, and compare/contrast their structure with those of an oyster.</p>

	<b>SL1-5</b> Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.	Students make drawings of their structures.
<b>Maryland Environmental Literacy Standards</b>		
<b><i>Ties to MD Environmental Literacy Standards</i></b>	<b>Standard 7:</b> Environment and Society <b>Topic A:</b> Environmental Quality <b>Indicator:</b> Investigate factors that influence environmental quality.	Students learn that the Chesapeake Bay is part of the environment and pollution is diminishing the quality of the water.

## Additional Resources

### Web Resources

#### Protecting Our Water Resources: Student Activities for the Classroom

Water and educational activities for Kindergarten through Ninth Grade

[http://www.stormwater.ucf.edu/toolkit/vol3/Contents/pdfs/Student%20Activities/student\\_activities.pdf](http://www.stormwater.ucf.edu/toolkit/vol3/Contents/pdfs/Student%20Activities/student_activities.pdf)

#### Olly the Oyster

Visit this website for coloring pages, puzzles, word searches, crafts, and more.

<http://www.ollytheoyster.com>

#### Sammy's Corner: An Oyster Recycling Program

Visit this site for some great teacher resources all about oysters. Download a poster, curriculum guides, and a wealth of oyster activities.

<http://oysterrecycling.org/sammys-corner/>

### Book Resources

Allen, Elaine Ann. *Olly the Oyster Cleans the Bay*. Tidewater Publishers, May 1, 2008. ISBN-10: 0870336037.

Tate, Suzanne. *Pearlie Oyster: A Tale of an Amazing Oyster*. Nags Head Art, Inc., June 1, 1989. ISBN 10: 0961634472.

Name \_\_\_\_\_



## What Do I See?

**Draw the oyster shells you have.  
Add as many details as you can.**

A large, empty rounded rectangular box with a thick black border, intended for the student to draw their oyster shells.

**What did you observe about your oyster shells?**

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Name \_\_\_\_\_



# My Structure

**Draw a picture of your structure.**

**Add as many details as you can.**

**Describe your structure.**

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