



K-12 Oysters in the Chesapeake Bay

Grade Level:
Kindergarten

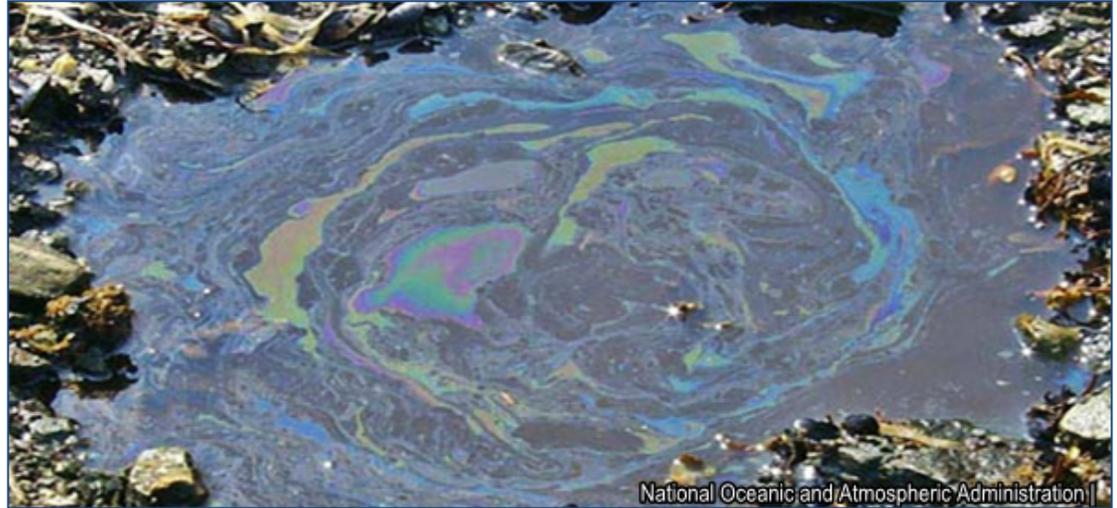
Teaching Time:
2-20 minute sessions

Materials:

- Clear tub or basin
- Clean tap water
- Clear plastic cups (2 per student group)
- Rubber bands (1 per student group)
- Filtering materials (coffee filter, cheesecloth, etc.)
- “Pollutants” for example:
 - Food coloring
 - Pieces of plastic grocery bags
 - Pencil shavings
 - Foam peanuts
 - Student response sheets 1 & 2

Teacher Note:

This activity can be used as an introduction to how oysters filter the Chesapeake Bay.



From Dirty to Clean in 15

Activity Summary

This activity teaches students about water pollution and cleaning polluted water with filters. Oysters filter nutrients out of water and clean water at the same time.

Learning Objectives

Students will be able to:

- Explain the importance of clean water to living organisms.
- Explain how oysters clean water.

Guiding Question

What role do oysters play in cleaning the water of the Chesapeake Bay?

Background Information

To survive, all living things must have clean water. Unfortunately, people do things every day that make water dirty and unsafe. They pollute the water by doing things such as throwing trash on the ground that gets into the rivers and streams and putting chemicals on their yards that runs off into the sewers. Polluted water (dirty water) affects the health of plants and animals. Very polluted water can even make them sick and in extreme case, cause death. Therefore, it is very important to prevent pollution. However, when there is pollution, filters can help remove some pollutants. Nature creates its own filters,

such as undisturbed soil, sand and oyster beds. Scientists also create filters to clean water. For example, a drinking water treatment plant uses sand filters. Other filters, like silt screens and straw bales, are used for construction sites.

Key Words

Filter – A device that separates or removes matter

Oyster – A sea creature with a rough irregular shell sometimes eaten as a delicacy that is often farmed for food or pearls

Pollution – Something that is harmful to living things

Activity Procedure

Day 1

Engagement

Put a clear tub of water where all the students can see it. Let students add food coloring, foam peanuts, pieces of plastic grocery bags and other materials to the water. Ask the students what they have done to the water. Guide them to understand that they created pollution in the water.

Exploration

Ask the students if they would like to go swimming in the polluted water they created. Why or why not? Then ask if they think a fish or a crab would like to swim in the water, why or why not? Discuss why clean water is important for them and other living things.

Day 2

Engagement

Give the students oyster shells to investigate for several minutes. Ask them to share what they observe, and then ask if they know what the shells are. Ask them to share what they know about oysters.

Exploration

1. Tell the students that it is time to clean water they polluted, and ask them how they would do it. Then ask how they would clean the water if they could not put anything into the water (hands, nets, tongs, etc.). Try the different ways they suggest (as much as feasible) and have them evaluate the results. Guide them to the idea of a filter. To help them understand, you can discuss how a fish tank filters/cleans water, how they sift sand in the sandbox, or how their parents keep the coffee grounds from going into the cup when they make coffee or keep the tea leaves out of the water when they make tea.
2. Scoop out several cups (one per group of students) of polluted water from the tub. Cover each polluted cup with one of the filtering materials, secured with a rubber band. Divide the students into small groups and have each group pour the polluted water into an empty clean cup (over the tub of water). Ask them to describe what is happening.

While each group is pouring the water with the teacher, the rest of the class can draw what the cup of polluted water looks like on the Student Response Sheet 1.

Explanation

1. Ask the class to explain what happened with they poured the polluted water through the filter into the clean cup. Have them describe what the cups looked like after the pouring and discuss what the filter did (blocked the pieces, took some of the food coloring out of the water, etc.). Have them draw what the cup looked like after they poured out the water and explain in writing, or orally, what happened and how the filter worked.
2. Explain that there are water filters in nature and the owners of the shells they looked at are very good at filtering and cleaning water. Show the students a live or shucked oyster so they can see the animal. Oysters eat tiny floating plants and animals. Explain that oysters suck in water, filter the water to get their food as the water flows through their body, and then spit clean water back out. One oyster can clean half a gallon of water in 15 minutes. The thousands of oysters that were in the Chesapeake Bay long ago kept the water clean, but now there are not enough. People try to clean the Bay water, but oysters are the pros. That is why people of all ages are helping oysters grow in the Bay again.

Extension

1. Send home the Student Response Sheet 2. Discuss with the class when returned to school. Make a chart with two columns. In the first column, list, with the class, the different types of filters used in class and those found at home. In the second column, list the results when they poured water or other items through filters at home. Help the students understand that successful filters remove unwanted items. Ask them why each one was a good filter. This helps them see a pattern in the activity.
2. Put together a box of small toys or other items and show it to the students. Then dump a couple tablespoons of Cheerios, sand, etc. into the box, and show it again. There should be an obvious size and shape difference between items in the box and the material to be filtered. Ask the students to design a filter to remove the Cheerios, but keep the other items in the box. They should draw their design and write about how it works if possible. Have them share the inventions with the class.
3. Read, *Ollie the Oyster Cleans the Bay*, by Elaine Ann Allen, or another story describing how oysters filter water. Ask the students to draw a picture or write a story about how an oyster helps to the water/bay.

Evaluation

Formative:

1. Class discussions and participation

Summative:

1. Student Response Sheet 1 (Classroom filtering investigation)
2. Student Response Sheet 2 (Take home investigation)

Education Standards

Three Dimensional Learning		
Disciplinary Core Idea(s)	<p>K-LS1.C Organization for Matter and energy Flow in Organisms All animals need food in order to live and grow. They obtain their food from plants or from other animals. (K-LS1-1)</p>	<p>How Standard is Addressed Students learn how the oyster filters water to gather its food.</p>
	<p>K-ESS2.E Plants and animals can change their environment.</p>	<p>Students learn how oysters change the polluted water of the Chesapeake Bay to clean water.</p>
Science/Engineering Practice	<p>Analyzing and Interpreting Data Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)</p> <p>Engaging in Argument from Evidence Construct an argument with evidence to support a claim. (K-ESS2-2)</p>	<p>Students list the results of each filter trial and are guided to see a pattern (good filters remove unwanted items).</p> <p>Students use evidence from testing each filter to explain what makes a filter.</p>
Cross – Cutting Concepts	<p>Patterns Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.</p>	<p>Students view, discuss, and use multiple types of filters in use to understand that successful filters block and/or remove substances.</p>
Common Core Standards		
Ties to Common Core	<p>ELA/Literacy Writing (W) 2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.</p>	<p>Students view, discuss, and use multiple types of filters in use to understand that filters block and/or remove substances from water.</p>
Maryland Environmental Literacy Standards		
Ties to MD Environmental Literacy Standards	<p>STANDARD 7: ENVIRONMENT AND SOCIETY Topic A: Environmental Quality Indicator: Investigate factors that influence environmental quality.</p>	<p>Students learn that the Chesapeake Bay is part of the environment and pollution is diminishing the quality of the water.</p>

Resources

Web

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

Olly the Oyster

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

<http://www.ollytheoyster.com>

The Water Project

The Water Project is dedicated to providing clean, safe water to people in the developing world. Lesson plans provided for pollution and filtration experiments.

http://thewaterproject.org/resources/water_pollution_filtration_experiments.asp

Books

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

Bullard, Lisa and Xin. *Watch over Our Water*. Lerner Pub Group, September 1, 2011. ISBN-10: 0761385177.

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

Name _____



Cleaning Our Water



Before



After



A large, empty rounded rectangular box with a black border, intended for a student to draw or write their response.

Seven horizontal lines spaced evenly down the page, providing a space for a student to write their response.



Name _____

Is it a filter?

Look around your house for three items that could be filters. Draw and label a picture of each one in the boxes. Then test each one by pouring water through it. Mark yes or no.

1.

Did it filter the water?

Yes

No

2.

Yes

No

3.

Yes

No

Which was the best filter? Why? Tell your answer to someone and have them write it.
