

Ways of the Bay



Water always flows to the lowest place. In many parts of the United States, that lowest place is a bay.

The Approach

Billy utilizes comprehensive sensory integration through song, dance, audience participation and a multi-dimensional backdrop to engage performance attendees in a journey into the "Ways of the Bay". Scientific concepts are presented in an accurate manner with an emphasis on the human connection to the bay environment as well as the school's watershed.

Estuaries, erosion, nutrient loading and runoff are all explored as Billy B. leads the audience on an excursion into the world of the bay and watersheds. Participants come away with a new appreciation of the abundance of life in the bay as well as the important role it plays in their own lives and positive actions they can take to preserve it.

Suggested Pre-Performance Activities

1. Display a map that includes; Maryland, Virginia, Pennsylvania, New York and the District of Columbia. Have the students locate the town or city they live in and/or go to school in on the map. Ask students if they live in or go to school in an area that is within the Chesapeake Bay watershed?
2. Have students draw a picture of the Chesapeake Bay and its tributaries including the name of each tributary.
3. Have students identify and list the number of ways that humans use the Chesapeake Bay.
4. Have students investigate and identify the number of different animals, birds and fish that live in the Chesapeake Bay habitat.

The Objective

Students will make a connection between themselves and the bay as they learn about algae, oxygen levels, the differences between fresh and salt water and much more. An awareness of what can be done to enhance the health of the bay will develop.

Students in grades 3-6 will delve deeper into the bay and explore ecosystem interactions. The vital role of nutrients, decomposers, phytoplankton, and more will be recognized and appreciated.



The Result

Feedback from the teachers, administration, and finally, the students proves "Billy B" is phenomenal! I've never seen our 4yr. olds so attentive and engaged. Our older students will have a better understanding of the science of the bay and hopefully be able to draw on some of what they learned today during MSA testing.

PTA Representative

Ways of the Bay In the Classroom

Vocabulary Words

airshed - a region sharing a common flow of air, which may become uniformly polluted and stagnant or the area that creates particulate matter, spews it into the air, where it can end up in a bay or other body of water.

algae - a photosynthetic organism that lives mainly in water. Algae differ from plants in not having true leaves, roots, or stems.

anoxia - an inadequacy in oxygen levels.

brackish water - somewhat salty, especially from being a mixture of fresh and salt water.

conservation - the preservation, management, and care of natural and cultural resources.

decomposition - to break down organic matter from a complex to a simpler form, mainly through the action of fungi and bacteria.

erosion - the gradual wearing away of rock or soil by physical breakdown, chemical solution, and transportation of material, as caused, e.g. by water, wind, or ice.

estuary - the wide lower course of a river where the tide flows in, causing fresh and salt water to mix.

filtration - the process of passing or putting something through a filter, e.g. water is filtered as it passes through soil.

habitat - the natural conditions and environment in which a human, plant or animal lives.

nutrient loading - quantity of nutrients entering an ecosystem in a given period of time. For example; the amount of nitrogen or phosphorus entering a body of water during a given time, such as "tons of nitrogen per year." Nutrients may enter the water from

runoff, groundwater, or the air (in the form of wet deposition such as rain or snow as well as dry deposition).

oxygen - a colorless odorless gas that is essential for plant and animal respiration.

phytoplankton - very small free-floating plants, e.g. one-celled algae, found in plankton.

runoff - (a) rainfall that does not soak into the soil but flows into surface waters. (b) agricultural or industrial waste products that are carried by rainfall and melting snow into surface waters.

sewage - human and domestic waste matter that is carried away through sewers.

watershed - the land area that drains into a particular lake, river, or ocean.

zooplankton - plankton that is made up of microscopic animals such as protozoans.



Post Performance Activities

1. Performing Arts; Have the students write a play about living in the Chesapeake Bay watershed illustrating the affect humans have on the bay and ways to help keep it healthy.
2. English; Students can write to their Congressmen, Delegates, County and City Councilmen requesting that they support programs to help the bay.
3. Community Service; Students can start a "litter brigade" to make sure that storm drains and sewers in their neighborhoods and around their school are clear of debris that will end up in the bay.
4. Science; Have students list and discuss the many things they can do each day to conserve energy.
5. Math; Using a specified amount of water have students estimate the amount of water that is wasted by the 17,000,000 people living in the watershed during normal daily activities, such as brushing teeth and washing cars. Students can investigate the different water conservation methods available and the also estimate the amount of water saved using these methods.

Teacher Resources

1. Billy B's CD entitled "The Ways of the Bay" features all the songs from the video, "It's Happening Today on the Chesapeake Bay," plus 4 new melodies. Preview and/or purchase this energetic and informative CD that has become a favorite of children, parents and teachers at <http://billybproductions.com/> . Click on Store, Purchase CD's, then *The Ways of the Bay*.
2. Billy B's video entitled "It's Happening Today on the Chesapeake Bay" is a highly informative, accurate and creative video which offers a better understanding of how a watershed works with a focus on the Chesapeake Bay and surrounding watersheds . Watersheds, estuaries, erosion, water quality and ecological interactions are among the concepts explained in song, dance and comical skits. For ages 6-11.
Purchase this video at <http://billybproductions.com/> . Click on Store, Purchase Videos, then *It's Happening Today on the Chesapeake Bay*.
3. Contact the Chesapeake Bay Foundation for information about programs and free materials available for your class and field trip outings. (301) 268-8816.
4. The Echo Hill Outdoor School offers educational boat charters and other experiential programs.

Call for more information (410) 348-2001.

5. Many free materials are available through the Governor's Chesapeake Bay Office, (410)974-5300.

6. "Hands On! Feet Wet!, A Book of Aquatic Projects and Resources," compiled and edited by the staff of Echo Hill Outdoor School, \$9.95 available by calling (410) 348-5880.

7. "Awesome Chesapeake, A Kid's Guide to the Chesapeake Bay," by David Owen Bell, Tidewater Publishers for 4th and 5th grades. Available by calling 1-800-638-7641.

READING MATERIALS

1. Blackistone, Mick, *The Day They Left the Bay*.
2. Blackistone, Mick, *The Buffalo and the River*.
3. Pringle, Laurence, *Estuaries Where Rivers Meet the Sea*.
4. Sharpe, Susan, *Waterman's Boy*.

National Science Education Standards

Ways of the Bay conveys connections to the following standards:

Science as Inquiry

_The dispositions to use the skills, abilities, and attitudes associated with science

_Understanding of scientific concepts

Physical Science

_Properties of objects and materials

_Position and motion of objects

_Properties and changes of properties in matter

_Motions and forces

_Transfer of energy

Life Sciences

_ Characteristics of organisms

_ Life cycles of organisms

_ Organisms and environments

_ Structure and function in living systems



- _Populations and ecosystems
- _Diversity and adaptations of organisms

Personal and Social Perspectives

- _ Types of resources
- _ Changes in environments
- _ Characteristics and changes in populations
- _ Populations, resources, and environments
- _ Personal Health
- _ Risks and benefits

Science and Technology

- _ Abilities to distinguish between natural objects and objects made by humans

National Research Council. *National Science Education Standards*. Washington, D.C.: National Academy Press, 1996.