

Importance of Wetlands (Grades K-5)

Objective: Students will create a model of a watershed to discover the impact of non-point source pollution and human activities on watershed habitats, wetlands and the ocean. Furthermore, students will demonstrate how wetlands are important at controlling runoff, trapping pollution and protecting against ocean storms.

California State Standards:

Science: K: 3.b, 4.c. **1st:** 4b, 4d. **2nd:** 4.g. **3rd:** 3c, 3d, 5d. **4th:** 3a, 3b, 5c. **5th:** 6h

English Language Arts:

- **Listening & Speaking: 4th:** 2.2a, 2.2b, 2.2c. **5th:** 2.2a, 2.2b, 2.2c

Background: Wetland areas, like estuaries, are vital for healthy ecosystems by helping to protect our oceans from the impacts of nature and humans. Plants that grow in the wetland can tolerate flooding from salt water and are effective storm buffers because they dissipate wave energy and soak up tidal surges. Wetland plants also serve as a defensive against the erosive power of tides because they have deep roots that hold soil in place. Watershed 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. Watershed plants help to handle pollutants in several ways. Estuaries can take up and filter the pollutants while others settle into the soil and are chemically reduced over time. More are processed by bacterial action. When estuaries 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, estuaries are capable of absorbing and holding large quantities of water for use by wildlife in times of drought.

Materials:

- Sponges
- Ticky tac
- Small Homes
- Painting roller pan
- Potting Soil
- Water
- Large cup
- Glitter

Procedure:

Grades K-2

1. Discuss the causes of water pollution and the possible origins of litter found on the beach, riverbank or wetlands area. For the younger students, create a watershed

- diorama as a class and discuss the causes and effects of wetland degradation and pollution.
2. The roller pan represents a watershed: the top being land and the bottom being the ocean. Using small amounts of tacky tac, secure a few homes half-way down the sloping “watershed.”
 3. Using the large cup, pour water into the top of the “watershed” and see what happens. Where does the water go? Directly into the ocean (remember that a wetland is any area of land where all the water in it drains down into one location – in this case, the ocean).
 4. The sponge represents a wetland. Place the “wetland” at the base of the slope on the “watershed,” below the homes and just before the “ocean.” Slowly pour water at the top of the “watershed” and see what happens. Where does the water go now? The “wetland” slows the flow of water into the “ocean,” keeping habitats and homes on land from being washed away.
 5. Take away the “wetland” and pour a small layer of water into the “ocean.”
 6. Simply using your hand, splash around in the “ocean” to make waves. What happens to the ocean water; where does it go? Directly onto the land, potentially washing away any habitats or homes that are built near shore.
 7. Now replace the “wetland” and repeat your “wave action.” Where does the water go now? The wetland helps to absorb the “ocean waves” and protect the homes farther up shore.
 8. Remove the “wetland” and add a thin layer of soil to the slope of the “wetland.”
 9. Slowly pour a cup of water at the top of the slope. Where does the soil go? Directly into the ocean. Without a wetland, there is nothing to catch sediment and runoff. By demonstration, wetlands prevent coastal waters from being inundated with sediment that could smother marine animals and plants.
 10. Now, empty out the “soiled ocean” and return the “wetland” to the “watershed.” Add more soil to the top of the slope and pour another cup of water into the “watershed.” What happens to the soil this time? The “wetlands” catch the soil and keep much of it from entering into the “ocean.”
 11. Lastly, wash out the soil and remove the “wetland.” Add some glitter (which represents pollution) to the water and pour it slowly into the top of the “wetland.” What happens to the “pollution?” It flows directly into the ocean.
 12. Now, return the “wetlands” to the “watershed” and add more “polluted water” to the wetland. What happens to the pollution now? Wetlands help trap pollution and keep it from entering areas where it will be more harmful, like the ocean. Furthermore, certain types of plants and animals found in a wetland actually utilize nutrient pollution for their own growth. In this way, wetlands also help to remove some forms of pollution from the environment.

Grades 3-5

Allow students to work in groups to create their own watershed diorama and perform the experiments on their own. For added effect, provide materials for the students to make a road, houses and birds. Go outside and allow students to collect branches and twigs to add “plant life” to their diorama. As a class, discuss the causes and effects of wetland

degradation and pollution. What solutions can the students come up with to protect the wetlands and prevent further pollution?

