

# Wetland in a Pan: Model Lessons

## Grades 2 – 6

### Two 45 minute science activities

#### Objectives

- Students will describe the importance of wetlands in flood control.
- Students will appreciate the wetlands ability to serve as a filter.
- Students will explain the wetlands role in controlling erosion.
- Students will value the role of the wetlands as a habitat.

**Vocabulary** wetland, erosion, sediment, pollutants, habitat

#### Background

Wetlands perform many valuable functions. They are homes to many species of animals. Fish, birds, mammals, amphibians, insects and reptiles make their home in the **wetland habitat**. At least 20 animals are endangered or threatened species including the brown pelican, black bear and whooping crane. In addition to year round inhabitants, migratory birds spend time in the wetlands of Louisiana. Wetlands serve as a nursery for the youngest of the species, providing protection and nutrition.

Wetlands serve as a **filter** to preserve good water quality in the coastal zone. Wetlands filter water by removing chemical pollutants such as nitrogen and phosphorous from fertilizer, reducing their spread into groundwater, lakes and streams.

Wetlands protect the coast by serving as a **buffer zone** between storm waves and the coastline. Research has shown that for every 2.7 miles of healthy wetlands, storm surge is reduced by one foot. Wetlands serve as a natural **flood control** by absorbing and slowing floodwaters and reducing damage caused to the shore.

Healthy wetlands help **control erosion** and hold together the banks of coastal lakes and dunes and beaches of barrier islands.

#### DAY 1

##### Anticipatory Set

(5 min)

TTW use a KWL chart to write down what students **K**now about wetlands. Then TTW ask students what they **W**ant to know. TTW show students a photograph or painting of a wetlands scene and discuss the role of the wetlands with students. This may be a review from an earlier lesson, or part of a discussion of different types of habitats.

### Activity 1

(20 min)

TTW demonstrate how wetlands help protect the coast using a model on a cork board.

1. Attach or draw a map of Louisiana's coastline to the top of a rectangular cork board.
2. Place push pins in the cork around the coast.
3. Place the cork board on a flat surface.
4. Give each student a pin and have them place them along the coast as well.
5. Set a ping pong ball at the far edge of the cork board, opposite the "coast."
6. Tilt the board so that the ball rolls towards the "coast."
7. Ask the class to make observations about what happened to the ball.
8. Tell the class that the ball is like a storm or big wave and that the push pins are like the wetlands. They protect the coast from damage and erosion.
9. Ask students to remove their pins a few at a time (first 5 students, then 5 more, etc.)
10. After each set of pins are removed, let the students tilt the board again and roll the ball toward the "coast."
11. Ask students what happens when there are no wetlands to protect the coast.
12. Ask students what they have learned about wetlands and add comments to the KWL chart.

### Activity 2

(15 min)

TTW demonstrate how wetlands help with flood control by building a wetlands model in a pan. This can be demonstrated by the teacher or directions can be handed out to small groups of students.

1. Spread modeling clay in one side of a metal cake pan so that the clay reaches the edge of the pan and slopes down. This represents land.
2. Make sure to smooth the clay down at the edges to create a seal.
3. Place a cut piece of carpet or florist's foam so that it is attached to the clay (land) and fills about  $\frac{1}{4}$  of the rest of the pan. This represents wetlands.
4. Add fresh water to the remaining portion of the pan.
5. Ask students to identify what the clay, carpet and water represent. (land, wetlands, Gulf of Mexico)
6. Ask students what they think will happen if there is a heavy rainfall. Let students make predictions.
7. Ask one student to "rain" on the model using a watering can to pour about 1 cup of water on the model.
8. Ask students where the water went. Were the predictions correct?
9. Remove the "wetland" and squeeze out the excess water into a clear container.
10. Ask students what would happen if the wetland was not there.
11. Say, "Let's see what would happen." With the "wetland" still removed from the pan, ask a student to pour water over the model.
12. Ask, "What happened this time? Did water fill the Gulf at the same speed? What happened to the land?"

## **Closure**

(5 min)

Ask students what role wetlands plays in flood protection and record answer on the Learned section of the KWL chart. Wetlands allow flood waters to pool in already wet places and protect residential areas from flooding. Wetlands slow down water as it passes through, reducing damage to homes, businesses and roads. Tell students that we will look at other ways that wetlands are important to us in our next lesson.

## **DAY 2**

### **Anticipatory Set**

(5 min)

Look at the KWL chart and ask students if there are more things that they wanted to learn about wetlands. Tell them that today we are going to look at how wetlands work as a filter.

### **Activity 1**

(20 min)

Using the wetland in a pan model from the previous lesson, with the “wetland” replaced, TTW demonstrate how wetlands serve as a filter.

1. Ask the class what kinds of pollution might be found in soil. What happens to those pollutants? (Nitrogen and phosphorous from fertilizer used in farming washes into rivers and streams. Wetland plants help remove these pollutants, preventing them from getting into ground water.)
2. Sprinkle a small amount of red Kool-Aide onto the “land.”
3. Ask students to make a prediction of what will happen to these pollutants when it rains. Students may write down predictions or just discuss.
4. Ask one student to “rain” on the pollutants using the watering can over the “land.”
5. Ask, “What happened? Were your predictions correct?”
6. Remove the “wetland” and squeeze it out over a clear container. Did the wetlands trap some of the pollutants?
7. Repeat this activity without the “wetland” in place.
8. Ask, “What do you think happens to these pollutants that the wetlands absorbed?” Wetland plants absorb nutrients from the fertilizers and wetland soil breaks down some of the chemical pollutants into less hazardous compounds.
9. Ask students to make observations and add new knowledge to the KWL chart.

### **Activity 2**

(10 min)

This activity demonstrates how wetlands act as a storm buffer and help control erosion.

1. Ask students what happens to land when water from bayous, lakes and rivers flows against it. How do people preserve their land when it abuts water? (Some people plant trees and vegetations, some build bulkheads with sand or rocks).
2. Use the wetland in a pan model without the “wetland.” Place mud along the banks of the “land.” Ask students to predict what will happen when waves from the “Gulf” runs into the soil.
3. Create waves by holding an electric fan over the “Gulf” water in the pan. The mud will wash into the “Gulf” simulating erosion.

4. Ask students what would happen if the “wetlands” were in place. Repeat the activity with the carpet back in place. Does this prevent erosion? No, but the wetlands buffer the waves so that erosion is not as severe.
5. Write new knowledge on the KWL chart.

### **Closure**

(5 min)

Using the KWL chart as a basis, review each of the functions of the wetlands that were explored in these lessons. Ask students to recall what happened with and without the wetland in place.

### **Materials**

KWL chart  
Cork board (2' x 4')  
Ping pong ball  
Push pins  
Paper map or drawing of Louisiana coastline

Large baking pan  
Scraps of indoor/outdoor carpeting OR florist's foam  
Clay or play-doh  
Watering can with sprinkler  
Empty clear container  
Spray bottle  
1 cup of soil  
Hand held electric fan  
1 packet sugar free Kool-Aide (or similar)

### **Evaluation**

Assign students to write a passage in their science journal and this writing assignment to be graded. Students can give a class presentation on one or more of the functions of wetlands. Students can prepare a checklist to see if their predictions were correct.

### **Accommodation**

Each activity can be set up in a station and students can move from one station to the other. Students can work in small groups and complete all activities, or each group can complete one aspect of this lesson and report back to the class. Models of wetlands can be more elaborate, using q-tips, sticks, Spanish moss or other materials to create a more realistic natural environment.

### **Extension**

Ask students to research different animals that live in wetlands.

Adapted from “A Schoolhouse View of the Estuary: The Teachers’ Companion to Louisiana Wetland Education” from the Barataria Terrebonne National Estuary Program in partnership with the Coastal Wetland Planning, Protection and Restoration Act.