



The Messy Meter

Recommended Grades:  
**3-5**

Estimated Time:  
**45 minutes**

Subject:  
**Environmental Science**

## WHAT YOU'LL NEED

### PANTRY STAPLES:

- Modeling Clay
- 2 cup Measuring Cup
- 1 cup Measuring Cup
- Measuring Spoons
- Italian Dressing (or combine ½ tablespoon cooking oil, ½ tablespoon vinegar, and 1 teaspoon of dried spice mix)

### SPECIALTY SUPPLIES:

- Paint Tray
- Bio-degradable Paint Tray Liner
- Register Vent Filters/Glass Wool (as an alternative collect and use natural materials from outside, such as pine straw, sand, or mulch).
- Activated Charcoal (available at pet store), rinsed to remove dust.
- Aquarium Gravel (rinsed to remove dust).

## Wonderful Wetlands, Nature's Filter

Wetlands are vital to healthy ecosystems. In this activity, participants will learn how wetlands improve water quality in rivers and oceans. Kids will use common materials to construct their own model wetland, and through hands-on experimentation, will illustrate how pollutants are naturally removed from runoff water before they enter rivers and oceans.

## STEPS

1. Place paint tray liner in the paint tray.
2. Use 1 block of modeling clay to create a levee at the bottom of the slope of the paint tray liner (at the bottom of the slope and above the paint reservoir.)
3. First, use 2 tablespoons of activated charcoal (carbon stored in the earth), next, 1 cup of aquarium gravel (rocks and stones on the earth's surface), and last, a vent filter (simulated vegetation) to create the simulated wetlands area. Fill the larger measuring cup with 2 cups of clean water. Add 1 tablespoon of Italian dressing to the 2 cups of clean water in the measuring cup.
4. Slowly pour the salad dressing/water mixture across the top of the slope and observe what happens as it runs downward to the levee and reservoir. (The spices in the salad dressing simulate debris and other large pollutants, while the oil will simulate grease and oil runoff from roads and parking lots.)
5. Record your observations of the water as it filters through your wetland. Also observe and record what you notice about the water collected in the reservoir below the levee.

If you don't have Italian dressing, combine ½ tablespoon cooking oil, ½ tablespoon vinegar, and 1 teaspoon of dried spice mix.

## BONUS FUN!

Try different combinations of materials to simulate different areas of the wetland, with some areas having more vegetation, some more gravel, etc. Collect the water in the reservoir and pour it through the wetland again. Observe and record what you see this time.





---

## QUESTIONS TO ENGAGE YOUTH

1. How do wetland areas play an important role in keeping our environment healthy?
2. What did you observe about the water after it passed through the wetland? Did it go through more easily in some areas, and if so, why?
3. What pollution was easiest for the wetland to filter out? What was most difficult? What kinds of things do you think might enter our waterways that these are like? How easy or hard would it be to filter out candy wrappers, plastic cups, or shopping bags?
4. What would happen if too many pollutants were in the water flowing through the wetland?
5. Were you able to collect two full cups of water after the first trial? Why or why not?

## EXPLANATION

Wetlands are important regions of the planet because they serve as the interface between water and land. According to the U.S. Fish and Wildlife Service, there are 107.7 million acres of wetlands in the 48 contiguous United States. Additionally, there are an estimated 170 - 200 million acres of wetlands in Alaska and 52,000 acres of wetlands in Hawaii (U.S. EPA). This is a tremendous amount of land, but its ecological function is largely not understood by the general public. Each of these wetland areas is unique and provides a vital ecological function in terms of preserving water quality and, in coastal regions as a defense against erosion caused by higher sea levels and tropical storms.

An understanding of the role wetlands play in the global ecology is paramount to developing sound water management and land use policies. Healthy wetlands not only serve to filter out pollution from water runoff, but also provide animal habitat, recreational opportunities and serve as natural storehouses for carbon that would otherwise be oxidized into the atmosphere. Furthermore, with predictions of rising sea levels due to global climate change, wetlands provide an important layer of protection for populated coastal areas.

## CAREER CONNECTIONS

**Wetland Scientist:** Wetland scientists work in wetlands assessing their health and factors influencing wetland conditions. They collect soil samples, survey land, and use scientific data analysis to study and report on wetlands.

Source: [environmentalscience.org/career/wetland-specialist](http://environmentalscience.org/career/wetland-specialist)

**Wetland Delineator:** Wetland delineators determine boundaries for wetlands to protect them during development and construction. They study the area and create detailed reports on the contents of the wetlands.

Source: [thompsonwetlands.com/what-is-wetland-delineation-.html](http://thompsonwetlands.com/what-is-wetland-delineation-.html)

**Environmental Engineer:** Environmental engineers are skilled in data science, engineering, and biology and use these skills and others to help businesses and governments make decisions that help the environment and people.

Source: [careerexplorer.com/careers/environmental-engineer/](http://careerexplorer.com/careers/environmental-engineer/)

## REFERENCES

Dahl, T.E. 2006. "Status and trends of wetlands in the contiguous United States 1998 to 2004". U.S. Department of the Interior; Fish and Wildlife Service, Washington, D.C., 112 pp.

---

Brought to you by:



Find this and other great STEM activities at [Shop4-H.org/STEM](http://Shop4-H.org/STEM)