Water Pollution (Environmental Degradation)

FRAMEWORK

I. Scientific and Engineering Practices 2, 3, 4
II. Cross-Cutting Concepts 4, 5
III. Physical Sciences LS2, ESS2, ESS3

SKILLS/OBJECTIVES

- Learning about the interconnectedness of the natural world, and its delicate balance.
- Understanding threats to the balance of nature, such as ecological problems, and how they manage to effect entire ecosystems, not just isolated segments.
- Garnering an appreciation for being a part of the world we live in, developed from demonstrating that human actions directly influence the natural things (plants/animals) that we all know and love
- Learning basic techniques of environmental clean-up and rehabilitation

MATERIALS

- Small cups for everyone
- One big water container
- Water
- Food coloring
- Feathers
- 1 aluminum pie pan half-filled with water
- A medicine dropper full of used motor oil (or vegetable oil, or most oils really…)
- Cotton balls
- Nylon
- Paper towels
- String
- Liquid detergent

NOTES
Things certainly have the potential to get messy. Lot of water could be spilt. Oil may be tough to work with as well.
Activity could run too short. But I expect students could take quite a long time on the oil spill exercise. In my experience, the first activity takes about 20-25 minutes with a good solid explanation.

BACKGROUND

- The air we breathe, the water we drink, and the food we eat is all part of the world we live in. Plants and animals also need these things.
- When we pollute—throwing garbage on the ground, pouring bad things in the water—we are hurting not only plants and animals, but also ourselves.
- Where does the water we drink come from? How do our actions effect water quality?
- The natural world is very sensitive to disturbances; when we harm the environment, we need to try and fix it.
- What are some sources of pollution? What are the ways in which we harm the environment? How can we change this?

Activity #1	**Water Pollution**
Materials	-Small cups for everyone -One big water container -Water -Food Coloring
Worksheet	N

- Where does our water come from? Discuss water cycle, rivers and lakes, reservoirs, aqueducts, and pollutants in every step. What are some sources of pollution you've seen?
- Pour everyone small glasses of water
- Pour a sizeable amount of food coloring into the large bucket of water as a simulation for a pollutant—explain and discuss types of pollutants.
- Pour a small amount of this dyed water into the first student's cup, explaining that this could be the transition from say a contaminated stream to a lake.
- Note the continued coloration in the new diluted solution.
- Instruct or assist this student to pour a portion of his recently polluted cup of water into the next student's—simulating a transition from the lake to a river.
- Continue this exercise for any number of students. All will have slight coloration
- Explain the significance of a small pollutant being evident in even the last stages of the exercise.

Activity #2	**Cleaning an Oil Spill**
Materials	-1 aluminum pie pan half-filled with water -A medicine dropper full of used motor oil (or vegetable oil, or most oils really…) -Cotton balls -Nylon -String -Paper towels -Liquid detergent -Feathers
Worksheet	N

This activity would begin with a brief discussion of oil spills. Have you heard of the oil spill in the Gulf of Mexico that happened this summer? How do you think it affects wildlife and fish?

This would work best in smaller groups of 2-4

- Pour water in aluminum pans
- Ask students what they think the oil will do when you add it. Add several drops of oil.

- Tell students to simulate wind and waves and tides by blowing on and gently shaking the pan.
- Dip the feather in the oil and see what happens to the feather.
- Ask students to predict the best way to clean up the oil. As well as cleaning up the feather.
- Have each group (or just some groups) try out cleaning up the oil using the materials provided (cotton balls, nylon, string, paper towels, detergent).
- When cleaning up the feather, talk about whether you think a bird would be able to survive (fly, eat, swim) with this kind of substance on it.
- Discuss further the sources of other types of water pollution and where they come from, and how we can help.

CONCLUSIONS

- Importance of understanding our relationship as a *part* of our environment.
- Good to know where our food and water comes from and why we should protect it.
- Kids often tell their parents about things they learn, inspiring eco-friendly change beyond the classroom.
- REMEMBER TO HAND OUT 'Eco Tips' at the end!