

What's That Slippery Mess?

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Subject: Science, English, Math

Duration: 2 - 3 class periods

Location: Classroom

Key Vocabulary: Pollutants, oil spill

Related Activities: Who's Killing Our Fish?; Shrimp Scampers; Lake Okeechobee, the Everglades and the Rainy Season in Three Cups

Florida Sunshine State Standards: MA.4.A.6.6, SC.4.L.17, MA.5.A.1, SC.5.L.15, MA.5.A.6



Objectives. The student will be able to: a) show ways oil spills can affect wildlife adversely, and b) point out possible negative consequences to wildlife, people, and the environment from human-caused pollutants and/or industry.

Method. Students conduct experiments using water, oil, hard-boiled eggs, detergent, and feathers.

Background. Oil drilling has been proposed for Florida's Gulf Coast and in the Dry Tortugas. Oil spills in Big Cypress Preserve, which is adjacent to the western border of Everglades National Park, are becoming far too common. Human error, mechanical failure, or plain bad luck are the causes of spilled oil in the preserve. The Big Cypress Oil Spills Report documents that oil spills have occurred in Big Cypress. Even though most of the spills are cleaned up promptly, and South Floridians have never seen a spill as large as those in Alaska and California, some environmental damage has been done. The potential for environmental damage from oil drilling in the Dry Tortugas, Florida's Gulf Coast, and the Big Cypress Preserve is a real and ever-present danger.

Materials

- Cooking oil
- Detergent (dishwashing liquid)
- Three hard-boiled eggs (shell on)
- For each group:
 - shallow container
 - graduated cylinder
 - hand lens
 - feather
 - beaker

Suggested Procedure

Part A:

1. As a class demonstration, the teacher may put enough oil in a small container to submerge three hard-boiled eggs. Have a student add the eggs. (You will be observing the eggs after 5, 15, and 30 minutes. You may want to continue with parts B and C simultaneously.)
2. Place the eggs under a good light and watch them closely. Remove one egg after 5 minutes and examine it - before, during, and after peeling off the shell. Try to remove the excess oil from the outside before attempting to peel the egg. Remove the second egg after 15 minutes, and the third egg after 30 minutes, repeating the procedure and examining each carefully. Discuss your observations as a class. What effect could oil have on the eggs of birds/turtles nesting near the water?

Part B:

1. Divide the class into small groups of 4 students.
2. Give each group a shallow pan and ask them to fill it with 100 ml of water.
3. Instruct the students to add 1 ml of oil to the water, and observe the interaction of oil and water.
4. Using this information, estimate the area that might be affected by an oil spill involving:
 - a) A tanker truck holding 8,000 liters of oil;
 - b) A ship holding 300,000 liters of oil.
5. Discuss and compare the estimates with other groups.

Part C:

1. Instruct the students to: Examine a feather with a hand lens. Sketch what you see. Dip the feather in water for one or two minutes, and examine again with a hand lens. Sketch and compare to the original observation. Place the feather in oil for one or two minutes more and then examine with a hand lens; sketch, and compare with your other sketches. Clean the feather in detergent, rinse in water, and dry. Examine with a hand lens, sketch and compare to the previous observations.
2. Discuss changes in the feather after exposure to oil and then to detergent. What effect could these changes have on organisms exposed to an oil spill?

Evaluation

Discuss possible effects of an oil spill on wildlife, humans, and the environment. Do we have to choose between oil and our wildlife? What are some alternatives? What are other examples of human-caused pollutants that have negative effects on wildlife, people, and the environment? What is being done or can be done about these issues?

Extension

Ask each student to write a report, summarizing the findings in the experiment as well as making recommendations.



PHOTO CREDITS: OILED PELICANS AFTER DEEPWATER HORIZON-INTERNATIONAL BIRD RESCUE RESEARCH CENTER; BROWN PELICANS-NPS