

Middle School Experiment

This experiment is designed to help you to understand the difficulties involving oil spill cleanups.* To perform this experiment you will need the following materials:

- Two aluminum pie cans, each half-filled with water;
- Cotton balls (use real cotton);
- Nylon;
- String;
- A medicine dropper full of used motor oil;
- Paper towels;
- Liquid detergent; and
- Feathers.

Interpretive Questions: Before you begin, make a list of predictions about the action of oil and water. You might want to answer the following questions:

1. What will happen to the oil when you drop it on the water? Will it sink, float or mix with the water? Can you think of any reasons that might explain the reaction?
2. Which material will clean up the oil in the least amount of time: cotton, nylon, paper towel, or string? What qualities does that particular material have that enables it to do so?
3. How might wind, waves, and climate affect the combination of oil and water?

Procedure: Complete each of the following steps, and observe what happens.

1. Put five drops of motor oil into one of the oceans (your aluminum pie pans). Observe the action of the oil and record what happens. How does this reaction compare with your predictions?
2. One at a time, use the different materials (nylon, cotton, string, and paper towels) to try to clean up the oil from the water, keeping track of the amount of oil each material was able to clean up and how fast it worked. (These materials are those from which booms and skimmers are made.) Which material cleaned up the oil fastest? Which one performed the best cleanup?
3. Add five drops of oil to the second pan, and then add five drops of detergent. (*The detergent represents a chemical dispersant.*) Observe what happens. Where do you think the oil would go in the real oceans?
4. Dip a feather directly into some oil. What happens to it? How do you think this might affect a bird's behavior, such as flying, preening, and feeding?

Inside the Lab:

THE FOLLOWING SECTION SHOULD ONLY BE PERFORMED IN A LABORATORY USING THE PROPER EQUIPMENT.

Repeat the experiment, this time changing the temperature of the "ocean." Fill a glass beaker with some water; heat over a Bunsen burner. Repeat the above experiment, and record what happens. Next, allow some ice to melt. Record the temperature of the water, and repeat the above experiment. Compare the oil's behavior in the different "climates." Did the temperature changes affect the cleaning materials and their performance? How so?

****Used with permission from Jane O. Howard, "Slick Science," *Science and Children*, vol. 27, no. 2 (October 1989).***