

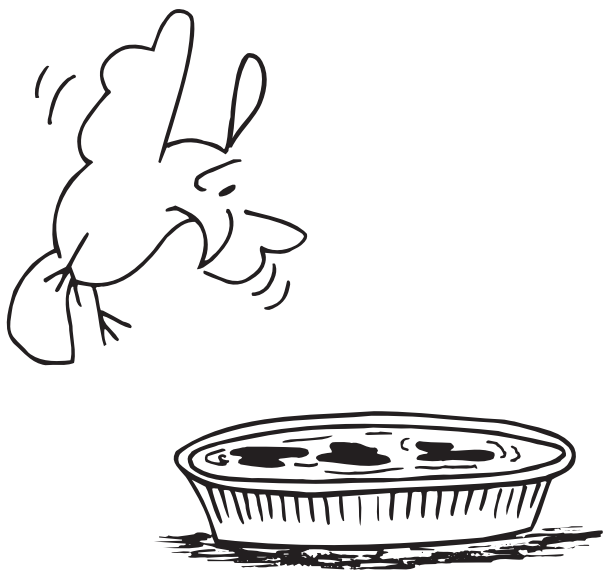
AN OILY MESS

No form of water pollution is easy to clean up. But oil spills are particularly difficult. How hard is it to clean up an oil spill? Find out for yourself by creating a mini spill.

MATERIALS: Two aluminum foil pie tins; water; used motor oil (or cooking oil, although it is not as visible); dropper; cotton balls; nylon; string; paper towels; dishwashing liquid; feather. Optional -- salt.

DOING IT:

1. Fill a pie tin halfway with water.
2. Create an "oil spill" in the water by putting in five to ten drops of oil. Does the oil mix with the water?
3. Create waves on the "ocean" in the pie tin by blowing on the water or moving the tin. What happens to the oil? Why would it be important to clean up an oil spill quickly?
4. Dip a feather into the "oil spill". What happens? How would oily feathers affect a bird?
5. Which material -- cotton ball, nylon, string, or paper towel -- cleans up the "spill" best? Test each material; make new "spills" as needed. How much oil is cleaned up by each material? How quickly can you clean up the "spill"? What problems do you have? What happens to the oil as time goes on? How difficult would it be to clean up the spill if there was a terrible storm?



6. Create an "oil spill" (five to ten drops of oil) in a second pie tin half-filled with water. Add five drops of dishwashing liquid. What happens to the oil? Where would the oil go in a real ocean? How "clean" is the water now that it has dishwashing liquid in it? What's worse -- oil or the cleaner?

7. *Variation:* Repeat the steps using salt water. How is salt water different?

Oil spills -- like the one off the coast of Alaska in 1989 or the ones during the Gulf War in 1991 -- attract a lot of attention. But these spills are only a small part of the oil that's polluting bodies of water. More than 50% of the oil in the oceans comes from land-based, nonpoint sources such as leakage from industrial processes. Tanker spills contribute about 10%. The remaining oil gets in the water through ordinary marine operations, such as tankers cleaning and flushing tanks at sea. The most disturbing fact is that at least 40% of the land-based, nonpoint oil pollution may result from car owners changing their own oil and disposing of it improperly (oil should be taken to a service station for recycling). Oil kills aquatic animals and plants. If the oil sinks to the bottom of a body of water or covers beaches, it does not allow animals like oysters and clams to reproduce; if the animals are able to reproduce, the offspring are usually affected. Birds that get covered in oil are unable to fly and their feathers lose the ability to keep the birds warm.

Oil in water isn't easy to clean up. Some oil spill clean-up methods can be as damaging to the environment as the oil itself. "Chemical surfactants" act like detergents to break up oil. They are often dropped on large spills from airplanes. In many cases, these surfactants are the only feasible solution to an oil spill, particularly in rough seas. Mechanical clean ups (where oil is contained by booms and absorbent materials such as straw, cotton, or nylon) are more expensive and take longer to implement than surfactants. A third, more controversial approach to cleaning spills involves "oil-eating microbes".

Topics: Pollution; Resources.

