

The Danger of Oil Spills



Objective

Students will understand what happens when there is an oil spill in the ocean. They will also observe the effects that humans have on marine animals and plants and the environment in general.

Background

When there is an oil spill in the ocean, not only is the water damaged, but perhaps more importantly, the animals that live within the habitat are harmed. Many people are familiar with tanker accidents, since they are highly publicized and they release such large volumes of oil into the ocean. However, only a small percentage of global oil spills are related to tanker accidents resulting from explosions, hull failure, running aground, and/or collisions. One of the most common causes of oil spills is actually runoff from the land. Cars run on petroleum fuel and use

petroleum-based lubricants. These substances accumulate on roads and in the ground and are slowly released, ultimately ending up in the ocean. A large problem occurs when people don't properly dispose of substances such as used motor oil. Used motor oil should always be taken to a gas or auto service station where it can be disposed of by a waste management company, either by recycling or burning it. Dumping used motor oil in the drain is illegal in many areas because many drains empty directly into the sea. Oil that is emptied in backyards or landfills is just as dangerous because it carries toxic contaminants to ground water, streams, and lakes.

Materials Needed

- Water
- Paper towels
- Glass bottle or jar with a tight lid
- Cooking oil
- Black tempera paint
- Feathers
- Cork

Activity

1. Take the glass bottle and fill with two-thirds tap water. This is your "ocean".
2. Mix cooking oil with the black tempera paint.
3. Add ½ to 1 inch of the black cooking oil to the water. (Pour slowly so that the oil stays on the surface of the water). This is your "oil spill".
4. Show the students the cork and have them pretend the cork is or a sea animal that floats on top of the ocean water such as birds or sea otters.
5. Place the cork into the water. Discuss what has happened to it. (It is floating on top of the water and is covered in oil.)

6. Put the lid on the bottle and shake. While shaking the "ocean" explain that the shaking represents a storm or waves in the ocean.
7. Have the students observe the "ocean" after the "storm". Tell them to pay close attention to the oil. They will notice that some of the oil mixes with the water. Discuss what happens to the animals that float on top of the ocean water. What happens to animals that need to come above the water to take a breath such as dolphins and whales? They will be covered with oil.
8. Have students feel the feathers and observe what they look like. Inform the students that feathers have natural oils that keep birds dry and warm.
9. Dip a feather into the oil that is on top of the "ocean". Discuss what it looks like now.
10. Have the students try to clean the feather with water. Is it easy to clean? Discuss the fact that if this was a bird it would have trouble staying dry and warm because the oil would cause it to lose its natural protective oils.

Have a discussion on how oil spills are cleaned up. It can take months or even years to clean an oil spill. When oil spills into water it has a tendency to spread out. Workers will place floating barriers, called floating booms, in the water to help stop the oil from spreading. While most of the oil floats near the water's surface, some sinks in the water. It will slowly dissolve and disperse into the water column. The water floating on top can be sucked up with a special vacuum. Workers apply oil-dissolving chemicals to the water that slowly break down the oil in the water. But this process takes many months to complete. Workers use several different types of chemicals and most of them are not harmful to the environment. As a last resort, workers may burn the water to remove the oil. The major disadvantages of burning include the difficulties of collecting and containing a large amount of the oil to burn, lower effectiveness as the oil weathers (spreads and emulsifies), and sensitivity to sea state and weather conditions. The ability of oil slicks to sustain combustion on open water depends largely on the thickness of the oil film. Also, smoke from the flames can be bad for the environment. Any oil that makes its way to the shore must be sprayed with high-pressure hoses, and the oil must be removed by hand.