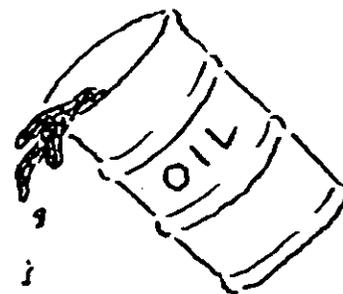


Oil Spill!!

Grades 4-5



Overview

The students will observe the effect bubble gum has on oil floating on water. They will do an experiment with water and oil to see what technique works best for cleaning up oil spills.

Objectives

- To help students understand the impact oil spills have on the environment.
- To help students understand what methods work best in cleaning up oil spills.
- To help students understand different methods for cleaning up oil spills.

Materials

For the presenter:

- chalkboard
- water
- chunk style bubble gum
- aluminum pie pan
- household machine oil (3-in-1 oil)
- toothpicks
- freezer
- a fine cheese grater

For each group of 4 students:

- an aluminum pie pan
- 10 inches of twine
- a handful of sand
- paper towel
- liquid detergent
- an eye dropper
- newspaper
- water
- a few drops of oil
- a tub to hold material for the group

Getting Ready

Activity 1

Fill a pie plate half full of water. Grate one piece of frozen bubble gum on to a paper plate. Place the water, oil, gum and the tooth picks on a table where everyone will be able to stand around.

Activity 2

Write the word *Oil Spill* on the chalkboard. Put the materials for each group in a tub. Have water ready in a pitcher for filling pans and a dropper for the oil.

Background Information

Oil, a major source of energy, is a very important natural resource. Oil is used as fuel for transportation, industry and heating. Petroleum or oil is also used in the manufacturing of different materials like plastic, detergents, paints, insecticides and even some medicines.

Land and water are both affected by oil spills. Fish, aquatic plants and other animals that live by water can be harmed by oil spilled on water. Ground water, lakes and streams, that are used as a source of drinking water, can be contaminated by an oil spill on land.

The largest oil spill in the United States was on March 24, 1989, the oil tanker *Exxon Valdez* struck a reef and spilled over a quarter of a million barrels of crude oil in Valdez, Alaska.

Nature will begin to clean up the moment an oil spill occurs. The oil separates into heavier and lighter parts which are then spread by winds and currents. Some of it evaporates and some of it is consumed by bacteria. People can help speed the natural processes and help reduce the environmental impact on wildlife. Success in cleaning up oil spills depends on quick action and being prepared.

There are a number of techniques used to clean up oil spills. One involves surrounding the spill with a boom. This is like a floating fence that surrounds the spill, and then uses pumps to remove the oil from the surface of the water. Another technique is using a special detergent called a dispersant. Oil breaks up into tiny droplets that mix with water when it is sprayed with a dispersant. Burning the oil on the surface of the water and soaking the oil up with oil-absorbing materials are two other techniques that are used to clean up oil spills. Avoiding an oil spill, of course, is best for the environment.

Activity 1

Explain to the student that you are going to do an experiment and you would like them to observe what happens. Have the students stand around the table where everyone will be able to see.

1. Begin by showing the students a can of oil and the pie plate of water, tell them a large truck just dumped a load of oil into the river.
2. Carefully drip 10 drops of household machine oil on the surface of the water.
3. If necessary, use the toothpick to move the oil into one big drop.
4. Take the frozen grated gum and sprinkle it over the oil.
5. Ask: "What do you think the gum will do to the oil?"
6. Use the toothpick to move around the gum covered oil.
7. Ask: "Does the grated gum dissolve in the water?"
8. Try and pick up the oil covered gum with 2 tooth picks.
9. Ask: "Was I able to clean up the oil using gum?"

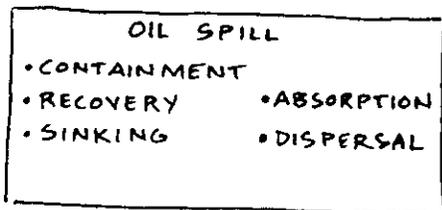
Use the information below to explain why the gum absorbed the oil. You should notice that the gum mixes with and soaks up the oil. A material containing an ingredient similar to the gum in bubble gum has been developed for soaking up oil spills in the ocean. When it is spread over an oil spill, the fine powder quickly dissolves in the oil and makes the oil stick together. It can then be removed from the surface of the water by a pump.

After this discussion have students return to their desks.

Activity 2

Questions

"What is an oil spill?" Refer to the words *Oil Spill* on the chalk board "Have you ever heard of the *Exxon Valdez*? What happened? How did it affect the plants and fish in the ocean? Do you think it could also affect animals that live near the water? Do you know how oil spills are cleaned up?" Write the students' ideas on the chalkboard. Share with them other methods that are used to clean up oil spills: *Containment* (using a boom to encircle it); *recovery* (using a pump to remove the oil); *removal by sinking* (using sand or another substance to make the oil sink to the bottom), *removal by absorption* (using oil-absorbing material to soak up the oil) and *dispersal* (using a detergent that breaks up the oil into tiny droplets that mix with water). List the techniques for cleaning up oil spills on the board.



Tell the students that they are going to do an experiment to see which technique works the best for cleaning up an oil spill. Explain that an oil tanker has just sprung an oil leak in the Pacific Ocean. Their group's responsibility is to clean up the pollution with as little damage as possible to the environment. Show them the ocean - a pie pan with water and two drops of oil. Show the students the twine, eye dropper, paper towel and sand. Describe for them the various techniques that are available to clean up the oil spill: eye dropper (*recovery*), sand (*sinking*), paper towel (*absorption*), detergent (*dispersal*), & twine (*containment*)

Have the students cover their desks with the newspaper. Hand each group a tub of material. Fill their pie plates about 1/2 full of water and add 2 drops of oil. As the students experiment with different methods of cleaning up the oil, walk around the classroom and ask the students what they are observing.

When all the groups have had a chance to experiment with the different techniques, discuss the advantages and disadvantages of each method. Ask: "Do all the methods actually remove the oil from the environment or do some just remove it from sight?"

Closure

Tell the groups to discuss oil spills and come up with three reasons why it is important to prevent them. When the groups are ready, have them share their ideas with the class.

Clean up

Have students put all their materials back in the tub. They should pour the water and oil in a bucket and not down the sink. Tell them how you plan to dispose of the liquid in the bucket.

