

Section 1

Understanding Life Systems

EXPLORATION 1

Cleaning Up Oil Spills

Explore different methods to clean up oil spills.

Natural oil is extracted under the ocean's surface and is an important resource on which our society depends. We use oil to power all types of engines, and oil by-products are used to manufacture everyday products such as laptops, cosmetics, and sports equipment.

However, there is always a risk of oil spills that negatively affects our environment. When there is an oil spill, animals are put at risk. For example, a seabird coated with oil cannot regulate its own temperature effectively and can die of hypothermia. When the population of seabirds goes down, the ecosystem will eventually be disrupted. Therefore, not only must we take actions to prevent oil spills but we must also find the best way to clean them up.



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Try this experiment to simulate an oil spill and test out different materials for absorbing the oil.

Materials:

- water
- a teaspoon
- testing materials (100 g each)
 - cotton balls
 - old socks
- oil
- a kitchen scale
- a big bowl
- a baking sheet
- cosmetic sponges
- cardboard
- paper towels

Steps:

1. Add cold tap water to the bowl. Then add a spoonful of oil to the water. This represents an oil spill.
2. Take the first set of testing materials and use it to absorb as much oil as possible from the water.
3. Repeat Steps 1 and 2 for each set of testing materials.
4. Let all the materials dry on the baking sheet.
5. Weigh them when they are dry.
6. Record the weight and complete the chart.



Testing Material	Weight		Difference in Weight (Amount of Oil Absorbed)
	before	after	
cotton balls	100 g		
cardboard	100 g		
cosmetic sponges	100 g		
old socks	100 g		
paper towels	100 g		

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Which testing material absorbed the greatest amount of oil? Do you know we can clean up the oil more effectively by combining two materials?

Read about how people in the Gulf of Mexico cleaned up an oil spill.

In 2010, the Louisiana oil spill in the Gulf of Mexico caused huge damage to the marine environment. Instead of using chemical-based absorbents to clean up the oil in the sea, some people suggested using a natural absorbent. Guess what this absorbent is.



It was hair! To do the cleanup, hair clippings were stuffed into old nylon stockings to form hair booms, which were then placed in the areas of the spill to soak up the oil. Astonishingly, each kilogram of hair is capable of absorbing as much as 10 L of oil. Since human hair is biodegradable, it is one of the safest cleaning solutions for an oil spill. Besides human hair, dog hair and feathers can also be used to help clean up oil spills.