

Oil Spill Simulation

How does an oil spill affect the water and the organisms living there? How do engineers clean up an oil spill? This simulation will teach both the effects and the basics of clean up for this environmental event.



Part One- Oil Spill Clean Up

Key Terms

Skimming- removal of a substance from the surface of a liquid

Absorb- to take in or soak up

Dispersant- liquid or gas used to break up particles

Materials

1 pan at least 2 inches deep

A spoon

A small bowl

Four cloth pads, can be paper towels or cotton balls

Dish soap

Water

Dark vegetable oil

Paper towels and garbage bag for cleanup

Procedure

1. Fill your pan about $\frac{3}{4}$ of the way with water. This pan of water acts as the body of water in our simulation. The edges of the pan act as the land.
2. Add 1 tablespoon of oil to the water. Observe the effects.
3. Test your first method of cleaning up the oil. Use your spoon to gently remove the oil from the surface of the water. Be careful not to scoop out water with the oil as well. Discard your collected oil into a bowl.
4. Test your next method of cleaning up the oil. Using your cotton balls or paper towel pieces, lay them on top of the water to absorb the oil. Discard the used pieces.
 - a. You may need to add another tablespoon of oil, if you were successful in cleaning the spill with the spoon.
5. Now it is time to add the dish soap. Add a few drops to the water and observe the effects.
 - a. You may need to add another tablespoon of oil, if you were successful in cleaning the spill with your cotton balls or paper towels.
 - b. What happened to the oil. Why?
6. Test each method of clean up after you've added the dish soap.
 - a. Were you more successful after the dispersant was added. Why or why not?

Guiding Questions

1. When you added the oil to the water, what did you observe?
 - a. Does the oil move toward the land?
 - b. Does the oil mix with the water?
 - c. What does the oil look like in the body of water?

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2. Were you able to clean up all of the oil from the spill? Why or why not?
3. Which method, or combination of methods worked best to clean up the oil?
4. Which step in the process represents each way to clean up oil?
 - a. Skimming
 - b. Absorb
 - c. Dispersant

Part Two- Effects on Wildlife

Materials

2 feathers, can be craft feathers or from old pillows
Pan with water and oil from Part One
3 hard boiled eggs
Vegetable oil
Food coloring (optional)
2 small bowls
Hand lens (optional)

Procedure

1. In two small bowls, fill each of them with about 1 ½ inches of oil. Place one hard boiled egg in each bowl. You should have one hard boiled egg left, untouched. Allow the eggs to sit for 15 minutes.
 - a. Optional: add a few drops of food coloring to each bowl to make the oil easier to see in the experiment.
2. While the eggs are sitting, gather your feathers, and examine them using all 5 senses.
3. Next, place a feather into your pan of water and oil from Part One. If you cleaned up all the oil, be sure to add another tablespoon before you place your feather in the pan. The feather should come in contact with some oil in the pan.
4. Remove the feather from the pan. Compare this feather to your dry feather.
5. Using your last hard boiled egg, remove the shell. What does your egg look like inside?
6. After the 15 minute waiting time has passed, remove an egg from one of your bowls of oil and remove the shell from the egg. What do you see? Compare this egg to your untouched egg.
7. Leave your remaining egg in the bowl of oil for an additional 45 minutes. Once the time has passed, remove the egg from the bowl and remove the shell. How does this egg compare to the untouched egg and the 15 minute egg?

Guiding Questions

1. When you observe your feathers, what do you notice?
 - a. What does the feather that was in oil feel like compared to the other one?

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- b. If you hold the feather out in front of you and drop it, what happens? Do you notice any differences between the two?
 - c. Carefully separate the pieces of each feather. Is there a difference between what happens to each one? Do they come back together?
2. What do you notice about the eggs that were soaked in oil?
 - a. Did the color seep into the egg?
 - b. Was the 15 minute egg affected after a short amount of time?
 - c. How did the 1 hour egg compare to the 15 minute egg? Were the effects the same, or more intense over time?
 3. Based on your observations of the feathers, and the eggs, how do you think an oil spill might affect wildlife in the area, like birds?