SCIENCE EXPERIMENT

An environmentally-friendly oil spill experiment for you to try with the supervision of an adult.

Do you want to try cleaning up an oil spill yourself? This experiment will help you understand why it is such a difficult task. All of the tools you will need are environmentally friendly and easy to find.

See your science teacher or ask an adult if you have any questions.

What you will need...

- one 28 cm x 19 cm x 4 cm clear glass baking dish (or equivalent)
- water
- blue food colouring
- 12 tbsp. vegetable oil
- 8 tbsp. pure cocoa powder
- 1 tsp. table salt
- a tablespoon
- a teaspoon
- 5 paddle-pop sticks
- a coffee mug
- sorbents (paper towel, cotton balls, rag, string, nylon pot scrubber, sponge, styrofoam cup, garden peat moss)
- 1 squirt of liquid dishwashing detergent
- tweezers or tongs
- bird feathers

To prepare the fresh water...

1) Fill baking dish with cold tap water within 1 cm of rim.
2) Add 5-6 drops of food dye.
3) Mix dye and water with a stirring stick.
4) Let solution settle.
5) Answer question 1 in Observations.

To simulate crude oil...

1) Place 3 tbsp. of vegetable oil in mug.
2) Add 2 tbsp. of cocoa powder.
3) Mix cocoa powder and oil thoroughly with a paddle pop stick.

To contaminate fresh water...

1) Very slowly pour simulated crude oil from a height of 1 cm onto the top of the fresh water dish. If you pour the oil too quickly, the experiment won't work.
2) Answer question 2 in Observations.
3) Wait 3 minutes.
4) Do you want to change your answer to question 2 in Observations?

To test the sorbents...

1) Place a small sorbent sample into the centre top of the contaminated fresh water.
2) Answer questions 3, 4, 5 and 6 in Observations.
3) Remove sorbent with tweezers or tongs.
4) Repeat step 1 with other sorbent samples.
5) Answer questions 7, 8, 9 and 10 in Observations.
6) Clean out contaminated fresh water.
7) Prepare new simulated fresh water following instructions above.
8) Add detergent to the oil-contaminated fresh water.
9) Answer questions 11, 12 and 13 in Observations.

To determine how oil affects feathers...

1) Dip feather into oil-contaminated fresh water.
2) Answer questions 14 and 15 in Observations.

Repeat all of the above procedures substituting an ocean for the fresh water.
To prepare the ocean, follow the fresh water procedures except add 1 tsp. of salt and mix it with the water before step 2.

At the end of the ocean experiments, answer question 16 in Observations on the next page...

Questions & observations

1. How is the fresh water/ocean different from tap water?
2. What happened to the oil when you dropped it on the fresh water/ocean? Did it sink? Float? Mix in?
3. How much oil did the sorbent clean up? How quickly?
4. Does the sorbent pick up water too? If so, how can you tell?
5. Does the sorbent sink or float?
6. What is the condition of the contaminated sorbent?
7. How would you pick up the oil-contaminated material in a "real" oil spill in fresh water/the ocean?
8. How would you dispose of the oil-contaminated material in a "real" oil spill?
9. Of the sorbents you tested, which one worked the fastest? The best?
10. What other materials could you use as sorbents?
11. What happened when the detergent was added to the contaminated fresh water/ocean?
12. Where would the oil go in "real" fresh water/ocean after a dispersant (like the dishwashing detergent is used?
13. How clean is the fresh water/ocean now that it has dishwashing liquid in it?
14. What happens when a feather gets oil on it?
15. How might an oiled feather affect a bird?
16. Are the results of the experiment different when you use fresh water instead of an ocean?

Experiment courtesy "Oil, water and chocolate mousse" Minister of Supply and Services Canada 1994