OIL SPILL CLEANUP

SUPERNOVA
DALHOUSIE UNIVERSITY | HALIFAX, NOVA SCOTIA

OVERVIEW

Description
Participants will explore/learn the issues with environmental clean up. They will do this by creating their own mini oil spills and exploring different ways that they can try to clean up the oil spill.

Learning Outcomes
- What environmental engineers do
- The effect of oil spills on wildlife and the environment

Outline
1. Environmental engineering. (5-10 min)
    a. What is an environmental engineer and what do they do
    b. What is their role in an oil spill?
    c. Why oil is hard to clean
    d. Intro activity
2. Activity Procedure (15 - 20 min)

Materials

Item	Quantity Per Group (*Groups of 2 or 3*)	Quantity Per Class
Jug of Water	N/A	1
Vegetable Oil	2 Tbsp	NA
Clear plastic cup	1	N/A
Craft feathers	2	N/A
Plastic spoon	4	N/A
Cotton balls	4	N/A
Dish Soap	N/A	1 small bottle
Aluminum pie plate	1	N/A
Rock (optional)	1	N/A
1 Tbsp Measuring spoon	NA	1

KEY INFORMATION

Topic 1: Environmental engineers are called upon to assist with the cleanup of oil spills and other environmental hazards. They must be familiar with different cleanup methods and then effectively communicate these strategies with the community, the cleanup crew and the company/person responsible for the spill. Environmental engineers' contributions to environmental cleanup are important in keeping our Earth's water and land healthy for plants and animals.

Most oil companies argue that the least expensive clean-up option should be used; whereas environmentalist and people impacted by oil spills want the method that works the best—no matter the cost.

Topic 2: The Exxon Valdez oil spill was one of the largest oil spills in recorded history. It took four summers to clean up the spill. Why is it so hard to clean up oil? Why does it take so long? One reason is because of its low density, which causes oil to float on top of water. In addition, oil is *hydrophobic* (afraid of water) so it does not like to be in water. Oil is more likely to stick to anything other than water; which explains how it pollutes animals, beaches and rocks rather than mixes with water.

LESSON PLAN & PROCEDURE

You can do this activity by telling the kids that they will be playing the role of the environmental engineer and that they are responsible for cleaning up an oil spill

Environmental engineering

1. Introduce the kids to environmental engineering and get them list jobs that environmental engineers do.
    a. biotechnology, water treatment, wastewater treatment, hazardous waste management, landfill construction, etc.
2. Introduce the students to the environmental concern of oil spills and the role of the environmental engineer in the clean up. Show them the pictures of the oil spill if you can.

3. Explain why oil is difficult to clean, Get the kids to brainstorm ideas to clean up an oil spill,
    a. The three main ones are: 1) **skimming**, because oil floats, 2) **absorbing** it onto pads that specifically absorb oil, and 3) adding a **dispersant** to break up the oil "slick" surface into little droplets.
    b. Mention that the environmental engineer wants to use the method that will do the best job of cleaning up an oil spill while the company or person that caused the oil spill want the method that will cost the less.
4. Introduce the kids to the activity and split them into groups of 2-3.

Activity Procedure
Prep:
(Fill each plastic cup with 2 Tbsp of water. Mark the water line with a marker so there is a 2 Tbsp indication.)

1. Fill the aluminum pan half full of water and put the rock inside (rock is optional)
2. Dispense a known amount of oil into the water (~2 Tbsp)
3. Use a spoon to skim as much oil as possible out of the water into the plastic cups.
    a. Look to see if the level of oil reaches the 2 Tbsp indicator on the plastic cup. Did you extract all of the oil?
        i. How can you extract more?
4. Try using cotton balls to soak up oil
    a. Would it be the most time and cost efficient method?
5. Add a few drops of soap into the oil spill and see what happens
    a. How can we collect the spill?
6. Insert the feather into the oil spill, notice what happens to them. Birds dive to the surface of the ocean all the time to get food, imagine what will happen to them if their bodies come in contact with oil?

Debrief

- What was the best method to clean the oil?
- Why environmental engineering is important and the role of the environmental engineer
- Oil's effect of birds and other marine life

REFERENCES & RESOURCES