**Using the Scientific Method – Oil Spill Lab**

Marine oil spills are an environmental problem. Spills expand in the water, sometimes forming “tar balls” that wash up onto beaches, shore lines, and river beds where it does considerable damage to aquatic and terrestrial wildlife. In this investigation, you will be learning why oil is difficult to clean up, and then will test your own ideas on how to best clean up marine oil spills. Essentially oil can be cleaned up by skimming or absorbing. Skimming is when oil is mechanically removed from the water. Absorbing is when materials are used to soak up the oil first, before trying to remove it from the water. Sometimes a detergent or soap is used in conjunction with one of those methods to disperse or break the oil down into smaller droplets (so it spreads out into a thinner layer). This may help improve the skimming or absorbing of the oil from the water. This is called dispersing. In this lab, you will determine and test the best course of action for cleaning up a marine oil spill.

**Pre-Lab Questions:**

1. What do you know about how well oil and water mix? Use your understanding of lipids and an example to explain your answer.

1. What is the difference between skimming and absorbing methods of oil removal?
2. Make a prediction about which mechanism (skimming or absorbing) will best remove oil from water. Support your prediction.

**Materials:**

* 100 mL graduated cylinder; 25 mL graduated cylinder (Part III)
* 2 shallow aluminum trays (one for your oil spill and one for waste collection)
* Small paper cup (for oil, Part I)
* Water from the tap
* Clean-up Materials (listed in data table)

# Part I: Initial Material Testing

As a group, you are to test the clean-up materials individually to determine the effectiveness of each and record the results in the data table provided. You will also determine if the material is best used for **skimming, absorbing,** or **dispersing** the oil.

**Procedure For Initial Testing:**

1. Fill a shallow tray with about 3cm of water.
2. Pour some “crude oil” from the beaker at the front of the room into a small paper cup. You will be using this oil throughout the lab.
3. Pour a small amount of oil from your cup into the water.
4. Use a spoon to try and remove the oil from the water. This is called skimming. **Discard the oil into the second tray (waste).**
5. In the data table, describe what is happening to the oil and how effective the spoon is at removing the oil.
6. Continue to attempt to clean up the oil using all of the materials available for you in the lab (see data table). You may have to add more oil from the cup to the paper tray.
   1. Test one material at a time using any safe method you can think of, to clean up the spill. Materials can be used in a variety of ways; there is no “one right way.”
   2. In Data Table 1, record what you did, and how it worked. Describe how you used the item, what effect the method had, and its effectiveness.
7. When finished with all the tests, please CLEAN with SOAP and SAVE the spoon and pipette. Return all other unused or cleaned materials to the appropriate labeled beakers on the side bench. You may dispose of all the other materials in the garbage can. Clean your lab table of any oily residue (use cleaner spray and paper towels).