CONTAMINATION!

Objectives:
Students will:

- use their collective knowledge to determine a solution to remove pollution from a cup of water
- describe some complications encountered in real-life water treatment issues.

Materials:

- Cup of water
- Drops of peppermint extract

Procedure:

1. Discuss contaminated water and the local, national, or global methods of treating it. Have students list several ways that water is treated. Review the activity *Design a Septic Tank*. For more information about treating wastewater explore the EPA's site http://www.epa.gov/students/water_on_tap.htm. or one connected to them called http://www.ebmud.com/services/waterquality/plants.html
2. Ask students which method they feel is the best. Which method would they feel most comfortable drinking from? Ask if they know which method they use at home.
3. Have the cup of water sitting in an obvious place. Put several drops of peppermint into it and tell the students that the water is now polluted it is their task to purify it. Since they have just listed several ways to do this, it should be easy… or not!
4. Have the students break into groups. Have each group work to find a way to clean the water. Give each group a cup of peppermint water and have them attempt to clean it. Remember that it is polluted, so they cannot throw any of it away! Make available other water sources, larger containers, freezers, stoves, etc. for them.
5. After each group has decided how to clean their water, ask them to do so. Let them try various methods for cleaning. When they are finished, ask them if they would be willing to drink it. What if they had started with oil rather than peppermint, would they drink it then?
6. Repeat the experiment putting several drops of oil on top of the water. Have the students try to remove it using various methods. Hint to teacher: detergent will help break down the oil, paper towels will soak it up, etc.
   - Do the same methods work for oil that did for the peppermint?
   - What are the properties of water that allow substances like detergent or cotton to clean an oil spill?
   - Would the students drink the water after they have cleaned it?
   - How might we clean large oil spills in our oceans or lakes?
   - Have the groups meet and talk about the different practices each used. Did any of the methods work?
   - What would the students do if they could not smell or see the pollution?
   - How does this pertain to real life?
   - Who has to decide how to clean the world's water?

- How do the cleaners know it is successful?
- Is this a job the students would want?

7. Discuss that cleaning pollution is more complex than we realize and there are many factors that must be considered. Stress the fact that prevention is the best method of control.