KEEPIN' IT CLEAN
Pre-Visit Class Activity
Water Pollution Experiment

Description:
Objective: Students will learn the answers to the following questions:
What is pollution?
Which liquids mix with water?
Which liquids won't mix with water?

Objectives: It is important for students to understand that:

- Pollution in our oceans, lakes, rivers and streams is a very serious matter. Pollution is when we add things to the ground, the air, or the water that will make it dirty or will bring harm to the life in and around it.
- People often dump liquids into oceans, lakes, rivers and streams. Some of these liquids will mix with water; others will not.

Procedures and Activity:
Begin experiment by asking the guiding questions:

1. What is pollution?
   Share ideas about examples of pollution. Then try to come up with a definition. Help them see that pollution is making something dirty or unsafe for life. Lead into thinking about water pollution. Talk about our oceans, lakes, rivers, and streams. What have they heard or read about pollution in these water bodies? Do they ever think about whether or not the water they swim in is safe? Have they ever been concerned about the fish we eat being poisoned and harmed from living in polluted water?
2. Which liquids mix with water?
   One big problem is that too often our oceans, lakes, rivers and streams can look like they are safe and clean when in fact they are not. Some of the solids and liquids we are dumping into water will mix up with the water so we cannot see them with just our eyes. Some things we put into water will not mix and we can see evidence that they are there. What we cannot see is a big problem!
3. Which liquids won't mix with water?
   Today we will do an experiment by making an "ocean in a bottle." We will try mixing different liquids with water to see what will and will not mix. In particular, we will see if oil or detergent will mix with water. Do you think we should drink in water with oil and/or detergent in it? Are these two liquids harmful to plant life, fish or other creatures? Oil and detergents are two common liquids that get dumped into our waters.

Activity:

1. Make a "bottle ocean."

   Each student or pair should put 3 cups of water into their clean 2-liter bottle. This is like a little ocean, lake, river, or stream.

2. What happens when oil is mixed with water?

   Add 1 cup of oil by pouring it into the bottle via the funnel. Screw top on bottle. Mix up the liquids by shaking the bottle. Observe what happens. We observe that oil and water will not mix. We call liquids that will not mix with each other immiscible. What do you think happens when there are oil spills in the oceans? How will oil affect the water, the fish, plant life or animals that live near the water?

   You may want to leave the bottle tipped on its side overnight. The next day, see if the oil settled or not. How would this impact our knowing that oil existed in an ocean or lake? How would this help us think about cleaning up oil spills?

3. Remove oil and water mixture and rinse out bottle. What happens when soaps and detergents are mixed with water?

   Put 3 cups of water in the clean 2-liter bottle. Add 1 cup of dish soap or liquid laundry detergent via the funnel. Screw top on bottle. Mix up the liquids by shaking the bottle. Observe what happens. We observe suds, bubbles and foaming. Do the two liquids combine? When two liquids will mix with each other, we call them miscible.

   You may want to leave the bottle tipped on its side overnight. The next day, is the detergent still mixed up with the water or did it separate? Can you still see the foaming and suds? How does this impact our thinking about soapy kinds of pollution?

4. What happens when oil and soap are mixed with water?

   Empty, rinse and clean the bottle. Add 3 cups of water, 1/2 cup of oil, and 1/2 cup of soap or detergent. Screw on top. Shake the bottle to mix the liquids. Look at what happens. Can you see evidence of the oil and soap? Observe what goes on in the bottle over a period of time. You will find that oil will mix with soap and then with water. This makes it very dangerous for our water systems. Oil can be present and we don't really see it because it got mixed up and broken down with soap and water.

   Compare this to trying to wash an oily pan after cooking with it. If you try to use just water, the oil won't come off. But when we add a little dish detergent, we can get rid of the oil.