



Science Lessons Letter O



Oil

Oil and Water Just Don't Mix

Tape generous sized pieces of waxed paper on the table. Have the students use eyedroppers to drop 10 drops of water on the waxed paper. Now have them drop 10 drops of oil on top the water. What happens? Now reverse the process. What happens? Now have them use straws to blow on the droplets. Will they mix? Oil floats on the surface because water is heavier than oil.

Oil and Water Still Won't Mix

This is the same experiment, just on a larger scale. This time fill a water bottle $\frac{1}{4}$ full of oil. Add water until the bottle is half full. Observe. The water will fall to the bottom. Now shake it up. Observe. The water again will move to the bottom. The experiment below adds food coloring to the mix for more excitement.

Oil Spill

After learning that oil and water do not mix, explain the problem of oil tankers spilling oil into the ocean and what a problem this is. Fill a container two-thirds full of water. Add a spoonful of vegetable oil. Attempt to remove the oil with a cotton ball, eye dropper or sponge. Observe and feel the water to see if all the water has been removed. This shows what a difficult task this is.

Oil and Water Fireworks!

Fill a ***tall glass*** with ***cold water***. Don't fill it all the way - Leave at least an inch of space at the top. Pour about an inch of cooking oil into a ***short glass***. Put two or three small drops of your favorite colors of food coloring into the cooking oil. Stir the oil/coloring mix slightly, just enough to break up the globs of color a little bit. Slowly pour the oil from the short glass into the tall glass. The oil will rise to the top of the water, and you can watch the globs of food coloring slowly settle to the bottom of the oil. In a few seconds, the color will begin floating down from the top of the oil mixture. It will hit the oil/water separation, and coloring will stream down through the water, looking like little streamers of color.

Oil Lava Lamp/Ocean Wave

Fill a water bottle 3/4 full with vegetable oil. Fill the rest of the bottle with water (almost to the top but not overflowing). Add about 10 drops of food coloring. Be sure to make the water fairly dark in color. Notice that the food coloring only colors the water and not the oil. Hmm... Divide an Alka-Seltzer tablet into 8 pieces. Drop one of the tiny pieces of Alka-Seltzer into the oil and water mixture. Watch what happens. When the bubbling stops, add another chunk of Alka-Seltzer. It's just like a lava lamp! When you have used up all of the Alka-Seltzer and the bubbling has completely stopped, screw on the soda bottle cap. Tip the bottle back and forth and watch the wave appear. The tiny droplets of liquid join together to make one big lava-like blob.

How does it work?

First of all, you confirmed what you already knew... oil and water do not mix. The molecules of water do not like to mix with the molecules of oil. Even if you try to shake up the bottle, the oil breaks up into small little drops, but the oil doesn't mix with the water. Also, food coloring only mixes with water. It does not color the oil.

When you pour the water into the bottle with the oil, the water sinks to the bottom and the oil floats to the top. This is the same as when oil from a ship spills in the ocean. The oil floats on top of

the water. Oil floats on the surface because water is heavier than oil. Scientists say that the water is more dense than the oil. Here's the surprising part... The Alka-Seltzer tablet reacts with the water to make tiny bubbles of carbon dioxide gas. These bubbles attach themselves to the blobs of colored water and cause them to float to the surface. When the bubbles pop, the color blobs sink back to the bottom of the bottle. Now that's a burst of color! Your own homemade lava lamp... groovy baby!

Freezing Oil and Water

Pour some water into the clear plastic container. Add some cooking oil. Leave this for a few minutes. After a few minutes the oil will have risen to the top of the container. The oil becomes lighter than the water. Put the container into the freezer for a few hours. Remove from freezer. The oil is now underneath the water. Water becomes a solid when it freezes. The water expands when it freezes and becomes less dense than the oil. This causes the water to rise to the top.

Ocean

Ocean Habitat

Take a zip lock bag, and add blue hair gel, sand, and real sea shells, etc. The children get to squish it around and feel the shells. You could also add Swedish fish to the mix. This should stay in the science center and not go home. There is no way to permanently lock the bag.

Ocean Bottle

Pour a half cup of sand into a clear plastic bottle. Add small shells and tiny toy fish. Fill the bottle 2/3 full of water, then add a drop of blue food coloring and some glitter. What do you see?