Unit 6 Lab Extravaganza **Name _____34 points_____** **Block # ___**

Use the space below to answer the Inquiry Questions for each lab station.

1) **Forces of Nature**
   a) How can a neutral molecule like water be affected by both positive and negative charges? Water contains a dipole. H^+ attracts negative/ O^{-2} attracts positive.
   b) What type of intermolecular force is involved in Turpentine? London Force
   c) Why is Turpentine better than water for removing oil based paints? Oil based paints are non-polar so they can only be dissolved in nonpolar solvents.

1) Visco-Elastic Fantastic
   a) What is a polymer? A long chain of monomers; repeating units
   b) What happens when you apply force to the Oobleck? It becomes a solid.
   c) What happens when the force is removed? It becomes a liquid.
   d) Explain the visco-elastic properties of the D3O polymer.
   When a phone is dropped or a football player is tackled, the polymer can harden and absorb the shock. When the force is remove, the polymer becomes flexible again.

2) **Polarity Races**
   a) Is wax paper made of polar or nonpolar molecules. Explain how you know.
   Nonpolar, because the water and other polar liquids are repelled by it.
   b) Which droplets have the same polarity as the wax paper? Hexane and Baby Oil
   c) Which moved the fastest? Why? Water and Hydrogen Peroxide). Polar moves fastest because nonpolar is attracted to the wax paper

3) **A Hold in One**
   a) Is pepper polar or nonpolar? Nonpolar
   b) How can you tell? It floats and is not attracted to the water.
   c) What type of intermolecular force does water contain? Hydrogen bonding
   d) Is soap polar or nonpolar? The soap contains a polar end and a nonpolar end. The polar end grabs bed the water and the nonpolar end grabbed the pepper. The soap ripped apart the hydrogen bonds in the water in order to spread out the pepper.

4) **Tie Dyed Milk**
   a) Given that the fat in the milk is nonpolar, what can you predict about the polarity of the food dye? Food dye is polar. It did not dissolve in milk.
   b) Explain what happened to the intermolecular forces when soap was added. The soap contains a polar end and a nonpolar end. The soap ripped apart the surface tension and spread out the dye.

5) **The Electric Slide**
   a) What happened to the pieces of foil when you induced a negative charge on the balloon? The foil pieces repelled each other. They spread apart.
   b) What happened when you touched the metal ball at the top of the electroscope? The foil moved back to normal position. The charge was removed.
   c) Do strips have same charge or different charge? Explain. Same charge because likes repel

6) **Hope to It**
   a) Was the rice attracted or repelled by the balloon? Attracted to it.
   b) How close did you need to get the balloon to induce a charge? Within one or two inches.
   c) What does this mean in terms of the charge on the balloon and the charge on the rice? Are the charges the same or different? How do you know? Charges are opposite because the balloon attracted the rice
   d) Assume the pieces of rice were gas molecules in the room. Why would it be difficult to induce a charge on the gas molecules? Gas molecules are usually far apart.

7) **Love Me, Love Me Not**
   a) Which polymer "'loves" the water? How can you tell? Sodium Polyacrylate because it mixed with the water.
   b) What happens when you add the Mystery Oil? It floats; it's repelled by water
   c) Why did the Mystery Oil bond to Enviro-Bond 403 and not the water? Oil and 403 are both non-polar so they attract each other because they have similar forces.
   d) List some of the different techniques that scientist use to remove oil from oceans, lakes and rivers. Booms to surround and collect oil; surfactants to break surface tension; absorbents like clay and straw; nanofibrillated cellulose sponge – absorbs oil and leaves water behind; bioaugmentation and biostimulation

8) **The Solution is Obviuos**
   a) Which liquid had the higher density? Water because it sank to bottom.
   b) What happened when the food dye entered the baby oil layer? It stayed in droplet form until it reached the water layer.
   c) What happened when the food dye entered the water layer? It spread out. It dissolved.
   d) Is the food dye polar or nonpolar? Polar How can you tell? It mixed with water
   e) When it comes to solubility, scientists say "Likes dissolve likes." What does this mean? Likes dissolve likes means polar is attracted to polar and nonpolar is attracted to nonpolar