

## Station 1 & 4

### Water and Hexane

1. Inside the glass vial is water ( $\text{H}_2\text{O}$ ) and hexane ( $\text{C}_6\text{H}_{14}$ ).  
*(Don't open or shake the jar!)*
2. Why won't the water and hexane layers mix? Which layer do you think is on top? Why?
3. Look closely between the two layers. There is a paper punch hole coated with graphite (an *allotrope* of carbon) on one side only.
4. Gently invert the jar several times. Does the graphite side of the paper face up or down?
5. Repeat Step 4. Did you obtain the same result?
6. Carefully turn the jar over, resting it on the lid. Did the paper dots also turn over?
7. What do you think is the cause of these unusual observations? Draw a diagram on the molecular level.

## Station 2 & 5

### Water and Methanol

1. Add exactly 5.0 mL of water (HOH) to one 10-mL graduated cylinder. Make sure the bottom of the meniscus is right on the line.
2. Add exactly 5.0 mL of methanol (CH<sub>3</sub>OH) to a second 10-mL graduated cylinder.
3. Pour one liquid into the other. Don't spill a drop! Then, pour the mixture from one graduated cylinder to another three or four times to mix it thoroughly.
4. Determine the final volume of the mixture. What happened? Why?
5. Draw a molecular diagram of the final mixture (H<sub>2</sub>O molecules and CH<sub>3</sub>OH molecules) to illustrate the phenomenon.
6. **CLEANUP:** Pour your water-methanol mixture into the sink. Carefully shake each graduated cylinder dry.

## Station 3 & 6

### Water, Sulfur, and a Mystery Compound

1. Rinse out beaker **VERY WELL** with water!
2. Fill your beaker approximately 2/3 full with water.
3. Gently “shake” in a bit of the *solid* yellow sulfur compound by tapping the beaker.
4. Why does the sulfur distribute itself in the water this way?
5. Carefully drop a TINY amount of the orange *liquid* onto the edge of the water surface. Watch carefully!
6. What do you think the “mystery liquid” is? Why?
7. Draw a molecular diagram of the water before *and* after the addition of the “mystery liquid”.
8. **CLEANUP:** Pour the contents of your beaker (not the beakers of sulfur or mystery liquid) down the drain. Rinse it with a LOT of water. Based on what you observed, why is this important? (Think about what happened when you added the mystery liquid!)