

## Lab: The Unique Properties of Water

### 1. Mr. Lincoln

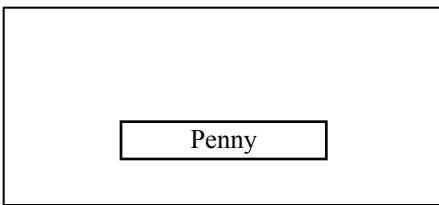
Place a FULL drop of water on a clean, dry, penny (a full drop is one that has a chance to form entirely and completely falls from the dropper before hitting its destination). See how many drops of water you can fit on one penny without it spilling. Try the same with alcohol. Then add a few drops of surfactant to the water and try again. Record any observations about the behavior of each substance being dropped.

#### Water

Trial 1 \_\_\_\_\_

Trial 2 \_\_\_\_\_

Trial 3 \_\_\_\_\_

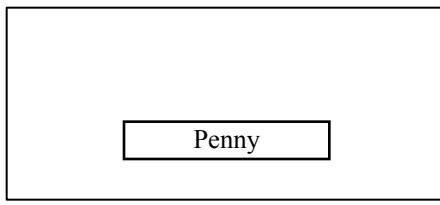
Diagram:  $\text{H}_2\text{O}$ 

#### Water + Surfactant

Trial 1 \_\_\_\_\_

Trial 2 \_\_\_\_\_

Trial 3 \_\_\_\_\_

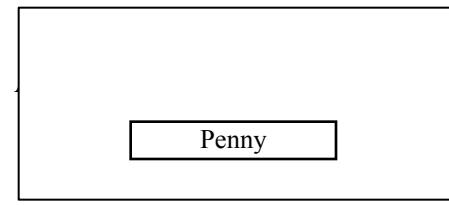
Diagram:  $\text{H}_2\text{O} + \text{Surfactant}$ 

#### Isopropyl Alcohol ( $\text{C}_3\text{H}_7\text{OH}$ )

Trial 1 \_\_\_\_\_

Trial 2 \_\_\_\_\_

Trial 3 \_\_\_\_\_

Diagram:  $\text{C}_3\text{H}_7\text{OH}$ 

**QUESTION 1:** Why doesn't water spread out infinitely thin but instead beads up? (Hint: What force attracts water molecules to one another?). Explain your thinking.

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**QUESTION 2:** Which substance were you able to fit the most drops of on the penny, water or alcohol? Why do you think it works better than the other? Explain your thinking.

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**QUESTION 3:** What does the surfactant do to the water to change its behavior? (Hint: Does it help or hinder the force that attracts water molecules to one another?) Explain your thinking

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## 2. Water Walk

Gently lay a paperclip on the surface of a beaker of water. If you are careful enough, you should be able to get it to float. (Hint: Dry the paperclip before each attempt and lay it as parallel to the surface as possible!)

**QUESTION 4:** How is it that we can float something denser than water, like a steel paperclip, on top of it? Explain your thinking

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## 3. Rising Water

Place the small end of the capillary tube in the water ever so slightly and observe. Make sure the capillary tube is not clogged w/ water or other debris before attempting (you can clear it by blowing through it, without touching your mouth to the tube, of course).

**QUESTION 5:** Why does the water flow up the tube? Draw a diagram along with your explanation.

Diagram:	<hr/> <hr/> <hr/>
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**QUESTION 6:** When you fill a graduated cylinder with water, why does a meniscus form? Explain your thinking

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## 4. Iceberg Ahead!

Place a piece of ice in water.

**QUESTION 7:** Solids are always more dense than liquids, right? Why, then, does solid water (ice) not sink in liquid water? Explain your thinking

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