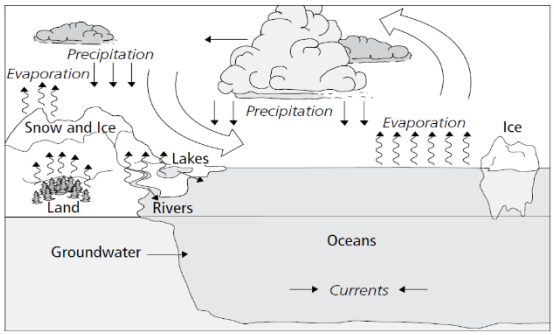
Name: _____ Period: _____ Date: _____

Water lab # 1

PRE-LAB: *Write down and sketch your observations for the two liquids. Explain the differences you see in the two liquids and why you believe these differences occur.*

	Sketch	Description/Explanation	What was it?
Liquid #1			
Liquid #2			

BACKGROUND: We observe and use water every day. It makes life on Earth possible. Water covers nearly three fourths of Earth's surface and affects almost all living and nonliving things. Because it is so abundant, it may not seem unusual, but water is unique when compared to other substances in the universe. In fact, its properties are quite different from those of other substances even here on Earth. For instance, it is the only substance on Earth that occurs naturally in all three states—solid (e.g., an iceberg), liquid (e.g., ocean water), and gas (e.g., steam or vapor in a cloud).



Most substances (water, air, dirt, etc.) are made up of **atoms**. Atoms are arranged in a specific way, often forming a **molecule**. The makeup of a water molecule—or any molecule— is called **molecular structure**. A substance's molecular structure is responsible for its properties and governs how it interacts with other things on Earth. This Activity introduces and explores one specific property of liquid water.

Activity #1: A Pile of Water

PROCEDURES:

A. Place a penny on a paper towel.
B. Estimate the number of water drops you can pile on the penny before the water runs over its edge.
C. Record your estimate in the data table.
D. Place water on the penny drop by drop. Count each drop until the water spills over.
E. Record your results in the table on the data table
F. Make a sketch of the water on the surface of the penny just before the water spilled over.
G. Based on what you observed with the penny, make a prediction comparing the number of drops you could pile on a nickel, dime, or quarter. Remember that the area of the different-size coins is important to your predictions. **Repeat Steps 4-6 with the different coins.**

Sketch the water and coin in the space below:

Data Table: Predicted and Observed Results		
Item	Number of Drops	
	Prediction	Observation
Penny		
Nickel		
Dime		
Quarter		

1) Describe the way water "sits" on the penny. Make sure to relate back to the molecular structure of water and discuss the atoms involved.

2) Why do some pennies hold more water droplets than others?

3) Why do you think water piles up on the penny, rather than spilling over the edges immediately?

4) When people think of raindrops, they typically imagine a teardrop shape. Why is this notion false?

Activity #2: On Top of Water

PROCEDURES:

A. Fill up the bottom of a plastic cup with water.
B. Gently place the paper clip on the top of the water so that it sits on top. Sketch an observation in the data table.
C. Use the eyedropper to add a few drops of soap. Describe what happens.
D. Attempt to float the paper clip again.

Paper clip and water	Paper clip and soap
Observation:	Observation:

5) Describe the differences in density between the paper clip and water.

6) Explain what changed when the soap was added.

7) What do you predict would happen if salt is added to the water? Would the paper clip sink or float? Why or why not?

OVERVIEW: The two activities that were completed demonstrated the properties of **cohesion** and **surface tension.** These properties occur because water is a **polar molecule** with **hydrogen bonds.** Develop definitions for these terms using the information and observations from the lab activity.

Cohesion → _____

Surface tension → _____

Polar molecule → _____

Hydrogen bonds → _____