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**Properties of Water Lab**

**Key Vocabulary:**

**Cohesion:** the attractive force between the molecules of the liquid (in this case water)

**Adhesion:** the attractive force between the molecules of the liquid (water) and another object.

**Capillary action:** the phenomenon in which the surface of a liquid is observed to be elevated where it comes into contact with a solid; the net result of cohesion and adhesion.

**Surface tension:** the attraction between water molecules at water’s surface that makes the water behave as if it were covered in a thin film; the tendency of water to stick together rather than to spread out.

**Heat Capacity:** The maximum amount of heat energy a liquid can absorb

**Universal Solvent:** refers to water’s ability to dissolve other polar substances

**Station 1:**

1. Use the supplies at the table to make TWO water molecule. Paste the molecules in the space below in the correct orientation. Label the covalent bonds in each water molecule and draw a Hydrogen bond between the two water molecules.
2. Water is a polar molecule. What does this mean?

**Station 2:**

1. Carefully drop water on to the surface of a penny count how many drops it takes for the water to spill over.
   1. How many drops did it take until the water spilled?
   2. Were you surprised by how much water stayed on the penny? What did it look like just before the water spilled over? Draw a picture!
   3. What properties of water allow a lot of water to stay on the penny? Explain.
2. Use the pipet to drop 10 drops of water on the wax paper.
   1. Describe how the water behaves. Why does this happen? (use key vocabulary!)

**Station 3:**

1. Place 2 drops of water on a microscope slide. Put another slide on top of that slide. Now, try to pull apart the slides. What happens? Why do you think this happens?
2. Use the pipet to transfer 20 mL of water from the beaker to the graduated cylinder. Observe the meniscus that forms. Why does this happen?

**Station 4:**

1. Use the tweezers to float a small paperclip on the surface of the water in the beaker. \*\*\*MAKE SURE THE PAPER CLIP IS DRY\*\*\*
   1. Why can you float the paperclip on the water’s surface? Which properties of water is being demonstrated?
   2. What is an example of how this phenomenon is demonstrated in nature?
2. In your beaker, add 2 drops of food coloring. Place the capillary tube in the colored water and measure how high up the capillary tube the water travels on its own. Make your measurements in millimeters.
   1. Record measurement of the water in the tube.
   2. Why does the water behave the way it does? (Use key vocabulary!)
   3. Why would this relationship be important to plant?

When finished, CLEAN UP! Dump out your water and rinse the beaker out.

**Station 5:**

1. Obtain a water and oil bottle. Water is polar and oil is nonpolar.

The oil is the top layer, the water the bottom layer. Shake up the bottle.

* 1. What happens to the oil and water after time? Why?

1. Add 10 grams of salt (NaCl) to the beaker of water. Stir the water until the salt has dissolved using the stirring rod.
   1. How long did it take for the salt to dissolve?
   2. What property of water is being demonstrated?
   3. What are the solute and the solvent in the solution you have just made?



* 1. What is unique about the positions of the water molecules around the Na+ and Cl- atoms?
  2. Why is water able to dissolve the salt and not the oil?

**Station 6:**

1. Place a drop of water on one hand and a drop of rubbing alcohol on another. Observe.
   1. Which drop feels cooler?
   2. Which one evaporates sooner? Why?
   3. Explain evaporation on a molecular level.
   4. Predict why they are the same temperature but feel different on your skin.
2. Your cells are constantly working, carrying out millions of chemical reactions per second that produce heat. Your body is made up of 60% water. This allows your cells to help regulate their temperature and maintain homeostasis. Explain why this is possible using key vocabulary.