

## Chemistry Unit 5 Classwork/Homework

### Event 1: 20mm Dash – Cohesion/Hydrophobicity

**Materials:** wax paper, cup, water, stopwatch/clock, scissors

1. Cut a strip of wax paper that is 20mm long. Fill cup with a small amount of water.
2. Transfer 1 drop of water to the edge of the wax paper. Make sure the entire drop is on the wax paper.
3. Partner 1: Blow on the drop of water as fast as you can to move it to the edge/finish line. Partner 2 times partner 1.
4. Switch roles and repeat.

**Data:**

Partner	Time (sec)
Partner 1: _____	
Partner 2: _____	

### Event 2: Penny High Dive – Adhesion/Cohesion/Surface Tension

**Materials:** 2 pennies, 2 pipettes, cup, water, isopropyl alcohol

**Safety:** No eating or drinking. Wash hands when done.

Partner 1:

1. Lay a penny heads up. Fill cup with water.
2. Using a pipette, carefully transfer as many drops of water onto the penny as you can. Keep count.
3. How many drops did you get before the liquid spilled?

Partner 2:

1. Lay a penny heads up. Fill cup with isopropyl alcohol.
2. Using a pipette, carefully transfer as many drops of isopropyl alcohol onto the penny as you can. Keep count.
3. How many drops did you get before the liquid spilled?

**Data:**

Substance	Number of Drops Water	Number of Drops Alcohol	Total Number of Drops (water + alcohol)
Partner 1 _____			
Partner 2 _____			

**Event 4: High Jump – Capillary Action**

**Materials:** filter paper, scissors, petri dish, ruler

1. Fill a petri dish with just enough water to cover the bottom.
2. Partner 1: Cut a rectangle out of filter paper that is 8 cm tall and 4 cm wide.
3. Touch the narrow edge of the rectangle to the surface of the water and hold it there.  
Watch as the water moves up the filter paper.
4. Once the water stops moving, use the ruler to measure the distance the water traveled up the filter paper.
5. Partner 2 repeat the procedure.

**Data:**

<b>Partner</b>	<b>Distance (cm)</b>
Partner 1: _____	
Partner 2: _____	

**Event 5: Sink or Swim – Hydrogen Bonding/Surface Tension**

**Materials:** 2 cups, water, isopropyl alcohol, paper clips

1. Fill a cup half way with water.
2. Fill another cup half way with isopropyl alcohol.
3. Set a clock (or stop watch) with 1 minute.
4. Partner 1 has 1 minute to try to balance as many paperclips on the surface of the water.  
Record data.
5. Partner 2 has 1 minute to try to balance as many paperclips on the surface of the alcohol  
as possible. Record data.
6. Switch liquids and repeat for 1 minute.

**Data:**

<b>Partner</b>	<b>Number of Paper Clips on Water</b>	<b>Number of Paper Clips on Alcohol</b>	<b>Total Number of Paper Clips</b>
Partner 1: _____			
Partner 2: _____			

## Pressure Data

1. Record original volume. \_\_\_\_\_
2. Record volume after kernels. \_\_\_\_\_
3. What is the volume of the kernels in liters? \_\_\_\_\_ Circle this answer!
4. Total mass of beaker, oil, and kernels before popping. \_\_\_\_\_
5. Total mass of beaker, oil, and kernels after popping. \_\_\_\_\_
6. Subtract to find the mass of water vapor released. \_\_\_\_\_
7. Convert this mass to moles using the molar mass of water. Circle your answer!
  
8. Use the ideal gas law ( $PV = nRT$ ) to calculate the pressure of the gas using **225 degrees C as the gas temperature** (this is the temperature of boiling oil, but you need to **convert it to Kelvin**), volume of the popcorn, and the moles of water. ( $PV = nRT$ ). As the constant R, use 8.315 L x kPa/mol x K. This means your answer will be in kPa.

## Factors Affecting Rate of Solvation

## Colligative Properties Demonstration

### Specific Heat Data

Mass of metal piece: \_\_\_\_\_

Initial temperature of styrofoam cup water: \_\_\_\_\_

Temperature of boiling water: \_\_\_\_\_

Maximum temperature of styrofoam cup water: \_\_\_\_\_