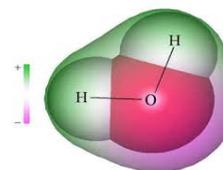


Properties of Water Lab



STATION 1: (20 pts)

Property: Cohesion / Surface Tension

Cohesion is the ability of water molecules to stick to themselves (H-bonds). Surface tension is a property of water created by cohesion that enables a drop of water to keep its shape.

- Predict how many drops of water will fit on the surface of a penny before it spills over _____.
- Put drops of water (one at a time) on the top of the penny until the water spills over the edge. Record your data in the table below. Include the data of all your group members then calculate the average.

Illustrating the Surface Tension of Water

Person 1	Person 2	Person 3	Person 4	Person 5	AVERAGE

- Adding surfactant to the surface will reduce the surface tension of water causing it to lose its shape and spread out.
Predict how many drops of water will fit on the surface of a dry penny after it has been smeared with a surfactant _____.
- Place one drop of soap on your finger then spread it on the surface of a dry penny.
- Put drops of water (one at a time) on the top of the penny until the water spills over the edge. Record your data in the table below. Include the data of all your group members then calculate the average.

Effect of Surfactant on Surface Tension

Person 1	Person 2	Person 3	Person 4	Person 5	AVERAGE

STATION 2: (5 pts)

Property: Water is a Universal Solvent

A solvent is something a substance is dissolved into. Complete the following test to see if water really does dissolve substances better than any other liquid.

- Measure 50 mL of water and put in cup A. Measure 50 mL of rubbing alcohol and put into cup B.
- Place 1 spoonful of salt in each of the cups at the same time.
- Use the stir rod to swirl contents in the cup at least 3 times.
- Observe for 1 minute then record the data below using the key shown.

Substance	Key
Cup A (water)	
Cup B (alcohol)	

++ 100% dissolved
+ partially dissolved
- did not dissolve

STATION 3: (10 pts)

Property: pH

Common household items have a variety of different pH levels. Test the following unknowns to determine which are acidic, basic, or neutral.

1. Dip the small strip of pH paper into each of the 5 unknown substances. Be sure to use a different strip of paper for each substance.
2. Using the pH scale on the package, immediately read the pH of each level.
3. Record your data for each substance in the table below. Also indicate if the substance was an acid, a base, or neutral.

pH Levels of Household Items

Substance	pH	Acid / Base / Neutral
A		
B		
C		
D		
E		

STATION 4: (10 pts)

Property: Adhesion (capillarity)

Adhesion is the attractive force that occurs between two different substances as in glass and water. Demonstrate this force by completing the procedure below.

1. Place the capillary tube vertically into the cup of colored water.
2. Observe, describe and sketch what happens (in the right margin). Be sure to include in your description which property of water allows this action to occur.

STATION 5: (10 pts)

Property: Less Dense as a Solid

1. Observe the ice floating on the water and the frozen water bottle.
2. What normally happens to materials when they get colder? (expand or shrink?)
3. Think about why the bottle has been "pushed outward".
4. Explain why ice floats on water. (What makes it less dense?)
5. How is this important to life on Earth? Give an example.

STATION 6: (5 pts)

Property: High Heat of Vaporization

1. Spray the back of your hand with the water. Think about how that feels on your skin.
2. When you boil water it seems to take forever for the water to heat up. Why do you think that is?
3. What is meant by the term "high heat of vaporization"?
4. Explain why this property of water is important to life of Earth.

STATION 7: (10 pts)

Property: High Heat of Vaporization (part 2)

1. Rub your hands together to create friction.
2. What are you producing with your hands?
3. Hold three 3D Water Molecule between your hands. Slowly move your hands together.
4. What is happening to the water molecules (and the hydrogen bonds)?
5. What is happening to the water molecules now?
6. What did you observe?

Analysis Questions (10 pts each)

1. Discuss why water is referred to as the universal solvent? (*synthesis*)
2. Compare which end of the water molecule is partially positive and which end is partially negative? Explain and justify your answer. (*evaluation*)
3. Distinguish the number of water drops a penny holds before and after the addition of a surfactant. Justify your answer using data from the lab. (*analysis*)