

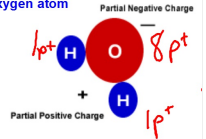
**Section 2.2 p.39-44: Properties of Water**

Pre Check	Objectives (*EOB)	Post Check
	1. Discuss the properties of water.*	
	2. Explain what acidic, basic, and neutral solutions are.	

1. Discuss the properties of water.\* liquid state over most of Earth's surface  
water is neutral but has a slight positive end and slight negative end...water is POLAR  
less dense when it freezes      cohesion, adhesion  
hydrogen bonding      heat capacity
2. How do hydrogen bonds between water molecules occur? \_\_\_\_\_  
The attraction between a hydrogen atom of one water molecule and the oxygen atom of another water molecule

3. Sketch a molecule of water labeling the partial charges and atoms.

Describe the structure of a water molecule to explain why it is polar.\* **Water Molecule Diagram**  
uneven distribution of electrons, creating a slight (-) charge in the oxygen atom  
and a slight (+) charge on the hydrogen atom



4. For the following questions, write True or False on the line provided.

- True Water is a polar molecule.  
False Hydrogen bonds are an example of adhesion.  
False Covalent bonds give water a low heat capacity.  
False A hydrogen bond is stronger than a covalent bond.

5. What is the difference between cohesion and adhesion?\*

Cohesion - same substance...water molecules are drawn together...surface tension


Adhesion - different substances...capillary action

6. What is special regarding water's heat capacity?\*

Because water has multiple hydrogen bonds between water molecules,  
it takes a large amount of heat energy to cause those molecules to move faster,  
which raises the temperature of the water.

7. How does water's polarity influence its properties as a solvent? \*

Because it has (+) and (-) ends it can dissolve both ionic (charged) compounds and other polar molecules

meniscus  
Bottom  
  
UNIVERSAL SOLVENT

8. What is the difference between a solution and a suspension? \*

A solution is a mixture of two or more substances in which the molecules of the substances are evenly distributed. Suspension is a mixture of water and non-dissolved materials.

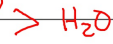
9. Complete the table.

Substance	Description	Example(s)
Mixture	<u>Physical combo of 2 or more substances</u>	<u>cinnamon and sugar</u>
Solution	<u>mixture, all substances are evenly distributed</u>	<u>Kool-aid drink</u>
Solute	<u>substance that is dissolved</u>	<u>Kool-aid powder</u>
Solvent	<u>substance in which the solute dissolves</u>	<u>water with the Kool-aid</u>
Suspension	<u>mixture of water and non-dissolved substances</u>	<u>blood</u>

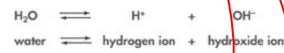
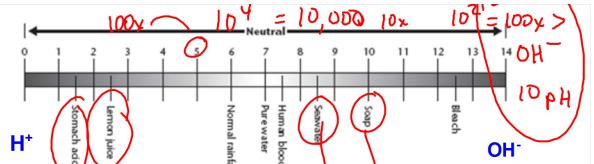
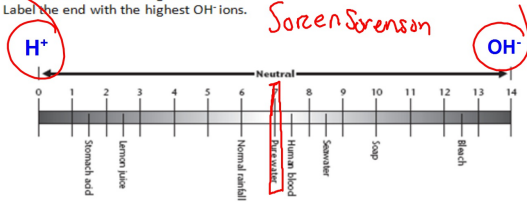
10. Explain what makes a solution acidic or basic (alkaline). \_\_\_\_\_

an acid forms hydrogen ions in solution  $H^+$

a base forms hydroxide ions in solution  $OH^-$



11. On the pH scale, indicate which direction is increasingly acidic and which is basic. Label the end with the highest  $H^+$  ions. Label the end with the highest  $OH^-$  ions.



12. Identify two solutions that have more  $H^+$  ions than  $OH^-$  ions. Are they acidic or basic?

13. Identify two solutions that have more  $OH^-$  ions than  $H^+$  ions. Are they acidic or basic?

14. Why is it important for cells to buffer solutions against rapid changes in pH? Buffers react with strong acids or bases to prevent sharp, sudden

changes in pH. In living things, controlling pH is important for maintaining homeostasis. If pH is lower or higher than acceptable (6.5 - 7.5) it will affect the chemical reactions. (ENZYMES)

15. The acid hydrogen fluoride (HF) can be dissolved in pure water. Will the pH of the solution

be greater or less than 7? less... $H^+$  will form