



If you are a student that **HAS** access to technology, this is not the packet for you. This packet is for students who pick up and drop off their work at the front office every week. If you have access to technology, please go back to your teacher's website and complete the correct assignment.

Name: _____ Period: _____ Teacher: _____

Assignment 6.1 – Solutions

Part I. → Fill in the blanks (word bank: solution, solute, solvent)

Solutions are composed of two parts. The solute (sugar, salt etc...) which is the part YOU put in to the solvent (water, alcohol etc...) which has the bigger quantity.



☞ Label the pictures: _____

Part II. → 3 Types of Solutions. (You'll use these to do Part III)

1. Dissociating:

Solid Ionic substances (salts) in water break up to make charged ions.

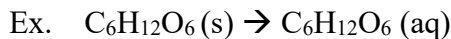


(s) = solid, (aq) = aqueous...surrounded by agua (water)

- When the ions are in water they separate or **DISSOCIATE** from each other.
- This is a **PHYSICAL CHANGE**. If you evaporate the water, you'll get the salt back.
- The charged ions in water can conduct electricity; so, these salt water solutions are called **ELECTROLYTES**.

2. Dissolving:

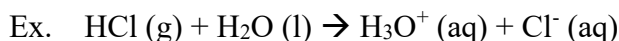
Solid Covalent substances (NO metals) breaks into its molecules which get surrounded by water.



- The molecules stay intact and the whole molecule gets surrounded by water which is called **DISSOLVING**.
- This is a **PHYSICAL CHANGE**. If you evaporate the water, you'll get the sugar back.
- There are no charges (ions) in this one, so it is NOT an electrolyte and won't conduct electricity.

3. Ionization:

Gaseous Covalent acids (molecules with 'H' in the front) are bubbled into water making charged ions.



(g) = gas, (l) = liquid...water is liquid because it's pure.
(aq) = aqueous...something dissolved/dissociated in the water

- When the gaseous acid is bubbled into the water, the acid gives its H to the H₂O but keeps its electron creating charged ions in a process called **IONIZING**.
- This is a **CHEMICAL CHANGE**.
- The charged ions in water can conduct electricity; so, these acid solutions are also called **ELECTROLYTES**.

Part III. → 3 Types of Solutions.

1. What is the main difference between ionizing and dissociating? _____
(Hint: look at type of compound)
2. What is the same between ionizing and dissociating? _____
(Hint: look at what they both make)
3. How is it possible for a covalent substance to conduct electricity? _____
(Hint: 2 of these are covalent...which one can conduct electricity?)

4. Fill out the data table:

Substance	Ionic or Covalent (Hint: if 1 st atom is metal = ionic)	Type of Particle in Solution (Ion or Molecule?)	Dissociates, Ionizes or Dissolves in Solution
a. KNO ₃ ex	Ionic	Ion	Dissociates
b. H ₂ S ex	Covalent	Ion	Ionizes
c. HCl			
d. NaOH			
e. C ₁₂ H ₂₂ O ₁₁			
f. H ₂ SO ₄			
g. CaCl ₂			

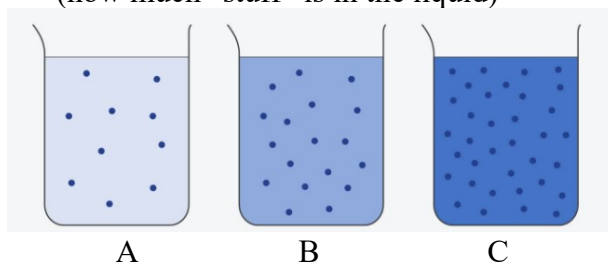
5. Question...If Gatorade is an ‘electrolyte’ what is it really? _____

(Hint: Your sweat = salt + water...more or less. Drinking salt water so you have salt to keep the water in your body wouldn't taste good. Drinking sugar water sure tastes good though, doesn't it? Good idea...sell salt water with a bunch of sugar in it to taste good and make it attractive with lots of pretty food coloring. Yum...Gatorade!!! Lol.)

Assignment 6.2 – Solution Concentrations

Part I. → Solution Molarity

Molarity (M) – describes how many moles of solute in liters of solution.
(how much “stuff” is in the liquid)



1. Which solution has the highest solution concentration? _____
2. Which solution has the lowest molarity? _____

Part II. → Changing Concentrations by various Stresses

4. Surface Area:

- Which dissolves better...sugar cube OR granulated sugar? _____
- Which has more surface area (surfaces that can touch the water)... sugar cube OR granulated sugar? _____
- When the sugar dissolves, will the molarity increase or decrease? _____

5. Shaking:

- In order to dissolve things quickly, is it better to pour sugar into water and leave it OR shake the sugar water solution? _____
- Is that shaking...kinetic OR potential energy? _____
- Solubility means 'dissolve-ability'...so, is sugar more soluble (dissolve-able) when you leave it alone or when you shake it? _____

6. Temperature:

- Which dissolves better, sugar in cold OR hot water? _____
(Hint: does sugar dissolve better in iced tea or hot tea?)
- Does gas dissolve better in cold water OR hot water? _____
(Hint: think of how well gas stays in soda in the fridge or outside on a hot day)
- So, solids and gases behave differently. Solids dissolve better in (hot/cold) _____ liquid and Gases are more soluble in (hot/cold) _____ liquid.

7. Pressure:

- Which can change by adding pressure...gas OR solid? _____
- Are gases more soluble (dissolve-able) in high/low pressure? _____
(Hint: when the cap is on the soda it is pressurized. When you release the cap, what happens to the bubbles in the soda? Less bubbles = less pressure)

8. In summary...

- **Solids dissolve better with (high/low) _____ surface area AND with (high/low) _____ temperature.**
Ex. If you want your sugar to dissolve fast in your tea, what are 2 things you should do?
 - 1.
 - 2.
- **Gases dissolve better with (high/low) _____ pressure AND with (high/low) temperature.**
Ex. If you want the bubbles to stay in your soda, what are 2 things you should do?
 - 1.
 - 2.

Assignment 6.3 – Acid and Base Solutions

Part I. → Acids and Bases

1. **Acids** – Have an ‘H-‘ in the front. Ex. HCl...hydrochloric acid



Acids are found in many foods, including citrus fruit, vinegar and yoghurt.

- How do acids taste? _____
- If you get acid in a cut, how does it feel? _____
(don't say burn...burn implies heat)
- Can acids change litmus paper color or liquid indicator colors? _____

2. **Bases** – Have ‘-OH’ in the back. Ex. NaOH...sodium hydroxide

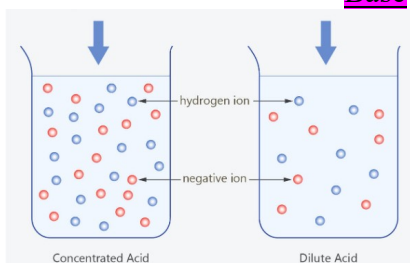


Commonly used bases include baking soda, caustic soda and limestone.

- Shampoo/soap is a base. How do bases taste? _____
- How do shampoo/soap feel on your hands? _____
(so, if you get bleach on your hands and they feel slippery...wash immediately!)
- Can bases change litmus paper color or liquid indicator colors? _____

Part II. → pH = POWER of the Hydrogen Ion!!!!

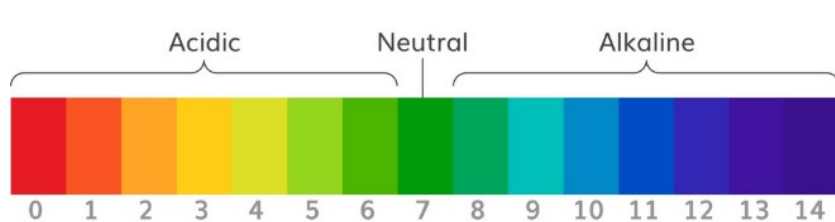
- All acids (H^+) and bases (OH^-) have **BOTH... H^+ and OH^-** .
- **Water is neutral** because it is half H^+ and half OH^- → HOH OR H_2O
Acid = more H^+ than OH^-
Base = more OH^- than H^+



← In these acids: red (acid, H^+) > blue (base, OH^-)

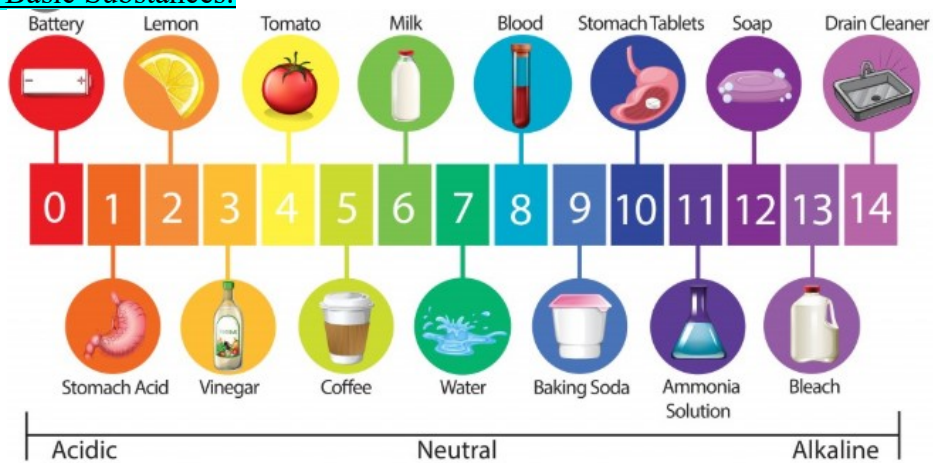
The pH Scale

- Since acids/bases have both H⁺ & OH⁻, chemists choose to focus on the H⁺ concentration which they refer to as pH...power (concentration) of the hydrogen ions.



1. The pH scale ranges from 0 to _____.
2. (acids/bases) _____ have a pH from 0 to just below 7.
3. (acids/bases) _____ have a pH from just above 7 to 14.
4. Water (HOH), which is neutral, has a pH of _____.

Acidic/Basic Substances:



5. Name 4 alkaline (basic) substances in your house:

-
-
-
-

6. Name 4 acidic substances in your house:

-
-
-
-

Neutralization

- **Neutralization:** Acid + Base → Salt + Water
Ex. $\text{HCl} + \text{KOH} \rightarrow \text{KCl} + \text{HOH}$

7. Pick 2 substances from the chart above that you could add together to make water:

_____ + _____
(acid) (base)

(Note: Yes, it will make salt (an ionic compound) too! LOL. 😊)