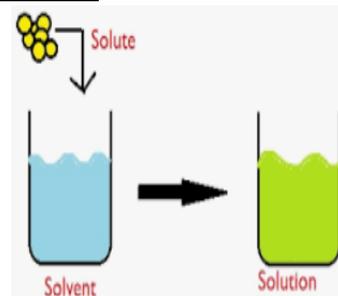


Unit 4 Learning Targets

Behavior of Matter & ENERGY in Solutions

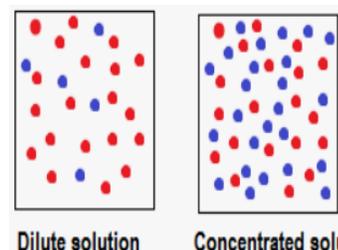
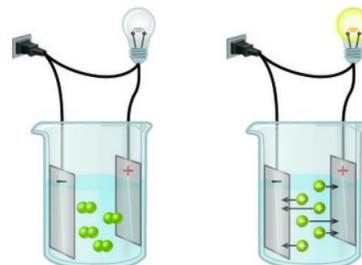
1. I can develop and use models to explain the properties of solutions.

- I can differentiate between the **SOLUTE** & **SOLVENT** of a given solution.
- I understand that **ELECTROLYTES** presence or absence in a solution determine conductivity of the solution.
 - ✓ Electrolytes are commonly referred to as Salts and are Ionic Compounds.
- I can discuss the **CONCENTRATION** of a solution based on the solute to solvent ratio.



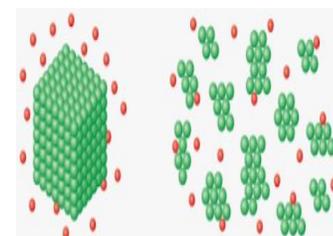
2. I can discuss methods for increasing and/or decreasing the rate at which a solute dissolve in a specific solvent.

- TEMPERATURE** typically has the most influence on the rate of solute dissolution.
 - ✓ Increasing the temperature of means there is more Kinetic ENERGY (speed) amongst the particles.
 - ✓ The faster the particles are moving the more violently they can collide.
 - ✓ Faster moving particles decreases the time needed for the solvent to interact with all of the solute.
- The amount of **SURFACE AREA** of a solute determines how quickly a solvent can come into contact with each particle of the solute to dissolve it.
 - ✓ More surface area = increased (faster) rate of solute dissolution.
 - ✓ Less surface area = decreased (slower) rate of solute dissolution.
- AGITATION** of the solution can decrease the rate of solute dissolution.
 - ✓ Stirring or shaking a solution decreases the time needed for the solvent to interact with all particles of the solute.



3. I can analyze and interpret data from a solubility curve to determine the effect of temperature on solubility.

- I can determine if the solution is saturated (= Full), unsaturated (< Full), or supersaturated (> Full)
- I can calculate solute levels at different solvent volumes.
- I can compare & contrast how much temperature influences solutes present on the curve.
- I can identify solutes that are electrolytes.
- I can predict what will happen to saturation levels if the temperature changes.



4. I can analyze a substance & communicate the properties as being an ACID, BASE (alkaline), or NEUTRAL.

- I can predict how an Acid or Base will react with indicators.
- I know pH ranges of Acids, Bases & Neutral substance.
- I know how the presence of Acids & Bases in foods effect taste.
- I understand why Acids and Bases are electrolytes.
- I know what corrosive means and how this word applies to acids and bases
- I know the Ions that are released when Acid/Base in solution
- I understand what happens in a neutralization (acid/base) reaction.

Properties of ACID & BASE (alkaline)

Property	ACID	BASE
Taste	Sour	Bitter
Litmus Paper	RED	BLUE
Hydriion Paper (weak to strong)	Orange - Red	Green - Blue
pH Range (weak to strong)	6.9 → 0	7.1 → 14
Electrolyte? (conductivity)	YES	YES
Corrosive?	To Metals (release H gas)	To Organic Molecules
Ion	H ⁺	OH ⁻
If you mix them (ACID + BASE)	React with each other to form a Salt (Ionic compound = metal & nonmetal) & water. Acid + Base = Salt + H ₂ O	

5. I can test household items and determine if they are Acid, Base, or Neutral

