**Chemistry of Life/Biochemistry**

***Standards:***

1. ***SD P.1.2 Students are able to describe ways atoms combine.***
2. ***SD L.1.1 Students are able to relate cellular functions and processes to specialized structures with in the cell.***

**Topic: Properties of Water**

1. Describe a single molecule of water. **Label** the regions of the molecule that are **polar** with the correct charge.



1. Explain why **water molecules have these polar charges** and where the **Hydrogen bonds form.**



1. The **Hydrogen bonds** of **water** give water itself three important properties essential to all living organisms. What are these three properties and describe each
	1. .
	2. .
	3. .

**Topic: Carbon Properties**

1. **Carbon** is said to be the element essential for life. It is a very important element due to its ability to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. What are the **4 Carbon based molecules** found in all living organisms? List each and write a brief description of the function each molecule has. Also sketch an image of what a monomer of each molecule will look like.

**Topic: Solutions/mixtures**

1. Define **solution**:
2. Define **solvent**:
3. Define **Solute**:
4. Sketch an image and **label the solution, solute, and solvent**.
5. Some compounds break up when they dissolve in water. The **amount of H+(hydrogen ions)** a solution contains **is measured by what scale**?
6. **Sketch the pH scale** and explain which direction from neutral 7 would be an acid and which direction from neutral 7 would be a base. (Know what the H+ concentration will be of each).

**Topic: Chemical Reactions**

1. Define **Chemical Reactions**:
2. **Chemical equations** are used to show what happens during a chemical reaction. Look at the example below and label the different parts. (Reactants, direction of reaction, and products)

**6CO2 + 6H2O 🡪C6H12O6 + 6O2**

1. If a reaction has a **double arrow** (one pointing in both directions) what does this represent?
2. Define **Activation Energy**:
3. Define **Endothermic Reactions**:
4. Define **Exothermic Reactions**:

**Topic: Enzymes**

1. ***Enzymes are catalysts***. Define **Catalyst**:
2. What affect do enzymes have on chemical reactions?
3. Define **Substrates**:
4. What and/or how does a **change in temperature** or a **change in pH**, change how an enzyme may work?