Unit 4: Chemistry of Seawater

UEQ: How does the chemistry of seawater affect the physical and biological environment of the ocean?

Concept 1: Pure Water

- LEQ's:
  1. What is the atomic structure of water?
  2. What are the groups and periods on the periodic table?
  3. How does the atomic structure of pure water affect its unique properties?

LEQ 1: What is the atomic structure of water?

- Water is made of two atoms of Hydrogen and one atom of oxygen held together by a covalent bond.
  - Covalent bonds are bonds in which two atoms share a pair of electrons, and this sharing holds them together.
- Water can also be written as H_2O.
- Water is polar, meaning that one side has a slight positive charge and the opposite side has a slight negative charge.

LEQ 2: What are the groups and periods on the periodic table?

- The periodic table was created to organize all the elements in the universe in a logical way.
- The groups are the columns on the periodic table and they are organized so that all the elements in a group have similar properties.
- The periods are the rows on the periodic table and they are organized so that all the elements in the period are about the same size.

LEQ 3: How does the atomic structure of pure water affect its unique properties?

- Water has many unique properties.
  1. The polar hydrogen bonds that hold water molecules together allow it to be **liquid** at room temperature. Without these hydrogen bonds water would be a gas at room temperature.
  2. These same hydrogen bonds cause water molecules to stick together, **cohesion**, and to other surfaces, **adhesion**.

LEQ 3: How does the atomic structure of pure water affect its unique properties?

3. Because water molecules are polar and cohesive they form a skin like surface. This skin like surface is called **surface tension**.
   - Surface tension means that water resists objects trying to penetrate it.
   - This is why small things can float on waters' surface without going into the water.
   - If chemicals are added to water that break the hydrogen bonds surface tension no longer forms.

LEQ 3: How does the atomic structure of pure water affect its unique properties?

4. Most solids sink in their liquid form, but not water. When you put an ice cube into a glass of water the **solid ice floats**.
   - This is caused because of the lopsided shape of the water molecule.

LEQ 3: How does the atomic structure of pure water affect its unique properties?

5. Also because of water being a polar molecule it is considered a **universal solvent**, meaning many different substances dissolve in water.
   - One of the many things that dissolves in water is salt!