Unit 4:
Chemistry of Sea Water

Concept 2: Sea Water

LEQ 1: What type of bonding is involved in creating a salt molecule?

- All of the atoms we have talked about so far have had no charge. Certain atoms called ions can be found in nature with a charge.
- Ions are atoms with a charge caused by an unequal amount of protons and electrons.
  - If electrons > protons, the atom has a negative charge (-)
  - If electrons < protons, the atom has a positive charge (+)
- Opposites charged ions are attracted to each other and will bond together because of this attraction. This is called an ionic bond.

LEQ 2: What is the atomic structure of salt?

- Salt is a general term in chemistry that describes any compound made when a negative atom from an acid and a positive atom from a base are held together by an ionic bond.
- There are many different salts in the oceans but the main one is Sodium Chloride (NaCl).
  - Positive sodium is attracted to negative chlorine and they are held together by this attraction in an ionic bond.

$$Na^+ + Cl^- \longrightarrow NaCl$$

LEQ 2: What is the atomic structure of salt?

- Because of the linear shape of the sodium chloride molecule it can form into a crystalline solid.
  - Each Na+ has a weak attraction to each Cl- so they form and very organized structure.

LEQ 3: How does the ionic structure of salt affect its ability to dissolve in water?

- Because liquid water is still polar (it has both positive and negative ends) it can easily break apart the weak attractive forces of the ionic bonds in NaCl.
  - The partially positive hydrogen atoms in water attract the negatively charged chlorine ions.
  - The partially negative oxygen atoms in water attract the positively charged sodium ions.

LEQ 3: How does the ionic structure of salt affect its ability to dissolve in water?

- When water is frozen it no long acts polar, so when salt water freezes only the water freezes leaving the salt behind.