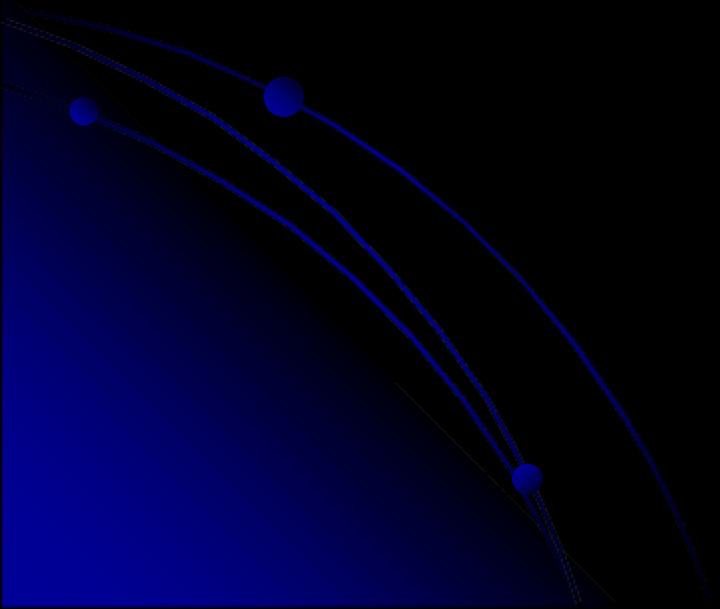


Chemistry of Life



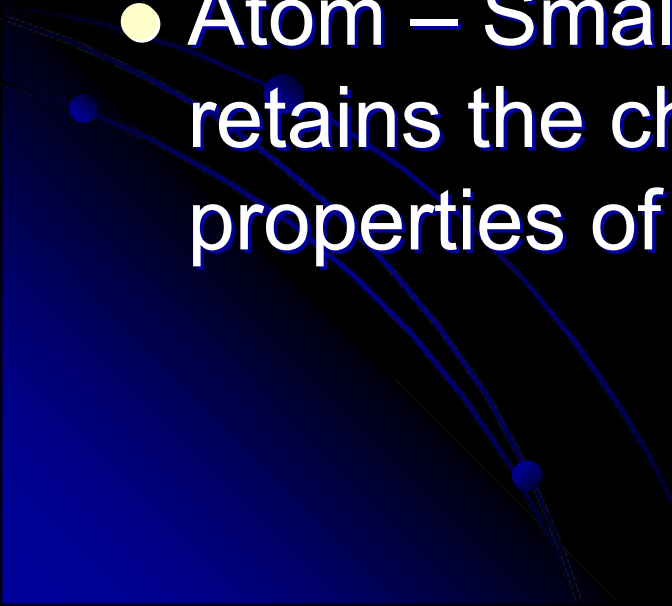
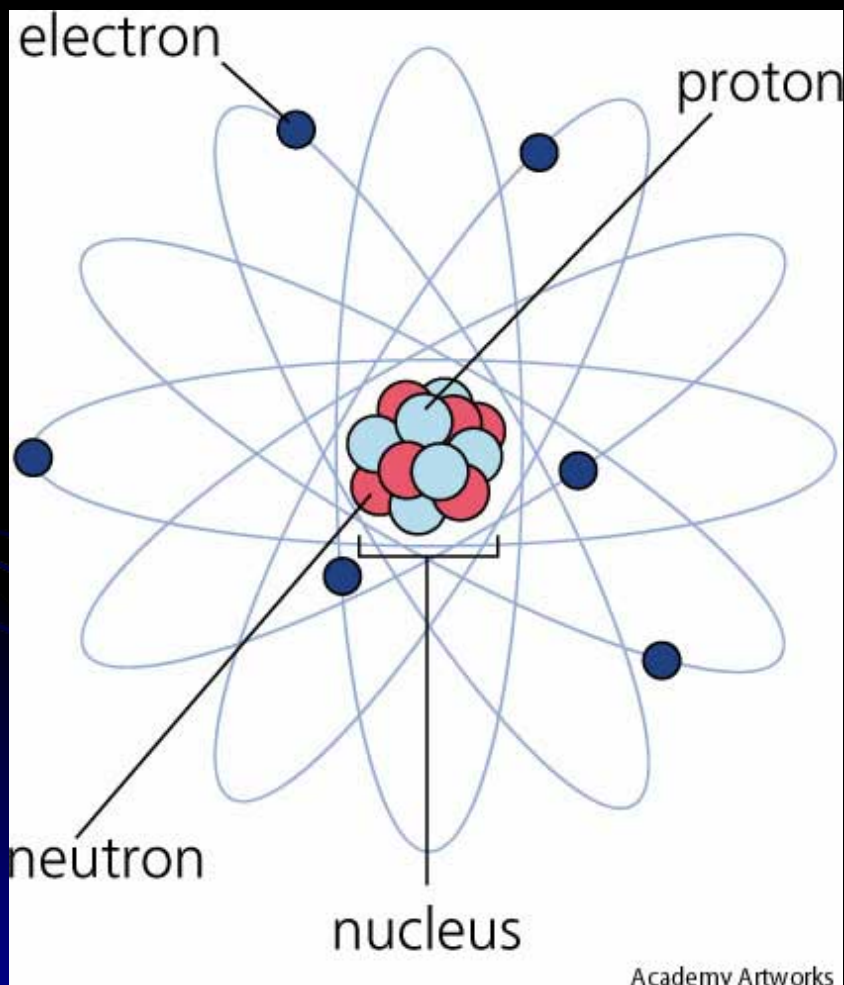
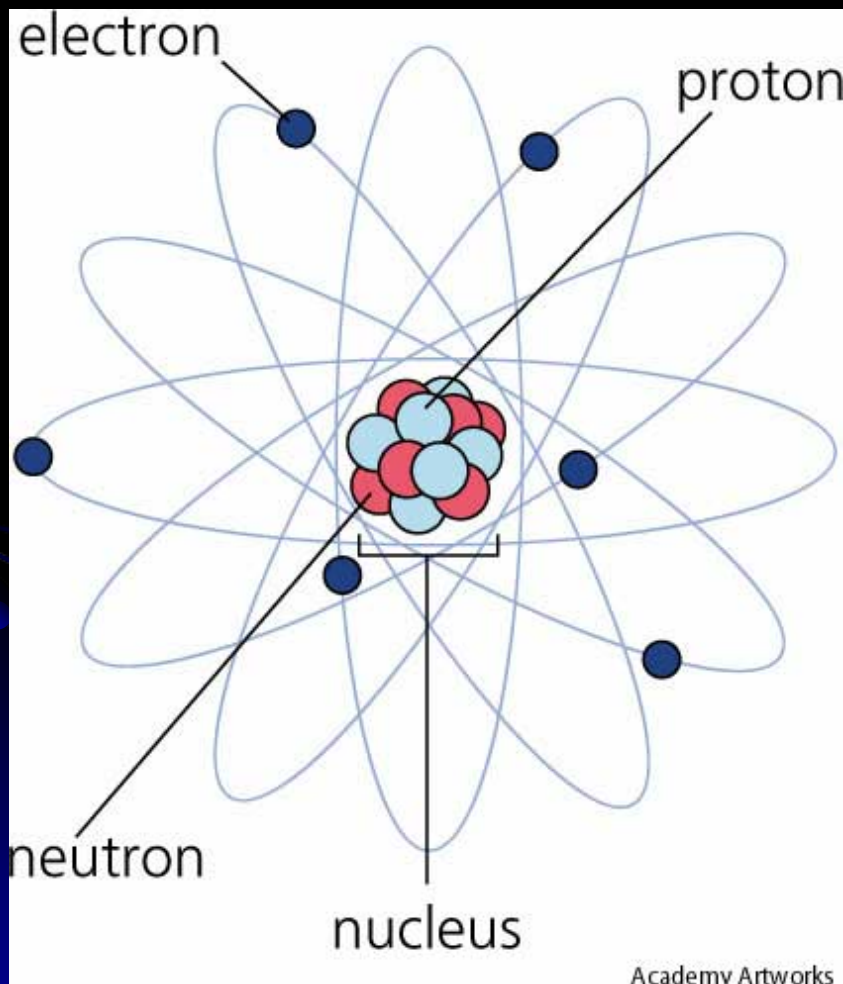
- Matter – Anything that takes up space and has weight/mass.
 - Element- basis of all substances – made up of only one atom.
 - Atom – Smallest unit of an element that retains the chemical and physical properties of that element.
- 

Diagram of an Atom



- **Nucleus**
 - **Protons**
 - + charge
 - Number of Atomic #
 - **Neutrons**
 - No charge
 - Add to protons for Atomic mass
- **Shells-energy level**
 - **Electrons**
 - - charge



- Shells-energy level
 - Electrons
 - - charge
- 1st shell – 2 electrons
- 2nd shell – 8 electrons
- 3rd shell – 8 electrons

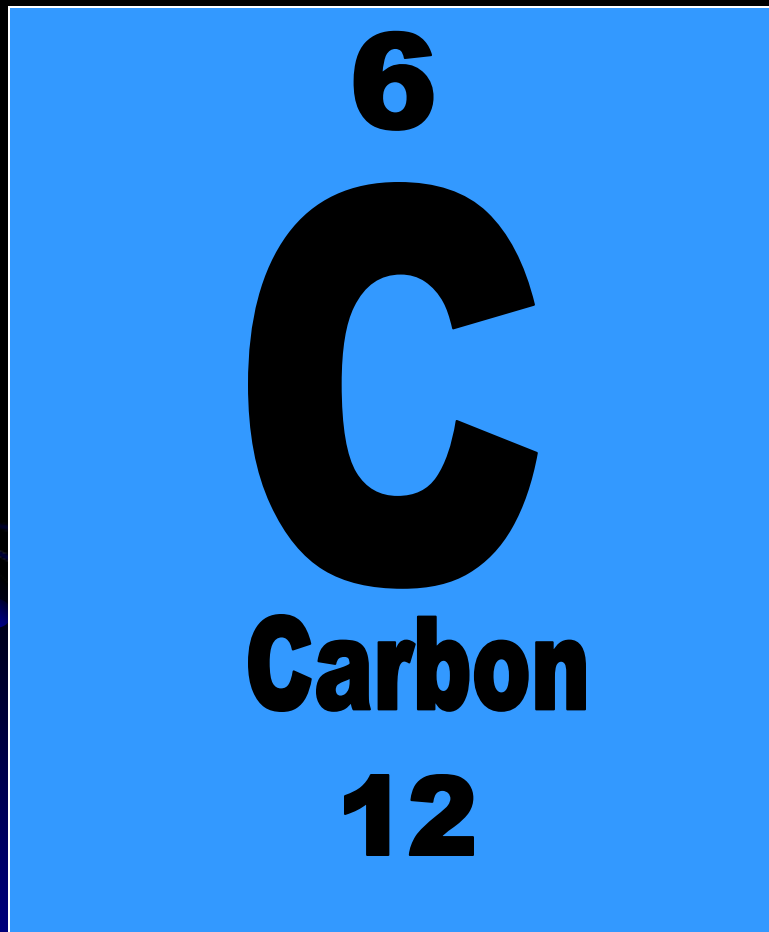
The Periodic Table

The periodic table is displayed with the following color scheme:

- Group 1 (Li, Na, K, Rb, Cs, Fr): Blue
- Group 2 (Be, Mg, Ca, Sr, Ba, Ra): Red
- Groups 3-10 (Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Y, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, Hf, Ta, W, Re, Os, Ir, Pt, Au, Hg, Rf, Db, Sg, Bh, Hs, Mt, Uun, Uuu, Uub): Yellow
- Group 11 (Cu, Ag, Au): Light Blue
- Group 12 (Zn, Cd, Hg): Cyan
- Group 13 (B, Al, Ga, In, Tl): Purple
- Group 14 (C, Si, Ge, Sn, Pb): Green
- Group 15 (N, P, As, Sb, Bi): Light Green
- Group 16 (O, S, Se, Te, Po): Orange
- Group 17 (F, Cl, Br, I, At): Pink
- Group 18 (He, Ne, Ar, Kr, Xe, Rn): Orange

H																		He
Li	Be											B	C	N	O	F	Ne	
Na	Mg											Al	Si	P	S	Cl	Ar	
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
Cs	Ba		Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
Fr	Ra		Rf	Db	Sg	Bh	Hs	Mt	Uun	Uuu	Uub							
			La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	
			Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	

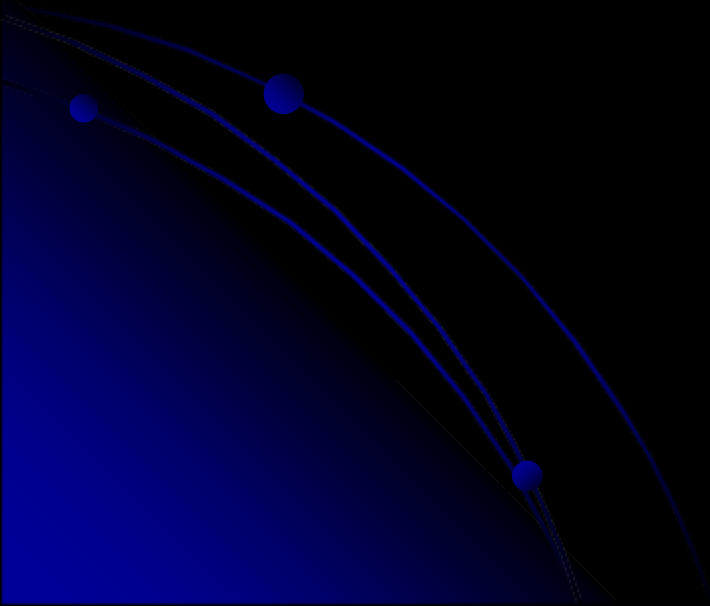
Carbon and its Isotopes



- Isotopes
 - Atoms of the same kind that differ in the number of neutrons. Protons stay the same
- Carbon 12
- Carbon 13
- Carbon 14

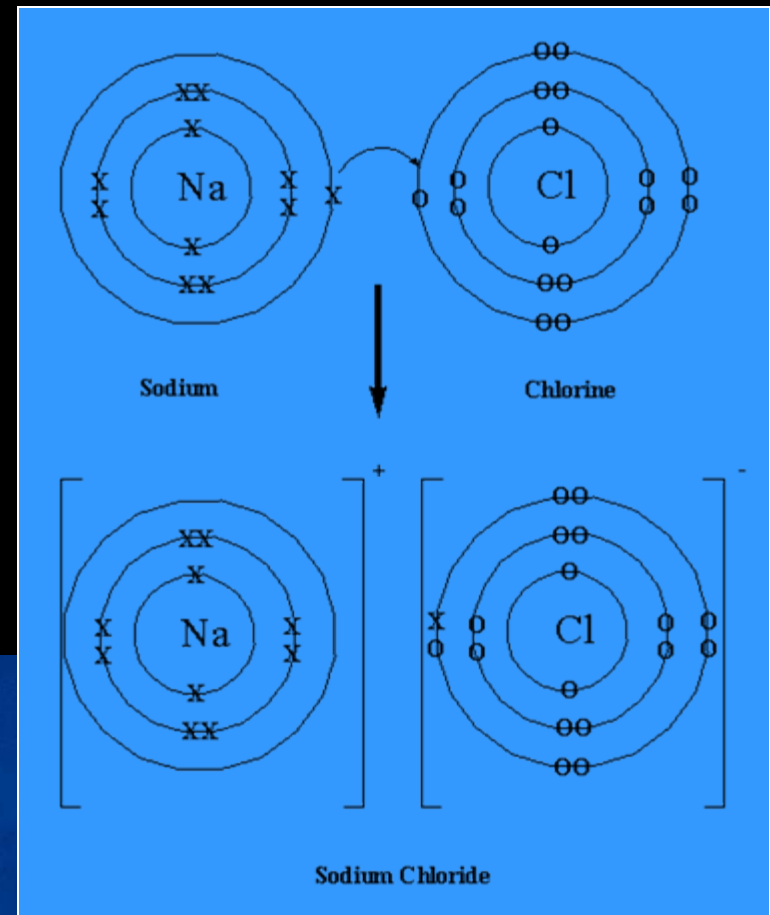
Molecules and Compounds

- Molecules – two or more atoms bond with each other (same or different)
- Compound – two or more different atoms bond together.

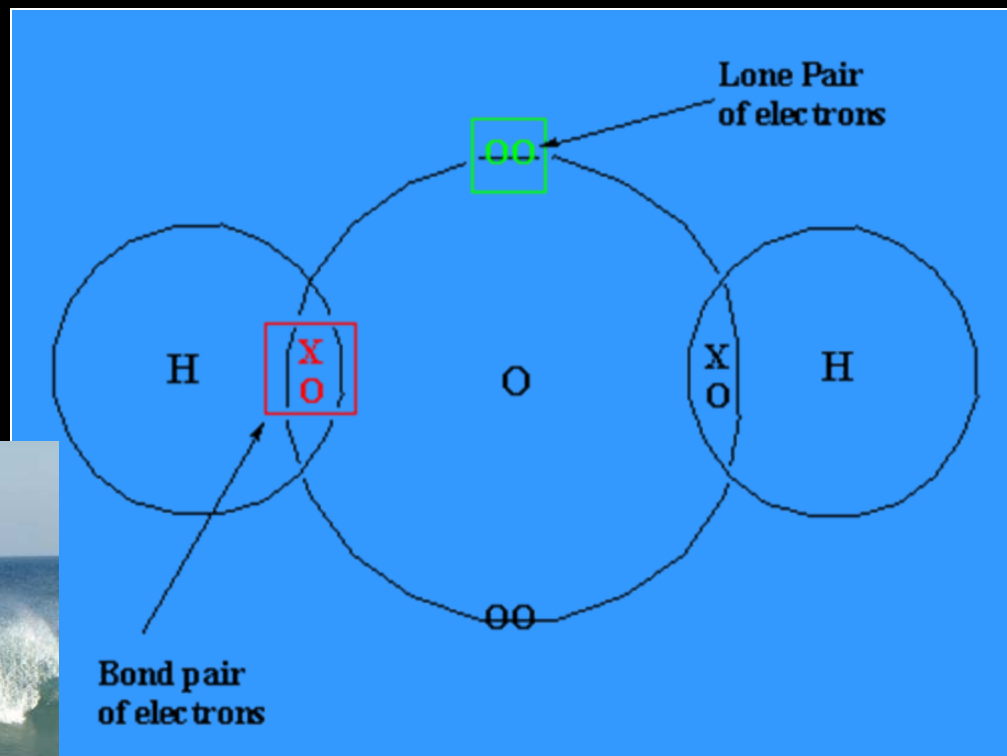


Types of Bonds

- Ionic bonds – chemical bonds in which ions (+ or -) are attracted to one another by opposite charges. Important in many body functions.

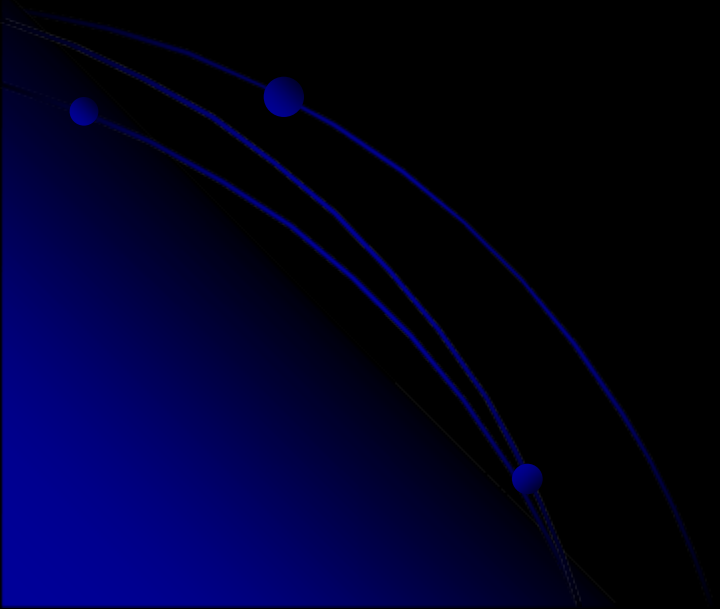


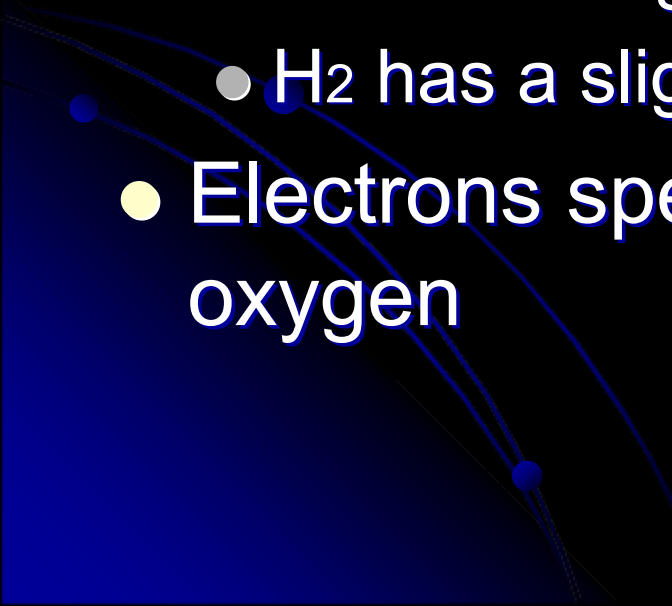
- Covalent bonds – Atoms share electrons in their outer shells



Single –
Double =
Triple ≡

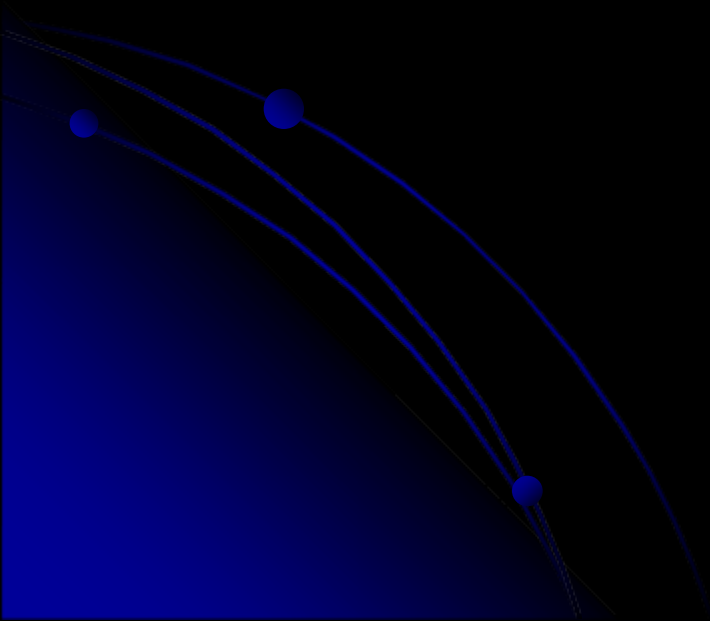
Water



- The most abundant molecule in living things
 - Makes up about 60-70% of total body weight
 - It's a polar molecule
 - O has a slight - charge
 - H has a slight + charge
 - Electrons spend more time circling the oxygen
- 

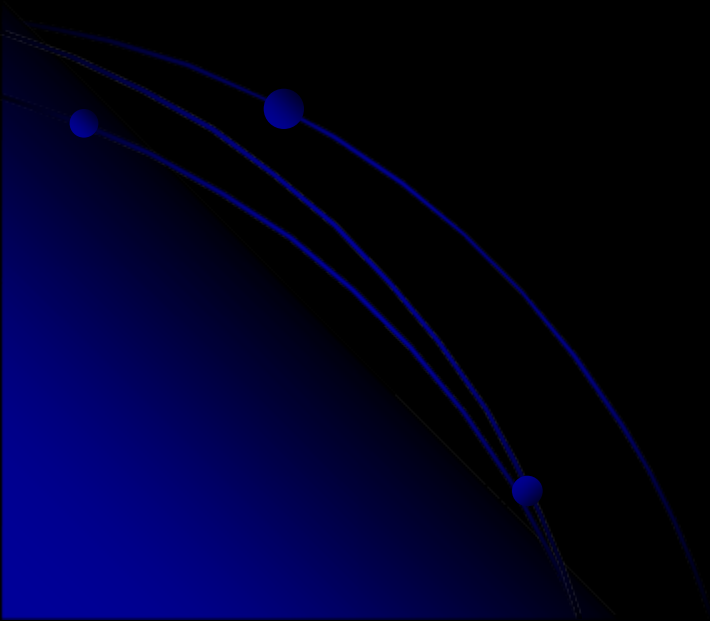
- Hydrogen bond

- + charged hydrogen is attracted to a – charged atom some distance away
- Relatively weak and can be broken easily



Properties of Water

- Because of polarity and hydrogen bonding
- Water molecules tend to be cohesive and stick together
- Blood in our body is 92% water



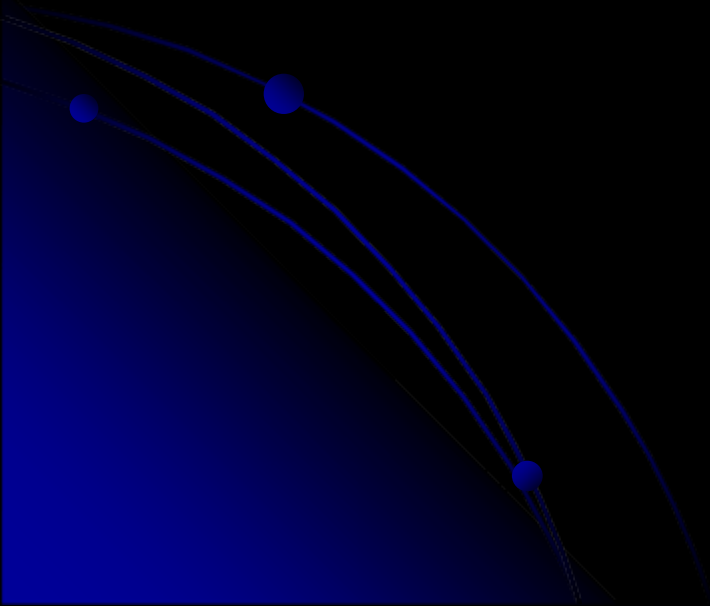
Solid

- Freezes below 0° C
- Less dense water
 - floats
- Expands when it freezes
- Lakes freeze from top down protecting life below by insulating the top



Liquid

- Stays liquid at room temperature
- Temperature rises and lowers slowly



Gas

- Vaporizes at 100° C
- Takes a huge amount of heat to change to a gas
 - Sweat to cool body



The Universal Solvent

- For polar (charged) molecules
 - O^- attracted to Na^+
 - H^+ attracted to Cl^-
 - Hydrophilic – interacts with water
 - Hydrophobic – does not interact with water
- 