Molecule of Life- Water

* H2O is a \_\_\_\_\_\_\_\_\_\_\_\_ molecule.
  + The \_\_\_\_\_\_\_\_\_\_\_ does \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ the electrons \_\_\_\_\_\_\_\_\_\_\_ with H and creates an area of charge
  + The area of charge (poles) creates a force called a Hydrogen bond.
  + +H attracted to –O
  + creates a \_\_\_\_\_\_\_\_\_\_ molecule
* Special properties of water

1. cohesion & adhesion

2. good solvent-

3. lower density as a solid

4. high specific heat

5.high heat of vaporization

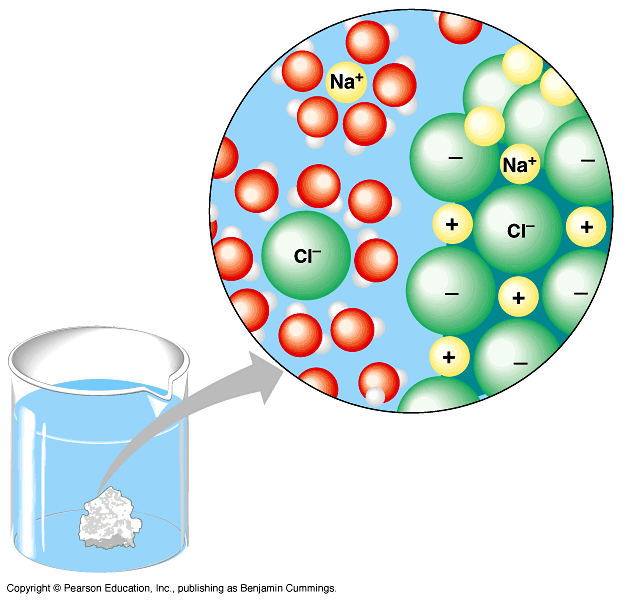
1-Cohesion and Adhesion

* Cohesion
  + Hydrogen bonding \_\_\_\_\_\_\_\_\_\_\_ H2O molecules
  + water is “sticky”
    - \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_
    - drinking straw
* Adhesion
  + H bonding between H2O & \_\_\_\_\_\_\_\_\_ substances
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ action
    - meniscus
    - water climbs up  
      paper towel or cloth

Transpiration-

2-Water is the \_\_\_\_\_\_\_\_\_\_\_\_ of life

* Polarity makes H2O a good \_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + polar H2O molecules surround \_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_ ions
  + solvents \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ solutes creating solutions



What is the solute?

How is the water turned?

What dissolves in water?

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + substances have attraction to H2O

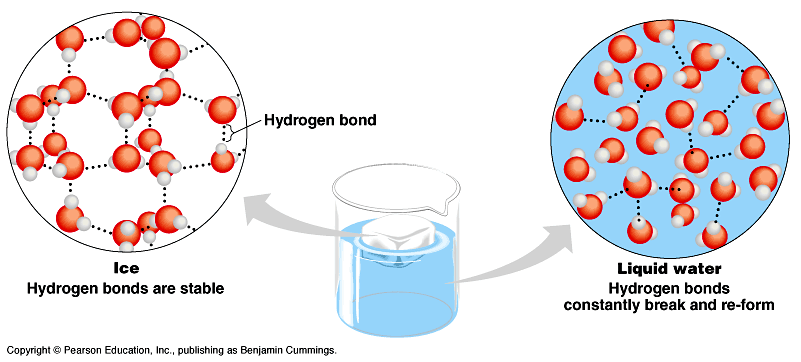
polar or non-polar?

* Hydrophobic
  + substances that \_\_\_\_\_\_\_\_\_\_ have an attraction to H2O

polar or non-polar?

3- Ice

* Most (all?) substances are \_\_\_\_\_\_\_\_\_\_\_\_ dense when they are solid, but not water…
* Ice \_\_\_\_\_\_\_\_\_\_\_\_! H bonds form a crystal. How is this a benefit?



4- Specific Heat

* H2O \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ changes in temperature
  + high specific heat
  + takes a lot to heat it up
  + takes a lot to cool it down
* H2O moderates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on Earth

5- High Heat of Vaporization- heat is absorbed as the substance evaporates.

Evaporation \_\_\_\_\_\_\_\_\_\_ body heat and \_\_\_\_\_\_\_ the organism.

How do we cool off?

Water and the pH scale

* Water \_\_\_\_\_\_\_\_\_\_\_\_\_
  + H+ splits off from H2O, leaving OH–
    - if [H+] = [-OH], water is\_\_\_\_\_\_\_\_\_\_\_\_\_
    - if [H+] > [-OH], water is \_\_\_\_\_\_\_\_\_\_\_\_\_
    - if [H+] < [-OH], water is \_\_\_\_\_\_\_\_\_\_\_\_\_
* pH scale- measures the H+ in solution
  + how acid or basic a solution is
  + Sometimes when substances are dissolved in water they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ extra H+ or OH-
* pH of cells must be kept ~\_\_\_\_\_\_\_\_
  + pH affects \_\_\_\_\_\_\_\_\_\_\_\_\_ of molecules
  + shape of molecules \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_
  + pH affects \_\_\_\_\_\_\_\_\_\_\_\_ function