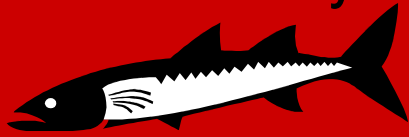


Attitude is Everything!



Tues, Aug 30, 2016

Pick up: DSQ –ISN pg 17/Concept Map-ISN pg 18  
/Properties & Connections-ISN pg 19

Today you will:

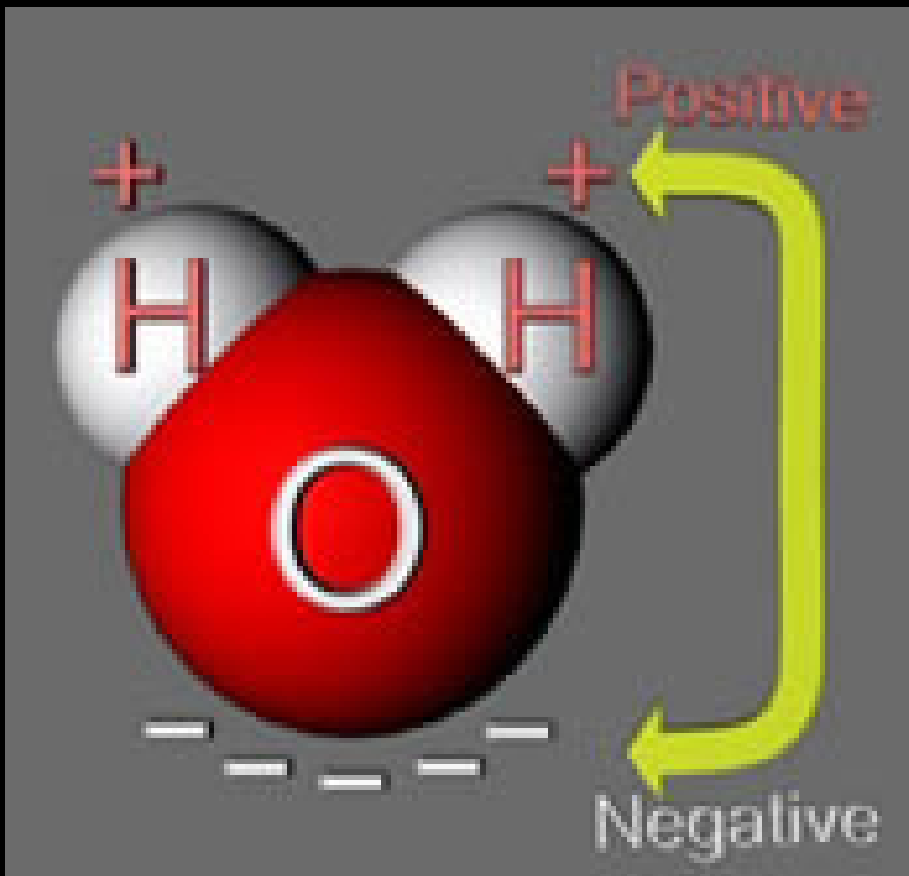
1. Work w/ neighbor to complete concept map
2. Discuss the properties of water & why they are important to life
3. Read background to tomorrow's lab

Homework:

**Complete your Cornell Notes**

Please make sure your  
phones are in your  
bags under your desk.

# Water is a Polar Molecule

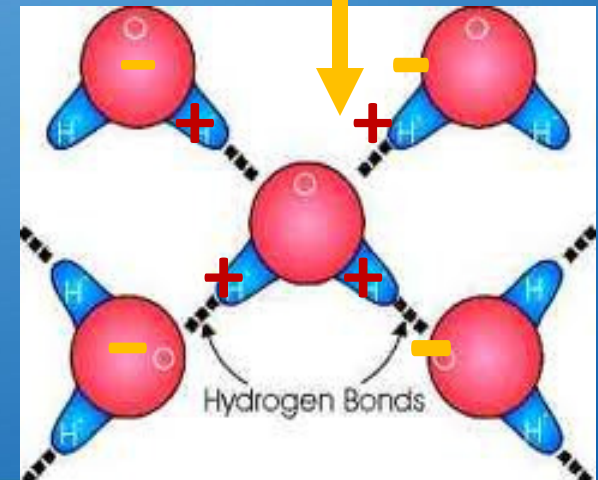
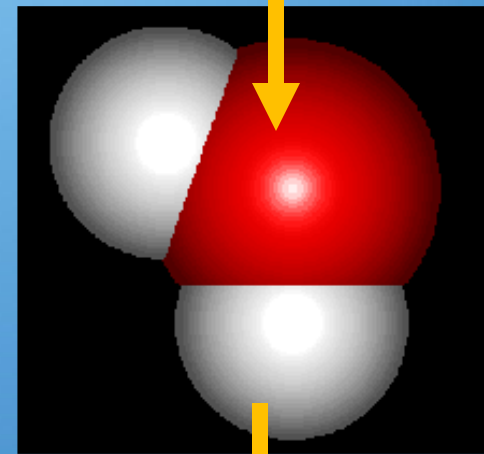
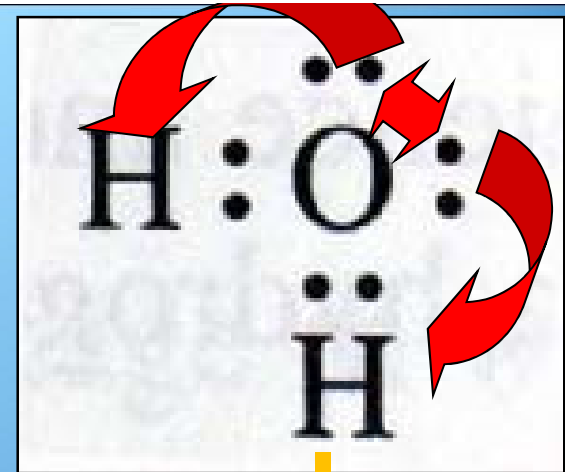


1. Water is **POLAR**:
  - because it is positively charged on one end and negatively charged on its opposite end

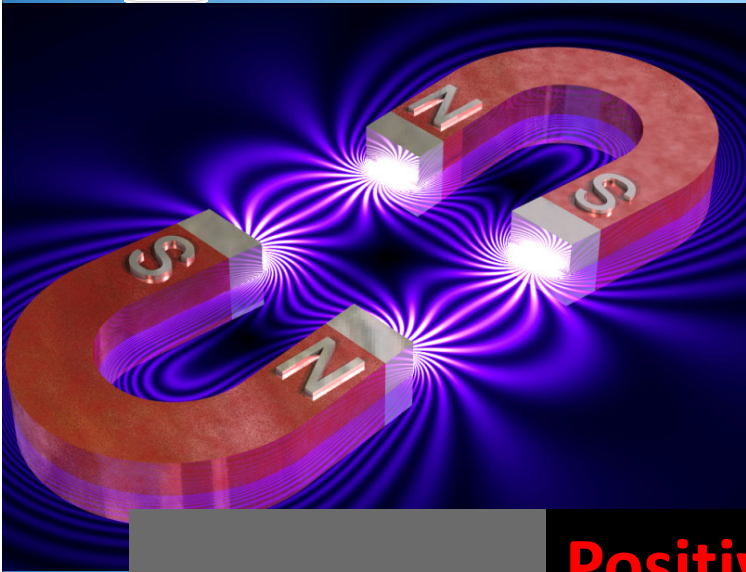


# Polarity

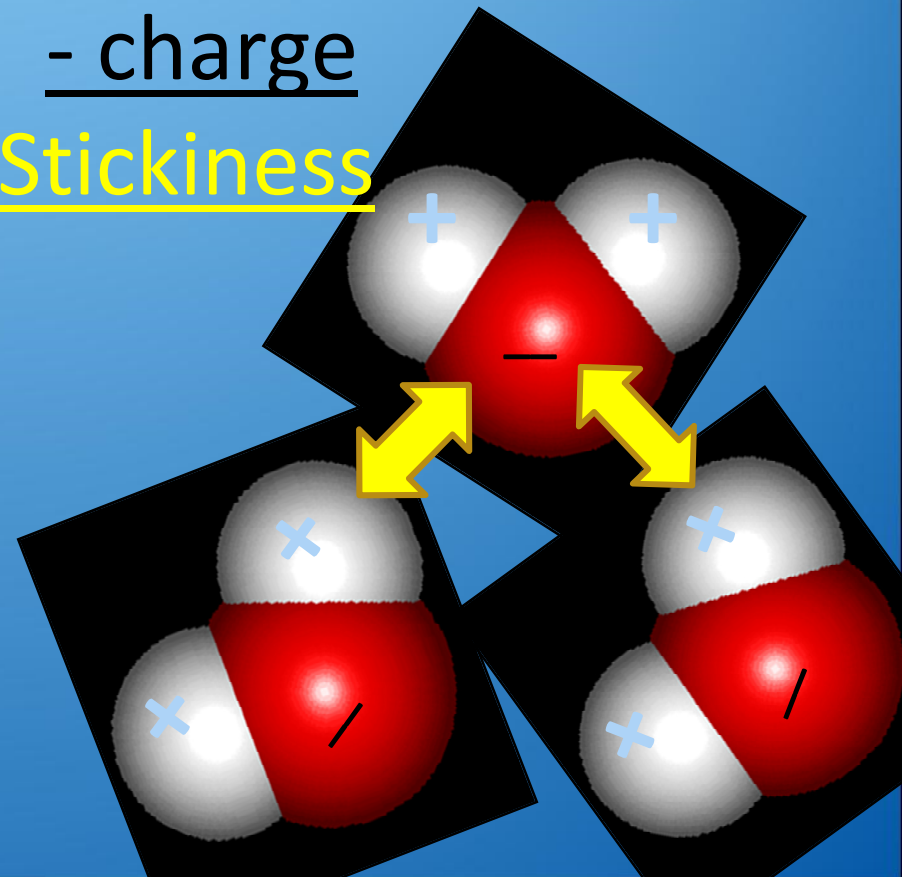
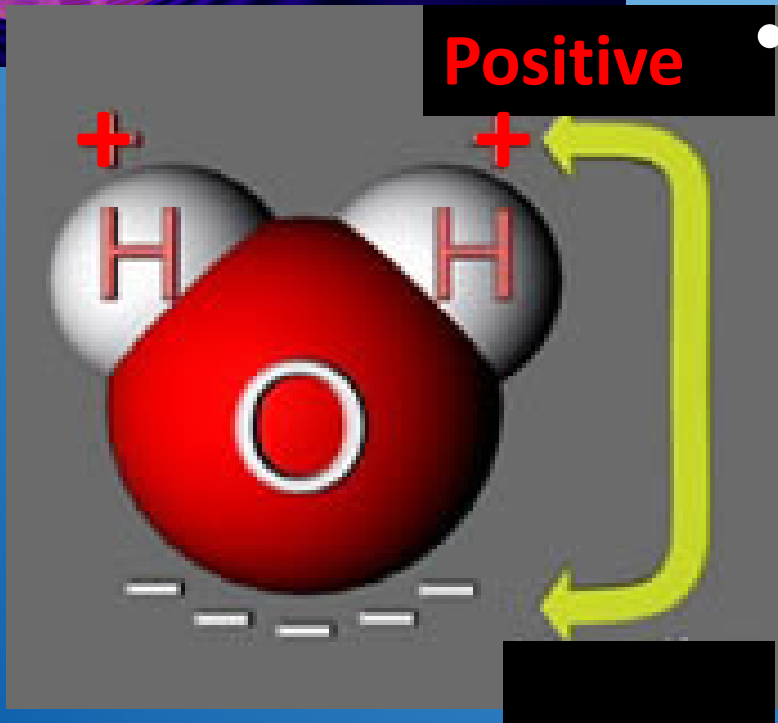
1.  $H_2O$  atoms - opposite charges  $\rightarrow$  attracted like magnets  $\rightarrow$  “sticky”
2. Why do we care?
  - *The Polarity, the Stickiness Gives water its other properties....*



# Water is like a magnet!



- Water is POLAR
- = OPPOSITE charges
  - + charge
  - - charge
- = Stickiness

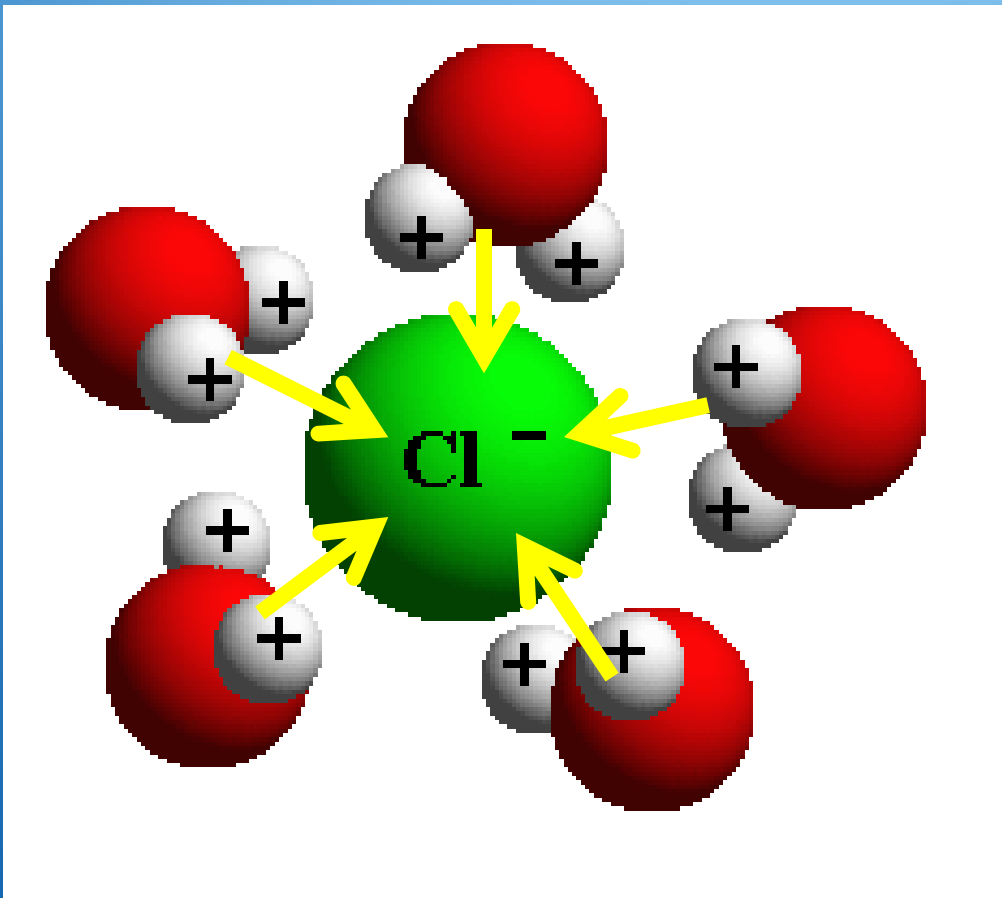


# Water's Polarity (+ and -), It's STICKINESS, Determines Its Other Properties

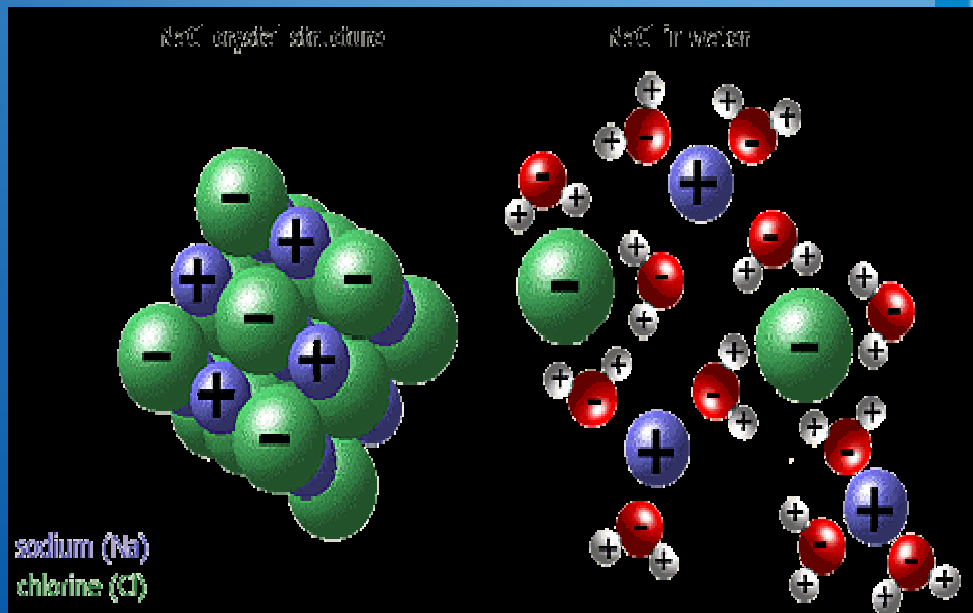
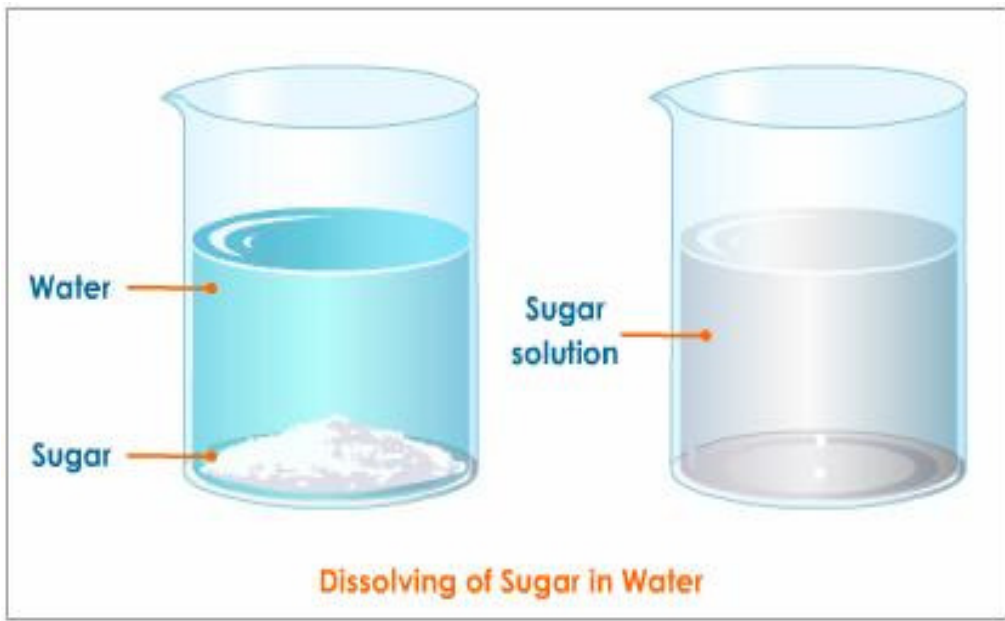
1. High Specific Heat → bonds hold energy in so it takes a lot of energy to change waters' temperature – maintains Thermal Stability
2. Cohesion → charges make water “stick” together
3. Cohesion forms thin skin = Surface Tension
4. Adhesion → water sticking to something else
5. Capillary Action → can result from both cohesion + adhesion
6. Density → Water is less dense when it freezes – so it floats
7. Universal Solvent → it's water that can dissolve

Water is...

*The Universal Solvent*



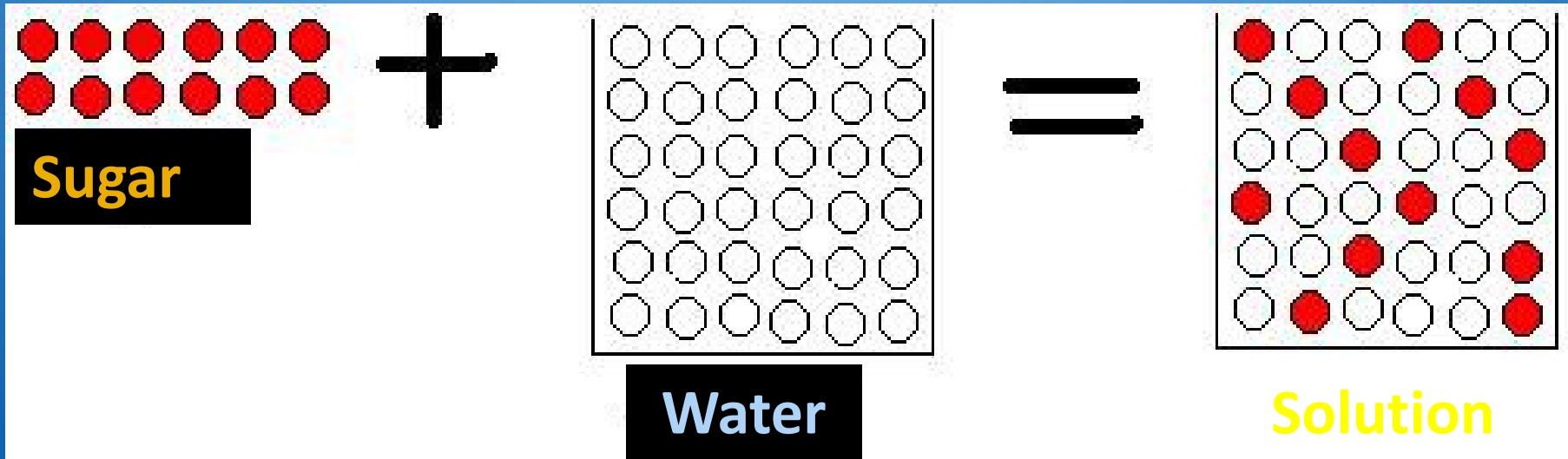
Weak H bonds  
allow it to bond  
with other sub....  
So it DISSOLVES  
STUFF!





# **Solute** + Solvent = **Solution**

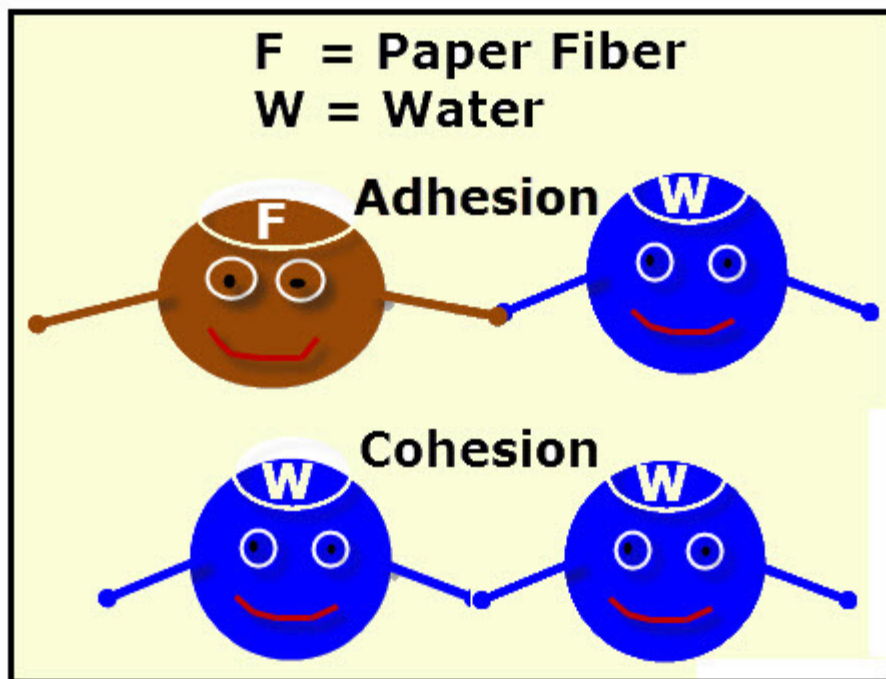
1. **Solute** = being dissolved – smaller amts.
2. **Solvent** = doing dissolving – LARGER amts
3. **Solution** = a mixture of 1 sub. dissolved in another so properties are *same throughout*







# Cohesion **VS** Adhesion

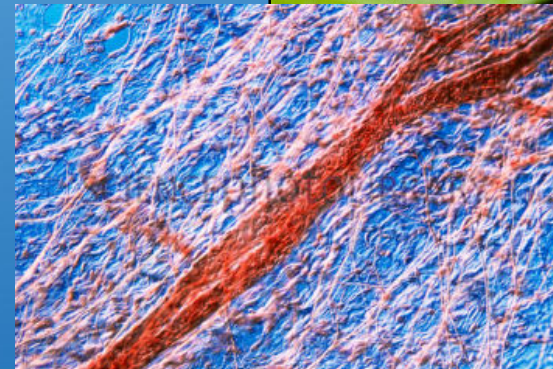
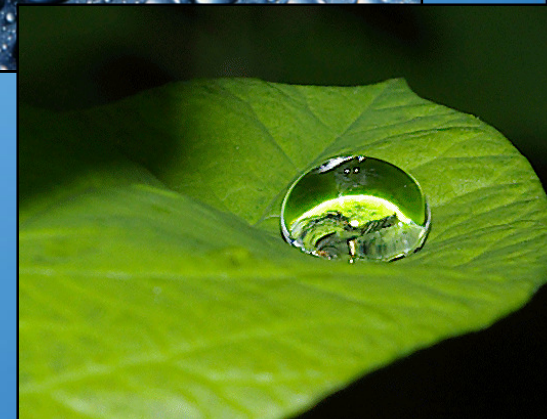




# Cohesion



- A. Sticking to itself!
- B. Water attracted to other water → “sticky”  
→ Droplets
- C. Why do we care?
  - *Keeps water/blood together as it moves through plant/blood vessels*



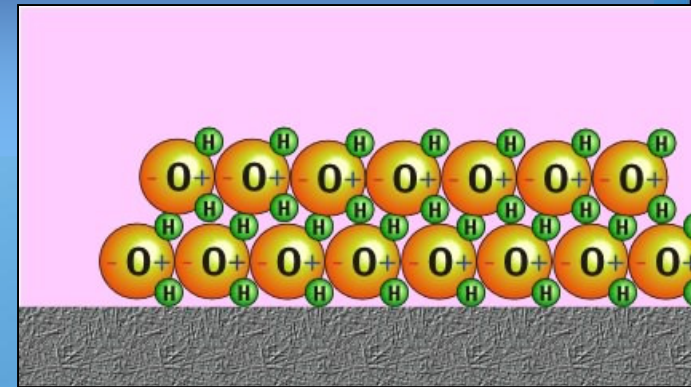
# Cohesion → Surface Tension

1. **Water** attraction (**cohesion**) forms a **thin 'skin'** barrier on surface.

2. **Why do we care?**

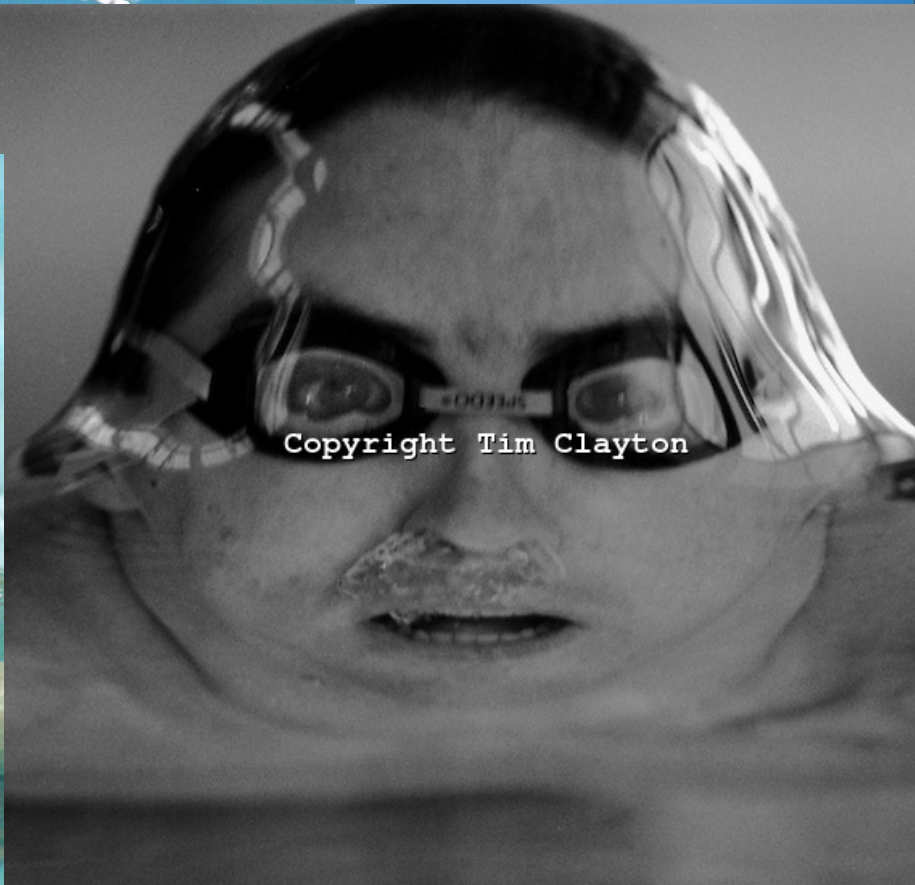
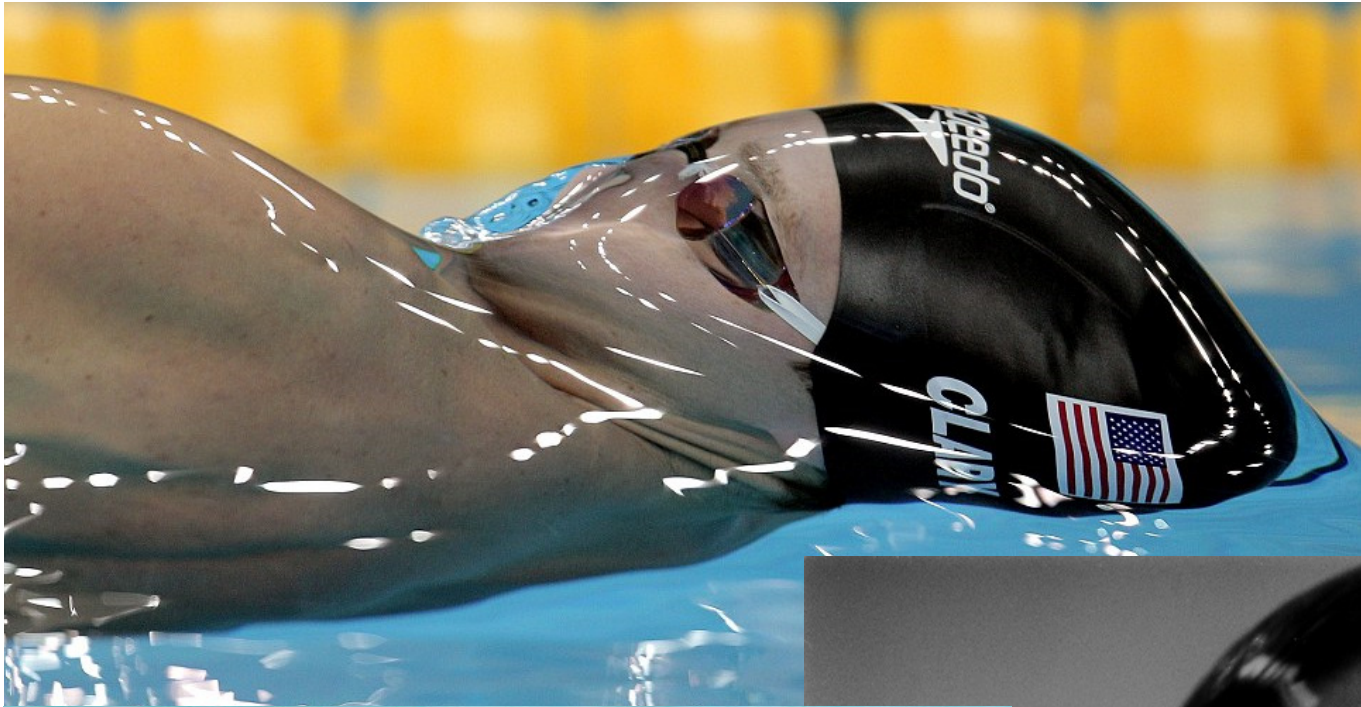
- *Dev. of chemicals to remove pollutants → to break surface tension of oil...*

- *fact, the lung excretes a surfactant that lowers the surface tension. Without the surfactant, the lungs will not fully inflate due to the surface tension.*





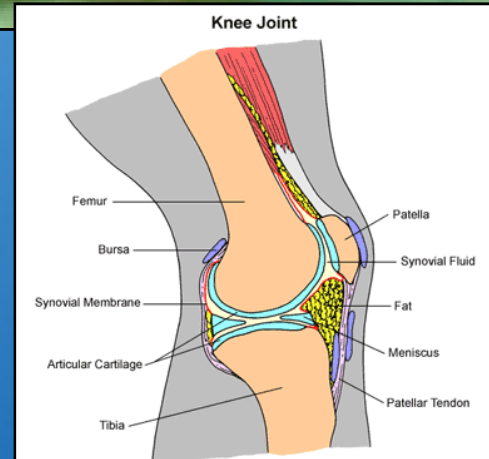
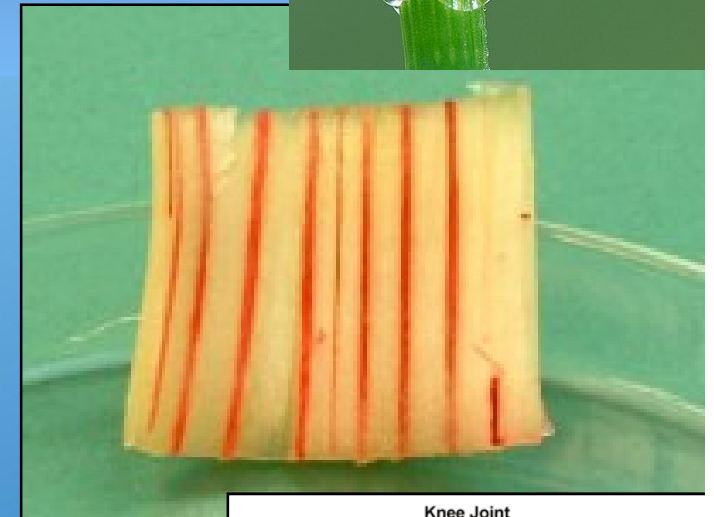
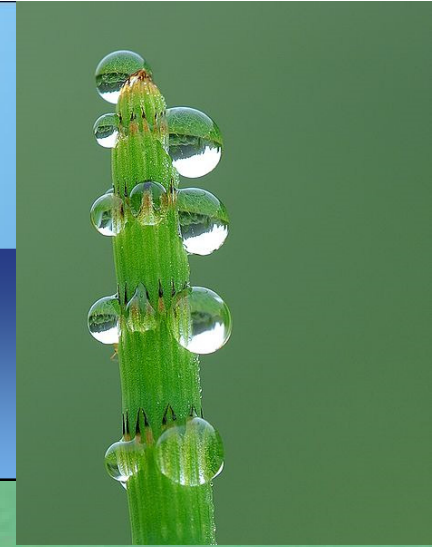






# Adhesion

- A. **Sticking to something else**
- B. **Attracted to other materials**
- c. Why do we care?
  - *Water sticking to sides of plant vessels & therefore moving UP from roots to leaves*
  - *Helps stabilize joints in body*
  - *Blood sticking to sides of blood vessels*





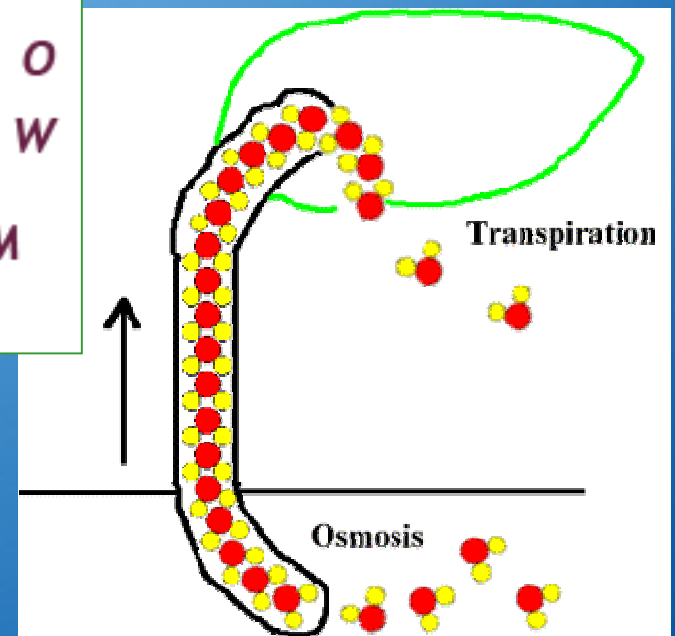
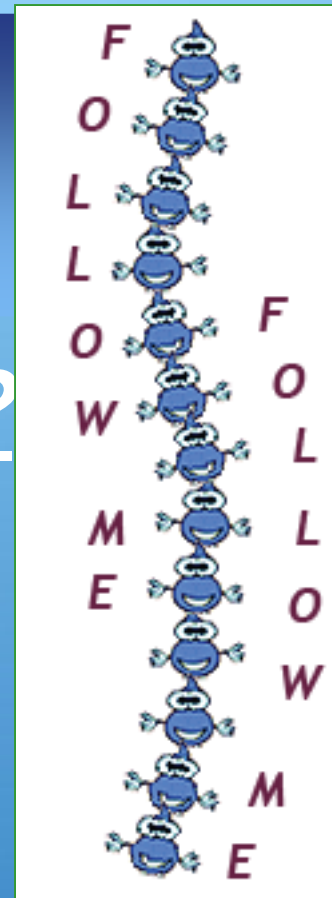


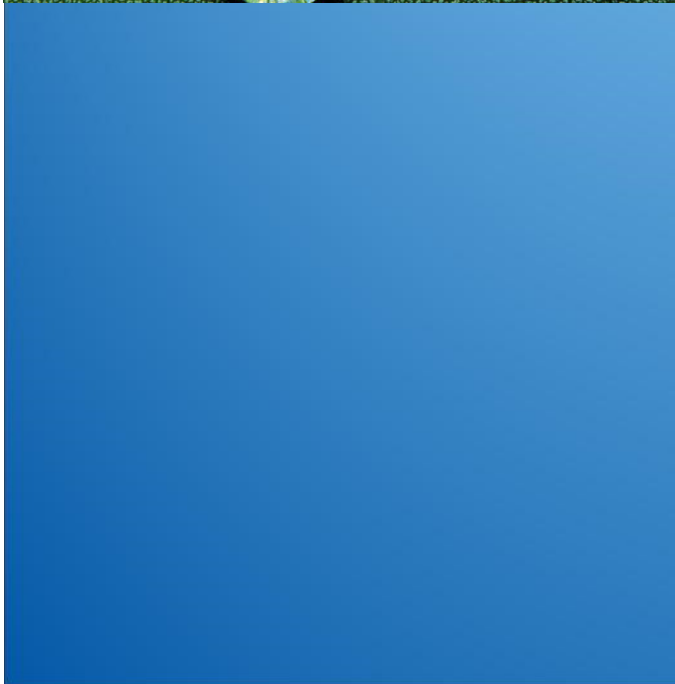
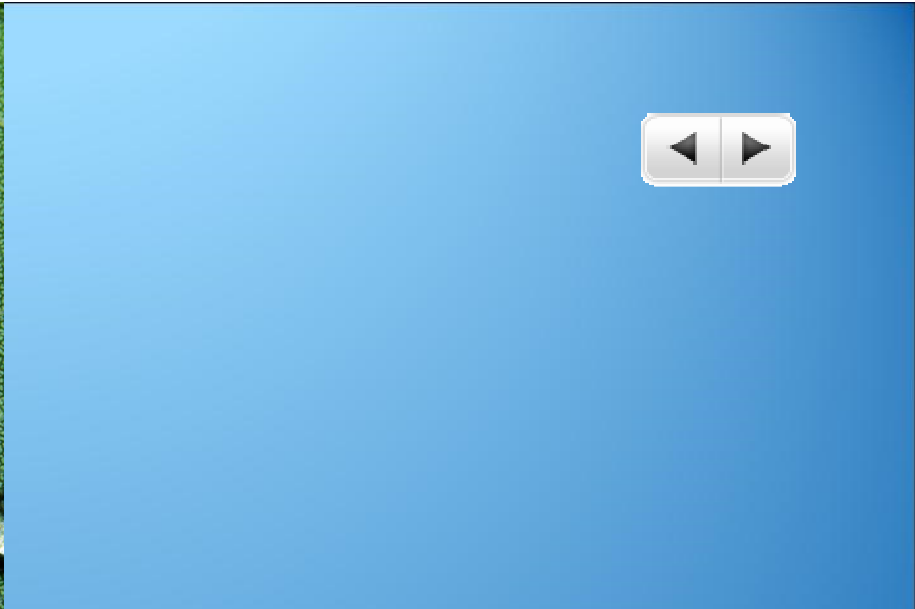
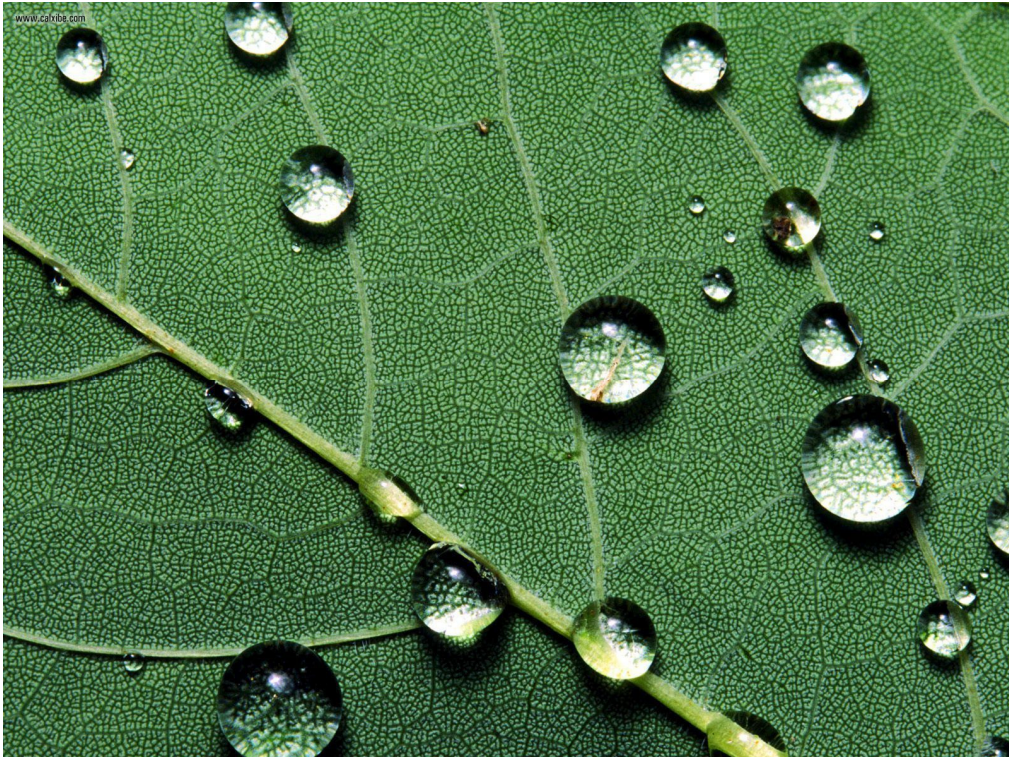
# Adhesion → Capillary Action

A. Water adhering to side of vessels & moving up

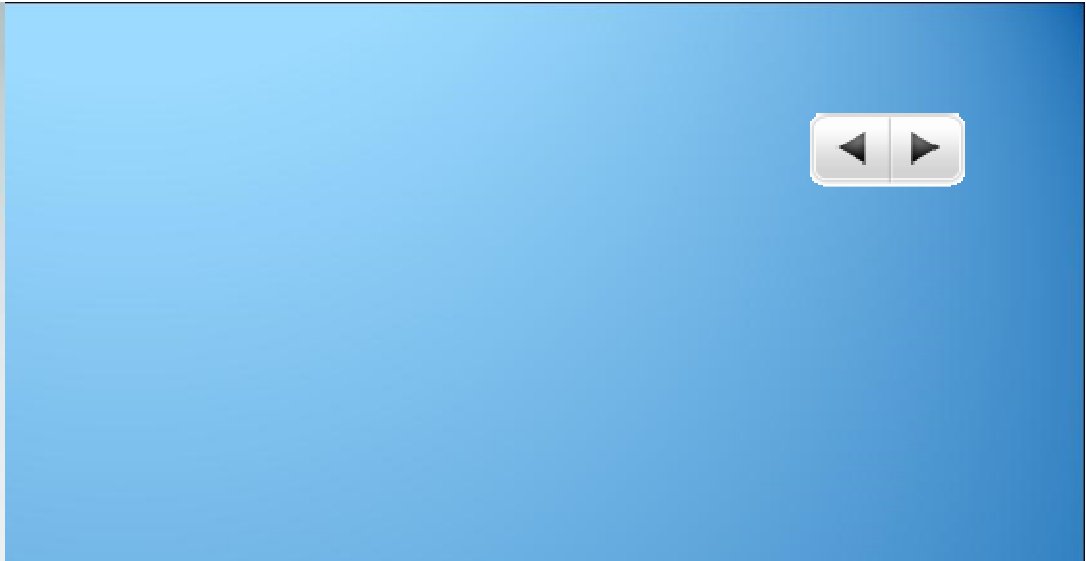
B. Why do we care?

- Pulls water up & out of roots
- *Delivers blood, nutrients, vitamins in body; tears*







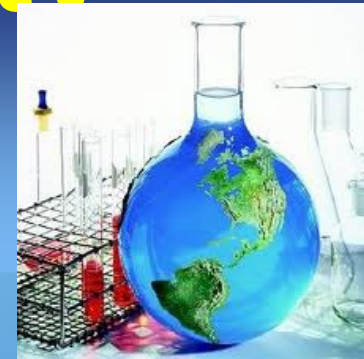




# High Specific Heat: High Heat Capacity



A. Water **absorbs** a lot of **heat**  
**before** it is **affected**



A. Why do we care?

- HOMEOSTASIS!!! → maintaining internal stability/balance
- Maintains temp. of earth

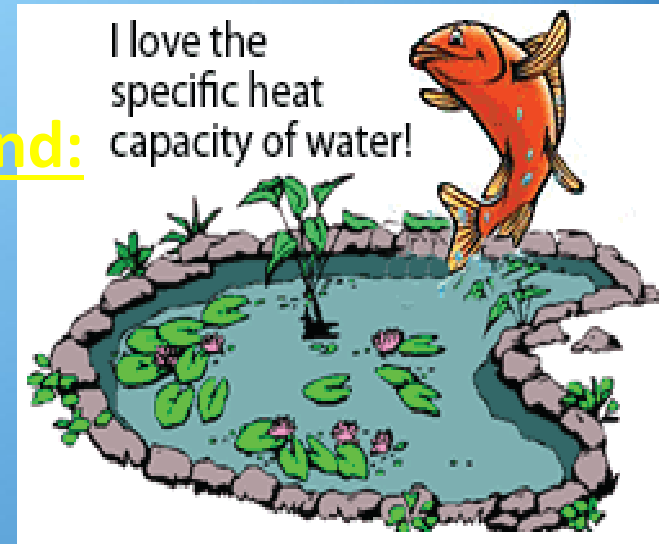


# Importance of Specific Heat capacity



1.Helps in regulating temperatures in a pond:

A. Fish stay “happy” because the heat capacity means the temp. of the pond will stay relatively the same from day to night.



2.This same concept can be expanded to a world-wide scale.

A. Oceans & lakes help regulate the temperature ranges...

- 1) Water near cities, take longer to heat up & longer to cool, so **cities near the oceans will tend to have less change & less extreme temps than inland**
- 2) Midwest states, such as Nebraska, will have colder winters & hotter summers than cities on coast!

# DENSITY



1. Water EXPANDS upon freezing →
2. making it less dense →
3. so it FLOATS!

