Attitude is Everything!

Monday, Aug 28, 2017

Pick up: Water CN pg 14

Today you will:

1. Discuss the properties of water & why they are important to life

Homework:

Complete your Cornell Notes

DSQ-pg 13

❖ <u>Copy</u>

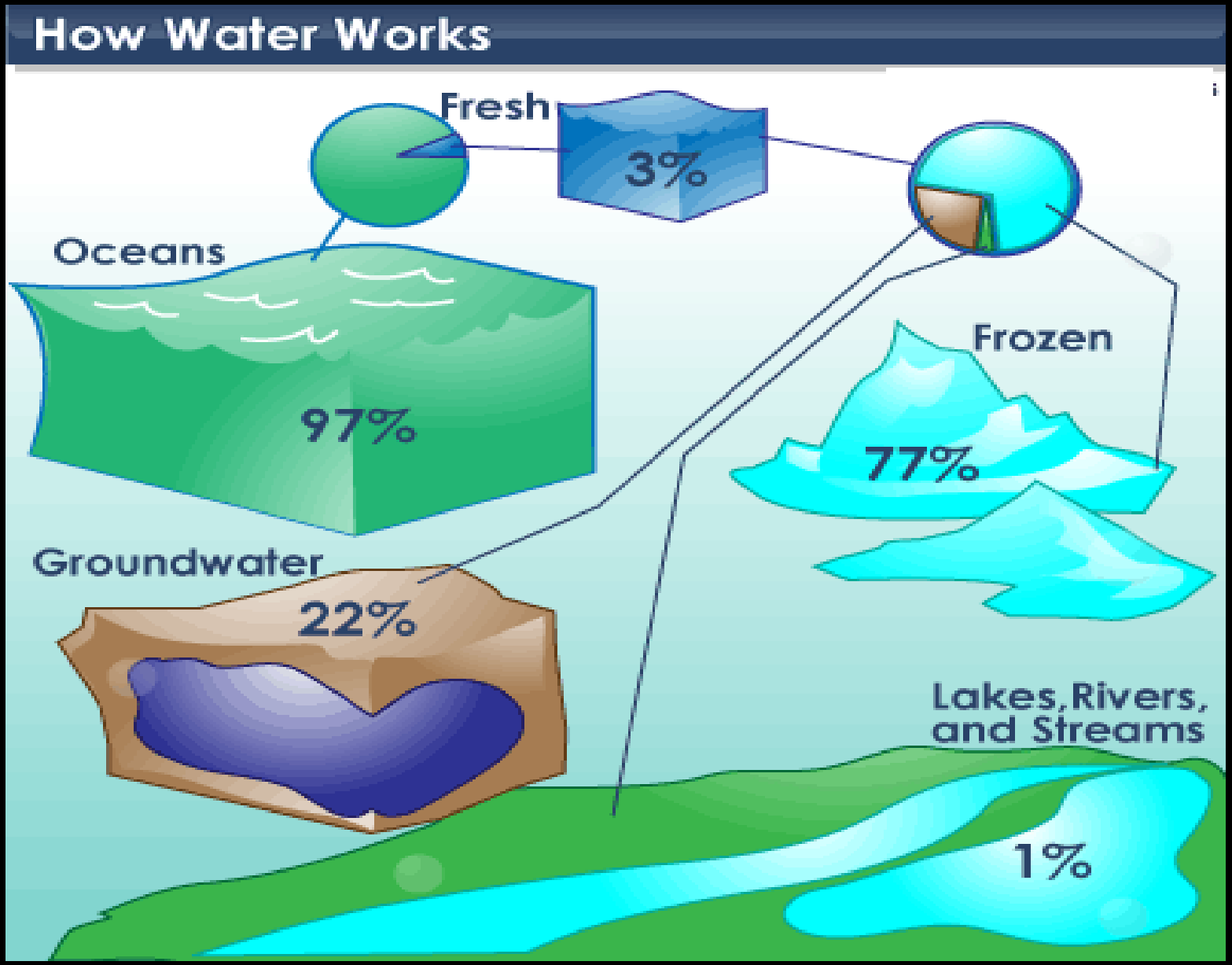
- *Ad- toward*
- *Herare- sticking*
- *Solvere- dissolve*
- *Mono- one*
- *Poly- many*
- *Carbo- carbon*
- *Hydro- water*

Co- with
Lip- fat
Pro- first
Amon- nitrogen
Equil- balanced
Act- capable
Lysis- cut

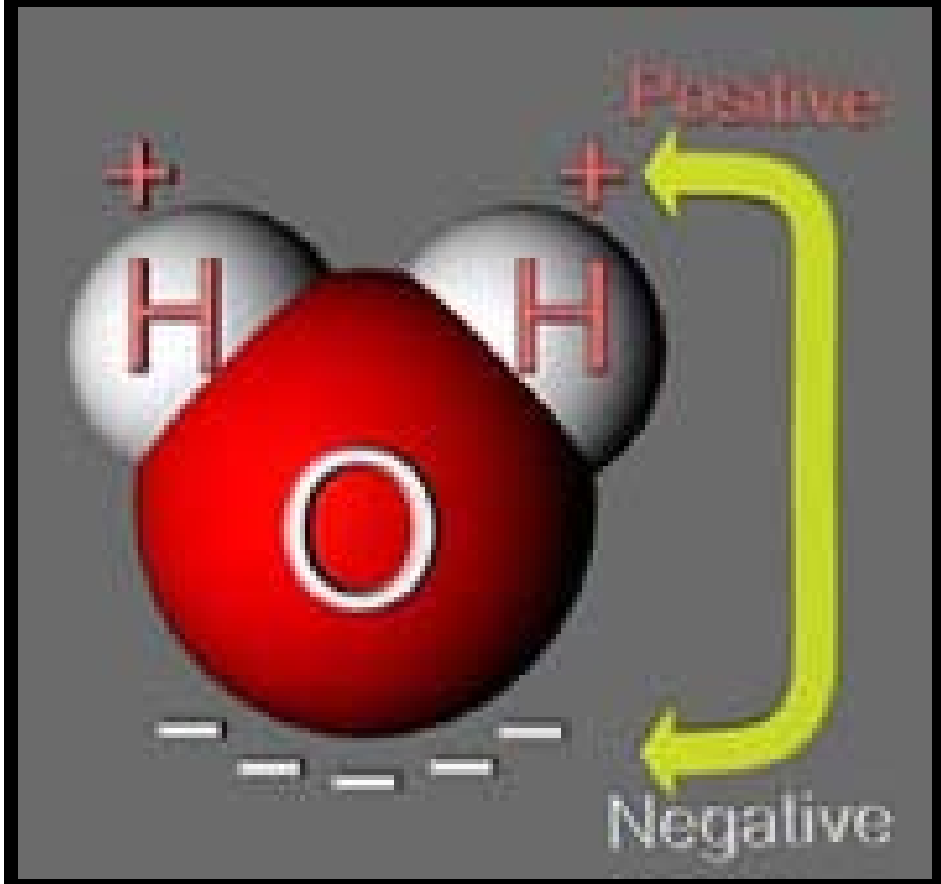
What is this?

1. It’s odorless, nearly colorless & tasteless.
2. It's in your body, the food you eat & the beverages you drink.
3. You use it to clean yourself, your clothes, your dishes…
4. You can or jump in it to cool off on hot summer days.
5. Many products you use contain it or were manufactured using it.
6. All forms of life need it!
7. Political disputes have centered around it.
8. In some places, it's treasured & difficult to get…. In others, it's incredibly easy to get and then squandered.
9. **What substance is more necessary to our existence than any other?**
10. **Water!**

What is the most important fact you see in this graphic?



Water is a Polar Molecule



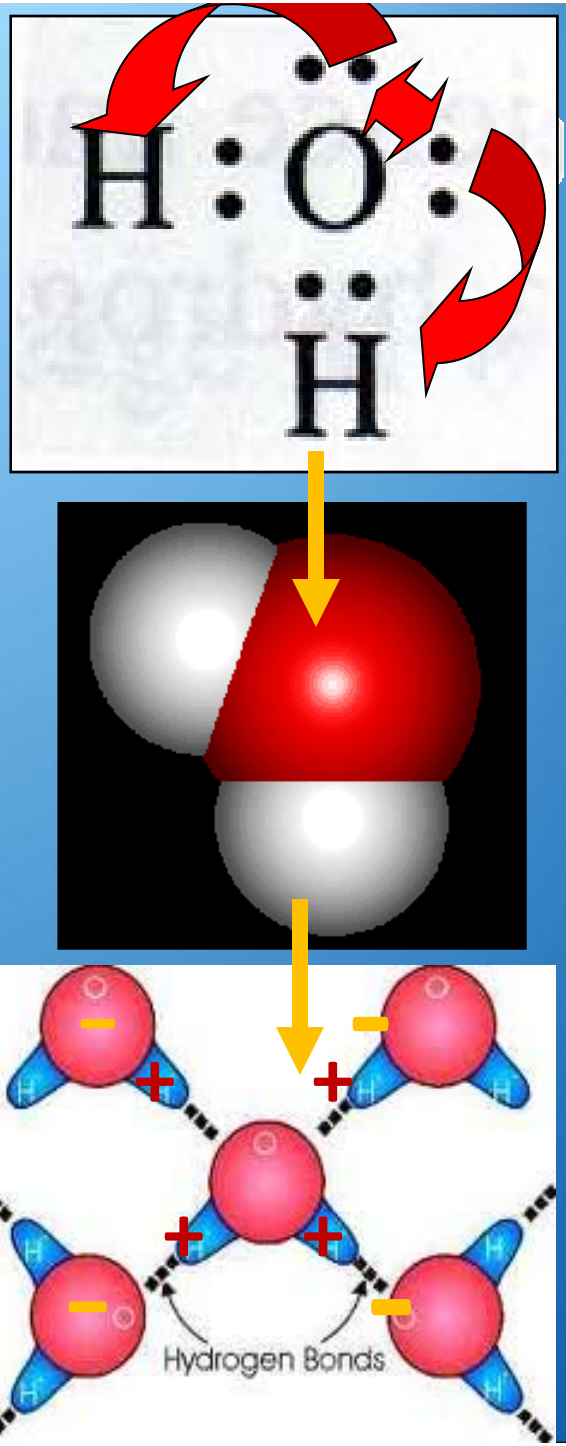
1. Water is **POLAR:**
   - because it is positively charged on one end and negatively charged on it's opposite end

Polarity

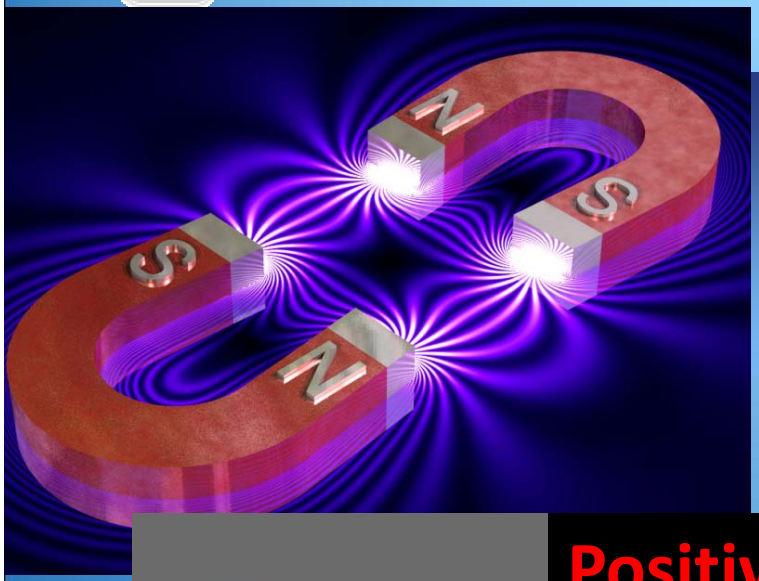
1. ***H_2O atoms - opposite charges →attracted like magnets → "sticky"***

2. **Why do we care?**

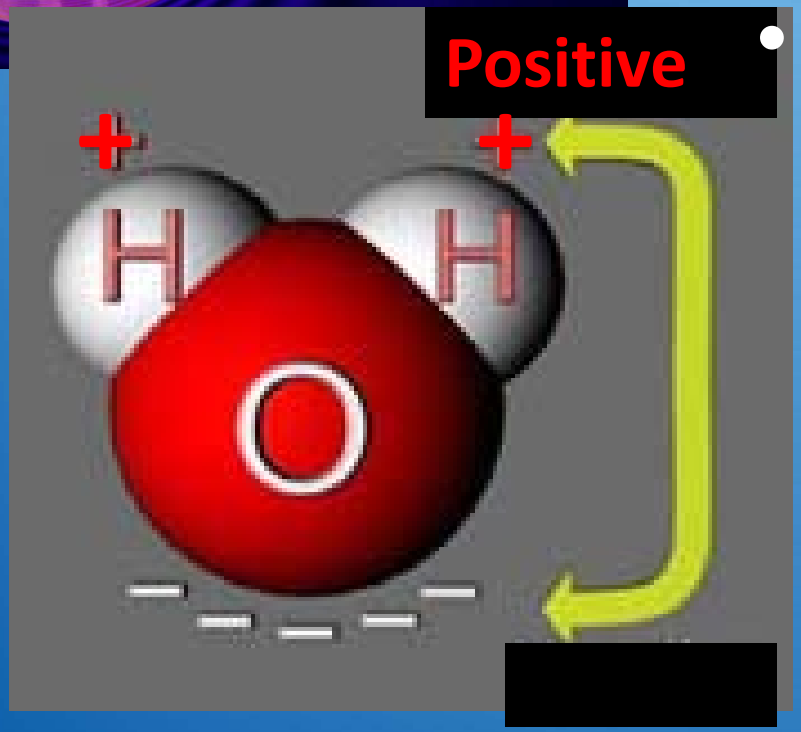
- ***The Polarity, the Stickiness Gives water its other properties….***

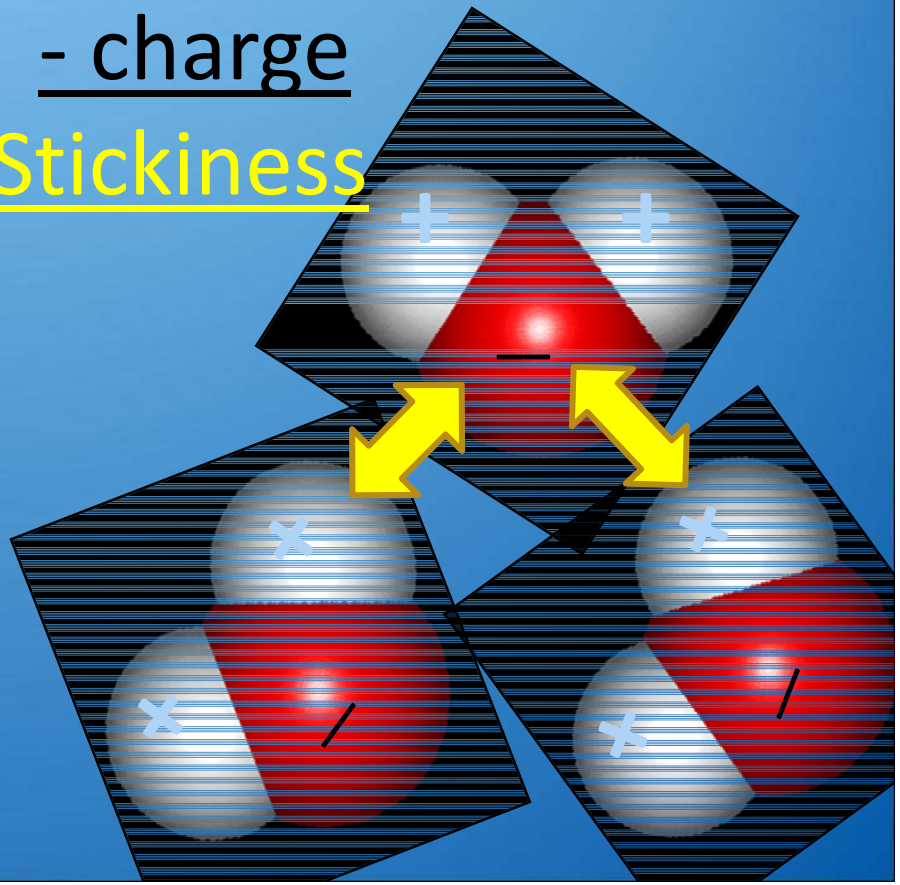


Water is like a magnet!



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



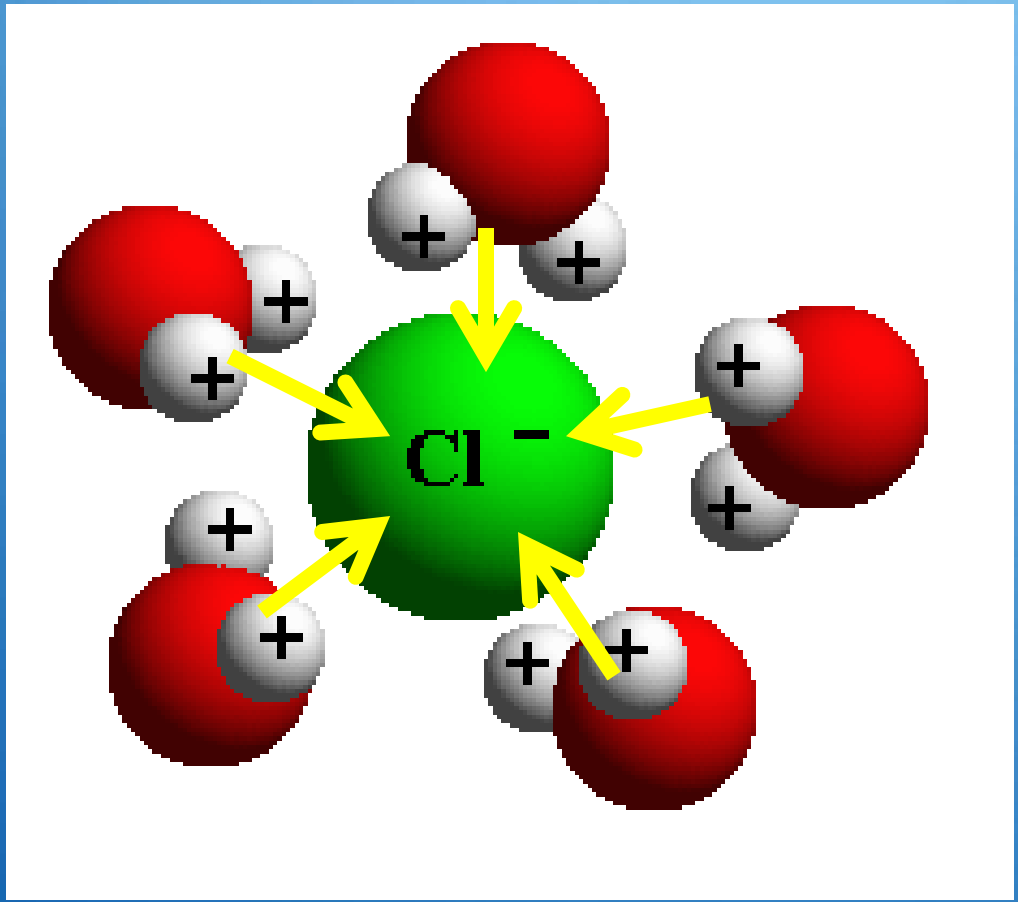


Water's Polarity (+ and -), It's STICKINESS, Determines Its Other Properties

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**

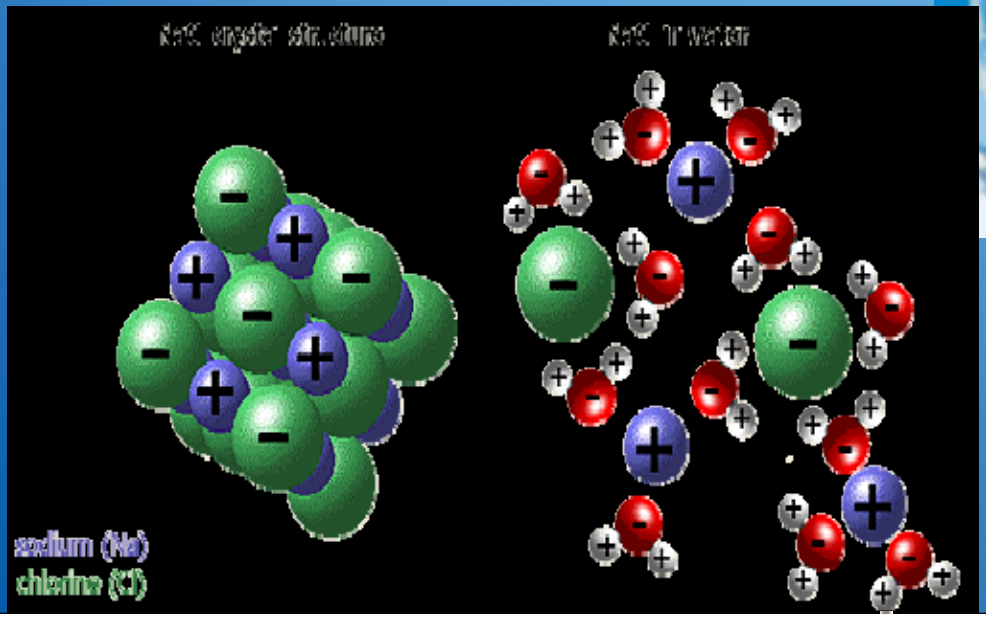
Water is…

The Universal Solvent



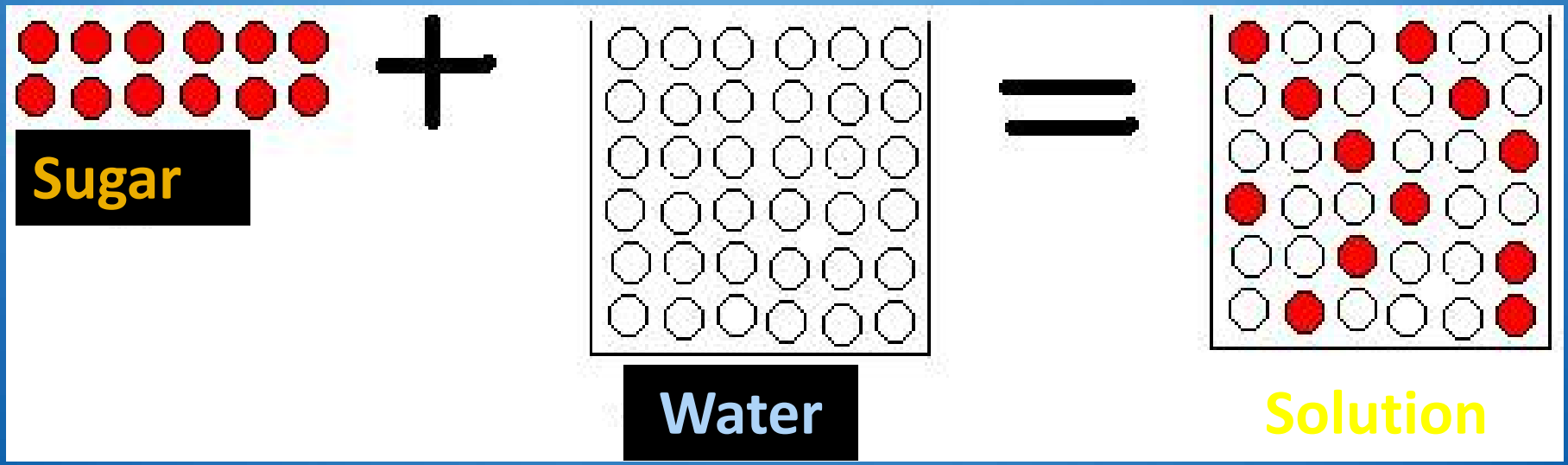
<u>Weak H bonds</u> allow it to bond with other sub…. **<u>So it DISSOLVES STUFF!</u>**


Water
Sugar
Sugar solution
Dissolving of Sugar in Water

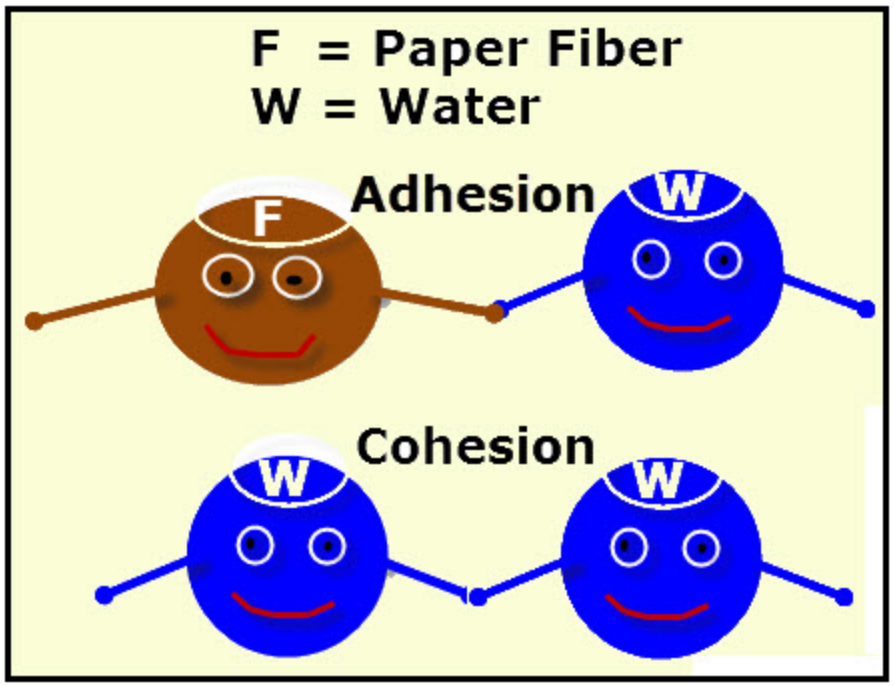

sodium (Na)
chlorine (Cl)

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*



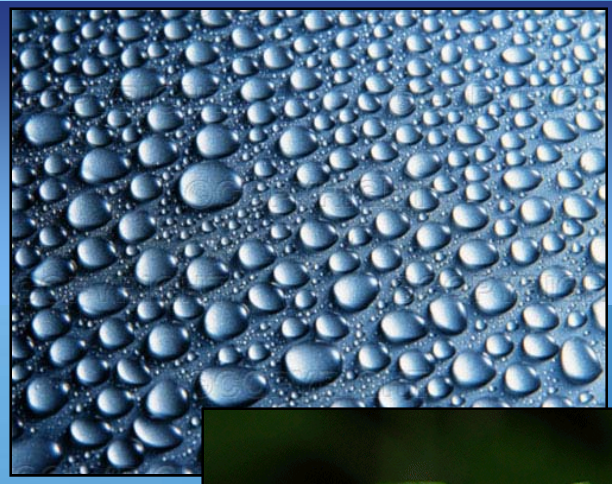
Cohesion vs Adhesion

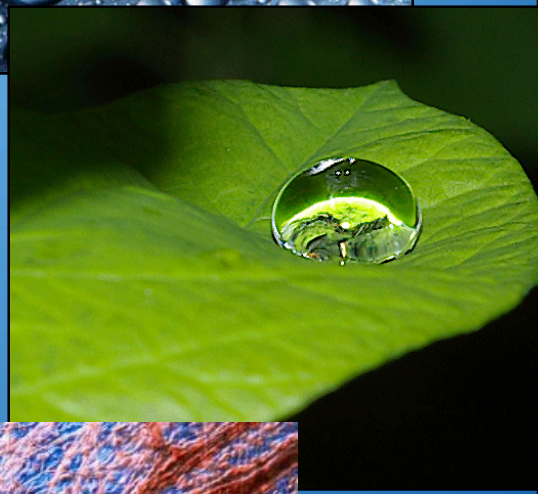


Cohesion

A. **Sticking to itself!**

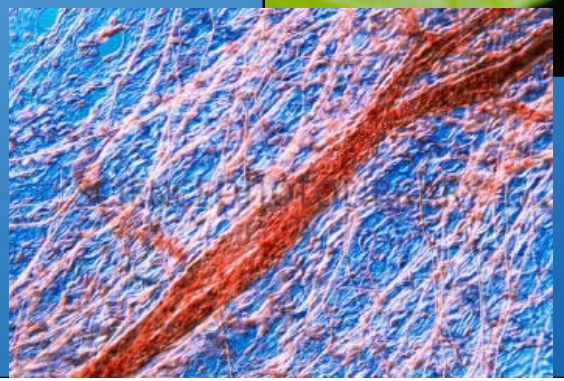
B. **Water attracted to other water → "sticky" →Droplets**





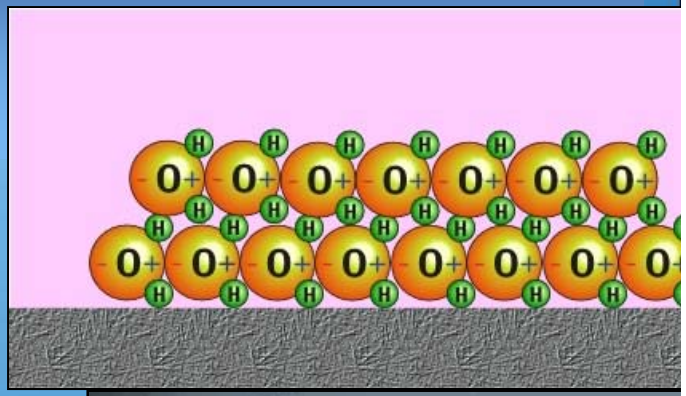
C. **Why do we care?**

- ***Keeps water/blood together as it moves through plant/blood vessels***



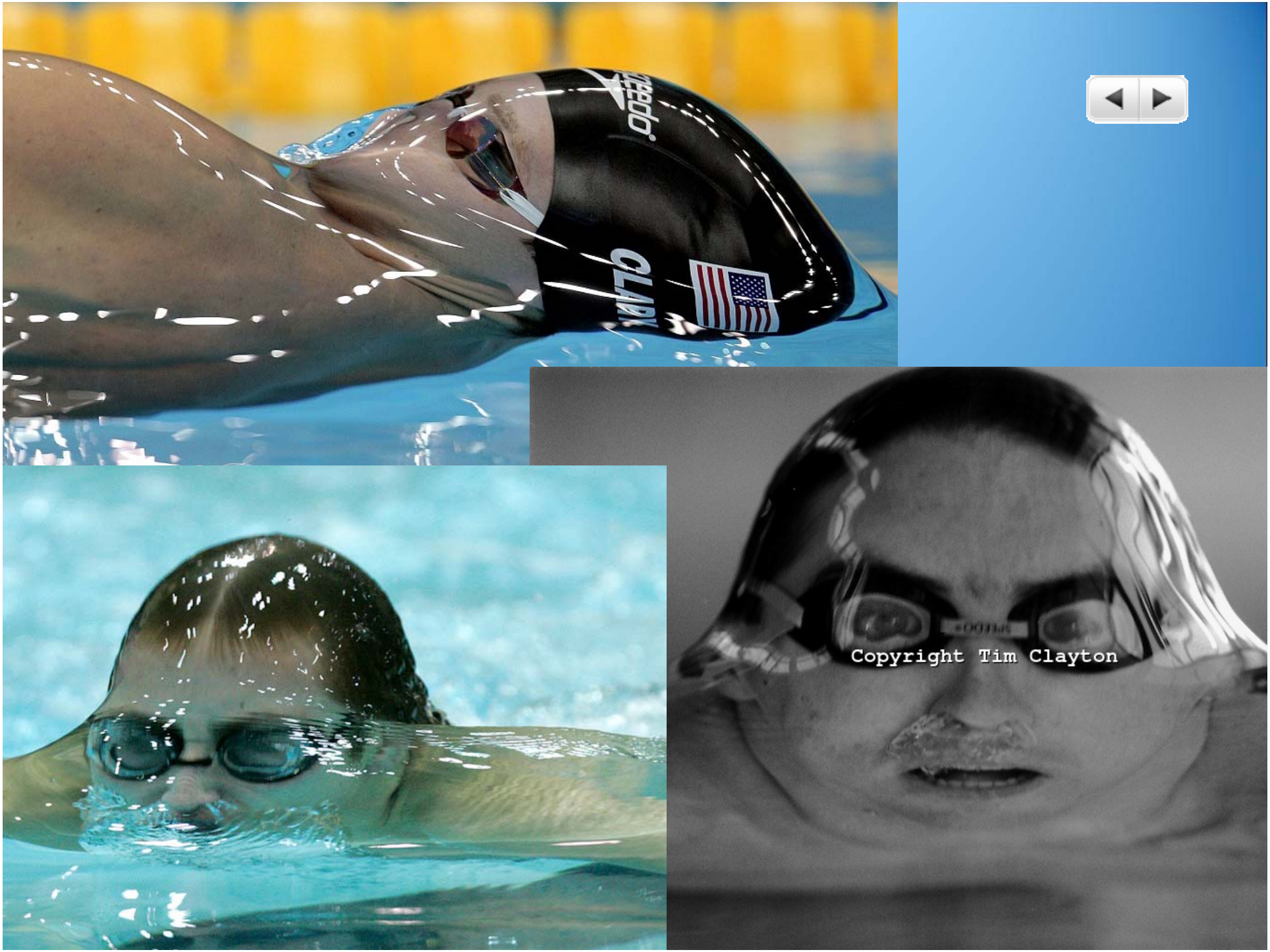
Cohesion → Surface Tension

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…*

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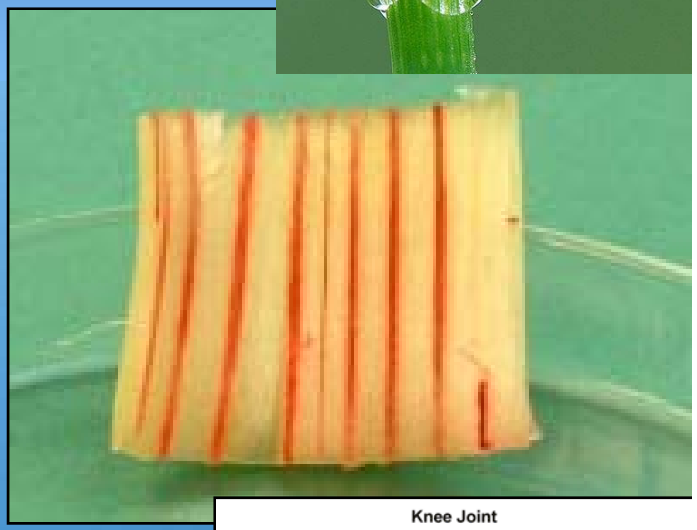
Adhesion

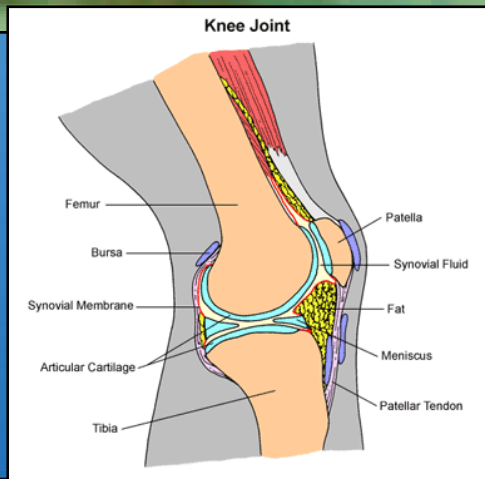
A. **Sticking to something else**

B. **Attracted to <u>other</u> materials**

C. **<u>Why do we care?</u>**

- ***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***



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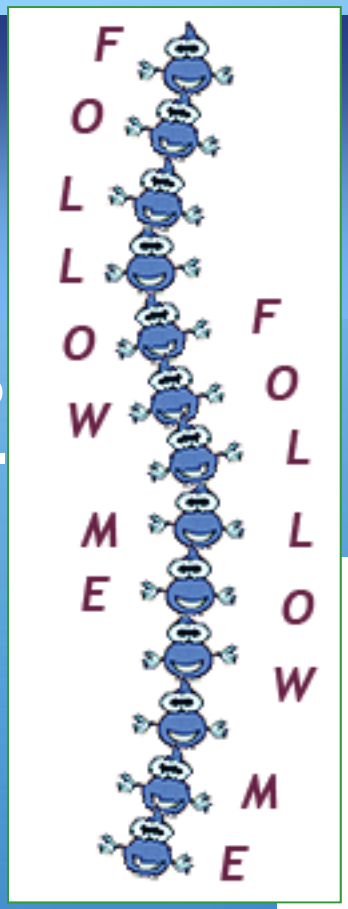
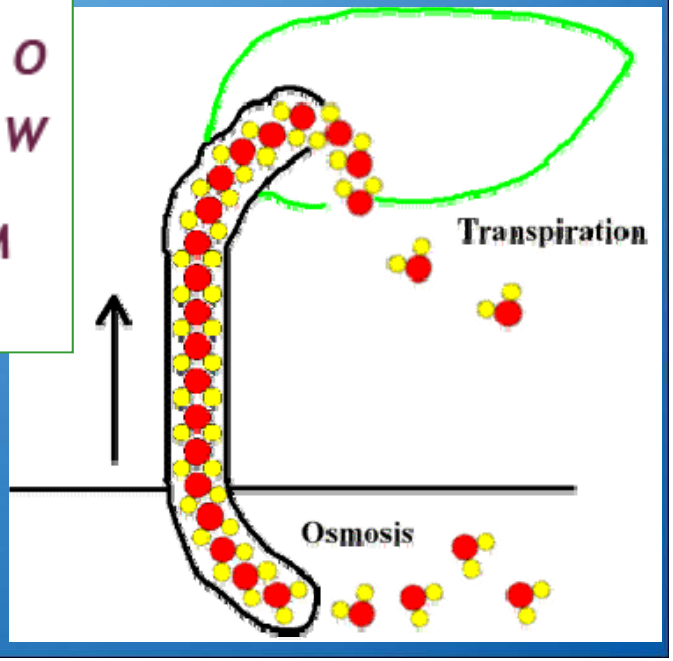
Adhesion → Capillary Action

A. **Water** adhering to side of vessels & **moving up**

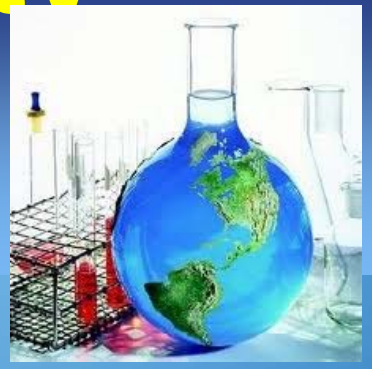
B. ***Why do we care?***

- ***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. O**ceans & 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!