

NOTES FOR THE HYDROFE

Name: _____

DO NOT LOSE! PUT IN SCIENCE BINDER

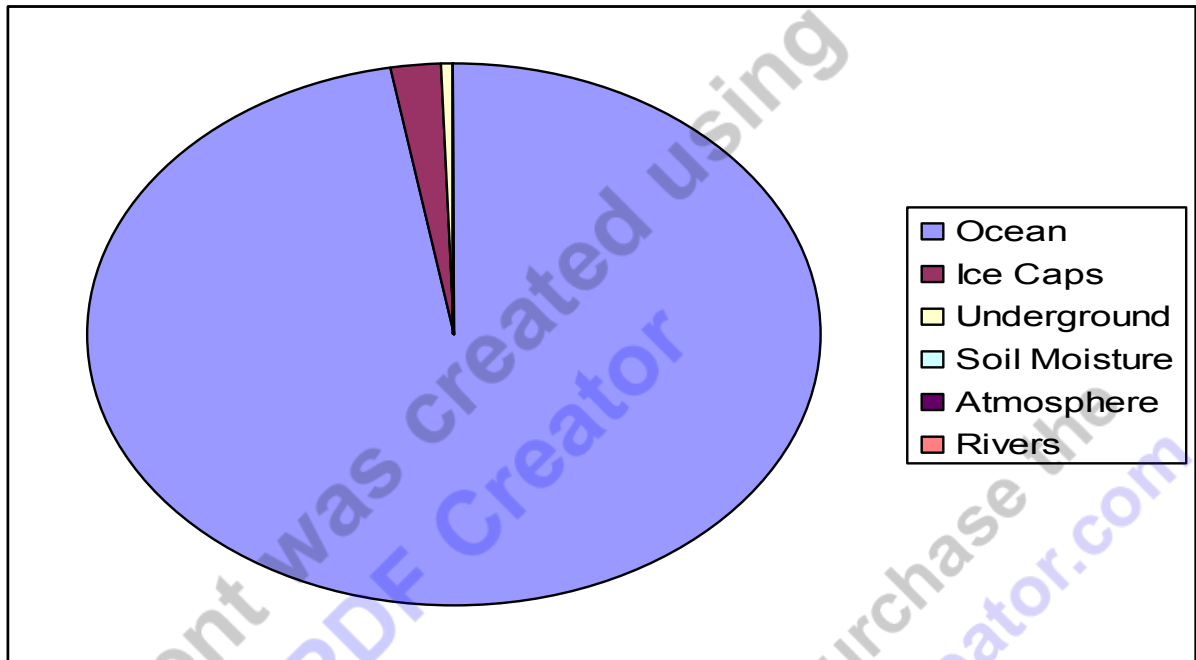
Area of Focus: Where is our water?

The six ways humans use water

- Survival / Health
- Household
- Recreational
- Industrial
- Transportation
- Agricultural

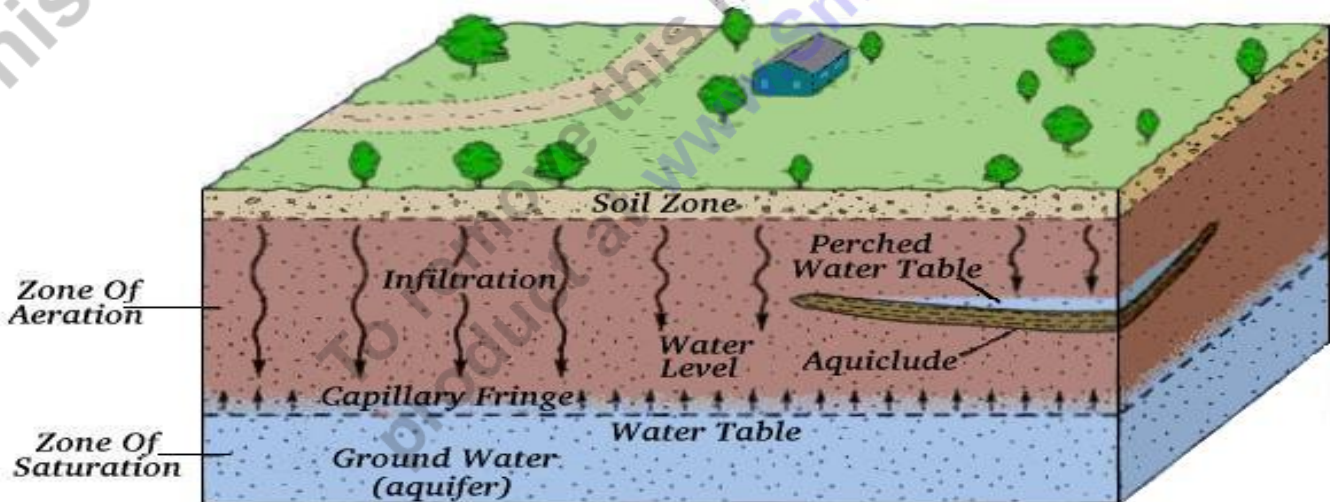
Earth's Water Supply

- Oceans 97.3% - Salt (Cannot drink or use for Agriculture)
- Ice Caps 2.19% (Locked)
- Groundwater 0.5% (Most is too Deep)
- Soil Moisture 0.005% (Can't Obtain)
- Atmosphere 0.001% (Can't Obtain)
- Inland Lakes 0.018% (Available)
- Rivers 0.000096% (Available)



New Area of Focus: Groundwater

Groundwater - Water stored in the ground



Negative Effects of Groundwater Depletion

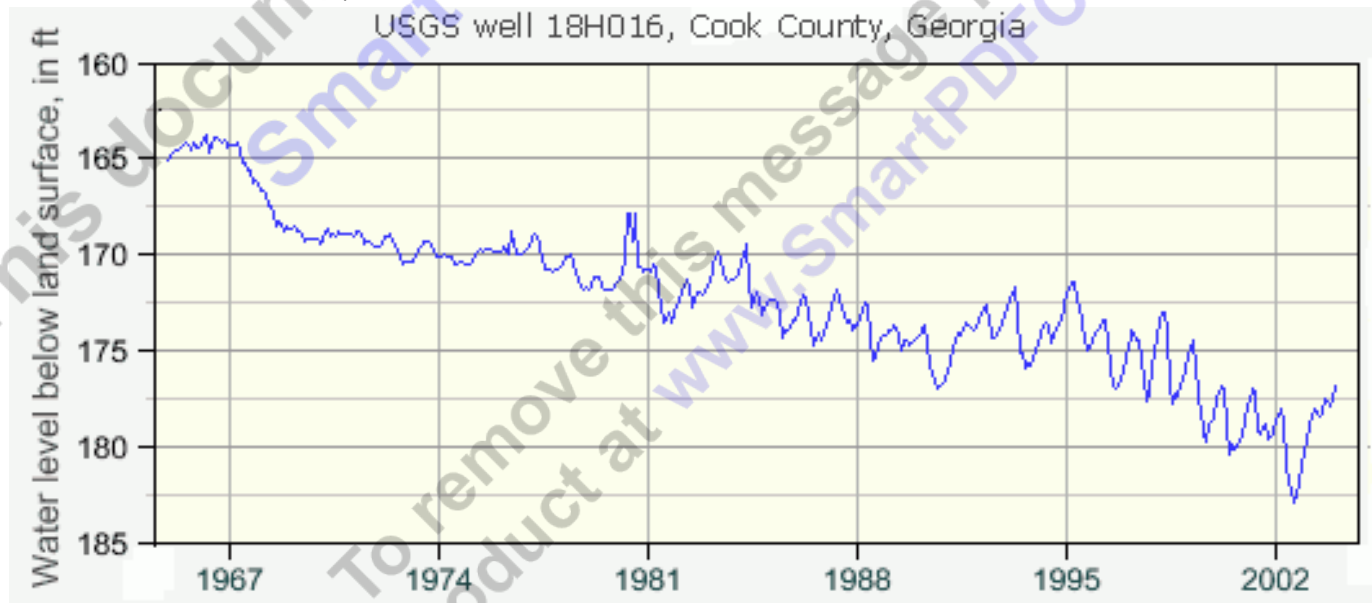
- Drying up of wells

- Reduction of water in streams and lakes
- Deterioration of water quality
- Increased pumping costs
- Land use decreases in quality

■ Please create a line graph in journal with the following data.

Year Water level below land
(Cook Co. Georgia)

- 1967 - 163 ft
- 1974 - 170 ft
- 1981 - 173 ft
- 1988 - 175 ft
- 1995 - 172 ft
- 2002 - 183 ft
- 2008 - 190 ft



Groundwater Contamination: The act of contaminating or polluting the groundwater.

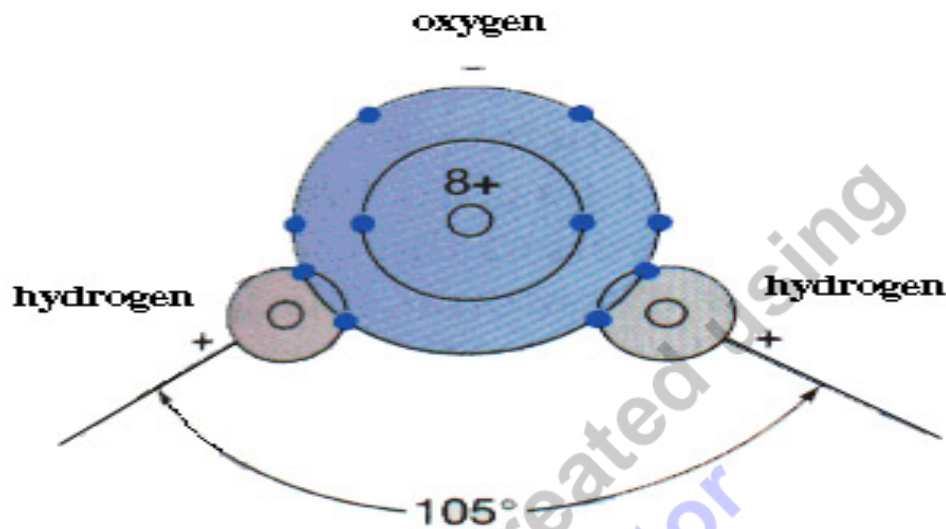
NEW AREA OF FOCUS: PROPERTIES OF WATER

Properties of Water: Water has unique properties because of its lopsided + and - ends.

Some water basics

- Water freezes at 0 degrees Celcius, and boils at 100 degrees
- Water freezes at 32 degrees Fahrenheit (F) and boils at 212 degrees F (Sea-Level)
- Water weighs 28.3 Kilograms per cubic foot.
- Weight: 62.416 pounds per cubic foot at 32°F (It's heavy).
- Density: 1 gram per cubic centimeter
- Water is H₂O. Two hydrogen atoms, one oxygen.

Structure- H₂O (water) One oxygen bound by two hydrogen.
Oxygen shares one electron with each hydrogen atom.

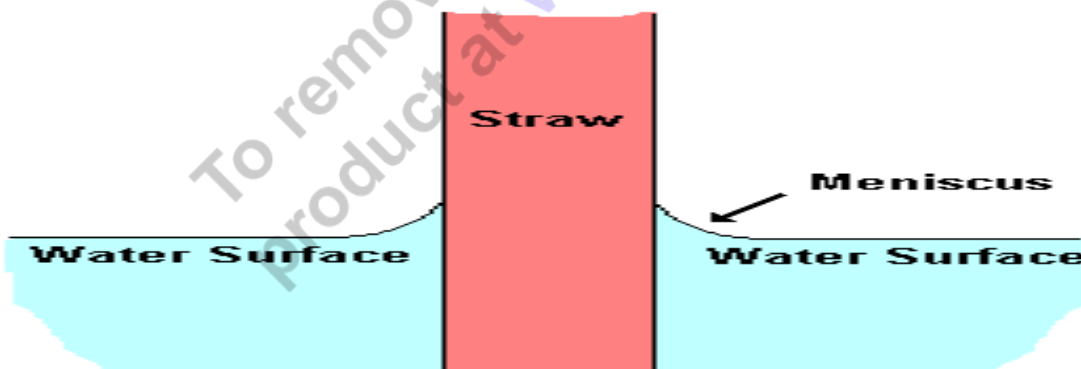


Polar molecule: One end of the water molecule tends to have a positive charge while the other has a negative charge.

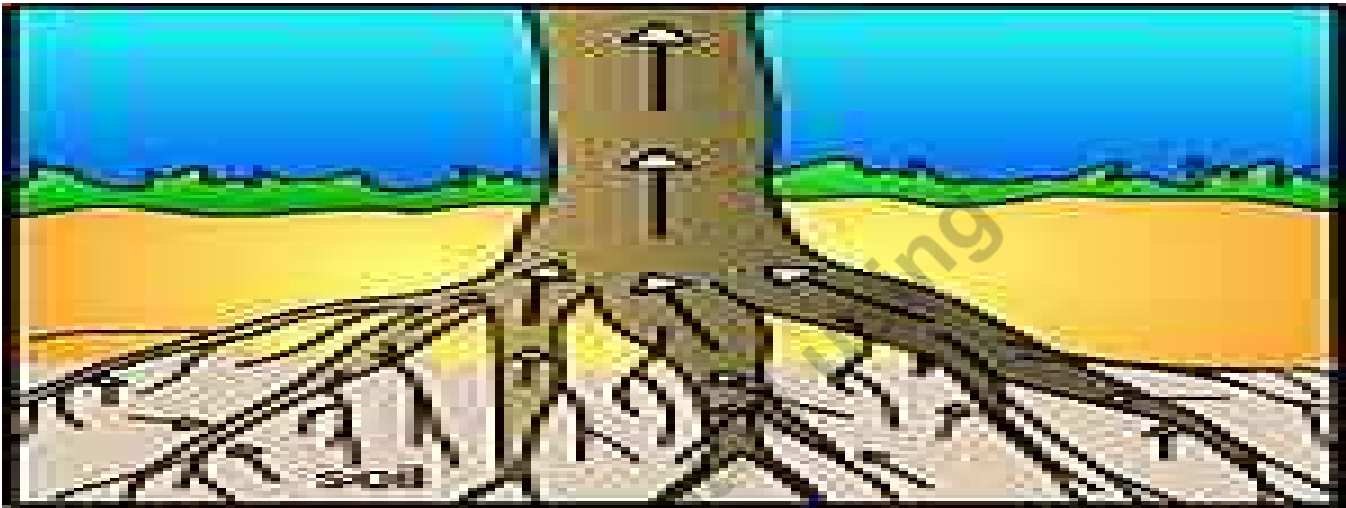
Non-polar (lipids) equal charge

Properties of Water

- Cohesion-Hydrogen bonds hold water molecules together to each other.
- Adhesion - Holds water to a surface
- A meniscus is the curved surface at the top of a column of liquid



- Capillary action - water can move up plants by adhesion.



Chromatography - A method used to separate complex mixtures

Surface tension: Water molecules stick to themselves.

High Specific Heat- Hydrogen bonds absorb heat when they break, and release heat when they form.

It takes a lot of energy to heat water, a lot of energy to freeze it, and a lot of energy to melt ice.

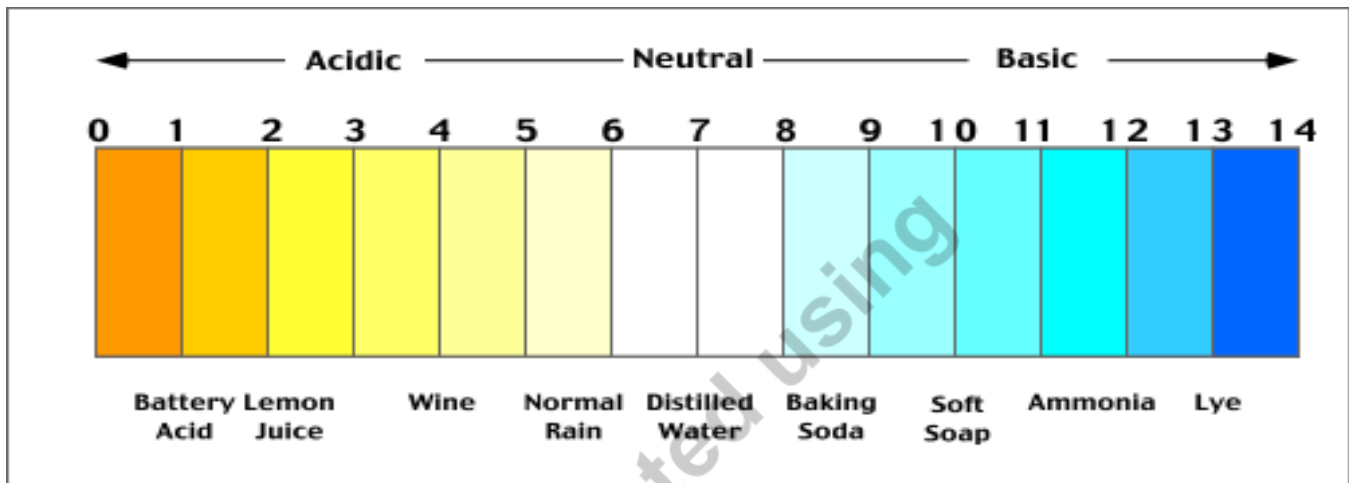
Water stabilizes the temperature of the earth.

Lower Density of Ice- Molecules are spaced far apart. Ice floats

Water in a pure state has a neutral pH. As a result, pure water is neither acidic nor basic.

pH scale goes 1-14

- 7 is neutral or very little pH
- 1 is Acidic
- 14 is basic



pH - An expression for the effective concentration of hydrogen ions in a solution.

The strength of an acid is based on the concentration of H⁺ (hydrogen) ions in the solution.

- Hydrochloric Acid can induce chemical change.
- $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$ (gas)

: Any form of precipitation that is unusually acidic. Usually around a pH of 5

Acid Rain is caused by Nitrogen and Sulfur dioxides. Aka - Air pollution.

Universal Solvent: Liquid water is able to dissolve a large number of different chemical compounds.

- Same throughout.
of two or more compounds.

Solution - The substance that does the dissolving (usually larger amount)

Solute - The substance that gets dissolved (usually lesser amount)

Solubility - How much solute can dissolve in a substance before it becomes saturated.

Supersaturated: When no more solute will dissolve. (crystals visible)

Water aided in the origin / evolution of life in 3 ways.

- 1 • As a solvent: Cells need water and the compounds (Oxygen) mixed with water to function (oxygen).
- 2• As a participant: Water is part of photosynthesis and respiration. (using energy)
- 3• As a medium: You can move through water, waste travels away, sex cells move through.

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