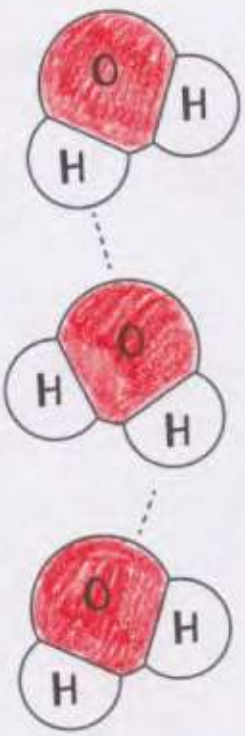
Name: _____

Properties of Water

Water molecules are very polar:

- The oxygen atoms attract shared electrons strong, so the oxygen atom has a slightly negative charge
- The hydrogen has a slightly positive charge
- This makes them "stick" to each other with a strong attraction called a hydrogen bond.

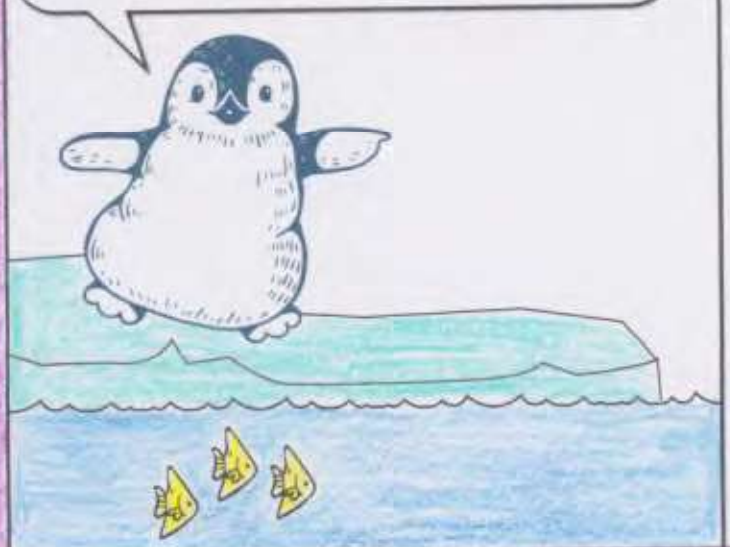


Water has a high specific heat:

- High specific heat means it takes a LOT of energy to change a body of water's temperature
- Aquatic life can live without rapid/deadly changes in temperature

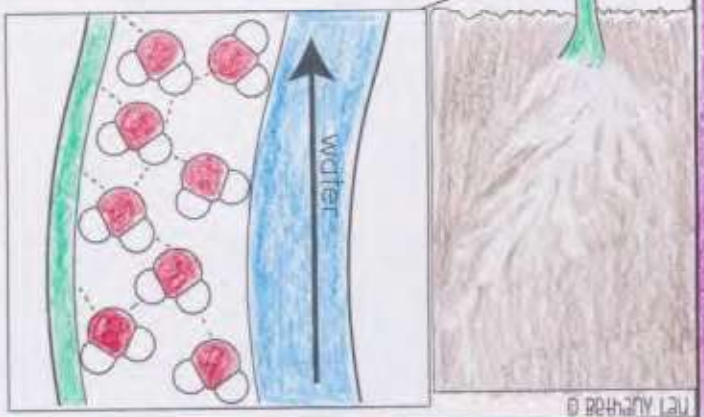
Ice is less dense than water:

- Ice forms at the top because of the cold air. Aquatic organisms that live underneath the ice in the water are insulated from extreme cold by the ice
- This also allows for some animals to live on top of the ice!



Capillary Action:

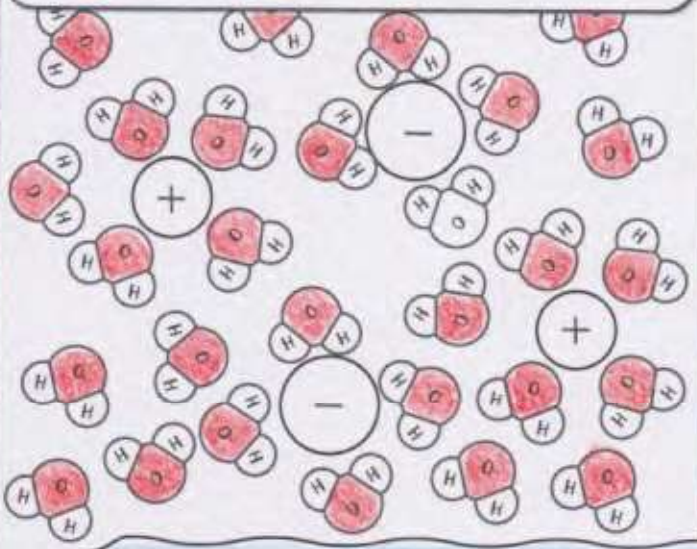
- water moves up thin tubes within plants!
- water is drawn up the tube, against gravity, by the forces of cohesion and adhesion.



Important for Life

Water is a terrific solvent:

- many ions and polar molecules necessary for life can dissolve in H_2O
- water is great for carrying these ions and molecules within cells or blood vessels between different body tissues.

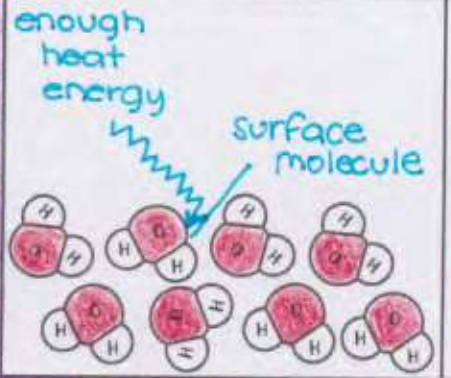


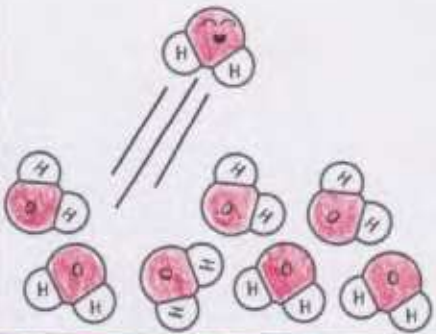
Water has a strong surface tension:

- molecules at the surface hold more tightly to each other than molecules further under the surface
- some life depends on being able to float on top of the surface
- this is also why water can bead up into droplets on a surface

Water has a relatively high boiling point and heat of vaporization for a small hydride molecule:

- It takes a lot of heat energy for water molecules to leave their liquid form, held together by hydrogen bonds
- Because water does not boil at a lower temperature, most water on the planet is found in the form of liquid, which is essential for life!
- Surface molecules of water can evaporate when individually they gain enough energy to break free from the hydrogen bonds of the molecules around them.





Is there water on other planets?

- many moons in our solar system have evidence of ice and perhaps liquid water is underneath
- Scientists believe liquid water is a requirement for life to exist, which is why we keep looking for it!
- most planets are too hot or too cold for liquid water to exist.