

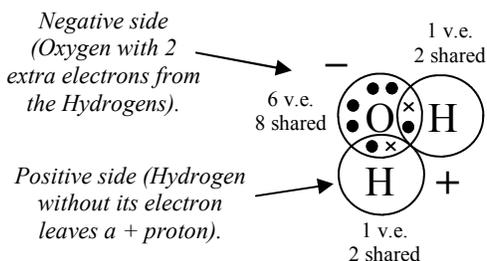
Name: _____

Period: _____

Day 20— The Properties of Water

Objective 4

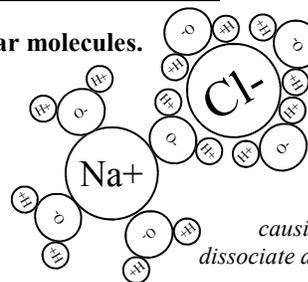
Water is a polar molecule:
it has a negative and positive side.



Water dissolves ionic and polar molecules.

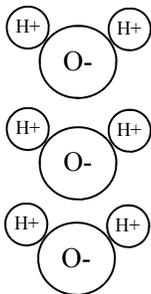
“Likes dissolve likes”. Polar compounds dissolve in polar solvents (like water). Non-polar compounds dissolve in non-polar solvents (liquids).

Water is called the “nearly” universal solvent because it dissolves so many things.



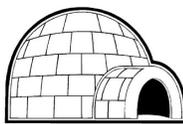
In water, negative Chlorines are attracted to positive Hydrogens and positive Sodiums are attracted to negative Oxygens, causing NaCl (table salt) to dissociate as it dissolves in water.

Compounds that can dissolve in water are called **water soluble**. Compounds that cannot dissolve in water are **insoluble**.



Water “chains” together by cohesion (attraction between other water molecules). This weak attraction between negative oxygens and positive hydrogens is called a **hydrogen bond**. It allows for **water tension** (and why some bugs to walk on water) and **capillary action** (how plants can “suck up” water from their roots to the leaves thru the **xylem**).

Water is the only substance that expands as it freezes. This expansion breaks rocks, causing erosion. This expansion also means **ice is less dense than water, so ice floats on top of water.**



Ice is also an insulator. Lakes freeze from the top down and the insulation of the top layer of ice means the rest of the lake takes longer to freeze, protecting the fish below.



- A. Which side of water is positive? B. Why?
- A. Do metals become positive or negative?
 B. Would a metal be attracted to water’s hydrogens or oxygen?
 C. Would a nonmetal be attracted to water’s hydrogens or oxygen?
- To which side of a Water Molecule are these Attracted?

<input type="checkbox"/> Magnesium	<input type="checkbox"/> Calcium	<input type="checkbox"/> Potassium	<input type="checkbox"/> Iron
<input type="checkbox"/> Chlorine	<input type="checkbox"/> Sulfur	<input type="checkbox"/> Helium	<input type="checkbox"/> Bromine
- What is the difference between soluble and insoluble?
- Soluble or insoluble in water?

<input type="checkbox"/> Cooking oil	<input type="checkbox"/> Sugar	<input type="checkbox"/> Ionic Compounds	<input type="checkbox"/> Non-polar molecules
<input type="checkbox"/> Polar molecules	<input type="checkbox"/> Salt	<input type="checkbox"/> Dissolves in water	<input type="checkbox"/> Wax
- What property of water allows it to dissolve so many compounds?
- What is cohesion?
- Why are water bugs able to “walk on water”?
- How do plants get water from their roots up to their leaves?
- A glass bottle is filled to the top with water and then sealed tightly. What will happen when the bottle is placed in the freezer?
- A. If solid iron is dropped into liquid iron, will the solid iron float or sink?
 B. If solid water is dropped into liquid water, will the solid water float or sink?
 C. Which of the above is the exception: iron or water?
- Why do roads break during the winter?
- Why don’t fish freeze under a frozen pond?