

## Cheat Sheet .

**Intermolecular Forces** - the forces of attraction or repulsion between neighboring particles (atoms)

**Covalent Bond vs Ionic Bonds:**

- **Covalent** - when atoms bond because they share electrons.
- **Ionic** - when ions that are oppositely charged are attracted to each other and bond.
  - “**ions**” are formed when atoms lose or gain electrons by transferring from one atom to another. The resulting ions are then oppositely charged.

**Electronegativity:** Electronegativity is the ability to attract electrons. If electronegativity is high, then it pulls at the electrons strongly. If it is low, it does not pull at electrons as much.

**Nonpolar bond** - when two atoms share their electrons equally because they have a similar electronegativity. There is no difference in the charges.

**Polar bond** - (*Angela and James DO NOT fully understand this*) is a covalent bond between two atoms where the electrons forming the bond are unequally distributed.

- One atom spends more time with the electrons - partial negative charge.
- The atom that spends less time with the electrons - partially positive charge.
- The bonded atoms have a partial and opposite charge at either “poles” of the atom.

**Hydrogen bond:** A type of polar bond that occurs in molecules containing hydrogen and the highly electronegative elements nitrogen (N), oxygen (O), or fluorine (F).

- **Water is a hydrogen bond.**

**Polarity of Water:** The electrons are unequally shared, with the oxygen atom spending more time with electrons than the hydrogen atoms. Since electrons spend more time with the oxygen atom, the oxygen atom carries a partial negative charge and both hydrogen atoms carry a partial positive charge.

**Surface Tension** - the property of the surface of a liquid that allows it to resist an external force.

- The term is typically used when the liquid surface is in contact with a gas.

**Surface Tension of Water** - (*Ciara and Jordan DO NOT understand this*) The water molecules in the center or bulk of the water are forming many weak hydrogen bonds with the other water molecules. The water molecules at the surface, however, do not bond with the air and only bond with what is below or next to them in the bulk of the water. Because there are fewer hydrogen bonds at the surface, the bonds are actually stronger and creates “tension” at the surface.

**Periodic Table:** arrangement of elements

**Rows:** Periods (series) the atomic number of the elements increase as you move along the periodic table

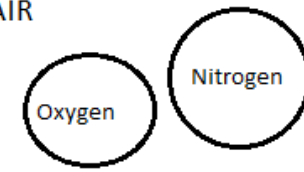
- **Left of Staircase** - Metals
- **Right of Staircase:** Nonmetals
- **Forming the Staircase:** metalloids

**Columns:** groups (families)

### Example of a Good Model with correct labeling

There is no interaction between the air molecules and the water molecules at the surface, so the water molecules are the surface are not experiencing any pull from the side that faces the air. They only experience pull from the sides and below them. Because they have of the pulls (hydrogen bonds), those bonds are stronger, creating surface tension.

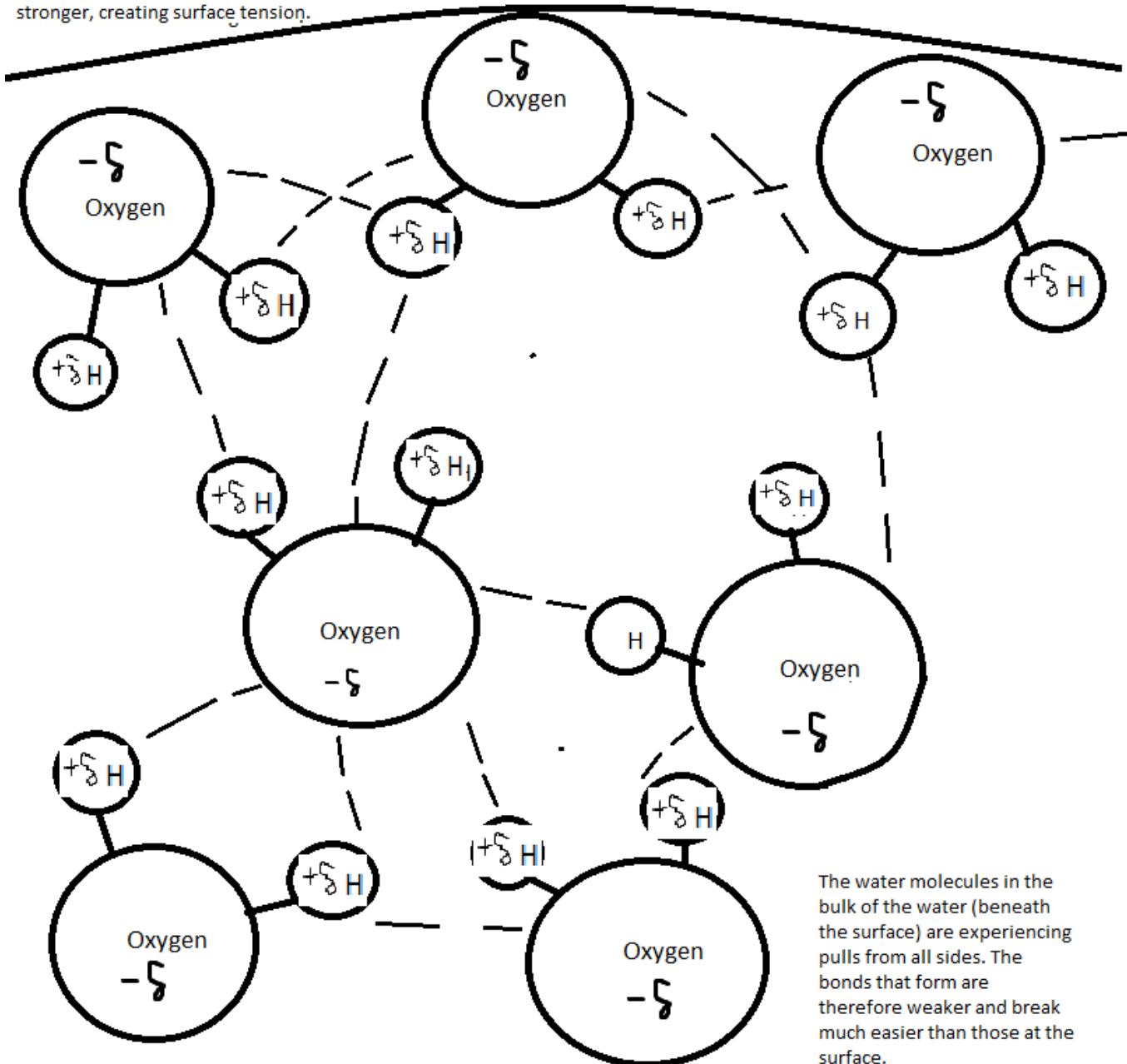
AIR



SURFACE OF WATER

Key

- Polar Bond
- Hydrogen Bond
- Partial Negative Charge
- Partial Positive Charge



The water molecules in the bulk of the water (beneath the surface) are experiencing pulls from all sides. The bonds that form are therefore weaker and break much easier than those at the surface.