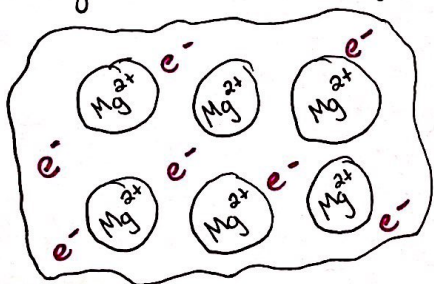


## Metallic Bonding:

Metals + Metals

- What are metals like?
  - ↳ Luster/shiny
  - ↳ Malleable (sheets)
  - ↳ Ductile (wires)
  - ↳ Conductive (heat/elec.)
- Why? (Pure metal - Mg)

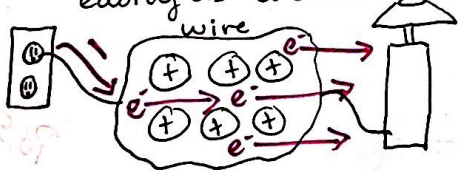


↳ Lattice of cations (Grid)

↳ Surrounded by a sea of delocalized e<sup>-</sup>

- Are they conductive?

↳ free-flowing e<sup>-</sup> can move easily as a current

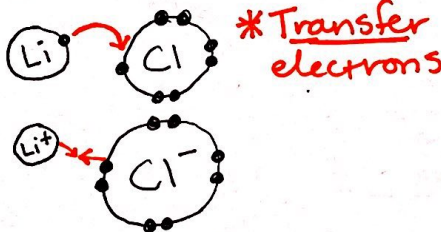


## Ionic Bonding:

Metals + Nonmetals ] Ions  
(or NH<sub>4</sub><sup>+</sup>) (Polyatomics)

- What are ionic compounds like?
  - ↳ All solid @ room temp.
  - ↳ Brittle crystal structures
  - ↳ Strong attractions (bonds)
  - ↳ High melting points

Ex: Li + Cl



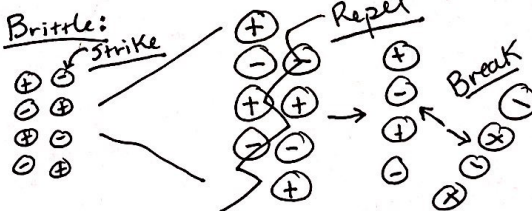
LiCl = [Li<sup>+</sup> Cl<sup>-</sup>] - Formula unit of Lithium chloride

- Solubility - most ionic compounds are H<sub>2</sub>O soluble; H<sub>2</sub>O pulls ions off into solution

↳ Separated ions now allow for flow of e<sup>-</sup>.

↳ conductive in solution!

- Brittle:

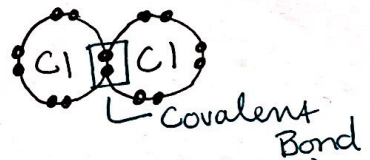
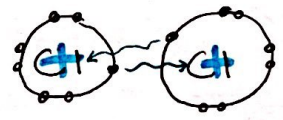


## Covalent Bonding:

Nonmetals + Nonmetals

- ↳ All nonmetals = gain e<sup>-</sup>
- ↳ None want to lose, so they have to share
- ↳ Actually, they fight over the electrons
- ↳ No one wins = NO IONS

Ex: Cl<sub>2</sub>



Properties: (Dynamic)

- All states of matter (S, L, G)
- Weaker than ionic
  - ↳ Low ~~low~~ Melting points
- Some are H<sub>2</sub>O soluble (based on polarity) but do not produce ions
  - ↳ Do not allow for e<sup>-</sup> flow
  - ↳ No/Low Conductivity