Organizer – Bond Types

Bond Type	**Valence Electrons are…**	**Occurs between…**	**Examples**
Ionic	TRANSFERRED as a result of an electronegativity difference greater than 1.7	Metals and nonmetals	Sodium has 1 valence electron, chlorine has 7. A transfer benefits the stability of both: Na $1s^2 2s^2 2p^6 \mathbf{3s^1}$ Cl $1s^2 2s^2 2p^6 \mathbf{3s^2 3p^5}$ This transfer forms **ions**, each with an octet: Na^+ $1s^2 \mathbf{2s^2 2p^6}$ Cl^- $1s^2 2s^2 2p^6 \mathbf{3s^2 3p^6}$ All salts, which are composed of metals bonded to nonmetals, are ionic compounds and form ionic crystals. A few examples: $MgCl_2$, Na_2O, KI, CaO, LiF, BaS
Covalent	SHARED as a result of an electronegativity difference less than 1.7 0 and 0.3 = equal sharing (nonpolar covalent) 0.3 – 1.7 = unequal sharing (polar covalent)	Nonmetals and other nonmetals	The vast majority of all known compounds involve the covalent bonding of nonmetals to other nonmetals: H_2O – water, NH_3 – ammonia, $C_{12}H_{22}O11$ – sucrose (table sugar), C_3H_8 – propane, C_2H_2 – acetylene C_2H_5OH –ethyl alcohol
Metallic	SHARED among all of the involved atoms in an “electron sea”	Metals and other metals	This bonding occurs in any pure metals such as: Copper, gold, silver, iron, sodium, zinc Metallic bonding occurs in metals alloys such as: Brass, Bronze, Stainless steel