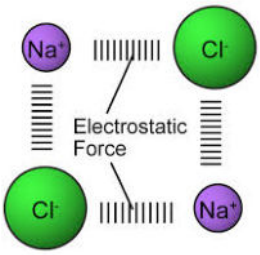
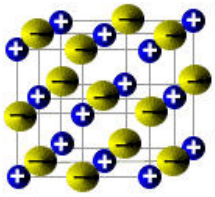
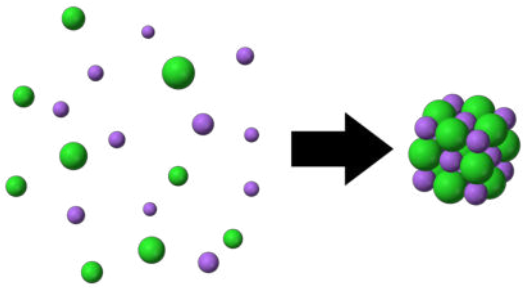
UNIT 5: CHEMICAL BONDING NAME _____ BLOCK___



Ionic bonds are the electrostatic forces of attraction between oppositely-charged **ions**. The oppositely-charged **ions** are arranged in a regular way to form a giant **ionic lattice**.



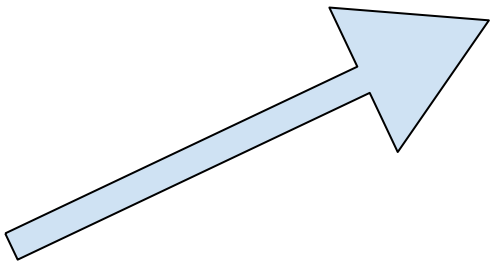
Lattice Energy: energy **given off** when oppositely charged ions in the gas phase come together to form a solid (OR



energy required to break ions apart)

TABLE 6.3 Lattice Energies of Some Ionic Solids (kJ/mol)

	Anion				
Cation	**F^-**	**Cl^-**	**Br^-**	**I^-**	**O^{2-}**
Li^+	1036	853	807	757	2925
Na^+	923	787	747	704	2695
K^+	821	715	682	649	2360
Be^{2+}	3505	3020	2914	2800	4443
Mg^{2+}	2957	2524	2440	2327	3791
Ca^{2+}	2630	2258	2176	2074	3401
Al^{3+}	5215	5492	5361	5218	15,916

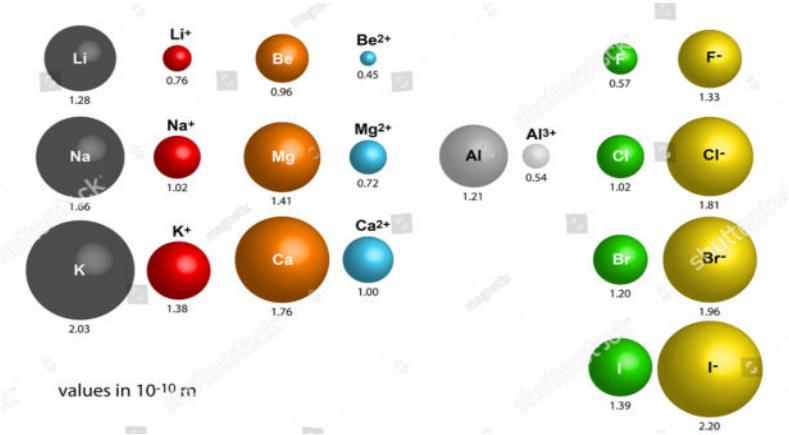


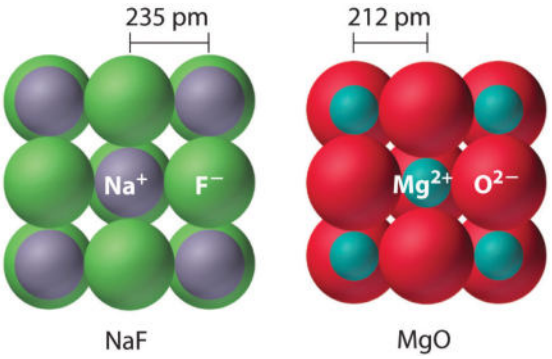
What patterns or trends do you see?

Coulomb's Law: The magnitude of the electrostatic force of attraction or repulsion between two point charges is directly proportional to the product of the magnitudes of charges and inversely proportional to the square of the distance between them. The force is along the straight line joining them.

$$F = \frac{kq_1q_2}{r^2}$$

In Summary: Ionic compounds are stronger when...





Explain:

(a) The lattice energy of NaCl is higher than CsCl

(b) A bond between Ca and O is stronger than a bond between Na and Cl

(c) The melting point of KBr is lower than LiF