Lewis Diagrams
Lewis Structures
Lewis Dot Diagrams
Lewis Dot Structures

All the same thing! ☺

A way to figure out the structure of molecules

- You have to know the # of valence electrons for EACH atom in the molecule!
  - From the periodic table group number!
    - 1A = 1 valence electron
    - 2A = 2 valence electrons
    - 3A = 3 valence electrons
    - etc…

Practice…

- Lithium
  - 1 valence
- Magnesium
  - 2 valence
- Nitrogen
  - 5 valence
- Neon
  - 8 valence

"8 is great!"
– many things want 8 valence e- =
"full shell" or "octet"

Why valence electrons and not all electrons?

- Because the valence electrons are the only ones on the outside! They are available for bonding. They are “accessible”

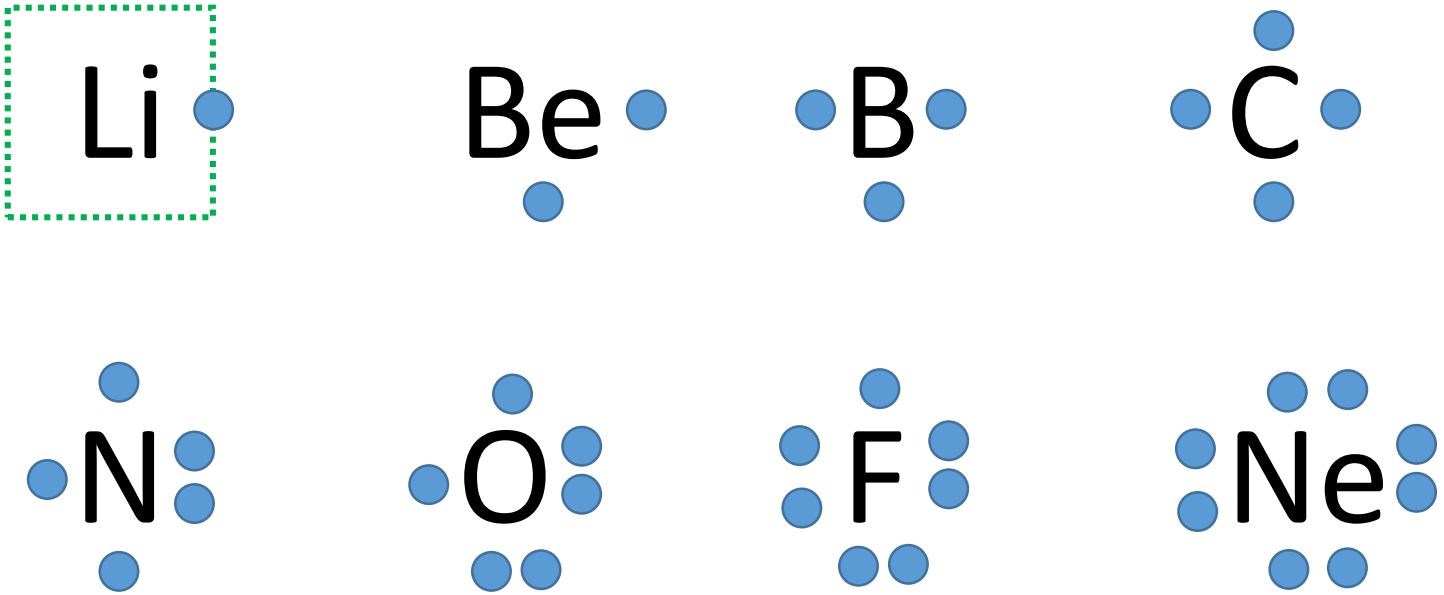
Octet "Rule"

- More like a suggestion than a "rule"
- Most elements want 8 valence electrons if possible
- ANYTHING can break the "rule" if it has to!
- Common exceptions – things that break the rules more often than they follow the rules

Element	H	B	P	S
# of Valence e- it is ok having	2	6	10	12

- Memorize them!

Drawing Single Atoms



Drawing Anions – a change has been made!

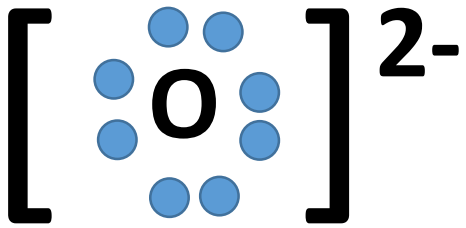
O^{2-}

Oxide

Oxygen normally has: 6 v.e-

Change: + 2 v.e- (two extra)

New Total: 8 v.e-



Drawing Anions – a change has been made!

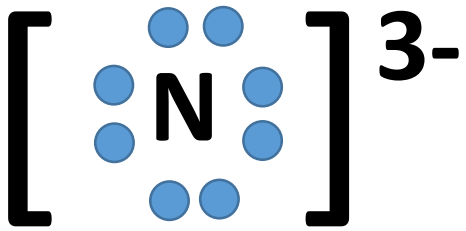
N^{3-}

Nitride

Nitrogen normally has: 5 v.e-

Change: + 3 v.e- (three extra)

New Total: 8 v.e-



Drawing Cations – a change has been made!

Mg^{2+}

Magnesium Ion

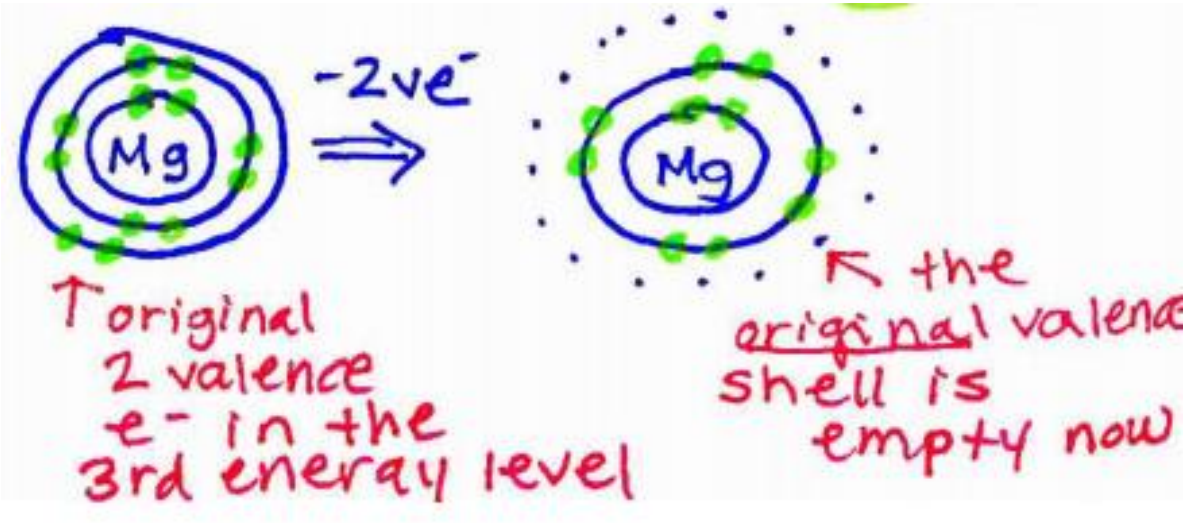
$[\ Mg\ ]^{2+}$

ONLY DRAW ORIGINAL valence shell!

Mg normally has: 2 v.e-

Change: - 2 v.e- (lost two)

New Total: 0 v.e-

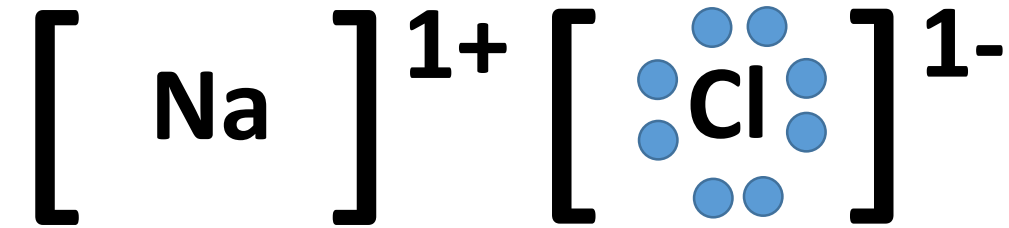


???? v.e-

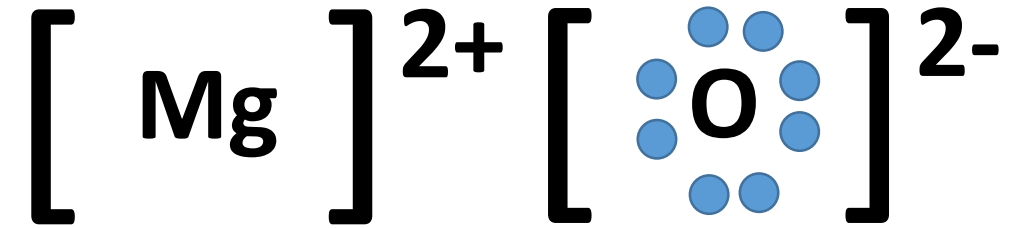
0 v.e- in the ORIGINAL valence shell

Drawing Ionic Compounds –
Draw the ions next to each other! That's it!

Sodium Chloride
NaCl



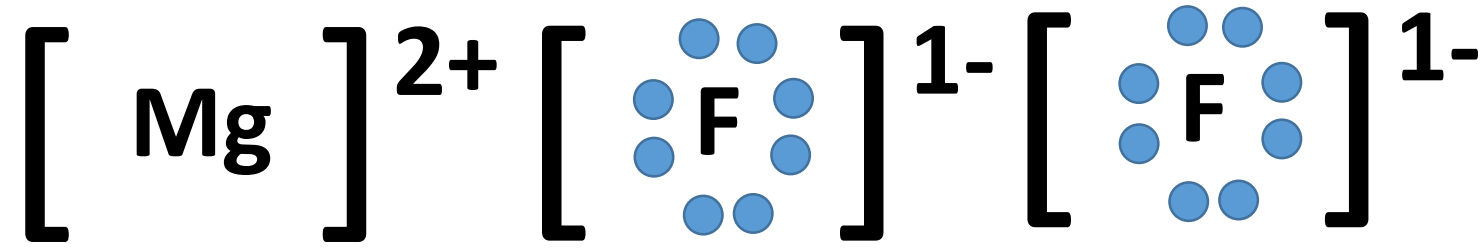
Magnesium Oxide
MgO



Drawing Ionic Compounds –
Draw the ions next to each other! That's it!

Calcium Fluoride

MgF_2



Don't waste all your time! Don't draw two fluorides!

Just use subscripts! ☺