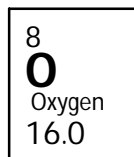


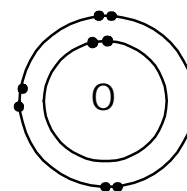
Atom

Atomic Number



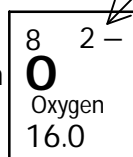
Atomic Mass = 16.0

$$\begin{aligned}
 \text{\# of protons} &= \text{atomic number} \\
 &= 8 \quad (\text{This number never changes}) \\
 \text{\# of electrons} &= \text{\# of protons} \\
 &= 8 \\
 \text{\# of neutrons} &= \text{Atomic Mass} - \text{\# of protons} \\
 &= 16 - 8 \\
 &= 8
 \end{aligned}$$

BohrLewis**Oxygen Atom: O****Ion - A charged particle**

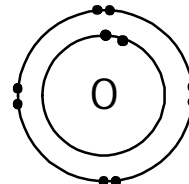
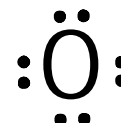
Atomic Number

Ion Charge

Oxide ion

Atomic Mass

$$\begin{aligned}
 \text{\# of electrons} &= \text{\# of protons} - \text{charge \#} \\
 &= 8 - (-2) \\
 &= 10
 \end{aligned}$$

BohrLewis**Oxygen Ion: O²⁻**

(Electrons have a negative charge. If the ion is negatively charged, it means it has more electrons. If an ion is positively charged, it means it is missing electrons)

$$\text{Atomic Mass} = \text{\# of protons} + \text{\# of neutrons}$$

Protons: Positive charge
Electrons: Negative charge
Neutrons: No charge

C11 - 1.2 - # Atoms Notes

How many of each atom are there in the following molecules?



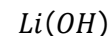
Na: 1
Cl: 1



Li: 2
O: 1



Cd: 3
P: 2



Li: 1
O: 1
H: 1

$$1 \text{ molecule } Li_2O \times \frac{2 \text{ atoms } Li}{1 \text{ molecule } Li_2O} = 2 \text{ atoms } Li$$

$$1 \text{ molecule } Li_2O \times \frac{1 \text{ atoms } O}{1 \text{ molecule } Li_2O} = 1 \text{ atoms } O$$



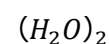
O: 1
H: 1



O: 2
H: 2



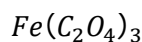
H: 2
O: 1



H: 4
O: 2

*Double whats
inside Brackets*

*Double whats
inside Brackets*



Fe: 1
C: 6
O: 12

*Triple whats
inside Brackets*



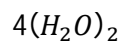
Na: 2
Cl: 2

*Double the
whole thing*



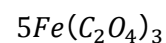
Li: 6
O: 3

*Triple the
whole thing*



H: 16
O: 8

*Quadruple the
whole thing*



Fe: 5
C: 30
O: 72

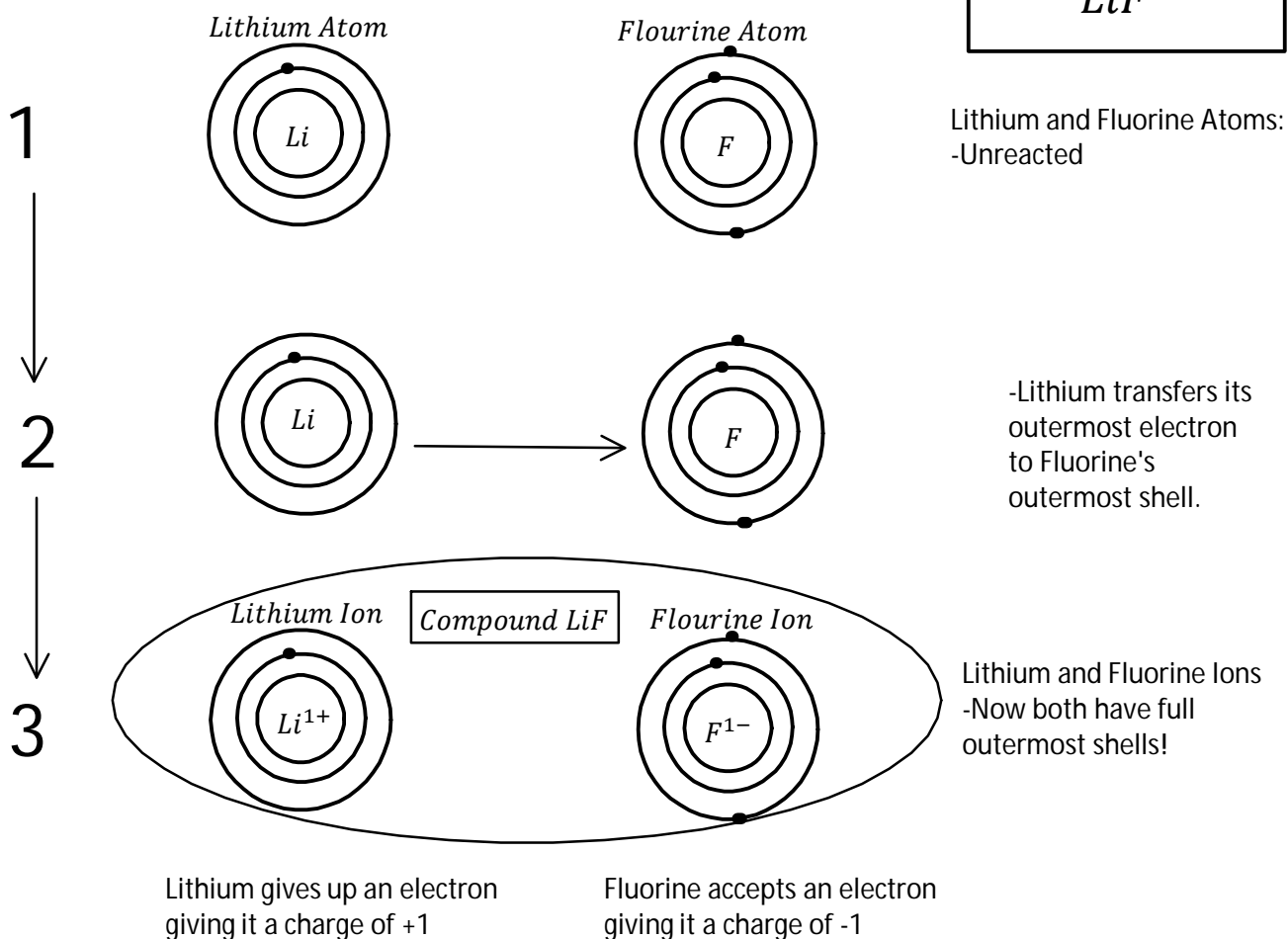
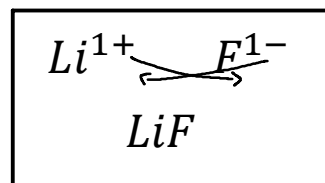
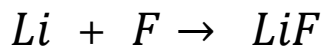
Multiply by 5

How many molecules of Fe_2O_3 if you have 6 atoms of Fe??

$$6 \text{ atoms } Fe \times \frac{1 \text{ molecule } Fe_2O_3}{2 \text{ atoms } Fe} = 3 \text{ molecules } Fe_2O_3$$

C11 - 1.2 - Ionic Bonding 1:1 Transfer Electrons Notes

Lithium and fluorine react to produce lithium fluoride.



Since electrons have a negative charge:

-losing an electron, a negative charge, will make you more positive charged.

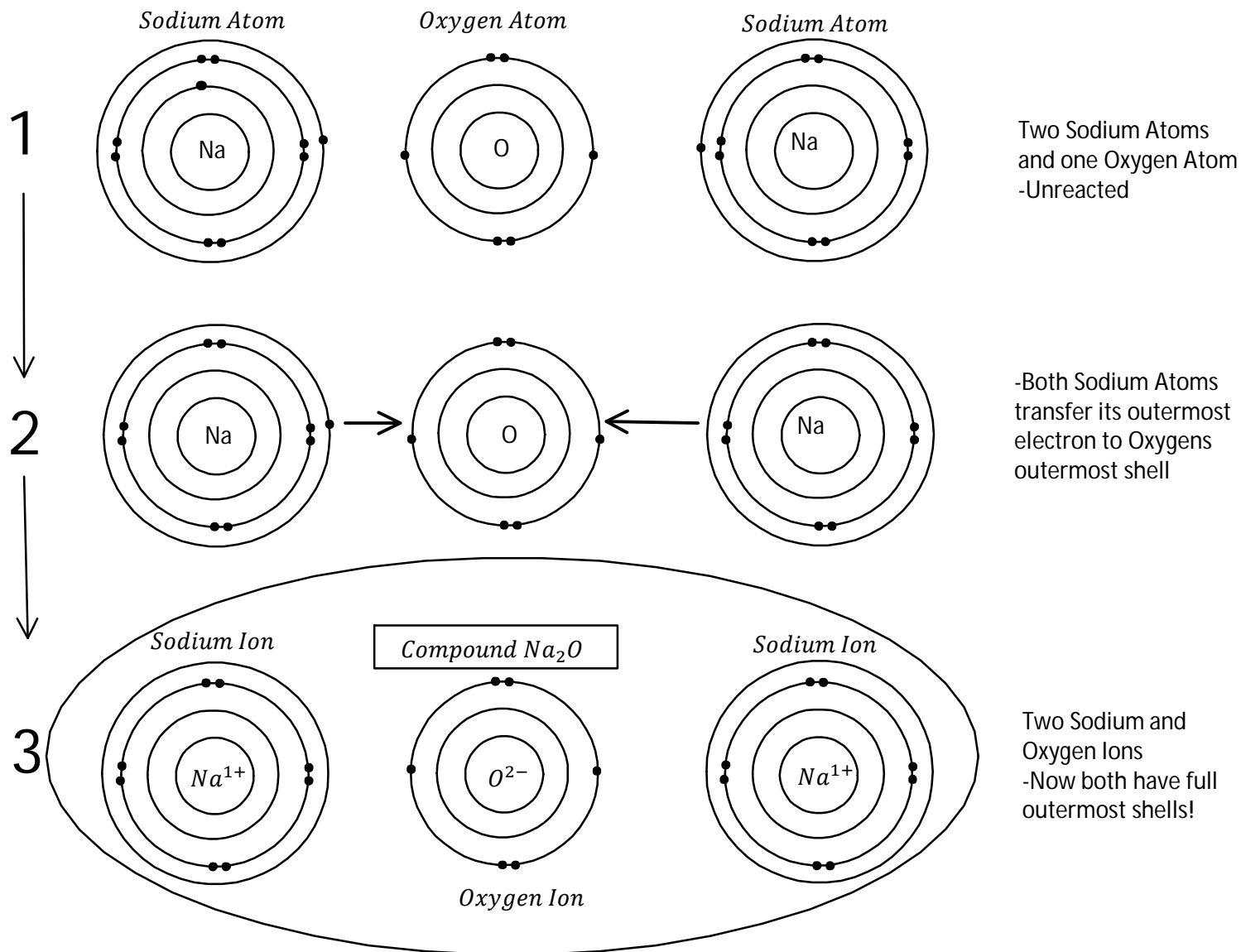
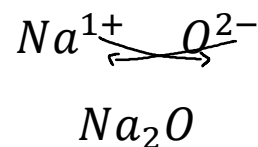
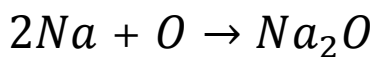
-gaining an electron, a negative charge, will make you more negatively charged

Elements are more stable with a full outermost shell (valence shell). Elements have a tendency to react with each other in certain proportions based on this fact. This is called the combining capacity.

An elements ionic charge is exactly the number of electrons it needs to give up or accept in order to have a full valence shell

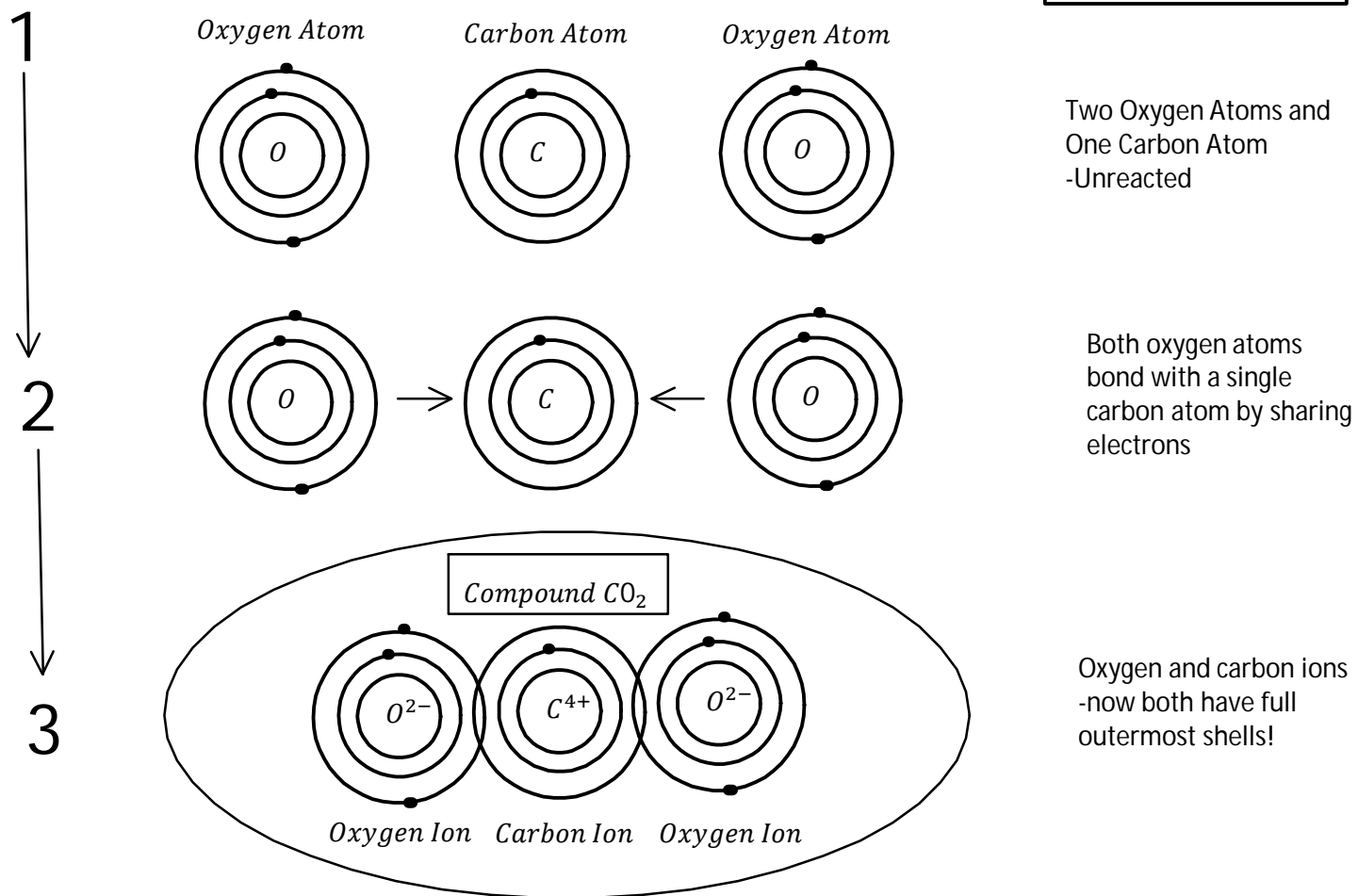
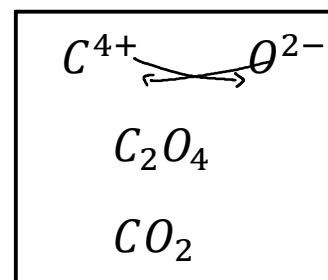
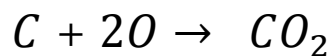
C11 - 1.2 - Ionic Bonding 2:1 Transfer Electrons Notes

Sodium and oxygen react to produce sodium oxide.



C11 - 1.3 - Covalent Bonding Share Electrons Notes

Carbon and oxygen react to produce carbon dioxide.

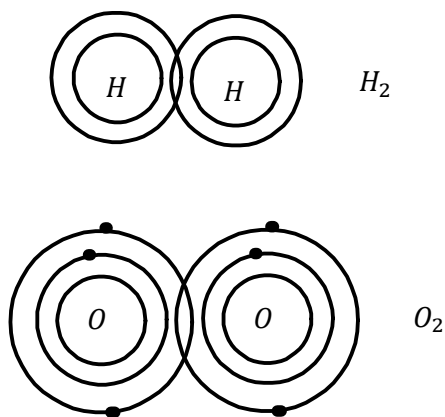


C11 - 1.4 - Diatomic Bonding

Diatomic Elements

Hydrogen:	H_2	H_2
Nitrogen:	N_2	N_2
Oxygen:	O_2	O_2
Fluorine:	F_2	F_2
Chlorine:	Cl_2	Cl_2
Bromine:	Br_2	Br_2
Iodine:	I_2	I_2

Bohr diagrams help explain why the previous atoms form as pairs to fill their valence shell in a covalent bond by sharing electrons.



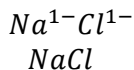
C11 - 1.5 - Naming Ionic/Covalent/Multivalent Compounds Notes

Ionic Compounds:

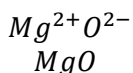
- Metal & non-metal
- Transfer electrons.

Naming:

Metal Non-metal-ide



Sodium Chlorine
~~ine~~
 $\text{NaCl} = \text{Sodium Chloride}$



Magnesium Oxygen
~~gen~~
 $\text{MgO} = \text{Magnesium Oxide}$

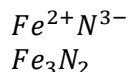
ine → ide
 gen → ide
 on → ide
 xxx → ide

Boron * *Boride*
 Oxygen * *Oxide*
 Flourine * *Flouride*
 Sulfur * *Sulfide*

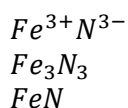
Multi-valent Compounds:

Multi-valent: More than one ionic charge

Naming:



$\text{Fe}_3\text{N}_2 = \text{Iron (II) Nitride}$



$\text{FeN} = \text{Iron (III) Nitride}$

Roman Numerals in brackets to the right of the element representing its charge being used.

I = 1
 II = 2
 III = 3
 IV = 4
 V = 5

Covalent Compounds:

- Non-metal & non-metal
- Share** electrons.

Non-metal Non-metal-ide

*always write the more metallic non-metal first.

Naming:

$\text{CO}_2 = \text{Carbon Dioxide}$

* *Monocarbon Dioxide*

$\text{BO} = \text{Boron Monoxide}$

$\text{CCl}_4 = \text{Carbon Tetrachloride}$

$\text{C}_2\text{H}_6 = \text{Dicarbon Hexahydride}$

Exceptions to the naming:

- NH_3 : *Ammonia*
- O_3 : *Ozone*
- Etc.

Prefixes

1	Mono
2	Di
3	Tri
4	Tetra
5	Penta
6	Hexa
7	Hepta
8	Octa
9	Nona
10	Deca

Monoboard
Dice
Tricycle
Tetrahedral
Pentagon
Hexagon
?
Octagon
Nonagon
Decagon