Name: _____

Period: _____

Naming Compounds

How to use this chart— Determine what the compound is made of and follow the arrows. The chart will tell you how to name the compound.

What's it Made of?

- Metal and non-metal → ionic compound
- 2 non-metals → covalent compound
- 3 or more elements → polyatomic compound

Exception— O_2 is "peroxide" and can make polyatomic compounds with only 2 elements! O_2 with a non-metal is *dioxide*. O_2 with a metal OR Hydrogen (acting as a metal) is *peroxide*.

ionic compound

USE "- IDE" ENDING **(NO PREFIXES!)**

Name the metal and non-metal and change the ending to "ide".

Li_2S

*Metal and non-metal— **ionic***

Lithium Sulfide

(**not** dilithium sulfide— no prefixes for ionic compounds)

Why are ionic compounds so easy to name? Because most ionic compounds can only form one way, using the oxidation numbers. In covalent compounds, though, non-metals can sometimes combine in multiple ways (carbon monoxide; carbon dioxide). So, covalent compounds use prefixes.

Transition Metals Can Have More Than One Oxidation Number

Iron (II) has an oxidation number of 2+
Iron (III) has an oxidation number of 3+.
When naming them you must specify WHICH ONE.

FeO—Iron (II) oxide
Fe_2O_3— Iron (III) oxide

covalent compound

USE GREEK PREFIXES

Put prefixes in front of element names to tell how many atoms are there.

Don't use "mono" for first name, but always for second name.

N_2O_4

*2 non-metals—**covalent***

(di =2 and tetra =4)

"Dinitrogen tetroxide"

Greek Prefixes

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

How to remember prefixes:

Monorail – one rail train
Monocle – glasses for one eye; single lens (Colonel Klink).
Dilemma – struggle between 2 choices.
Tricycle – 3 wheels
Pentagon – 5 five sided military building in Washington, D.C.
Octopus – 8 legs
Decade – 10 years

polyatomic compound

CHECK THE CHART BELOW **(NO PREFIXES!)**

Use the names on the chart. If the polyatomic ion is the cation end the second name with "-ide".

$NaNO_3$

*3 elements — **polyatomic***

Check chart (*see below*)
Na - sodium
NO_3 - nitrate (on chart)

Sodium nitrate

Polyatomic Ions

Oxidation #	Name	Formula
1+	ammonium	NH_4^+
1-	acetate	$C_2H_3O_2^-$
2-	carbonate	CO_3^{2-}
2-	chromate	CrO_4^{2-}
1-	hydrogen carbonate	HCO_3^{1-}
1+	hydronium	H_3O^+
1-	hydroxide	OH^{1-}
1-	nitrate	NO_3^{1-}
2-	peroxide	O_2^{2-}
3-	phosphate	PO_4^{3-}
2-	sulfate	SO_4^{2-}
2-	sulfite	SO_3^{2-}

Name: _____

Period: _____

Metal or Non-metal?	**Ionic or Covalent?**
M N Iron Oxide	*Ionic*
Barium Chloride	_____
Carbon Dioxide	_____
Magnesium Oxide	_____
Aluminum Fluoride	_____
Nitrogen Tribromide	_____
Chromium Fluoride	_____
Potassium Oxide	_____

Name These Ionic Compounds	
MgF_2	Magnesium Fluor-*ide*
Li_2O	Lithium Ox- _____
NaCl	Sodium Chlor- _____
K_2O	Potassium Ox- _____
CaS	_____ Sulf- _____
BeI_2	_____ Iod- _____
$AlBr_3$	_____ Brom- _____
CaF_2	_____
MgO	_____
LiCl	_____

Use the Polyatomic Ion Chart on the front of the worksheet to name these Polyatomic Ions:	
HCO_3^{1-}	*Hydrogen carbonate*
SO_4^{2-}	_____
O_2^{2-}	_____
SO_3^{2-}	_____
NO_3^{1-}	_____
NH_4^{+}	_____
CrO_4^{2-}	_____
OH^{1-}	_____
PO_4^{3-}	_____
CO_3^{2-}	_____

Define these Greek Prefixes

Penta = _____	Tetra = _____
Nona = _____	Hexa = _____
Mono = _____	Hepta = _____
Octa = _____	Deca = _____
Tri = _____	Di = _____

1. CO_2	A. Carbon monoxide
2. C_2O_4	B. Carbon dioxide
3. C_3O_5	C. Dicarbon monoxide
4. CO	D. Tricarbon pentoxide
5. C_2O	E. Dicarbon tetroxide
6. CO_8	F. Carbon octoxide

Name These Covalent Compounds	
Si_2O_3	Disilicon _____oxide
N_3Cl_4	_____nitrogen tetrachloride
SO_2	Sulfur _____oxide
PO_5	Phosphorous _____ox____
S_2F_4	____sulfur _____fluor____

Name these Polyatomic Compounds (Remember — no prefixes!)	
$CaSO_4$	Calcium _____
K_2CO_3	_____ carbonate
$CuNO_3$	Copper (I) _____
NH_4Cl	_____ chloride
$Mg(NO_3)_2$	Magnesium _____
K_3PO_4	Potassium _____
$Li_2(CrO_4)$	Lithium _____
$Mg(OH)_2$	M_____ H_____
$Al(PO_4)$	A_____ P_____
$K(NO_3)$	_____ _____
Ca_2SO_3	_____ _____

Classify and Name These Compounds		
	Ionic, Covalent, or Polyatomic	**Name**
1. $BaCl_2$	*Ionic*	*Barium chloride*
2. CO	_____	_____
3. Ag_2O	_____	_____
4. K_2SO_4	_____	_____
5. $MgBr_2$	_____	_____
6. SO_3	_____	_____
7. P_2O_4	_____	_____
8. $Be(CrO_4)$	_____	_____
9. LiF	_____	_____
11. CO_2	_____	_____
12. OF_2	_____	_____