

Name: \_\_\_\_\_

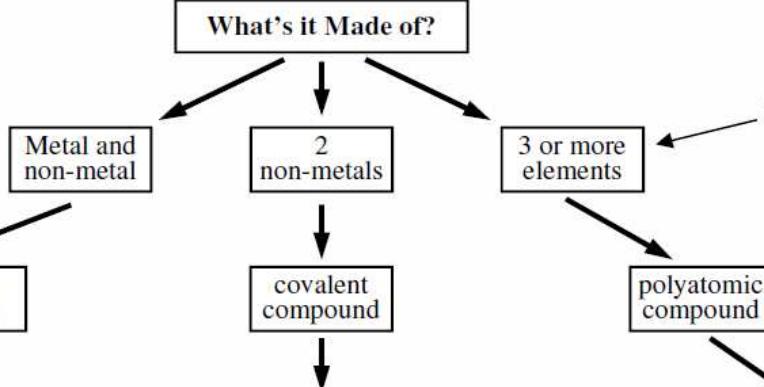
Period: \_\_\_\_\_

## Naming Compounds

3.1

**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.

**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.



### USE “- IDE” ENDING (NO PREFIXES!)

Name the metal and non-metal and change the ending to “ide”.



*Metal and non-metal—ionic*  
Lithium Sulfide  
(not dilithium sulfide—  
no prefixes for ionic compounds)

### 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.



*2 non-metals—covalent*  
(di = 2 and tetra = 4)  
“Dinitrogen tetroxide”

### 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”.



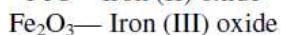
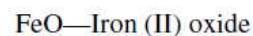
*3 elements — polyatomic*  
Check chart (see below)  
Na - sodium  
 $NO_3$  - nitrate (on chart)  
Sodium nitrate

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.



### Greek Prefixes

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

### Hints to remember prefixes:

Monorail – one rail train  
Monocle – glasses for one eye with only a single lens.

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 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	$SO_3^{2-}$

All sections marked with a  are considered essential concepts and must be completed to receive full credit on WS.

Metal or Non-metal?	Ionic or Covalent 	Name These Ionic Compounds 	Use the Polyatomic Ion Chart on the front of the worksheet to name these Polyatomic Ions:
M N Iron Oxide	<u>Ionic</u>	MgF <sub>2</sub> Magnesium Fluor- <u>ide</u>	HCO <sub>3</sub> <sup>1-</sup> <u>Hydrogen carbonate</u>
Barium Chloride		Li <sub>2</sub> O Lithium Ox-	SO <sub>4</sub> <sup>2-</sup>
Carbon Dioxide		NaCl Sodium Chlor-	O <sub>2</sub> <sup>2-</sup>
Magnesium Oxide		K <sub>2</sub> O Potassium Ox-	SO <sub>3</sub> <sup>2-</sup>
Aluminum Fluoride		CaS _____ Sulf-	NO <sub>3</sub> <sup>1-</sup>
Nitrogen Tribromide		BeI <sub>2</sub> _____ Iod-	NH <sub>4</sub> <sup>+</sup>
Chromium Fluoride		AlBr <sub>3</sub> _____ Brom-	CrO <sub>4</sub> <sup>2-</sup>
Potassium Oxide		CaF <sub>2</sub> _____	OH <sup>1-</sup>
		MgO _____	PO <sub>4</sub> <sup>3-</sup>
		LiCl _____	CO <sub>3</sub> <sup>2-</sup>

Define these Greek Prefixes 		1. CO <sub>2</sub>	A. Carbon monoxide 	Name These Covalent Compounds	
Penta = _____	Tetra = _____	2. C <sub>2</sub> O <sub>4</sub>	B. Carbon dioxide	Si <sub>2</sub> O <sub>3</sub>	Disilicon _____ oxide
Nona = _____	Hexa = _____	3. C <sub>3</sub> O <sub>5</sub>	C. Dicarbon monoxide	N <sub>3</sub> Cl <sub>4</sub>	_____ nitrogen tetrachloride
Mono = _____	Hepta = _____	4. CO	D. Tricarbon pentoxide	SO <sub>2</sub>	Sulfur _____ oxide
Octa = _____	Deca = _____	5. C <sub>2</sub> O	E. Dicarbon tetroxide	PO <sub>5</sub>	Phosphorous _____ ox_____
Tri = _____	Di = _____	6. CO <sub>8</sub>	F. Carbon octoxide	S <sub>2</sub> F <sub>4</sub>	_____ sulfur _____ fluor_____

Name these Polyatomic Compounds (Remember — no prefixes!)		Classify and Name These Compounds		
		Ionic, Covalent, or Polyatomic	Name	
CaSO <sub>4</sub>	Calcium _____	1. BaCl <sub>2</sub> <u>Ionic</u>	<u>Barium chloride</u>	
K <sub>2</sub> CO <sub>3</sub>	_____ carbonate	2. CO		
CuNO <sub>3</sub>	Copper (I) _____	3. Ag <sub>2</sub> O		
NH <sub>4</sub> Cl	_____ chloride	4. K <sub>2</sub> SO <sub>4</sub>		
Mg(NO <sub>3</sub> ) <sub>2</sub>	Magnesium _____	5. MgBr <sub>2</sub>		
K <sub>3</sub> PO <sub>4</sub>	Potassium _____	6. SO <sub>3</sub>		
Li <sub>2</sub> (CrO <sub>4</sub> )	Lithium _____	7. P <sub>2</sub> O <sub>4</sub>		
Mg(OH) <sub>2</sub>	M_____ H_____	8. Be(CrO <sub>4</sub> )		
Al(PO <sub>4</sub> )	A_____ P_____	9. LiF		
K(NO <sub>3</sub> )	_____	11. CO <sub>2</sub>		
Ca <sub>2</sub> SO <sub>3</sub>	_____	12. OF <sub>2</sub>		