

# Naming Compounds

Compounds

# Guided Instruction: Naming Compounds

# Review: What is an ionic compound?

- Formed when electrons are **transferred** between a metal and nonmetal

# Review: What is a covalent compound?

- Formed when electrons are **shared** between a nonmetals

# A. Naming covalent compounds

1. Use a prefix to indicate the number of atoms of each element

# of atoms	prefix
1	mono-
2	di-
3	tri-
4	tetra-
5	penta-
6	hexa-

# A. Naming covalent compounds

2. Replace the ending of the 2<sup>nd</sup> element with -ide.

- Count 2 vowels back from the end of the nonmetal and remove all those letters
- Add **ide**

**Ex = N<sub>2</sub>O<sub>3</sub>**

# of atoms	prefix
1	mono-
2	di-
3	tri-
4	tetra-
5	penta-
6	hexa-

## B. Naming covalent compounds

2. Replace the ending of the 2<sup>nd</sup> element with -ide.

- Count 2 vowels back from the end of the nonmetal and remove all those letters
- Add **ide**

**Ex = N<sub>2</sub>O<sub>3</sub> = Dinitrogen Trioxide**

# of atoms	prefix
1	mono-
2	di-
3	tri-
4	tetra-
5	penta-
6	hexa-

# B. Naming covalent compounds

## 3. Prefix EXCEPTION:

a. NEVER use mono on the 1<sup>st</sup> element!!!

Example = CO

~~Mono~~carbon Monoxide

**Carbon Monoxide**

# of atoms	prefix
1	mono-
2	di-
3	tri-
4	tetra-
5	penta-
6	hexa-



# Example #1

Covalent Compound =  $\text{H}_2\text{O}$

1. How many atoms do I have of Hydrogen?
2. How many atoms do I have of Oxygen?
3. What will the first element name be changed to?
4. What will the last element name be changed to?
5. Final answer?

# Example #1

Covalent Compound =  $\text{H}_2\text{O}$

1. How many atoms do I have of Hydrogen? 2
2. How many atoms do I have of Oxygen?
3. What will the first element name be changed to?
4. What will the last element name be changed to?
5. Final answer?

# Example #1

Covalent Compound =  $\text{H}_2\text{O}$

1. How many atoms do I have of Hydrogen? **2**
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# Example #1

Covalent Compound =  $\text{H}_2\text{O}$

1. How many atoms do I have of Hydrogen? **2**
2. How many atoms do I have of Oxygen? **1**
3. What will the first element name be changed to? **Dihydrogen**
4. What will the last element name be changed to?
5. Final answer?

# Example #1

Covalent Compound =  $\text{H}_2\text{O}$

1. How many atoms do I have of Hydrogen? **2**
2. How many atoms do I have of Oxygen? **1**
3. What will the first element name be changed to? **Dihydrogen**
4. What will the last element name be changed to? **Monoxide**
5. Final answer?

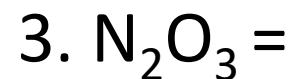
# Example #1

Covalent Compound =  $\text{H}_2\text{O}$

1. How many atoms do I have of Hydrogen? **2**
2. How many atoms do I have of Oxygen? **1**
3. What will the first element name be changed to? **Dihydrogen**
4. What will the last element name be changed to? **Oxide**
5. Final answer? **Dihydrogen Monoxide**

# Snappy Practice!

In the next **4** minutes, use your notes to name the following covalent compounds:



# Snappy Practice!

In the next 4 minutes, use your notes to name the following covalent compounds:

1.  $\text{CH}_4$  = Carbon tetrahydride

2.  $\text{HI}$  =

3.  $\text{N}_2\text{O}_3$  =

4.  $\text{PH}_3$  =



# Snappy Practice!

In the next 4 minutes, use your notes to name the following covalent compounds:

1.  $\text{CH}_4$  = Carbon tetrahydride
2.  $\text{HI}$  = Hydrogen monoiodide
3.  $\text{N}_2\text{O}_3$  =
4.  $\text{PH}_3$  =

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# Snappy Practice!

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1.  $\text{CH}_4$  = Carbon tetrahydride
2.  $\text{HI}$  = Hydrogen monoiodide
3.  $\text{N}_2\text{O}_3$  = Dinitrogen trioxide
4.  $\text{PH}_3$  = Phosphorous trihydride

## B. Naming ionic compounds

**\*\*Just like covalent, WITHOUT the prefixes!\*\***

1. Write the metal first
2. Write the nonmetal second and change the ending to -ide

# Practice

- What is the name of the compound formed between

1. LiCl

2.  $\text{Al}_2\text{O}_3$

3.  $\text{Mg}_3\text{N}_2$

# Practice

- What is the name of the compound formed between

1. LiCl **Lithium chloride**

2.  $\text{Al}_2\text{O}_3$

3.  $\text{Mg}_3\text{N}_2$

# Practice

- What is the name of the compound formed between

1.  $\text{LiCl}$  Lithium chloride

2.  $\text{Al}_2\text{O}_3$  Aluminum oxide

3.  $\text{Mg}_3\text{N}_2$

# Practice

• What is the name of the compound formed between

1. LiCl Lithium chloride
2. Al<sub>2</sub>O<sub>3</sub> Aluminum oxide
3. Mg<sub>3</sub>N<sub>2</sub> Magnesium Nitride



# In Summary...

- After your notes, write the following heading and answer the questions in complete sentences :

## Summary

1. What was the main idea of today's lesson?
2. What are three things that you learned?
3. What is one area you struggled with?

# Writing Compound Formulas

Compounds

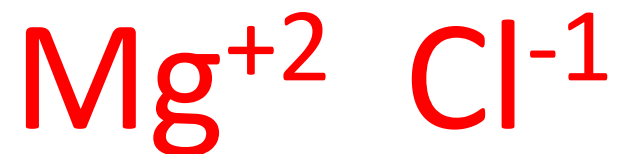
# Guided Instruction: Writing Compound Formulas

# Review: What is the pattern for ion formation on the periodic table?

		<b>2</b>															
<b>+1</b>												<b>+3</b>		<b>-3</b>	<b>-2</b>	<b>-1</b>	<b>8</b>
<b>1</b>												<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	
<b>1A</b>	<b>+2</b>											<b>13A</b>	<b>14A</b>	<b>15A</b>	<b>16A</b>	<b>17A</b>	<b>18B</b>
<b>2</b>	<b>2A</b>																
hydrogen 1 <b>H</b> 1.0079												boron 5 <b>B</b> 10.811	carbon 6 <b>C</b> 12.011	nitrogen 7 <b>N</b> 14.007	oxygen 8 <b>O</b> 15.999	fluorine 9 <b>F</b> 18.998	helium 2 <b>He</b> 4.0026
lithium 3 <b>Li</b> 6.941	beryllium 4 <b>Be</b> 9.0122											aluminum 13 <b>Al</b> 26.982	silicon 14 <b>Si</b> 28.086	phosphorus 15 <b>P</b> 30.974	sulfur 16 <b>S</b> 32.065	chlorine 17 <b>Cl</b> 35.453	neon 10 <b>Ne</b> 20.180
sodium 11 <b>Na</b> 22.990	magnesium 12 <b>Mg</b> 24.305	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	gallium 31 <b>Ga</b> 69.723	germanium 32 <b>Ge</b> 72.61	arsenic 33 <b>As</b> 74.922	selenium 34 <b>Se</b> 78.96	bromine 35 <b>Br</b> 79.904	argon 18 <b>Ar</b> 39.948
potassium 19 <b>K</b> 39.098	calcium 20 <b>Ca</b> 40.078	scandium 21 <b>Sc</b> 44.956	titanium 22 <b>Ti</b> 47.867	vanadium 23 <b>V</b> 50.942	chromium 24 <b>Cr</b> 51.996	manganese 25 <b>Mn</b> 54.938	iron 26 <b>Fe</b> 55.845	cobalt 27 <b>Co</b> 58.933	nickel 28 <b>Ni</b> 58.693	copper 29 <b>Cu</b> 63.546	zinc 30 <b>Zn</b> 65.39	indium 49 <b>In</b> 114.82	tin 50 <b>Sn</b> 118.71	antimony 51 <b>Sb</b> 121.76	tellurium 52 <b>Te</b> 127.60	iodine 53 <b>I</b> 126.90	krypton 36 <b>Kr</b> 83.80
rubidium 37 <b>Rb</b> 85.468	strontium 38 <b>Sr</b> 87.62	yttrium 39 <b>Y</b> 88.906	zirconium 40 <b>Zr</b> 91.224	niobium 41 <b>Nb</b> 92.906	molybdenum 42 <b>Mo</b> 95.94	technetium 43 <b>Tc</b> [98]	ruthenium 44 <b>Ru</b> 101.07	rhodium 45 <b>Rh</b> 102.91	palladium 46 <b>Pd</b> 106.42	silver 47 <b>Ag</b> 107.87	cadmium 48 <b>Cd</b> 112.41	thallium 81 <b>Tl</b> 204.38	lead 82 <b>Pb</b> 207.2	bismuth 83 <b>Bi</b> 208.98	polonium 84 <b>Po</b> [209]	astatine 85 <b>At</b> [210]	xenon 54 <b>Xe</b> 131.29
caesium 55 <b>Cs</b> 132.91	barium 56 <b>Ba</b> 137.33	57-70 *	lutetium 71 <b>Lu</b> 174.97	hafnium 72 <b>Hf</b> 178.49	tantalum 73 <b>Ta</b> 180.95	tungsten 74 <b>W</b> 183.84	rhodium 75 <b>Re</b> 186.21	osmium 76 <b>Os</b> 190.23	iridium 77 <b>Ir</b> 192.22	platinum 78 <b>Pt</b> 195.08	gold 79 <b>Au</b> 196.97	mercury 80 <b>Hg</b> 200.59	ununquadium 114 <b>Uuq</b> [289]				radon 86 <b>Rn</b> [222]
francium 87 <b>Fr</b> [223]	radium 88 <b>Ra</b> [226]	89-102 * *	lawrencium 103 <b>Lr</b> [262]	rutherfordium 104 <b>Rf</b> [261]	dubnium 105 <b>Db</b> [262]	seaborgium 106 <b>Sg</b> [266]	bohrium 107 <b>Bh</b> [264]	hassium 108 <b>Hs</b> [269]	meitnerium 109 <b>Mt</b> [268]	ununnium 110 <b>Uun</b> [271]	unununium 111 <b>Uuu</b> [272]	ununbium 112 <b>Uub</b> [277]					

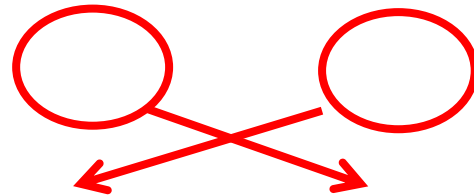
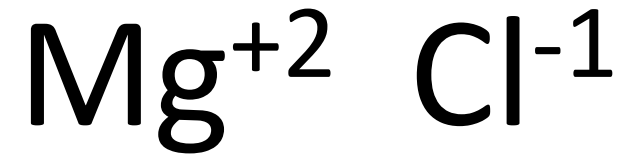
# A. Ionic Compound Formulas

1. Write the element symbol AND ION CHARGE for the metal first
  2. Write the element symbol AND ION CHARGE for the nonmetal
  3. Criss-cross the numbers - NOT the charges
- Example: Magnesium chloride



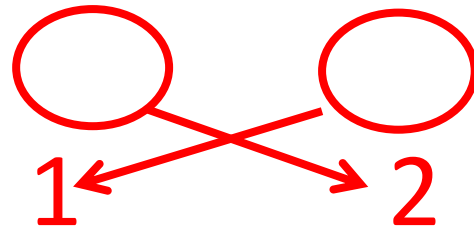
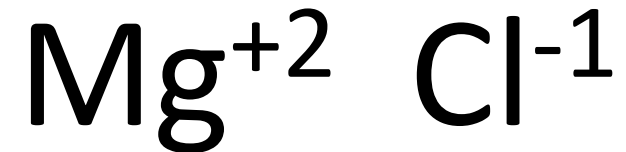
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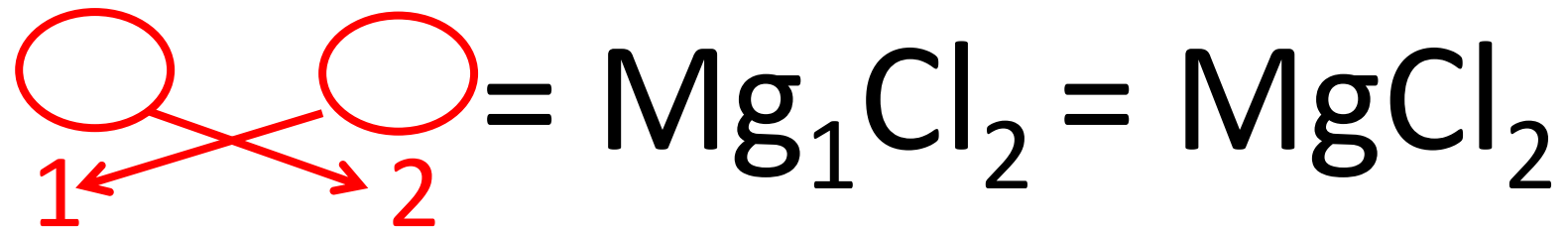
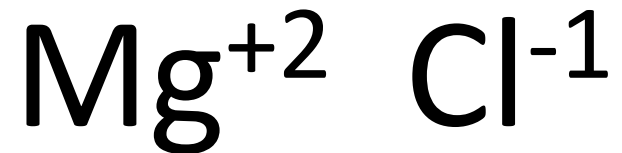
# A. Ionic Compound Formulas

1. Write the element symbol AND ION for the metal first
  2. Write the element symbol AND ION for the nonmetal
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- Example: Mg and Cl



# A. Ionic Compound Formulas

1. Write the element symbol AND ION for the metal first
  2. Write the element symbol AND ION for the nonmetal
  3. Criss-cross the numbers NOT the charges
- Example: Mg and Cl





# Practice

- Write the formula for the following ionic compounds:
  1. Lithium oxide
  2. Aluminum oxide
  3. Magnesium nitride

# Practice

• Write the formula for the following ionic compounds:

1. Lithium oxide  $\text{Li}_2\text{O}$

2. Aluminum oxide

3. Magnesium nitride

# Practice

• Write the formula for the following ionic compounds:

1. Lithium oxide  $\text{Li}_2\text{O}$

2. Aluminum oxide  $\text{Al}_2\text{O}_3$

3. Magnesium nitride

# Practice

• Write the formula for the following ionic compounds:

1. Lithium oxide  $\text{Li}_2\text{O}$

2. Aluminum oxide  $\text{Al}_2\text{O}_3$

3. Magnesium nitride  $\text{Mg}_3\text{N}_2$

## B. Ionic Compound with Transition Metals

Example: Cobalt (II) fluoride

1. Write the metal ion with charge
  - a. Use the roman numeral for the charge
    - Cobalt has a +2 charge
2. Write the nonmetal ion
3. Crisscross the numbers

# Transition Metal Practice

- Write the formula for the following compounds:
  1. Cobalt (II) fluoride
  2. Iron (III) bromide
  3. Lead (IV) sulfide

# Transition Metal Practice

- Write the formula for the following compounds:

1. Cobalt (II) fluoride =  $\text{CoF}_2$

2. Iron (III) bromide

3. Lead (IV) sulfide

# Transition Metal Practice

- Write the formula for the following compounds:

1. Cobalt (II) fluoride =  $\text{CoF}_2$

2. Iron (III) bromide =  $\text{FeBr}_3$

3. Lead (IV) sulfide



# Transition Metal Practice

• Write the formula for the following compounds:

1. Cobalt (II) fluoride =  $\text{CoF}_2$

2. Iron (III) bromide =  $\text{FeBr}_3$

3. Lead (IV) sulfide =  $\text{Pb}_2\text{S}_4$

# C. Covalent Compound Formulas

1. Write the **symbol** for each element
2. Use the *prefix* to determine **how many atoms** you have and write as a subscript

# of atoms	prefix
1	mono-
2	di-
3	tri-
4	tetra-
5	penta-
6	hexa-

# Example

Covalent Compound = Carbon Tetrachloride

1. What are the two elements involved?
2. What are the symbols for each element?
3. How many atoms do I have of the first element?
4. How many atoms do I have of the second element?
5. Final answer?

# Example

Covalent Compound = Carbon Tetrachloride

1. What are the two elements involved?

Carbon and Chlorine

2. What are the symbols for each element?

3. How many atoms do I have of the first element?

4. How many atoms do I have of the second element?

5. Final answer?

# Example

Covalent Compound = Carbon Tetrachloride

1. What are the two elements involved?

Carbon and Chlorine

2. What are the symbols for each element? C, Cl

3. How many atoms do I have of the first element?

4. How many atoms do I have of the second element?

5. Final answer?

# Example

Covalent Compound = Carbon Tetrachloride

1. What are the two elements involved?

Carbon and Chlorine

2. What are the symbols for each element? C, Cl

3. How many atoms do I have of the first element? 1

4. How many atoms do I have of the second element?

5. Final answer?

# Example

Covalent Compound = Carbon Tetrachloride

1. What are the two elements involved?

Carbon and Chlorine

2. What are the symbols for each element? C, Cl

3. How many atoms do I have of the first element? 1

4. How many atoms do I have of the second element? 4

5. Final answer?

# Example

Covalent Compound = Carbon Tetrachloride

1. What are the two elements involved?

Carbon and Chlorine

2. What are the symbols for each element? C, Cl

3. How many atoms do I have of the first element? 1

4. How many atoms do I have of the second element? 4

5. Final answer?  $\text{CCl}_4$



# Snappy Practice!

In the next **4** minutes, use your notes to write the formula for the following covalent compounds:

1. Carbon Dioxide
2. Triphosphorus Monochloride
3. Dinitrogen Trichloride
4. Nitrogen Dioxide

# Snappy Practice!

In the next **4** minutes, use your notes to write the formula for the following covalent compounds:

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3. Dinitrogen Trichloride =
4. Nitrogen Dioxide =

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4. Nitrogen Dioxide =

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1. Carbon Dioxide =  $\text{CO}_2$
2. Triphosphorus Monochloride =  $\text{P}_3\text{Cl}$
3. Dinitrogen Trichloride =  $\text{N}_2\text{Cl}_3$
4. Nitrogen Dioxide =  $\text{NO}_2$

# In Summary...

- After your notes, write the following heading and answer the questions in complete sentences :

## Summary

1. What was the main idea of today's lesson?
2. What are three things that you learned?
3. What is one area you struggled with?