

## Warm Up

Either state the name or write the formula for each ionic compound.

(a)  $\text{Na}_3\text{P}$

(b) gold(I) oxide

(c)  $\text{SnO}_2$

## Polyatomic Compounds

**Polyatomic Ions** - groups of atoms that tend to stay together and carry an overall ionic charge.

Examples:



When these ions are combined with metals they form **Polyatomic Compounds**.

Examples:



# Where to find polyatomic ions

Nelson Chemistry Alberta 20-30 Periodic Table of the Elements

**Table of Common Polyatomic Ions**

acetate	$\text{CH}_3\text{COO}^-$	chromate	$\text{CrO}_4^{2-}$	phosphate	$\text{PO}_4^{3-}$
ammonium	$\text{NH}_4^+$	dichromate	$\text{Cr}_2\text{O}_7^{2-}$	hydrogen phosphate	$\text{HPO}_4^{2-}$
benzoate	$\text{C}_6\text{H}_5\text{COO}^-$	cyanide	$\text{CN}^-$	dihydrogen phosphate	$\text{H}_2\text{PO}_4^-$
borate	$\text{BO}_3^{3-}$	hydroxide	$\text{OH}^-$	silicate	$\text{SiO}_3^{2-}$
carbide	$\text{C}_2^{2-}$	iodate	$\text{IO}_3^-$	sulfate	$\text{SO}_4^{2-}$
carbonate	$\text{CO}_3^{2-}$	nitrate	$\text{NO}_3^-$	hydrogen sulfate	$\text{HSO}_4^-$
hydrogen carbonate	$\text{HCO}_3^-$	nitrite	$\text{NO}_2^-$	sulfite	$\text{SO}_3^{2-}$
perchlorate	$\text{ClO}_4^-$	oxalate	$\text{OOCOO}^{2-}$	hydrogen sulfite	$\text{HSO}_3^-$
chlorate	$\text{ClO}_3^-$	hydrogen oxalate	$\text{HOOCOO}^-$	hydrogen sulfide	$\text{HS}^-$
chlorite	$\text{ClO}_2^-$	permanganate	$\text{MnO}_4^-$	thiocyanate	$\text{SCN}^-$
hypochlorite	$\text{OCl}^-$ or $\text{ClO}^-$	peroxide	$\text{O}_2^{2-}$	thiosulfate	$\text{S}_2\text{O}_3^{2-}$
		persulfide	$\text{S}_2^{2-}$		

**Table of Common Polyatomic Ions**

acetate (ethanoate)	$\text{CH}_3\text{COO}^-$	chromate	$\text{CrO}_4^{2-}$	phosphate	$\text{PO}_4^{3-}$
ammonium	$\text{NH}_4^+$	dichromate	$\text{Cr}_2\text{O}_7^{2-}$	hydrogen phosphate	$\text{HPO}_4^{2-}$
benzoate	$\text{C}_6\text{H}_5\text{COO}^-$	cyanide	$\text{CN}^-$	dihydrogen phosphate	$\text{H}_2\text{PO}_4^-$
borate	$\text{BO}_3^{3-}$	hydroxide	$\text{OH}^-$	silicate	$\text{SiO}_3^{2-}$
carbide	$\text{C}_2^{2-}$	iodate	$\text{IO}_3^-$	sulfate	$\text{SO}_4^{2-}$
carbonate	$\text{CO}_3^{2-}$	nitrate	$\text{NO}_3^-$	hydrogen sulfate	$\text{HSO}_4^-$
hydrogen carbonate	$\text{HCO}_3^-$	nitrite	$\text{NO}_2^-$	sulfite	$\text{SO}_3^{2-}$
perchlorate	$\text{ClO}_4^-$	oxalate	$\text{OOCOO}^{2-}$	hydrogen sulfite	$\text{HSO}_3^-$
chlorate	$\text{ClO}_3^-$	hydrogen oxalate	$\text{HOOCOO}^-$	hydrogen sulfide	$\text{HS}^-$
chlorite	$\text{ClO}_2^-$	permanganate	$\text{MnO}_4^-$	thiocyanate	$\text{SCN}^-$
hypochlorite	$\text{OCl}^-$ or $\text{ClO}^-$	peroxide	$\text{O}_2^{2-}$	thiosulfate	$\text{S}_2\text{O}_3^{2-}$
		persulfide	$\text{S}_2^{2-}$		

## Polyatomic Compounds

Steps to solving Polyatomic Compounds:

*Step 1: Write the symbols of the metal and of the polyatomic group.*



*Step 2: Write the ionic charges above the ions.*



*Step 3: Cross the ion charges to the opposing ions and drop the signs.*



*Step 4: Combine the ions together and get rid of any 1's.*



The name for this ionic compound would be...

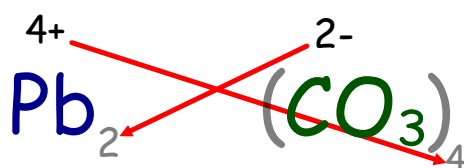
**Sodium Sulfate**

## Naming Polyatomic Ions

The name is simply a combination of the name of the metal and the name of the polyatomic ion.

Try this one...

What is the chemical formula of lead(IV) carbonate?



## Exit Question

What is the difference between an ionic compound (ex. NaCl) and a polyatomic compound (ex. H<sub>2</sub>SO<sub>4</sub>). How can you tell the difference by looking at the symbols and words?