

Chemical Bonding (PCNBE)
Activity 2 - What's in a name?

(Objective: Identify some simple rules about nomenclature naming)

The Model

Examine the table below, and answer the following questions:

Table 1

Cation	Anion	Chemical formula	Compound name
Na^+	Cl^-	NaCl	sodium chloride
Ca^{2+}	Cl^-	CaCl_2	sodium chloride
Al^{3+}	Cl^-	AlCl_3	iron chloride
Li^+	N^{3-}	Li_3N	lithium nitride
K^+	N^{3-}	K_3N	potassium nitride

Describing the Model

1. Are ALL cations positive ions or negative ions?
2. Are ALL anions positive ions or negative ions?
3. What is the name of the compound formed by the combination of Cl^- and N^{3-} ions?

Exploring the Model

4. What is the name of the ions composed to give Li_3N is named first?
5. Compare the first part of the compound name to the name of the element from the periodic table. How does the name of the cation correspond to the name of the element?
6. Compare the second part of the compound name to the name of the element from the periodic table. How does the name of the anion correspond to the name of the element?
7. From what part of the periodic table do the cations in the Model come (metals or nonmetals)?
8. From what part of the periodic table do the anions in the Model come?

Discovering New Knowledge

9. For each of the following, predict whether the ion will likely be a cation or an anion.
 - a. Magnesium ion
 - b. Sulfide ion
 - c. Bromide ion
 - d. Fluorine ion
10. For each ionic compound, identify the cation and the anion.
 - a. Sodium chloride
 - b. Strontium nitride
 - c. Lithium nitride
 - d. Barium chloride
11. In what way did the name provide clues about the classification of each element as a cation or anion?
12. Where on the periodic table would you expect to find elements that form no ionic cations?
13. Where on the periodic table would you expect to find elements that form no ionic anions?

Summarizing Your Thoughts

14. Consider the clues you identified, and write a general rule for how you change the name of elements to cations when naming ionic compounds.
15. Consider the clues you identified, and write a general rule for how you change the name of elements to anions when naming ionic compounds.
16. Given the chemical formula of an ionic compound, list at least three necessary steps to give the correct name of the compound. Illustrate one or two chemical formulas of a compound from the table above as an example including the naming steps.