13. Identify the block in the periodic table of metals that tend to form more than one type of ion.

14. What is the basic form for the names of ionic compounds containing a metal that forms only one type of ion?

15. What is the basic form for the names of ionic compounds containing a metal that forms more than one type of ion?

16. Why are roman numerals needed in the names of ionic compounds containing a metal that forms more than one type of ion?

19. What is the basic form for the names of molecular compounds?

21. What is the basic form for the names of binary acids?

22. What is the basic form for the name of oxyacids whose oxyanions end with *-ate*?

23. What is the basic form for the name of oxyacids whose oxyanions end with *-ite*?

33. Write chemical formulas for compounds containing:
   (a) three iron atoms for every four oxygen atoms
   (b) one phosphorus atom for every three chlorine atoms
   (c) one phosphorus atom for every five chlorine atoms
   (d) two silver atoms for every oxygen atom

37. Determine the number of each type of atom in each formula.
   (a) $MgCl_2$
   (b) $NaNO_3$
   (c) $Ca(NO_2)_2$
   (d) $Sr(OH)_2$

39. Complete the table.

Formula	Number of $C_2H_3O_2^-$ Units	Number of Carbon Atoms	Number of Hydrogen Atoms	Number of Oxygen Atoms	Number of Metal Atoms
$Mg(C_2H_3O_2)_2$	____	____	____	____	____
$NaC_2H_3O_2$	____	____	____	____	____
$Cr_2(C_2H_3O_2)_4$	____	____	____	____	____

41. Give the empirical formula that corresponds to each molecular formula.
   (a) C_2H_6
   (b) N_2O_4
   (c) $C_4H_6O_2$
   (d) NH_3

43. Classify each element as atomic or molecular.
   (a) chlorine
   (b) argon
   (c) cobalt
   (d) hydrogen

45. Classify each compound as ionic or molecular.
   (a) CS_2
   (b) CuO
   (c) KI
   (d) PCl_3

47. Match the substances on the left with the basic units that compose them on the right.

helium	molecules
CCl_4	formula units
K_2SO_4	diatomic molecules
bromine	single atoms

49. What are the basic units—single atoms, molecules, or formula units—that compose each substance?
   (a) $BaBr_2$
   (b) Ne
   (c) I_2
   (d) CO

51. Classify each compound as ionic or molecular. If it is ionic, determine whether the metal forms only one type of ion or more than one type of ion.
   (a) KCl
   (b) CBr_4
   (c) NO_2
   (d) $Sn(SO_4)_2$

53. Write a formula for the ionic compound that forms from each pair of elements.
   (a) sodium and sulfur
   (b) strontium and oxygen
   (c) aluminum and sulfur
   (d) magnesium and chlorine

55. Write a formula for the compound that forms from potassium and
   (a) acetate
   (b) chromate
   (c) phosphate
   (d) cyanide

55. Write a formula for the compound that forms from potassium and
   (a) acetate
   (b) chromate
   (c) phosphate
   (d) cyanide

63. Determine whether the metal in each ionic compound forms only one type of ion or more than one type of ion and name the compound accordingly.
   (a) Cr_2O_3
   (b) NaI
   (c) $CaBr_2$
   (d) SnO

65. Name each ionic compound containing a polyatomic ion.
   (a) $Ba(NO_3)_2$
   (b) $Pb(C_2H_3O_2)_2$
   (c) NH_4I
   (d) $KClO_3$
   (e) $CoSO_4$
   (f) $NaClO_4$

67. Name each polyatomic ion.
   (a) BrO^-
   (b) BrO_2^-
   (c) BrO_3^-
   (d) BrO_4^-

69. Write a formula for each ionic compound.
   (a) copper(II) bromide
   (b) silver nitrate
   (c) potassium hydroxide
   (d) sodium sulfate
   (e) potassium hydrogen sulfate
   (f) sodium hydrogen carbonate

71. Name each molecular compound.
   (a) SO_2
   (b) NI_3
   (c) BrF_5
   (d) NO
   (e) N_4Se_4

73. Write a formula for each molecular compound.

(a) carbon monoxide
(b) disulfur tetrafluoride
(c) dichlorine monoxide
(d) phosphorus pentafluoride
(e) boron tribromide
(f) diphosphorus pentasulfide

75. Determine whether the name shown for each molecular compound is correct. If not, provide the compound's correct name.

(a) PBr_5 phosphorus(V) pentabromide
(b) P_2O_3 phosphorus trioxide
(c) SF_4 monosulfur hexafluoride
(d) NF_4 nitrogen trifluoride

77. Determine whether each acid is a binary acid or an oxyacid and name each acid. If the acid is an oxyacid, provide the name of the oxyanion.

(a) $HNO_2(aq)$
(b) $HI(aq)$
(c) $H_2SO_4(aq)$
(d) $HNO_3(aq)$

79. Name each acid.

(a) $HClO$
(b) $HClO_2$
(c) $HClO_3$
(d) $HClO_4$

81. Write a formula for each acid.

(a) phosphoric acid
(b) hydrobromic acid
(c) sulfurous acid

85. Arrange the compounds in order of decreasing formula mass.

Ag_2O, PtO_2, $Al(NO_3)_3$, PBr_3

91. Specify the number of hydrogen atoms (white) represented in each set of molecular models:

95. Is each name correct for the given formula? If not, provide the correct name.

(a) $Ca(NO_2)_2$ calcium nitrate
(b) K_2O dipotassium monoxide
(c) PCl_3 phosphorus chloride
(d) $PbCO_3$ lead(II) carbonate
(e) KIO_2 potassium hypoiodite

97. For each compound, list the correct formula and calculate the formula mass.

(a) tin(IV) sulfate
(b) nitrous acid
(c) sodium bicarbonate
(d) phosphorus pentafluoride

99. Name each compound and calculate its formula mass.

(a) PtO_2
(b) N_2O_5
(c) $Al(ClO_3)_3$
(d) PBr_5