Name Date

Applying Knowledge
Section 3.2

Use with textbook pages 84–92.

Writing names and formulas of ionic compounds

You can use the periodic table on page 202 to help you answer these questions.

1. Complete the following table. First, identify each ion and its charge. Then, give the formula and name for each ionic compound formed. The table has been partially completed to help guide you.

	Chloride Cl^-	**Fluoride** F^-	**Oxygen** O^{2-}
sodium Na^+	NaCl sodium chloride	NaF sodium fluoride	Na_2O sodium oxide
magnesium Mg^{2+}	$MgCl_2$ magnesium chloride	MgF_2 magnesium fluoride	MgO magnesium oxide
calcium Ca^{2+}	$CaCl_2$ calcium chloride	CaF_2 calcium fluoride	CaO calcium oxide

2. Write the names of the following compounds.

(a) KCl potassium chloride

(b) LiBr lithium bromide

(c) BaF_2 barium fluoride

(d) Ag_3P silver phosphide

(e) ZnS zinc sulphide

(f) SrO strontium oxide

(g) $AlCl_3$ aluminum chloride

(h) Mg_2C Magnesium carbide

3. Write the chemical formulas for the following compounds.

(a) beryllium sulphide BeS

(b) silver oxide Ag_2O

(c) sodium bromide NaBr

(d) zinc chloride $ZnCl_2$

(e) calcium sulphide CaS

(f) lithium nitride Li_3N

(g) rubidium chloride RbCl

(h) germanium bromide $GeBr_4$

Use with textbook pages 84–92.

Compounds with a multivalent metal

You can use the periodic table on page 202 to help you answer these questions.

1. Write the formulas for the compounds formed from the following ions. Then name the compounds.

	Ions	Formula	Compound name
(a)	Mn^{3+} O^{2-}	Mn_2O_3	manganese(III) oxide
(b)	Pb^{3+} Br^-	$PbBr_3$	lead(III) bromide
(c)	Pt^{2+} Cl^-	$PtCl_2$	platinum(II) chloride
(d)	Au^{3+} S^{2-}	Au_2S_3	gold(III) sulphide (or sulfide)
(e)	Pb^{4+} O^{2-}	PbO_2	Lead (IV) oxide
(f)	Sb^{3+} S^{2-}	Sb_2S_3	antimony(III) sulphide
(g)	Fe^{2+} S^{2-}	FeS	iron (II) sulphide
(h)	Co^{3+} O^{2-}	~~Co^3~~ Co_2O_3	cobalt(III) oxide

2. Write the names of the following ionic compounds using Roman numerals.

(a) FeF_3 iron(III) fluoride

(b) $CuCl_2$ Copper(II) chloride

(c) SnO_2 ~~Tin(II) oxide~~ Tin (IV) oxide

(d) PtS_2 Platinum (IV) sulphide

(e) $CoBr_2$ Cobalt(II) bromide

(f) Au_2O gold(I) oxide

(g) CrP chromium (III) phosphide

(h) PbI_2 Lead(II) iodide

3. Write the chemical formulas for the following compounds.

(a) iron(III) chloride $FeCl_3$

(b) copper(I) oxide Cu_2O

(c) tin(IV) sulphide SnS_2

(d) bismuth(V) chloride $BiCl_5$

(e) gold(I) oxide Au_2O

(f) chromium(II) fluoride CrF_2

(g) manganese(II) iodide MnI_2

(h) iron(III) selenide Fe_2Se_3

Use with textbook pages 84–92.

Names and formulas of ionic compounds

Match each Compound Name on the left with the correct Chemical Formula on the right. Each Chemical Formula may be used only once.

Compound Name	Chemical Formula
1. A aluminum sulphide	A. Al_2S_3
2. D aluminum sulphate	B. $AlSO_4$
3. G ammonium sulphite	C. $Al_2(SO_3)_3$
	D. $Al_2(SO_4)_3$
	E. NH_4SO_3
	F. NH_4SO_4
	G. $(NH_4)_2SO_3$
	H. $(NH_4)_2SO_4$

Circle the letter of the best answer.

4. How many chlorine atoms are in the compound calcium chlorate, $Ca(ClO_3)_2$?

A. 1

B. 2

C. 3

D. 6

5. What is the ending of an ionic compound consisting of two elements (a metal and a non-metal)?

A. ate

B. ide

C. ine

D. ite

6. In a chemical formula, what part shows the relative numbers of ions in the compound?

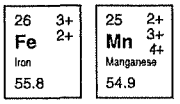
A. the coefficient in front of the element symbol

B. the subscript to the right of the element symbol

C. the superscript to the right of the element symbol

D. the positive or negative number to the right of the element symbol

Use the following diagrams to answer question 7.



7. What do iron and manganese have in common?

I.	they are multivalent metals ✓
II.	they have more than one ion charge ✓
III.	their most common ion charge is 2+ ✗

most common goes first

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III

8. In the name "cobalt(II) phosphate," what does the Roman numeral reveal about cobalt?

A. it has gained two electrons

B. it has an ion charge of 2–

C. it has an ion charge of 2+ metals are positive!

D. it can form two positive ions

9. What is the name for the compound $CaCl_2$?

A. calcium chlorate

B. calcium chloride

C. calcium chlorine

D. calcium(II) chloride

Name Date

Comprehension
Section 3.2

Use with textbook pages 84–92.

Compounds with polyatomic ions

You can use the periodic table on page 202 to help you answer these questions.

1. Write the names of the following ionic compounds.

(a) $AgNO_3$ silver nitrate

(b) $BaSO_4$ barium sulphate

(c) NH_4Cl ammonium chloride

(d) $Ca_3(PO_4)_2$ Calcium phosphate

(e) $Ni(OH)_2$ Nickel(II) hydroxide

(f) $CuCO_3$ Copper(II) carbonate

(g) $Sr(NO_3)_2$ Strontium nitrate

(h) $Cr_2(SO_4)_3$ chromium(III) sulphate

2. Write the chemical formulas for the following compounds.

(a) calcium hydroxide $Ca(OH)_2$

(b) ammonium chloride NH_4Cl

(c) sodium nitrite $NaNO_2$

(d) lithium hydrogen carbonate $LiHCO_3$

(e) potassium dichromate $K_2Cr_2O_7$

(f) tin(II) hydroxide $Sn(OH)_2$

(g) ammonium phosphate $(NH_4)_3PO_4$

(h) iron(III) nitrate $Fe(NO_3)_3$

3. Write the formulas and names of the compounds with the following combination of ions. The table has been partially completed to help guide you.

	Positive ion	Negative ion	Formula	Compound name
(a)	Ca^{2+}	CO_3^{2-}	$CaCO_3$	calcium carbonate
(b)	K^+	SO_3^{2-}	K_2SO_3	potassium sulphate
(c)	Na^+	ClO_3^-	$NaClO_3$	sodium chlorate
(d)	Mg^{2+}	ClO_4^-	$Mg(ClO_4)_2$	magnesium perchlorate
(e)	Cs^+	OH^-	$Cs(OH)_2$	cesium hydroxide
(f)	$(NH_4)_3PO_4$ ←	PO_4^{3-}	→ NH_4^+	ammonium phosphate
(g)	Ca^{2+}	CN^-	$Ca(CN)_2$	Calcium cyanide
(h)	Fe^{3+}	HSO_4^-	$Fe(HSO_4)_3$	iron(III) hydrogen sulfite or iron(III) Bisulfite

Date: _____ **8.3**

ltivalent Metal Ions

Write Names of

	$Ca(OH)_2$ calcium hydroxide
	$CrCl_3$ chromium(III) chloride
	$CrCO_3$ chromium(II) carbonate
	Ag_2SO_4 silver sulfate
	NH_4F ammonium fluoride
	$Fe_2(Cr_2O_7)_3$ iron(III) dichromate
	PbS lead(II) sulphate
	$Cu(MnO_4)_2$ copper(II) permanganate
	$Cr_2(SO_4)_3$ chromium(III) sulphate
	CuF_2 copper(II) fluoride
	$Cr(HCO_3)_3$ chromium(III) hydrogen carbonate
2.	$FePO_4$ Iron(III) phosphate
3.	Na_2S sodium sulphide
4.	$PbCl_4$ lead(IV) chloride
5.	$Hg(NO_3)_2$ mercury(II) nitrate
6.	CrO chromium(II) oxide
7.	$Hg_2(NO_3)_2$ mercury(I) nitrate
8.	CaC_2O_4 Calcium oxalate
9.	$Ba_3(PO_4)_2$ Barium phosphate
0.	$Sn(SO_4)_2$ tin(IV) sulphate

Date: _____ **8.2**

NB: $C_2O_4^{2-}$ = oxalate

npounds

Write Formulas of

21.	copper(II) chloride $CuCl_2$
22.	iron(III) oxide Fe_2O_3
23.	manganese(II) nitrate $Mn(NO_3)_2$
24.	lead(IV) bromide $PbBr_4$
25.	chromium(III) carbonate $Cr_2(CO_3)_3$
26.	tin(IV) chromate $Sb(CrO_4)_2$
27.	lead(II) sulfate PbS
28.	ammonium permanganate NH_4MnO_4
29.	silver oxalate $Ag_2C_2O_4$
30.	iron(III) hydroxide $Fe(OH)_3$
31.	manganese(IV) phosphate $Mn_3(PO_4)_4$
32.	iron(II) nitrate $Fe(NO_3)_2$
33.	copper(II) carbonate $Cu(CO_3)_2$
34.	zinc chlorate $Zn(ClO_3)_2$
35.	iron(II) oxide FeO
36.	mercury(II) sulfate $HgSO_4$
37.	lead(IV) sulfide PbS_2
38.	iron(III) carbonate $Fe(CO_3)_3$
39.	potassium oxalate $K_2C_2O_4$
40.	manganese(II) sulfide MnS