Practice Table #1: Finding Charges on Ions

Element	Group #	Ion	Element	Group #	Ion
Li	1	Li^{+}	F	17	F^{-}
Mg	2	Mg^{2+}	S	16	S^{2-}
Al	3	Al^{3+}	N	15	N^{3-}
Be	2	Be^{2+}	Br	17	Br^{-}
Na	1	Na^{+}	P	15	P^{3-}

Practice Table #2: Writing Formulas of Regular Ionic Compounds

Metal	Non-metal	Compound	Metal	Non-metal	Compound
Na	Br	NaBr sodium bromide	Al	Cl	$AlCl_3$ aluminum chloride
Mg	Br	$MgBr_2$ magnesium bromide	B	O	B_2O_3 boron oxide
Al	Br	$AlBr_3$ aluminum bromide	Ca	N	Ca_3N_2 calcium nitride
Li	S	Li_2S lithium sulfide	K	O	K_2O potassium oxide
Ca	S	CaS calcium sulfide	Na	P	Na_3P sodium phosphide
B	S	B_2S_3 boron sufide	Al	O	Al_2O_3 aluminum oxide
K	N	K_3N potassium nitride	Mg	S	MgS magnesium sulfide
Be	N	Be_3N_2 beryllium nitride	B	P	BP boron phosphide
Al	N	AlN aluminum nitride	Na	Cl	NaCl sodium chloride
Li	O	Li_2O lithium oxide	Ca	F	CaF_2 calcium fluoride

Practice Table #3: Chemical Names and Formulas of Regular Ionic Compounds

Chemical Name	Metal Ion	Non-metal Ion	Chemical Formula
sodium fluoride	Na^{+}	F^{-}	NaF
boron iodide	B^{3+}	I^{-}	BI_3
calcium phosphide	Ca^{2+}	P^{3-}	Ca_3P_2
magnesium oxide	Mg^{2+}	O^{2-}	MgO
potassium chloride	K^{+}	Cl^{-}	KCl
beryllium sulfide	Be^{2+}	S^{2-}	BeS
barium nitride	Ba^{2+}	N^{3-}	Be_3N_2
aluminum sulfide	Al^{3+}	S^{2-}	Al_2S_3
lithium phosphide	Li^{+}	P^{3-}	Li_3P
potassium sulfide	K^{+}	S^{2-}	K_2S
boron oxide	B^{3+}	O^{2-}	B_2O_3
calcium fluoride	Ca^{2+}	F^{-}	CaF_2

Practice Table #4: Writing Formulas with Transition Metals

Compound Name	Metal Ion	Non-metal Ion	Formula
gold (I) chloride	Au^{+}	Cl^{-}	AuCl
nickel (III) sulfide	Ni^{3+}	S^{2-}	Ni_2S_3
cobalt (II) oxide	Co	O	CoO
iron (III) phosphide	Fe	P	FeP
mercury (IV) fluoride	Hg^{4+}	F^{-}	HgF_4
nickel (II) nitride	Ni^{2+}	N^{3-}	Ni_3N_2
gold (III) sulfide	Au^{3+}	S^{2-}	Au_2S_3
copper (I) oxide	Cu^{+}	O^{2-}	Cu_2O

Practice Table #5: Naming Ionic Compounds with Transition Metals

Formula	Reverse Crossover Predicted Charges		Name
	Metal Ion	Non-Metal Ion	
CoS	1+ (X2)	1- (X2)	cobalt (II) sulfide
NiO	1+ (X2)	1- (X2)	nickel (II) oxide
HgI_4	4+	1-	mercury (IV) iodide
FeF_2	2+	1-	iron (II) fluoride
Fe_2O_3	3+	2-	iron (III) oxide
$CuCl_2$	2+	1-	copper (II) chloride
HgF_2	2+	1-	mercury (II) fluoride
CoN	1+ (X3)	1- (X3)	cobalt (III) nitride
NiP	1+ (X3)	1- (X3)	nickel (III) phosphide
FeS	1+ (X2)	1- (X2)	iron (II) sulfide
Cu_2O_3	3+	2-	copper (III) oxide

Practice Table #6: Names and Formulas of Molecular Compounds

Chemical Name	Formula	Chemical Name	Formula
nitrogen monoxide	NO	sulfur dichloride	SCl_2
silicon dioxide	SiO_2	sulfur dioxide	SO_2
sulfur trioxide	SO_3	nitrogen monoxide	NO
carbon tetrachloride	CCl_4	silicon disulfide	SiS_2
diarsenic trioxide	As_2O_3	phosphorus trioxide	PO_3
phosphorus pentabromide	PBr_5	phosphorus trifluoride	PF_3
nitrogen dioxide	NO_2	carbon tetrabromide	CBr_4
sulfur hexafluoride	SF_6	nitrogen trichloride	NCl_3
selenium dioxide	SeO_2	silicon trioxide	SiO_3
dinitrogen tetroxide	N_2O_4	phosphorus trichloride	PCl_3
sulfur dioxide	SO_2	carbon disulfide	CS_2

Practice Table #7: Writing Formulas with Polyatomic Ions

Compound Name	Positive Ion	Negative Ion	Formula
sodium carbonate	Na^+	CO_3^{2-}	Na_2CO_3
calcium nitrate	Ca^{2+}	NO_3^-	$Ca(NO_3)_2$
manganese (V) sulfate	Mn^{5+}	SO_4^{2-}	$Mn_2(SO_4)_5$
aluminum hydrogen carbonate	Al^{3+}	HCO_3-	$Al(HCO_3)_3$
potassium phosphate	K^+	PO_4^{3-}	K_3PO_4
beryllium hydroxide	Be^{2+}	OH^-	$Be(OH)_2$
gold (I) hydrogen sulfate	Au^+	HSO_4^-	$AuHSO_4$
ammonium chloride	NH_4^+	Cl^-	NH_4Cl
nickel (II) phosphate	Ni^{2+}	PO_4^{3-}	$Ni_3(PO_4)_2$
mercury (I) sulfate	Hg^+	SO_4^{2-}	Hg_2SO_4
ammonium carbonate	NH_4^+	CO_3^{2-}	$(NH_4)_2CO_3$

Practice Table #8: Naming Compounds with Polyatomic Ions

FORMULA	NAME OF COMPOUND
$Fe(OH)_2$	iron (II) hydroxide
$CaCO_3$	calcium carbonate
NH_4Cl	ammonium chloride
$LiHCO_3$	lithium hydrogen carbonate
$Al(NO_3)_3$	aluminum nitrate
$Be_3(PO_4)_2$	beryllium phosphate
$Cu(HSO_4)_2$	copper (II) hydrogen sulfate
$(NH_4)_3N$	ammonium nitride

Review: Naming Chemical Compounds

Element #1 (or ion and charge)	Element #2 (or ion and charge)	Type of Compound	Formula	Name
Be^{2+}	F^{-}	Ionic	BeF_2	beryllium fluoride
Na^{+}	Cl^{-}	Ionic	NaCl	sodium chloride
Ni^{3+}	O^{2-}	Ionic Transition	Ni_2O_3	nickel (III) oxide
Cl	O	Molecular	Cl_2O	dichlorine monoxide
Na^{+}	CO_3^{-2}	Ionic Polyatomic	Na_2CO_3	sodium carbonate
Na^{+}	PO_4^{3-}	Ionic Polyatomic	Na_3PO_4	sodium phosphate
Ca^{2+}	Cl^{-}	Ionic	$CaCl_2$	calcium chloride
NH_4^{+}	F^{-}	Ionic Polyatomic	NH_4F	ammonium fluoride
Ni^{2+}	S^{2-}	Ionic Transition	NiS	nickel (II) sulfide
Ca^{2+}	NO^{3-}	Ionic Polyatomic	$Ca(NO_3)_2$	calcium nitrate
N	F	Molecular	NF_3	nitrogen trifluoride
Au^{3+}	I^{-}	Ionic Transition	AuI_3	gold (III) iodide
Co^{2+}	F^{-}	Ionic Transition	CoF_2	cobalt(II) fluoride
K^{+}	HSO_4^{-}	Ionic Polyatomic	$KHSO_4$	potassium hydrogen sulfate
K^{+}	Cl^{-}	Ionic	KCl	potassium chloride
Cu^{2+}	OH^{-}	Ionic Transition Polyatomic	$Cu(OH)_2$	copper (II) hydroxide
Hg^{2+}	SO_4^{2-}	Ionic Transition Polyatomic	$HgSO_4$	mercury (II) sulfate
C	O	Molecular	CO	carbon monoxide
Fe^{3+}	O^{2-}	Ionic Transition	Fe_2O_3	iron (III) oxide
Pb^{4+}	SO_4^{2-}	Ionic Transition Polyatomic	$Pb(SO_4)_2$	lead (IV) sulfate