+ CATIONS +

1+ Ions	
Ammonium	NH_4^+
Copper (I)	Cu^+
Hydrogen	H^+
Hydronium	H_3O^+
Silver	Ag^+
Mercury (I)	Hg_2^{2+}
2+ Ions	
Cadmium	Cd^{2+}
Cobalt (II)	Co^{2+}
Copper (II)	Cu^{2+}
Iron (II)	Fe^{2+}
Lead (II)	Pb^{2+}
Manganese (II)	Mn^{2+}
Mercury (II)	Hg^{2+}
Nickel (II)	Ni^{2+}
Tin (II)	Sn^{2+}
Zinc	Zn^{2+}

3+ Ions	
Aluminum	Al^{3+}
Antimony (III)	Sb^{3+}
Arsenic (III)	As^{3+}
Bismuth (III)	Bi^{3+}
Chromium (III)	Cr^{3+}
Cobalt (III)	Co^{3+}
Iron (III)	Fe^{3+}
Titanium (III)	Ti^{3+}
4+ Ions	
Manganese (IV)	Mn^{4+}
Tin (IV)	Sn^{4+}
Titanium (IV)	Ti^{4+}
5+ Ions	
Antimony (V)	Sb^{5+}
Arsenic (V)	As^{5+}

- Cations lose electrons (More protons than electrons)
- Some metals can make more than one charge so you must show the Roman numeral to indicate what the magnitude of the charge is. No Roman numeral in your answer makes it wrong!

ANSWER KEY

+ CATIONS +

1+ Ions	
Ammonium	NH_4^+
Copper (I)	Cu^+
Hydrogen	H^+
Hydronium	H_3O^+
Silver	Ag^+
Mercury (I)	Hg_2^{2+}
2+ Ions	
Cadmium	Cd^{2+}
Cobalt (II)	Co^{2+}
Copper (II)	Cu^{2+}
Iron (II)	Fe^{2+}
Lead (II)	Pb^{2+}
Manganese (II)	Mn^{2+}
Mercury (II)	Hg^{2+}
Nickel (II)	Ni^{2+}
Tin (II)	Sn^{2+}
Zinc	Zn^{2+}

3+ Ions	
Aluminum	Al^{3+}
Antimony (III)	Sb^{3+}
Arsenic (III)	As^{3+}
Bismuth (III)	Bi^{3+}
Chromium (III)	Cr^{3+}
Cobalt (III)	Co^{3+}
Iron (III)	Fe^{3+}
Titanium (III)	Ti^{3+}
4+ Ions	
Manganese (IV)	Mn^{4+}
Tin (IV)	Sn^{4+}
Titanium (IV)	Ti^{4+}
5+ Ions	
Antimony (V)	Sb^{5+}
Arsenic (V)	As^{5+}

- Cations lose electrons (More protons than electrons)
- Some metals can make more than one charge so you must show the Roman numeral to indicate what the magnitude of the charge is. No Roman numeral in your answer makes it wrong!

ANSWER KEY

- ANIONS -

1- Ions	
Acetate	$C_2H_3O_2^-$
Bromate	BrO_3^-
Chlorate	ClO_3^-
Chlorite	ClO_2^-
Cyanide	CN^-
Hydride	H^-
Hydrogen Carbonate (Bicarbonate)	HCO_3^-
Hydrogen Sulfate (Bisulfate)	HSO_4^-
Hydrogen Sulfite (Bisulfite)	HSO_3^-
Hydroxide	OH^-
Hypochlorite	ClO^-
Iodate	IO_3^-
Nitrate	NO_3^-
Nitrite	NO_2^-
Perchlorate	ClO_4^-
Permanganate	MnO_4^-
Thiocyanate	SCN^-

2- Ions	
Carbonate	CO_3^{2-}
Chromate	CrO_4^{2-}
Dichromate	$Cr_2O_7^{2-}$
Hydrogen Phosphate (Biphosphate)	HPO_4^{2-}
Peroxide	O_2^{2-}
Sulfate	SO_4^{2-}
Sulfite	SO_3^{2-}
Thiosulfate	$S_2O_3^{2-}$
3- Ions	
Borate	BO_3^{3-}
Phosphate	PO_4^{3-}
Phosphide	P^{3-}
Phosphite	PO_3^{3-}

- Anions gain electrons
  (More electrons than protons)
- Use the name pattern to help you!
  - –ide = one type of element
  - –ate = most number of oxygens
  - –ite = minus one oxygen from -ate
  - hypo– = minus two oxygens from -ate
  - bi- = a hydrogen is added

ANSWER KEY

- ANIONS -

1- Ions	
Acetate	$C_2H_3O_2^-$
Bromate	BrO_3^-
Chlorate	ClO_3^-
Chlorite	ClO_2^-
Cyanide	CN^-
Hydride	H^-
Hydrogen Carbonate (Bicarbonate)	HCO_3^-
Hydrogen Sulfate (Bisulfate)	HSO_4^-
Hydrogen Sulfite (Bisulfite)	HSO_3^-
Hydroxide	OH^-
Hypochlorite	ClO^-
Iodate	IO_3^-
Nitrate	NO_3^-
Nitrite	NO_2^-
Perchlorate	ClO_4^-
Permanganate	MnO_4^-
Thiocyanate	SCN^-

2- Ions	
Carbonate	CO_3^{2-}
Chromate	CrO_4^{2-}
Dichromate	$Cr_2O_7^{2-}$
Hydrogen Phosphate (Biphosphate)	HPO_4^{2-}
Peroxide	O_2^{2-}
Sulfate	SO_4^{2-}
Sulfite	SO_3^{2-}
Thiosulfate	$S_2O_3^{2-}$
3- Ions	
Borate	BO_3^{3-}
Phosphate	PO_4^{3-}
Phosphide	P^{3-}
Phosphite	PO_3^{3-}

- Anions gain electrons
  (More electrons than protons)
- Use the name pattern to help you!
  - –ide = one type of element
  - –ate = most number of oxygens
  - –ite = minus one oxygen from -ate
  - hypo– = minus two oxygens from -ate
  - bi- = a hydrogen is added

ANSWER KEY

+ CATIONS +

1+ Ions	
Ammonium	
Copper (I)	
Hydrogen	
Hydronium	
Silver	
Mercury (I)	
2+ Ions	
Cadmium	
Cobalt (II)	
Copper (II)	
Iron (II)	
Lead (II)	
Manganese (II)	
Mercury (II)	
Nickel (II)	
Tin (II)	
Zinc	

3+ Ions	
Aluminum	
Antimony (III)	
Arsenic (III)	
Bismuth (III)	
Chromium (III)	
Cobalt (III)	
Iron (III)	
Titanium (III)	
4+ Ions	
Manganese (IV)	
Tin (IV)	
Titanium (IV)	
5+ Ions	
Antimony (V)	
Arsenic (V)	

FORMULAS MISSING

+ CATIONS +

1+ Ions	
Ammonium	
Copper (I)	
Hydrogen	
Hydronium	
Silver	
Mercury (I)	
2+ Ions	
Cadmium	
Cobalt (II)	
Copper (II)	
Iron (II)	
Lead (II)	
Manganese (II)	
Mercury (II)	
Nickel (II)	
Tin (II)	
Zinc	

3+ Ions	
Aluminum	
Antimony (III)	
Arsenic (III)	
Bismuth (III)	
Chromium (III)	
Cobalt (III)	
Iron (III)	
Titanium (III)	
4+ Ions	
Manganese (IV)	
Tin (IV)	
Titanium (IV)	
5+ Ions	
Antimony (V)	
Arsenic (V)	

FORMULAS MISSING

- ANIONS -

1- Ions	
Acetate	
Bromate	
Chlorate	
Chlorite	
Cyanide	
Hydride	
Hydrogen Carbonate (Bicarbonate)	
Hydrogen Sulfate (Bisulfate)	
Hydrogen Sulfite (Bisulfite)	
Hydroxide	
Hypochlorite	
Iodate	
Nitrate	
Nitrite	
Perchlorate	
Permanganate	
Thiocyanate	

2- Ions	
Carbonate	
Chromate	
Dichromate	
Hydrogen Phosphate (Biphosphate)	
Peroxide	
Sulfate	
Sulfite	
Thiosulfate	
3- Ions	
Borate	
Phosphate	
Phosphide	
Phosphite	

FORMULAS MISSING

- ANIONS -

1- Ions	
Acetate	
Bromate	
Chlorate	
Chlorite	
Cyanide	
Hydride	
Hydrogen Carbonate (Bicarbonate)	
Hydrogen Sulfate (Bisulfate)	
Hydrogen Sulfite (Bisulfite)	
Hydroxide	
Hypochlorite	
Iodate	
Nitrate	
Nitrite	
Perchlorate	
Permanganate	
Thiocyanate	

2- Ions	
Carbonate	
Chromate	
Dichromate	
Hydrogen Phosphate (Biphosphate)	
Peroxide	
Sulfate	
Sulfite	
Thiosulfate	
3- Ions	
Borate	
Phosphate	
Phosphide	
Phosphite	

FORMULAS MISSING

+ CATIONS +

1+ Ions	
	NH_4^+
	Cu^+
	H^+
	H_3O^+
	Ag^+
	Hg_2^{2+}
2+ Ions	
	Cd^{2+}
	Co^{2+}
	Cu^{2+}
	Fe^{2+}
	Pb^{2+}
	Mn^{2+}
	Hg^{2+}
	Ni^{2+}
	Sn^{2+}
	Zn^{2+}

3+ Ions	
	Al^{3+}
	Sb^{3+}
	As^{3+}
	Bi^{3+}
	Cr^{3+}
	Co^{3+}
	Fe^{3+}
	Ti^{3+}
4+ Ions	
	Mn^{4+}
	Sn^{4+}
	Ti^{4+}
5+ Ions	
	Sb^{5+}
	As^{5+}

NAME MISSING

+ CATIONS +

1+ Ions	
	NH_4^+
	Cu^+
	H^+
	H_3O^+
	Ag^+
	Hg_2^{2+}
2+ Ions	
	Cd^{2+}
	Co^{2+}
	Cu^{2+}
	Fe^{2+}
	Pb^{2+}
	Mn^{2+}
	Hg^{2+}
	Ni^{2+}
	Sn^{2+}
	Zn^{2+}

3+ Ions	
	Al^{3+}
	Sb^{3+}
	As^{3+}
	Bi^{3+}
	Cr^{3+}
	Co^{3+}
	Fe^{3+}
	Ti^{3+}
4+ Ions	
	Mn^{4+}
	Sn^{4+}
	Ti^{4+}
5+ Ions	
	Sb^{5+}
	As^{5+}

NAME MISSING

- ANIONS -

1- Ions	
	$C_2H_3O_2^-$
	BrO_3^-
	ClO_3^-
	ClO_2^-
	CN^-
	H^-
	HCO_3^-
	HSO_4^-
	HSO_3^-
	OH^-
	ClO^-
	IO_3^-
	NO_3^-
	NO_2^-
	ClO_4^-
	MnO_4^-
	SCN^-

2- Ions	
	CO_3^{2-}
	CrO_4^{2-}
	$Cr_2O_7^{2-}$
	HPO_4^{2-}
	O_2^{2-}
	SO_4^{2-}
	SO_3^{2-}
	$S_2O_3^{2-}$
3- Ions	
	BO_3^{3-}
	PO_4^{3-}
	P^{3-}
	PO_3^{3-}

NAMES MISSING

- ANIONS -

1- Ions	
	$C_2H_3O_2^-$
	BrO_3^-
	ClO_3^-
	ClO_2^-
	CN^-
	H^-
	HCO_3^-
	HSO_4^-
	HSO_3^-
	OH^-
	ClO^-
	IO_3^-
	NO_3^-
	NO_2^-
	ClO_4^-
	MnO_4^-
	SCN^-

2- Ions	
	CO_3^{2-}
	CrO_4^{2-}
	$Cr_2O_7^{2-}$
	HPO_4^{2-}
	O_2^{2-}
	SO_4^{2-}
	SO_3^{2-}
	$S_2O_3^{2-}$
3- Ions	
	BO_3^{3-}
	PO_4^{3-}
	P^{3-}
	PO_3^{3-}

NAMES MISSING