

Name \_\_\_\_\_

## HONORS CHEMISTRY

### Elements and Polyatomic Ions



You will be quizzed on the names and symbols of the elements and polyatomic ions on this sheet throughout the year (given the chemical symbol provide the properly spelled name or given the name provide the proper chemical symbol). You must know the spelling and symbol. All elements are to be written *as shown on this list* with a capital letter as the first letter and lowercase letter as the second letter. *Do not write in all caps, or in cursive.*

### ELEMENTS

Atomic #	Name	Symbol
1	Hydrogen	H
2	Helium	He
3	Lithium	Li
4	Beryllium	Be
5	Boron	B
6	Carbon	C
7	Nitrogen	N
8	Oxygen	O
9	Fluorine	F
10	Neon	Ne
11	Sodium	Na
12	Magnesium	Mg
13	Aluminum	Al
14	Silicon	Si
15	Phosphorus	P
16	Sulfur	S
17	Chlorine	Cl
18	Argon	Ar
19	Potassium	K
20	Calcium	Ca
21	Scandium	Sc
22	Titanium	Ti
24	Chromium	Cr
25	Manganese	Mn

Atomic #	Name	Symbol
26	Iron	Fe
27	Cobalt	Co
28	Nickel	Ni
29	Copper	Cu
30	Zinc	Zn
31	Gallium	Ga
32	Germanium	Ge
35	Bromine	Br
37	Rubidium	Rb
38	Strontium	Sr
47	Silver	Ag
50	Tin	Sn
53	Iodine	I
54	Xenon	Xe
55	Cesium	Cs
56	Barium	Ba
78	Platinum	Pt
79	Gold	Au
80	Mercury	Hg
82	Lead	Pb
83	Bismuth	Bi
86	Radon	Rn
92	Uranium	U

Name \_\_\_\_\_

## POLYATOMIC IONS



Polyatomic ions are groups of multiple atoms that have a charge (positive or negative). The symbols shown below tell you what elements are in the ion, how many atoms of each (shown with a subscript behind each element symbol), and the charge (shown as a superscript at the end of the whole formula). For example:  $\text{NH}_4^{+1}$  contains a nitrogen atom, four hydrogen atoms and the entire group has a charge of +1.

**Memory Hint:** If you have two ions with similar names and the only difference is the number of oxygen atoms in your ion:

-ite means smaller number of O

-ate means larger number of O

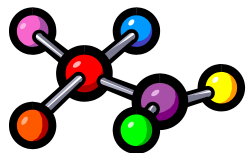
Hypo- (smallest) and Per- (largest) are used if there are four ions with similar names and different numbers of oxygen.

<b>ION</b>	<b>NAME</b>
$\text{NH}_4^{1+}$	ammonium
$\text{ClO}^{1-}$	hypochlorite
$\text{ClO}_2^{1-}$	chlorite
$\text{ClO}_3^{1-}$	chlorate
$\text{ClO}_4^{1-}$	perchlorate
$\text{CN}^{1-}$	cyanide
$\text{OH}^{1-}$	hydroxide
$\text{IO}_3^{1-}$	iodate
$\text{NO}_3^{1-}$	nitrate

<b>ION</b>	<b>NAME</b>
$\text{NO}_2^{1-}$	nitrite
$\text{MnO}_4^{1-}$	permanganate
$\text{CO}_3^{2-}$	carbonate
$\text{O}_2^{2-}$	peroxide
$\text{SO}_4^{2-}$	sulfate
$\text{SO}_3^{2-}$	sulfite
$\text{PO}_4^{3-}$	phosphate
$\text{CH}_3\text{COO}^{1-}$	acetate

Name \_\_\_\_\_

# Element – Polyatomic Ion Worksheets



Fill in the missing symbol/name of the element. The date of discovery and the origin of the name are included for your information only. You will only be responsible for the names and symbols.

Symbol	Name	Date	Origin of Name
	aluminum	1825	Latin, alumen = astringent taste
Ar		1894	Greek, argos = neutral or inactive
	barium	1808	Greek, baryos = heavy
Bi		~1450	German, wismut = white mass
	boron	1808	Arabic, bawraq
Br		1826	Greek, bromos = stench
C		B.C.	Latin, carbo = coal
Cs		1860	Latin, caesius = blue
	chlorine	1808	Greek, chloros = green gas
Cr		1797	Greek, chroma = color
	cobalt	1735	Greek, cobolos = goblin
Cu		B.C.	Latin, cuprum
	fluorine	1886	Latin, fluere = to flow
Ga		1875	Latin name, Gaul, of France
	germanium	1886	country, Germany
Au		B.C.	Latin, aurum
He		1895	Greek, helios = the sun
H		1766	Greek, hydro genes = water former
I		1811	Greek, iodos = violet color
Fe		B.C.	Latin, ferrum
	lead	B.C.	Latin, plumbum
	magnesium	1803	Latin, magnesia = a place in Asia Minor
Mn		1774	Latin, magnes = magnet
Hg		B.C.	Latin, hydragyrum = god and planet
	neon	1898	Greek, neo = new
	nickel	1750	German, goblin
	nitrogen	1772	Latin, nitro = native soda and gen = born

Name \_\_\_\_\_

O		1771	Greek, oxys = sharp and gen = born
P		1669	Greek, phosphoros = light bringer
	platinum	1735	Spanish, plata = silver
K		1807	Latin, kalium
	radon	1900	originates from radium
Rb		1860	Latin, rubidius = red
	scandium	1879	Scandanavian peninsula by its discoverer
	silicon	1823	Latin, silex = flint
Ag		B.C.	Latin, argentum
	sodium	1807	Latin, natrium
Sr		1808	town of Strontian, Scotland
	sulfur	B.C.	Latin, sulphur
	tin	B.C.	Latin, stannum
Ti		1791	Greek mythology, first sons of earth
U		1789	planet Uranus
Xe		1808	Greek, xenos = strange
	zinc	B.C.	German, zink = like tin

Write your answers in the blanks below

1. Mg is \_\_\_\_\_
2. Magnesium is \_\_\_\_\_
3. Aluminum is \_\_\_\_\_
4. Silicon is \_\_\_\_\_
5. Fe is \_\_\_\_\_
6. H is \_\_\_\_\_
7. Cu is \_\_\_\_\_
8. N is \_\_\_\_\_
9. C is \_\_\_\_\_
10. Helium is \_\_\_\_\_
11. Oxygen is \_\_\_\_\_
12. Copper is \_\_\_\_\_
13. Calcium is \_\_\_\_\_
14. Iron is \_\_\_\_\_
15. Potassium is \_\_\_\_\_
16. Hydrogen is \_\_\_\_\_
17. Carbon is \_\_\_\_\_
18. Nitrogen is \_\_\_\_\_
19. O is \_\_\_\_\_
20. F is \_\_\_\_\_
21. Fluorine is \_\_\_\_\_
22. Na is \_\_\_\_\_
23. Sodium is \_\_\_\_\_

Name \_\_\_\_\_

Spell the name of the following ions correctly:

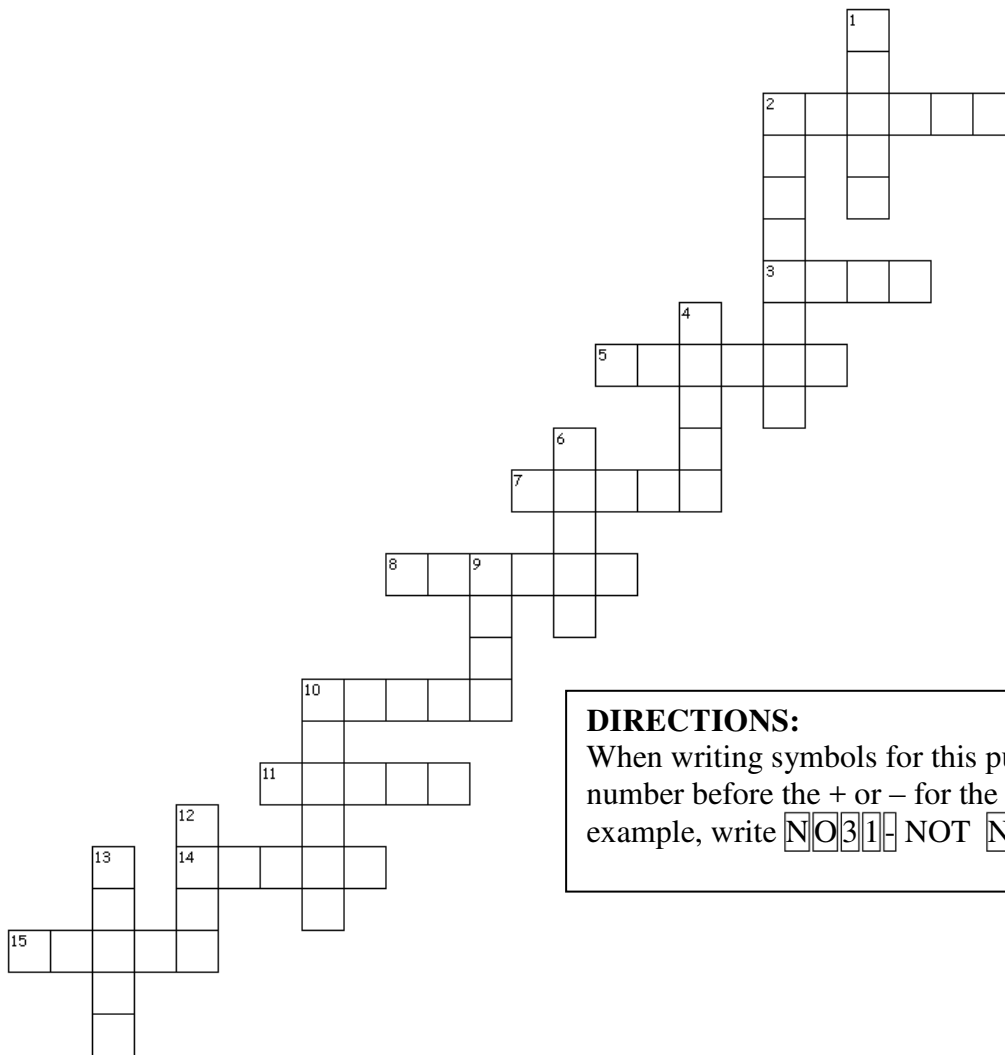
1.  $\text{NO}_2^{1-}$  \_\_\_\_\_
2.  $\text{CO}_3^{2-}$  \_\_\_\_\_
3.  $\text{ClO}_3^{1-}$  \_\_\_\_\_
4.  $\text{OH}^{1-}$  \_\_\_\_\_
5.  $\text{PO}_4^{3-}$  \_\_\_\_\_
6.  $\text{NH}_4^{1+}$  \_\_\_\_\_
7.  $\text{SO}_4^{2-}$  \_\_\_\_\_
8.  $\text{CN}^{1-}$  \_\_\_\_\_
9.  $\text{CH}_3\text{COO}^{1-}$  \_\_\_\_\_
10.  $\text{O}_2^{2-}$  \_\_\_\_\_
11.  $\text{NO}_3^{1-}$  \_\_\_\_\_
12.  $\text{IO}_3^{1-}$  \_\_\_\_\_
13.  $\text{MnO}_4^{1-}$  \_\_\_\_\_
14.  $\text{ClO}_2^{1-}$  \_\_\_\_\_
15.  $\text{O}_2^{2-}$  \_\_\_\_\_

Write the symbol and charge of the following ions.

1. phosphate \_\_\_\_\_
2. sulfate \_\_\_\_\_
3. cyanide \_\_\_\_\_
4. hydroxide \_\_\_\_\_
5. carbonate \_\_\_\_\_
6. nitrate \_\_\_\_\_
7. acetate \_\_\_\_\_
8. chlorate \_\_\_\_\_
9. perchlorate \_\_\_\_\_
10. hypochlorite \_\_\_\_\_
11. iodate \_\_\_\_\_
12. nitrite \_\_\_\_\_
13. sulfite \_\_\_\_\_
14. peroxide \_\_\_\_\_
15. permanganate \_\_\_\_\_

Name \_\_\_\_\_

# Polyatomic Ion Puzzle



**DIRECTIONS:**  
When writing symbols for this puzzle, write the number before the + or - for the charge. For example, write  $\boxed{\text{N}}\boxed{\text{O}}\boxed{3}\boxed{1}\boxed{-}$  NOT  $\boxed{\text{N}}\boxed{\text{O}}\boxed{3}\boxed{-}\boxed{1}$

Across

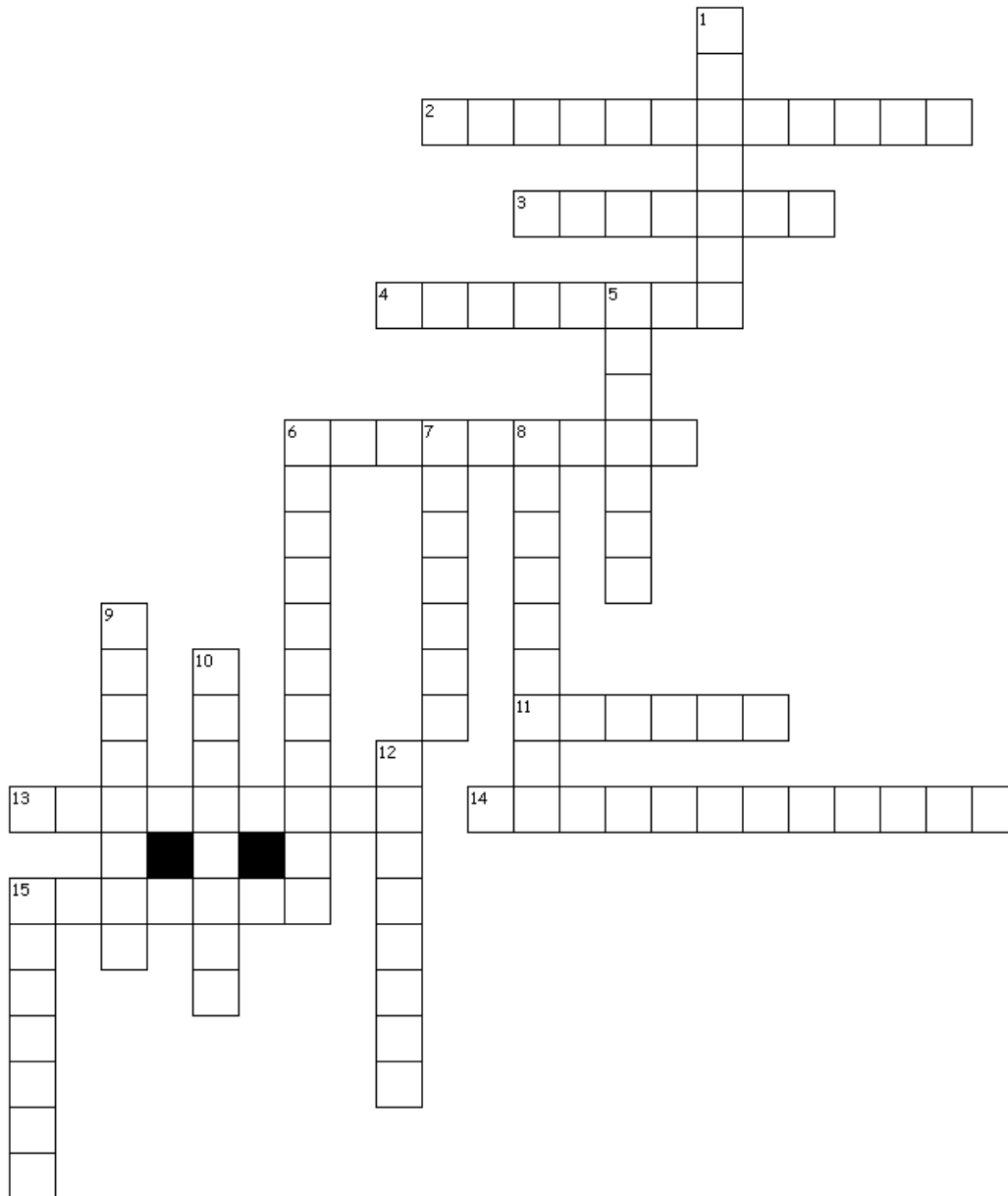
- 2. chlorite
- 3. peroxide
- 5. chlorate
- 7. sulfite
- 8. permanganate
- 10. carbonate
- 11. nitrite
- 14. nitrate
- 15. sulfate

Down

- 1. hypochlorite
- 2. acetate
- 4. phosphate
- 6. iodate
- 9. hydroxide
- 10. perchlorate
- 12. cyanide
- 13. ammonium

Name \_\_\_\_\_

# Polyatomic Ion Puzzle



Across

- 2.  $\text{ClO}^{1-}$
- 3.  $\text{CN}^{1-}$
- 4.  $\text{ClO}_3^{1-}$
- 6.  $\text{PO}_4^{3-}$
- 11.  $\text{IO}_3^{1-}$
- 13.  $\text{CO}_3^{2-}$

14.  $\text{MnO}_4^{1-}$

15.  $\text{NO}_2^{1-}$

Down

- 1.  $\text{SO}_3^{2-}$
- 5.  $\text{CH}_3\text{COO}^{1-}$
- 6.  $\text{ClO}_4^{1-}$
- 7.  $\text{SO}_4^{2-}$

8.  $\text{OH}^{1-}$

9.  $\text{ClO}_2^{1-}$

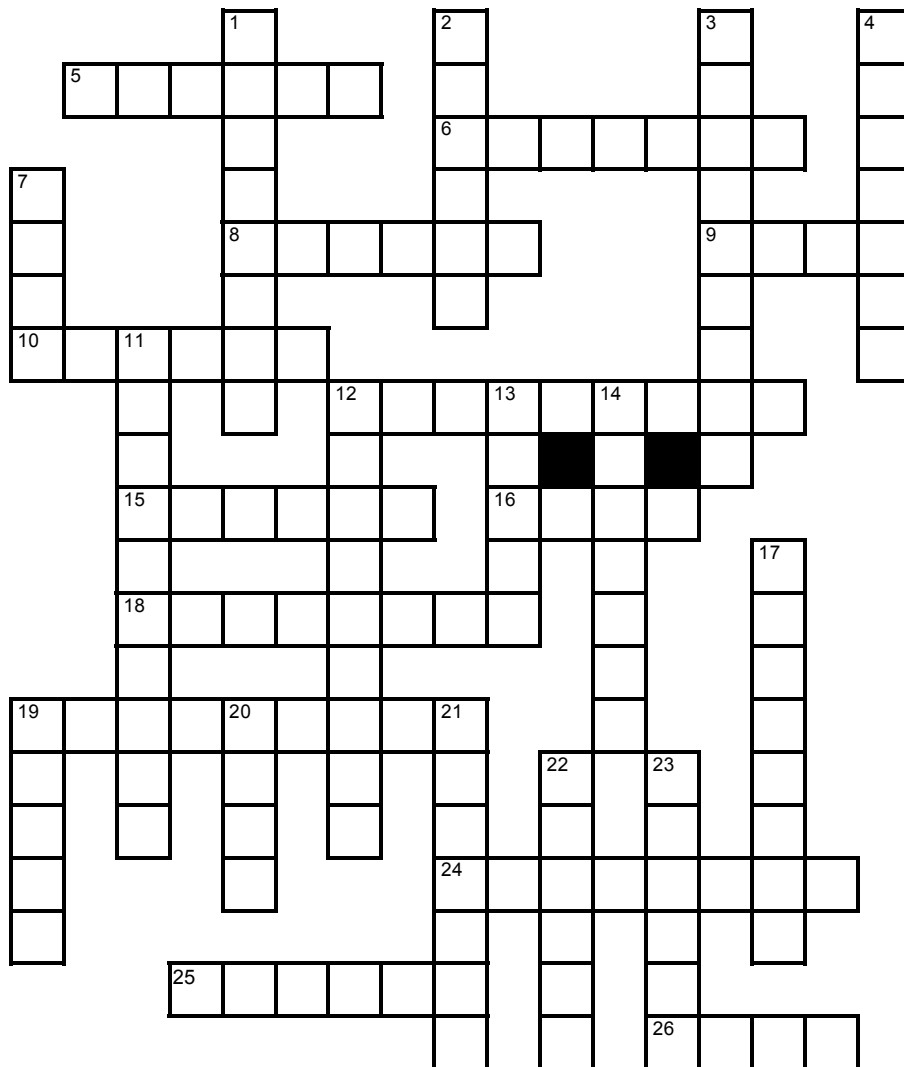
10.  $\text{NH}_4^{1+}$

12.  $\text{O}_2^{2-}$

15.  $\text{NO}_3^{1-}$

Name \_\_\_\_\_

# Elements of the Periodic Table

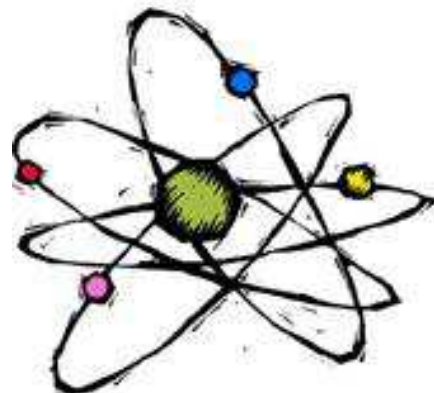


## Across

- 5 He (6)
- 6 Ca (7)
- 8 O (6)
- 9 Fe (4)
- 10 Cu (6)
- 12 K (9)
- 15 Na (6)
- 16 Au (4)
- 18 H (8)
- 19 Be (9)
- 24 Cl (8)
- 25 S (7)
- 26 Ne (4)

## Down

- |           |           |
|-----------|-----------|
| 1 N (8)   | 14 Si (7) |
| 2 Ni (6)  | 17 F (8)  |
| 3 Al (13) | 19 B (5)  |
| 4 As (7)  | 20 Pb (4) |
| 7 Zn (4)  | 21 Hg (7) |
| 11 P (10) | 22 Ag (6) |
| 12 Pu (9) | 23 C (6)  |
| 13 Ar (5) |           |





Name \_\_\_\_\_

## Periodic Table of the Elements

Fill in the blanks with the atomic symbols and names of the first 20 elements.

		scandium	titanium	vanadium	chromium	manganese	iron	cobalt	nickel	copper	Zinc	gallium	Germanium	arsenic	selenium	bromine	krypton
		<b>Sc</b>	<b>Ti</b>	<b>V</b>	<b>Cr</b>	<b>Mn</b>	<b>Fe</b>	<b>Co</b>	<b>Ni</b>	<b>Cu</b>	<b>Zn</b>	<b>Ga</b>	<b>Ge</b>	<b>As</b>	<b>Se</b>	<b>Br</b>	<b>Kr</b>