

**Section 1**

1. List the elements that occur as diatomic molecules in their elemental forms and their corresponding formulas?

Ans. Hydrogen ( $H_2$ ), nitrogen ( $N_2$ ), oxygen ( $O_2$ ), and the halogen gases: fluorine ( $F_2$ ), chlorine ( $Cl_2$ ), etc...

2. Name the three main categories of elements and describe their properties:

Ans. Metals, non-metals, and metalloids

3. Elements that exhibit similar chemical properties are arranged into groups.

4. Name the 5 "primary" groups in the periodic table and their corresponding column(s). Have you ever heard of these names in everyday experience? If so, where?

Ans. (i) alkali metals (group 1)  
(ii) alkaline earth metals (group 2)  
(iii) transition metals (groups 3-12)  
(iv) halogens (group 17)  
(v) noble (or inert) gases (group 18)

5. What is an ion?

Ans. An ion is an atom or molecule that has gained or lost one or more electrons.

6. Name the 2 types of ions.

Ans. Cations and anions

7. How are the 2 ion types distinguished?

Ans. Cations have positive charge (fewer electrons than protons) and anions have negative charge (more electrons than protons)

8. For the following compounds, indicate the # of each element per 1 molecule:

- |                   |                    |
|-------------------|--------------------|
| a) KCl            | K=1, Cl=1          |
| b) $MgCl_2$       | Mg=1, Cl=2         |
| c) $CCl_4$        | C=1, Cl=4          |
| d) $N_2O_3$       | N=2, O=3           |
| e) $Ag_2S$        | Ag=2, S=1          |
| f) PbO            | Pb=1, O=1          |
| g) $NH_4Cl$       | N=1, H=4, Cl=1     |
| h) $NaNO_3$       | Na=1, N=1, O=3     |
| i) $Ca_3(PO_4)_2$ | Ca=3, P=2, O=8     |
| j) $Fe_2(SO_4)_3$ | Fe=2, S=3, O=12    |
| k) $(NH_4)_2SO_4$ | N=2, H=8, S=1, O=4 |
| l) $Ba(OH)_2$     | Ba=1, O=2, H=2     |

# The Periodic Table of Elements

	1																	18
1	1 <b>H</b> 1.008	2																2 <b>He</b> 4.003
2	3 <b>Li</b> 6.941	4 <b>Be</b> 9.012											5 <b>B</b> 10.81	6 <b>C</b> 12.01	7 <b>N</b> 14.01	8 <b>O</b> 16.00	9 <b>F</b> 19.00	10 <b>Ne</b> 20.18
3	11 <b>Na</b> 22.99	12 <b>Mg</b> 24.31											13 <b>Al</b> 26.98	14 <b>Si</b> 28.09	15 <b>P</b> 30.97	16 <b>S</b> 32.06	17 <b>Cl</b> 35.45	18 <b>Ar</b> 39.95
			3	4	5	6	7	8	9	10	11	12						
4	19 <b>K</b> 39.10	20 <b>Ca</b> 40.08	21 <b>Sc</b> 44.96	22 <b>Ti</b> 47.88	23 <b>V</b> 50.94	24 <b>Cr</b> 52.00	25 <b>Mn</b> 54.94	26 <b>Fe</b> 55.85	27 <b>Co</b> 58.93	28 <b>Ni</b> 58.70	29 <b>Cu</b> 63.55	30 <b>Zn</b> 65.38	31 <b>Ga</b> 69.72	32 <b>Ge</b> 72.59	33 <b>As</b> 74.92	34 <b>Se</b> 78.96	35 <b>Br</b> 79.90	36 <b>Kr</b> 83.80
5	37 <b>Rb</b> 85.47	38 <b>Sr</b> 87.62	39 <b>Y</b> 88.91	40 <b>Zr</b> 91.22	41 <b>Nb</b> 92.91	42 <b>Mo</b> 95.94	43 <b>Tc</b> (98)	44 <b>Ru</b> 101.1	45 <b>Rh</b> 102.9	46 <b>Pd</b> 106.4	47 <b>Ag</b> 107.9	48 <b>Cd</b> 112.4	49 <b>In</b> 114.8	50 <b>Sn</b> 118.7	51 <b>Sb</b> 121.8	52 <b>Te</b> 127.6	53 <b>I</b> 126.9	54 <b>Xe</b> 131.3
6	55 <b>Cs</b> 132.9	56 <b>Ba</b> 137.3	57 <b>La</b> 138.9	72 <b>Hf</b> 178.5	73 <b>Ta</b> 180.9	74 <b>W</b> 183.9	75 <b>Re</b> 186.2	76 <b>Os</b> 190.2	77 <b>Ir</b> 192.2	78 <b>Pt</b> 195.1	79 <b>Au</b> 197.0	80 <b>Hg</b> 200.6	81 <b>Tl</b> 204.4	82 <b>Pb</b> 207.2	83 <b>Bi</b> 209.0	84 <b>Po</b> (209)	85 <b>At</b> (210)	86 <b>Rn</b> (222)
7	87 <b>Fr</b> (223)	88 <b>Ra</b> 226.0	89 <b>Ac</b> 227.0	104 <b>Rf</b> (261)	105 <b>Db</b> (262)	106 <b>Sg</b> (263)	107 <b>Bh</b> (262)	108 <b>Hs</b> (265)	109 <b>Mt</b> (266)	110 <b>Unn</b> (269)	111 <b>Uuu</b> (272)	112 <b>Uub</b> (277)	113	114 <b>Uuq</b> (289)	115	116 <b>Uuh</b> (289)	117	118 <b>Uuo</b> (293)

Lanthanides	58 <b>Ce</b> 140.1	59 <b>Pr</b> 140.9	60 <b>Nd</b> 144.2	61 <b>Pm</b> (145)	62 <b>Sm</b> 150.4	63 <b>Eu</b> 152.0	64 <b>Gd</b> 157.3	65 <b>Tb</b> 158.9	66 <b>Dy</b> 162.5	67 <b>Ho</b> 164.9	68 <b>Er</b> 167.3	69 <b>Tm</b> 168.9	70 <b>Yb</b> 173.0	71 <b>Lu</b> 175.0
Actinides	90 <b>Th</b> 232.0	91 <b>Pa</b> 231	92 <b>U</b> 238.0	93 <b>Np</b> 237.0	94 <b>Pu</b> (244)	95 <b>Am</b> (243)	96 <b>Cm</b> (247)	97 <b>Bk</b> (247)	98 <b>Cf</b> (251)	99 <b>Es</b> (252)	100 <b>Fm</b> (257)	101 <b>Md</b> (258)	102 <b>No</b> (259)	103 <b>Lr</b> (262)