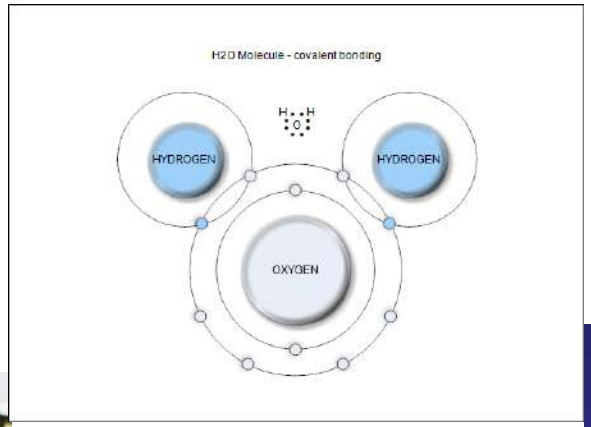
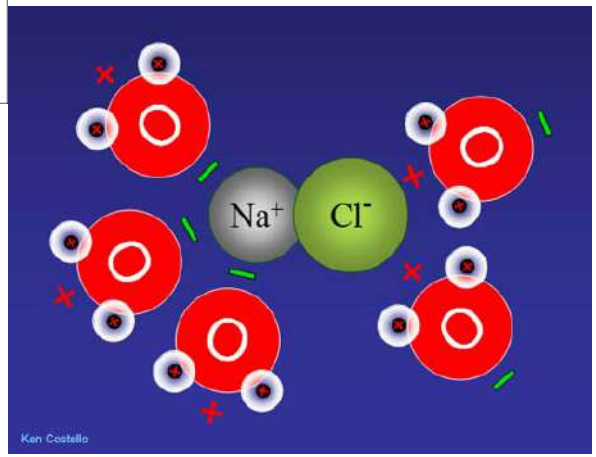
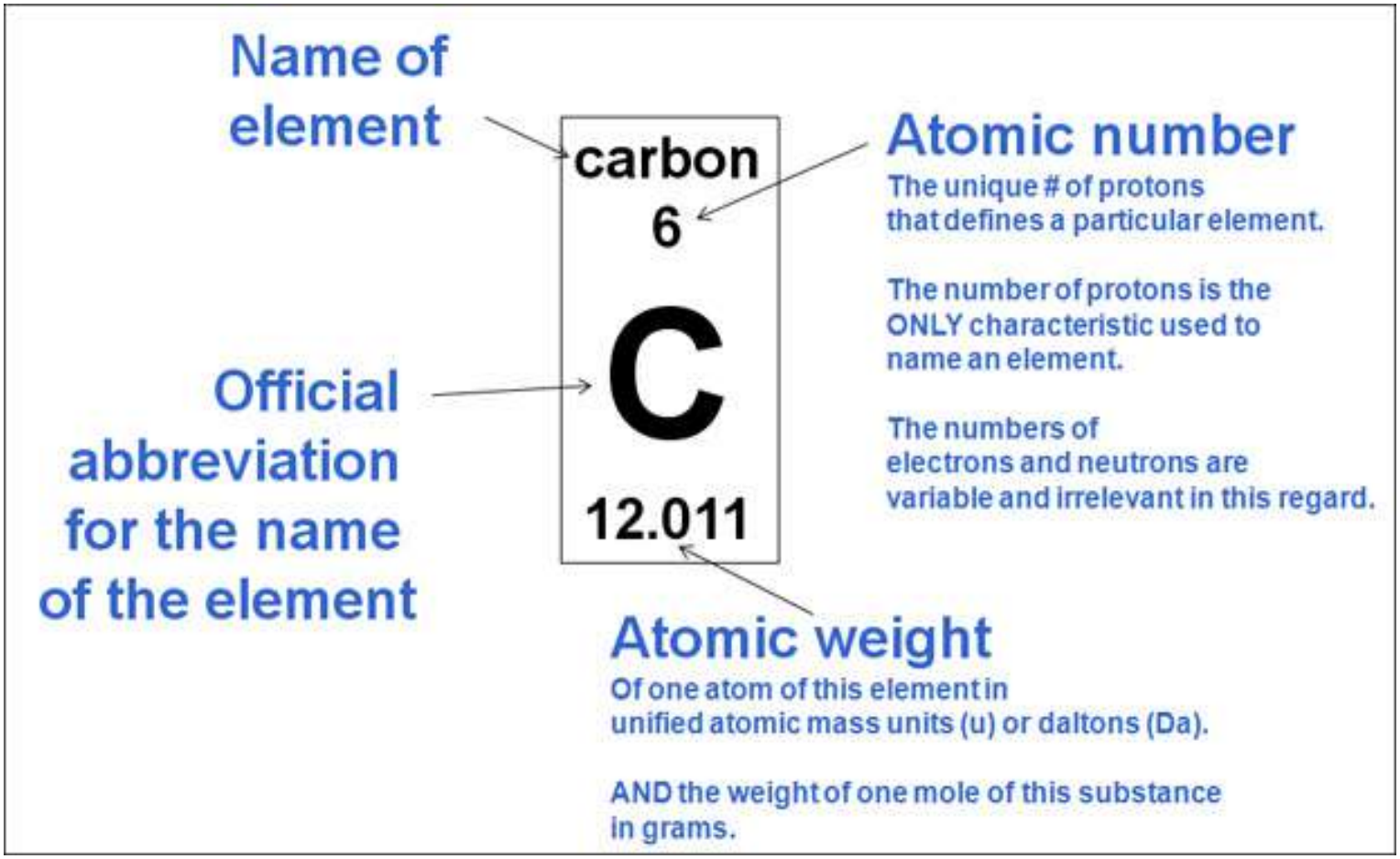
Elements, Compounds, & Mixtures





ELEMENTS

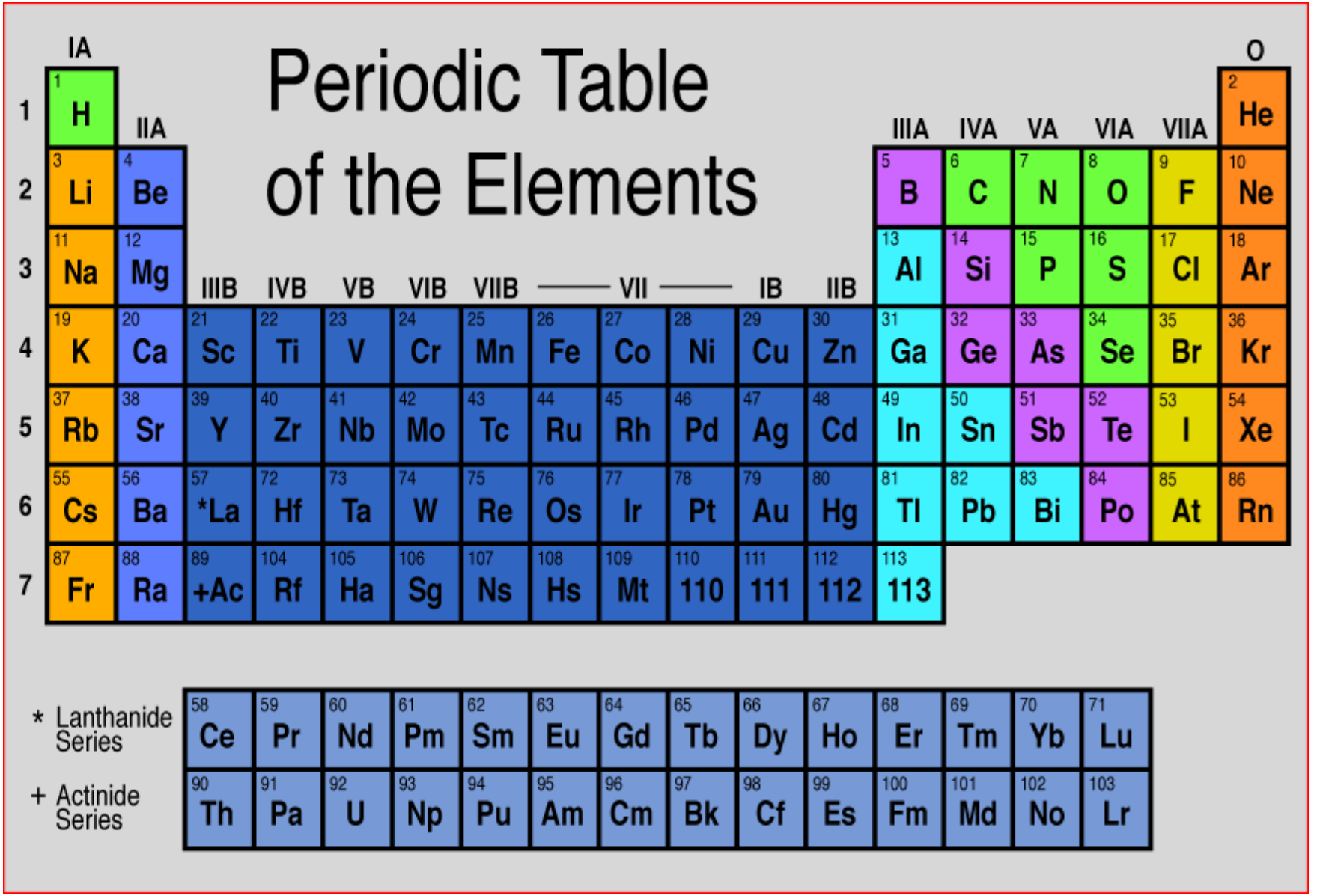

Name of element
carbon
6
C
12.011
Atomic number
The unique # of protons that defines a particular element.
The number of protons is the ONLY characteristic used to name an element.
The numbers of electrons and neutrons are variable and irrelevant in this regard.
Official abbreviation for the name of the element
Atomic weight
Of one atom of this element in unified atomic mass units (u) or daltons (Da).
AND the weight of one mole of this substance in grams.

- A ***pure*** form of ***matter***

- consists of only ***one type*** of ***atom***

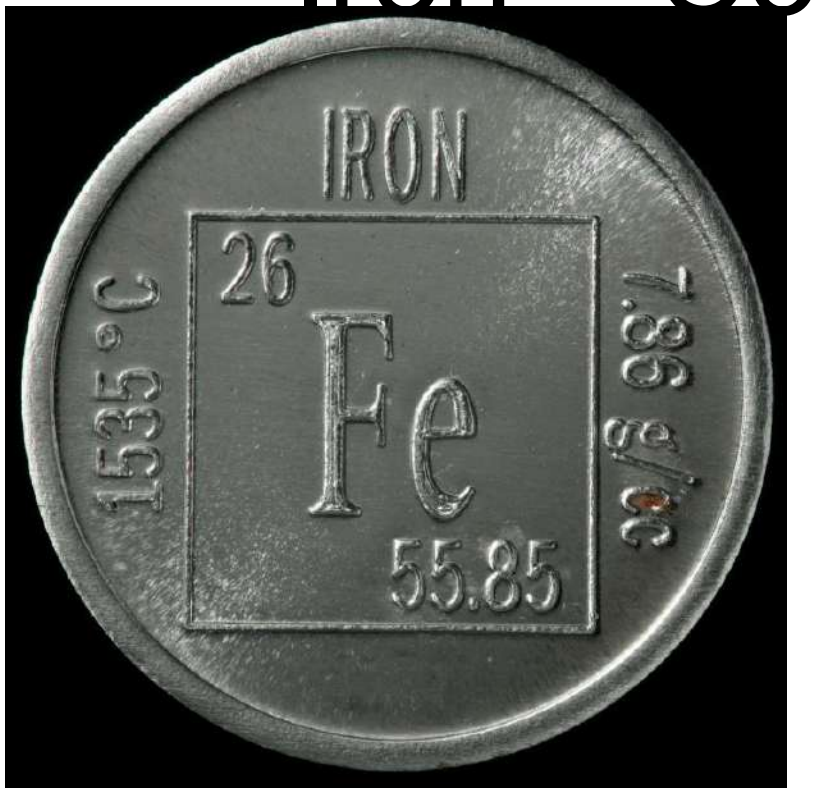
- ***118*** elements known to man (***March 2010***)
  94 = naturally occurring
  24 = man-made / synthetic

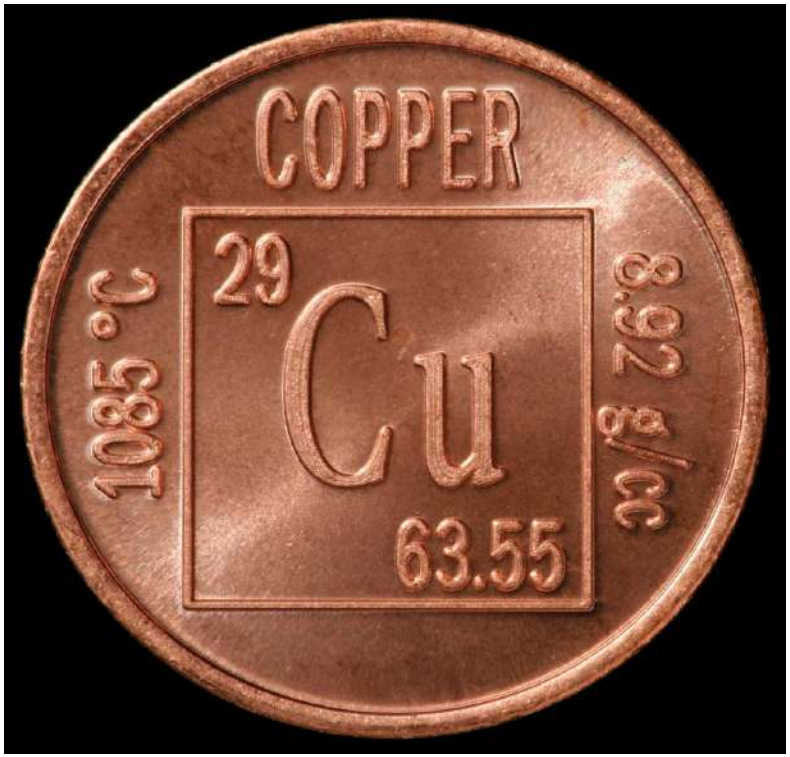
- Listed on ***periodic table***


Periodic Table of the Elements
IA
IIA
IIIB
IVB
VB
VIB
VIIB
VII
IB
IIB
IIIA
IVA
VA
VIA
VIIA
O
1 H
2 He
3 Li
4 Be
5 B
6 C
7 N
8 O
9 F
10 Ne
11 Na
12 Mg
13 Al
14 Si
15 P
16 S
17 Cl
18 Ar
19 K
20 Ca
21 Sc
22 Ti
23 V
24 Cr
25 Mn
26 Fe
27 Co
28 Ni
29 Cu
30 Zn
31 Ga
32 Ge
33 As
34 Se
35 Br
36 Kr
37 Rb
38 Sr
39 Y
40 Zr
41 Nb
42 Mo
43 Tc
44 Ru
45 Rh
46 Pd
47 Ag
48 Cd
49 In
50 Sn
51 Sb
52 Te
53 I
54 Xe
55 Cs
56 Ba
57 *La
72 Hf
73 Ta
74 W
75 Re
76 Os
77 Ir
78 Pt
79 Au
80 Hg
81 Tl
82 Pb
83 Bi
84 Po
85 At
86 Rn
87 Fr
88 Ra
89 +Ac
104 Rf
105 Ha
106 Sg
107 Ns
108 Hs
109 Mt
110 110
111 111
112 112
113 113
* Lanthanide Series
58 Ce
59 Pr
60 Nd
61 Pm
62 Sm
63 Eu
64 Gd
65 Tb
66 Dy
67 Ho
68 Er
69 Tm
70 Yb
71 Lu
+ Actinide Series
90 Th
91 Pa
92 U
93 Np
94 Pu
95 Am
96 Cm
97 Bk
98 Cf
99 Es
100 Fm
101 Md
102 No
103 Lr

Examples

Iron Copper

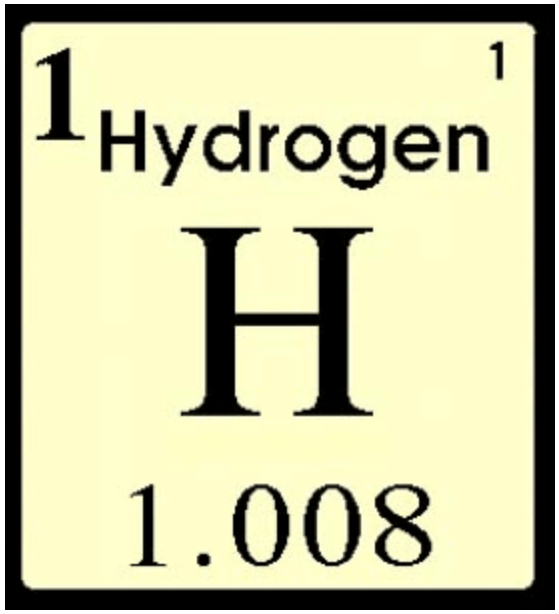


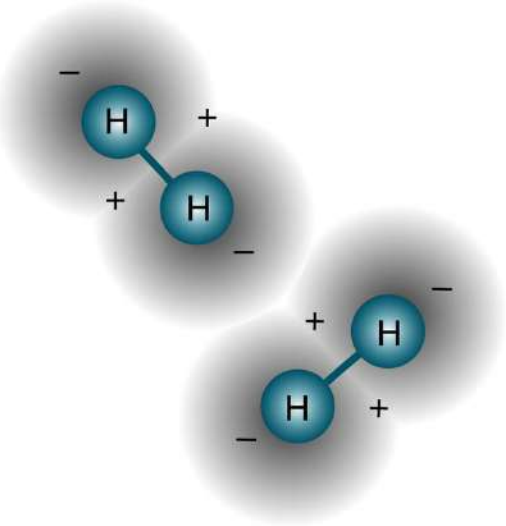


Silver

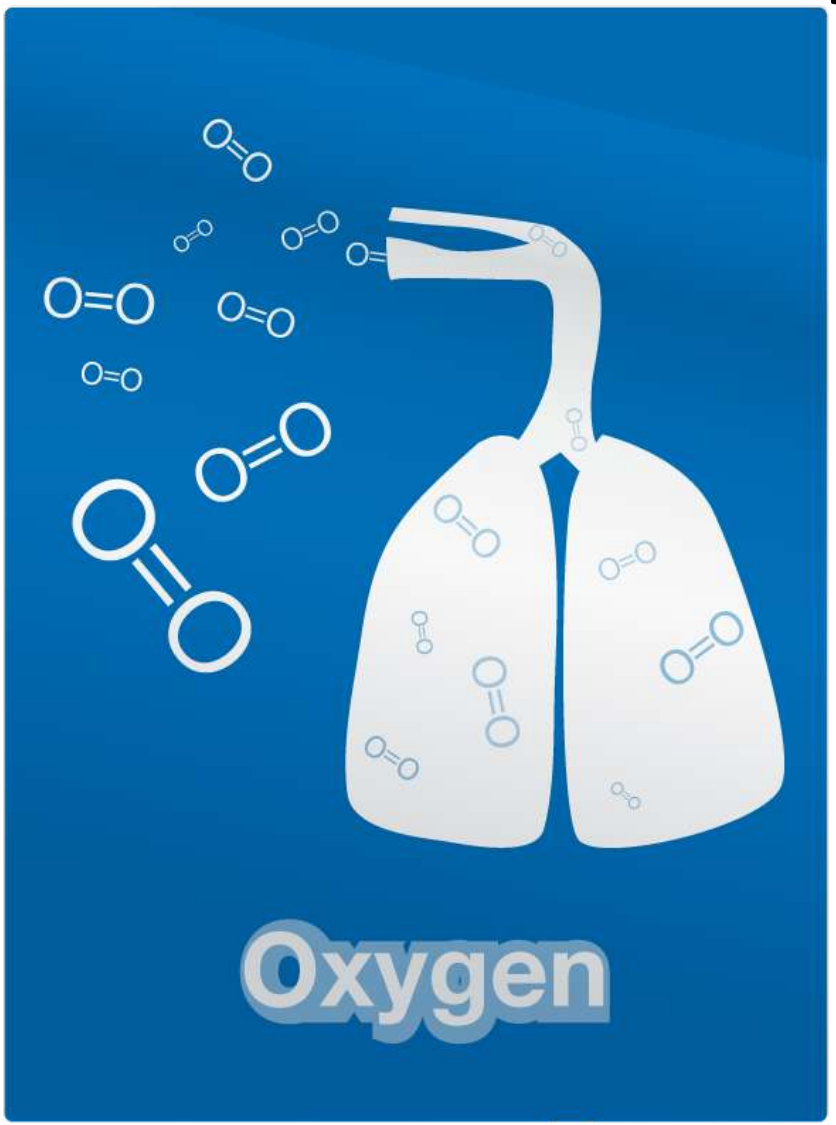
Gold

Hydrogen





Oxygen


Oxygen


MADACYLINDER
OXYGEN
OXYGEN
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Periodic Table

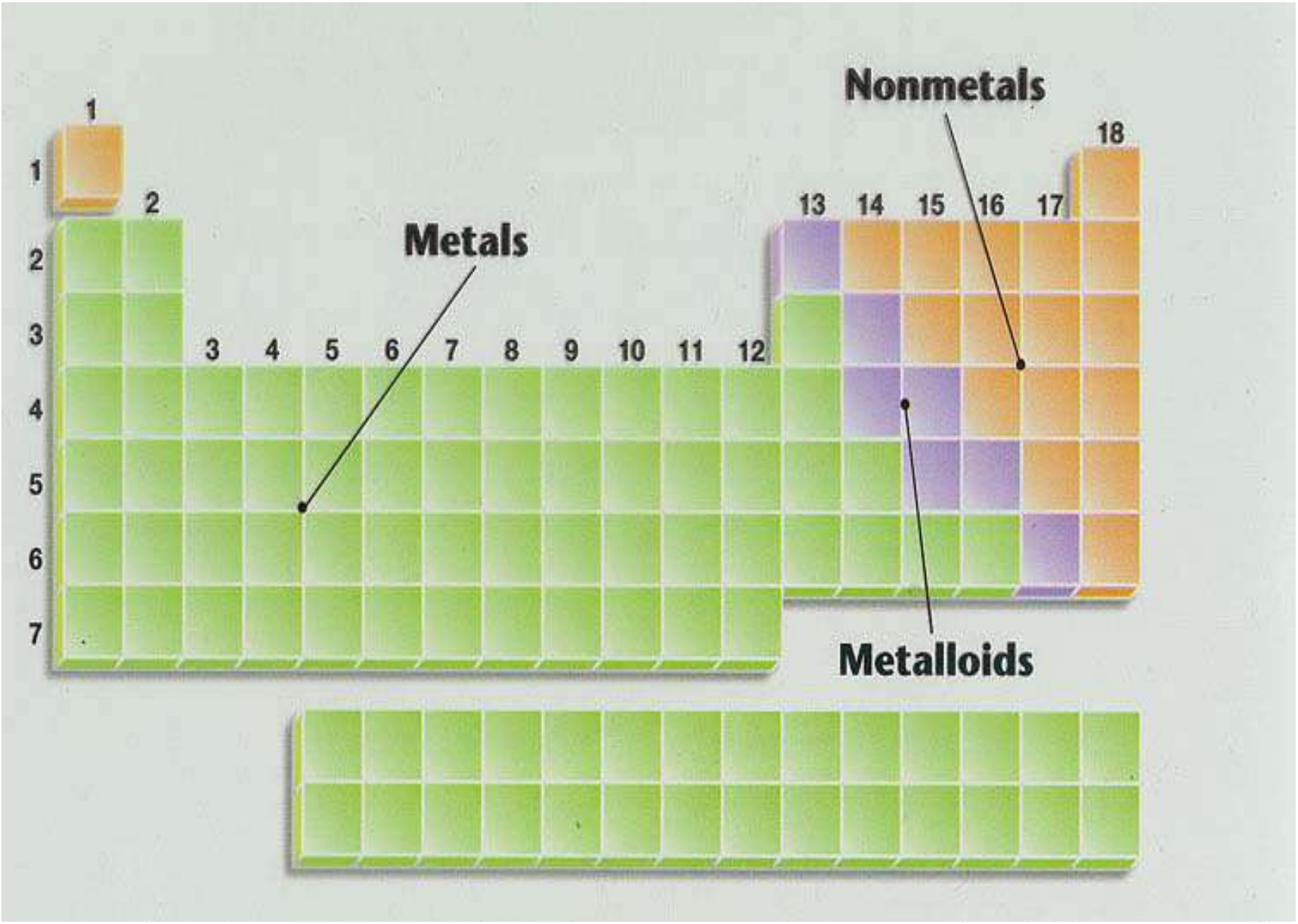
- tabular display of ***elements***

- Grouped by similar ***characteristics*** or ***properties***:

  groups/families (18) = columns

  periods (7) = rows

- 3 groups: ***metals, non metals, metalloids***


Nonmetals
Metals
Metalloids
1
2
3
4
5
6
7
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

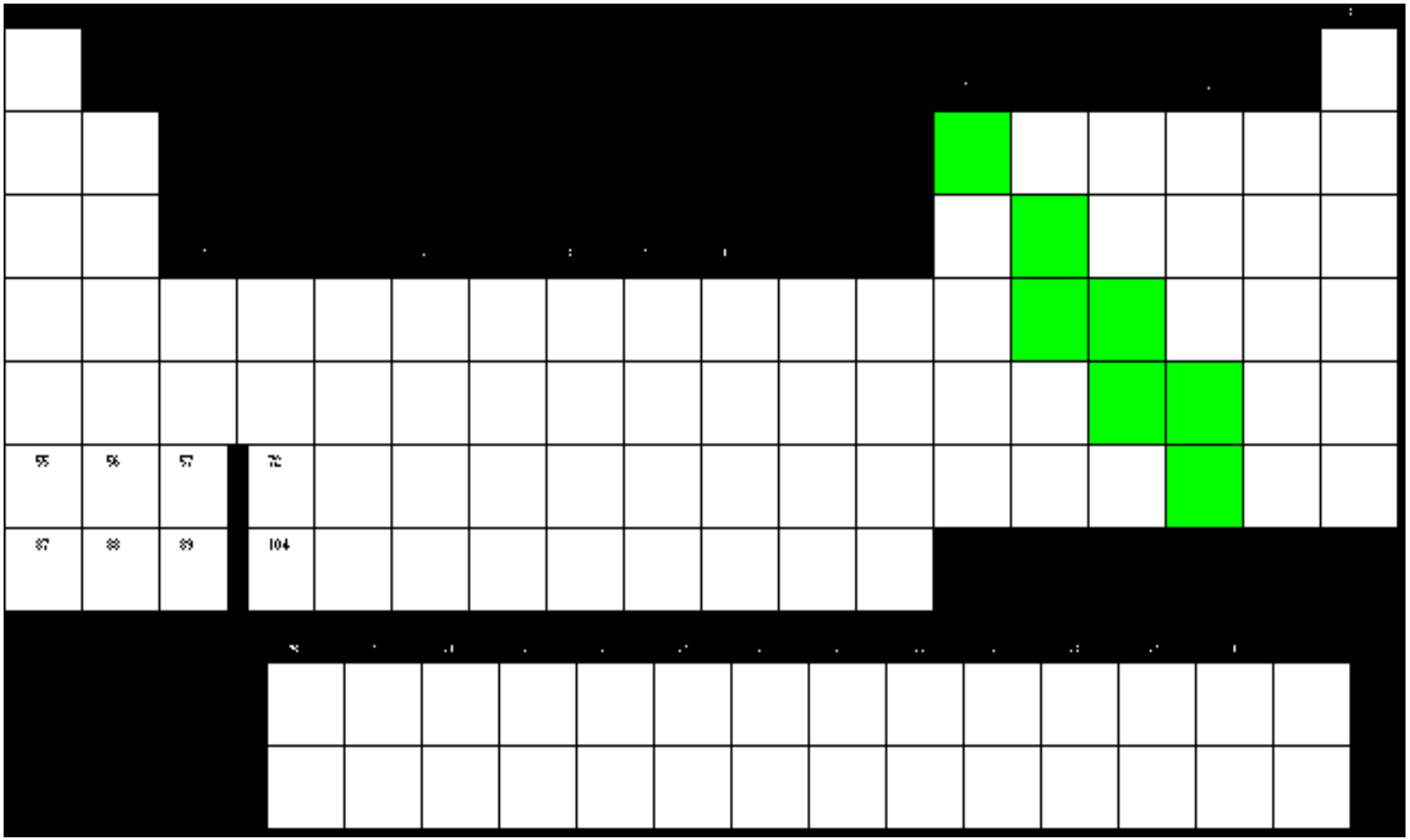
Metals

- good conductors of ***heat*** & ***electricity***
- ***solid*** at room temperature
- ***lustrous*** (shiny) & ***malleable*** (can be shaped)
- High ***densities***, and ***melting*** & ***boiling*** points

Nonmetals

- ***Poor*** conductors of heat & electricity
- in solid form, they are ***dull*** and ***brittle***
- significantly ***lower*** densities, and melting & boiling points when compared to ***metals***

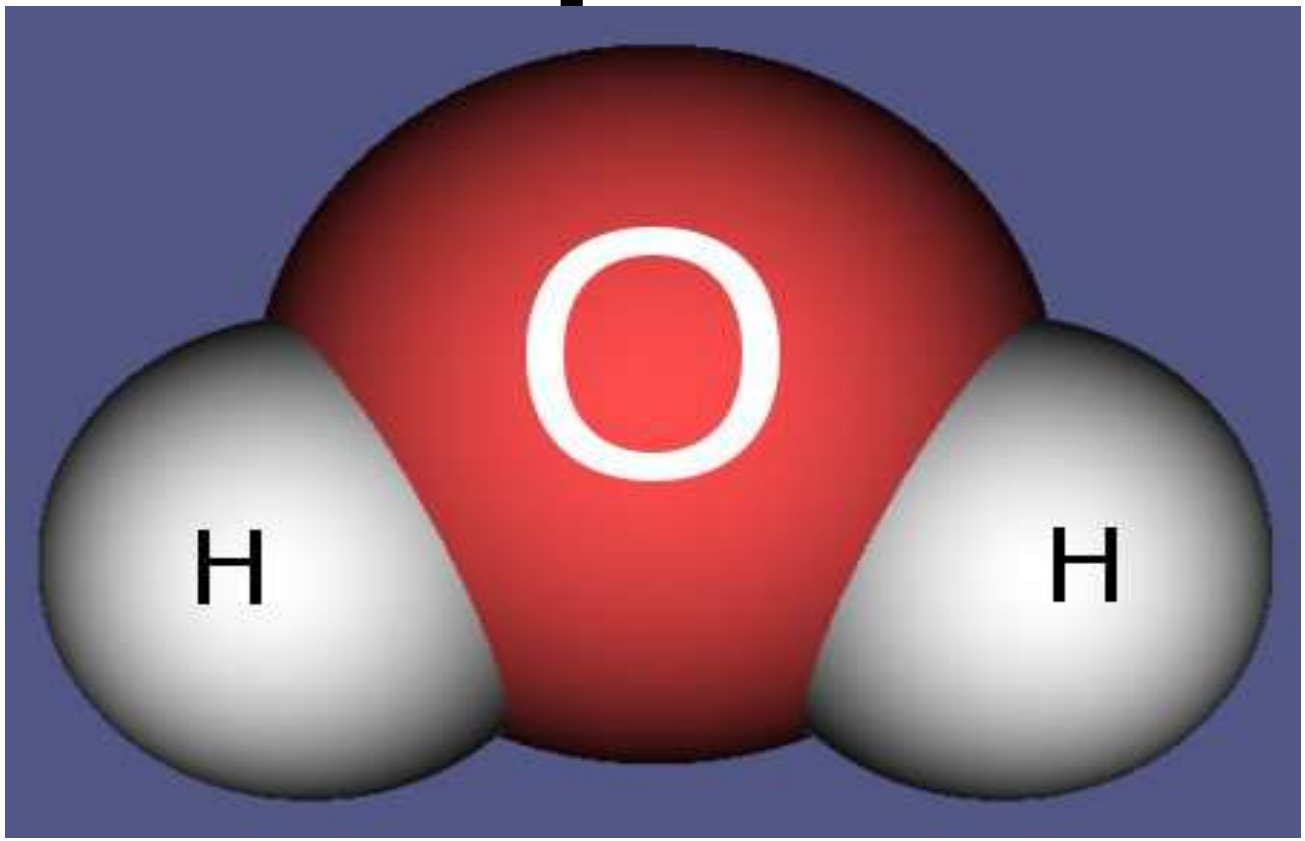
Metalloids



- Display qualities of both ***metals*** & ***nonmetals***

- Includes ***boron (B), silicon (Si), germanium (Ge), arsenic (As), antimony (Sb), tellurium (Te), polonium (Po)***

Compounds



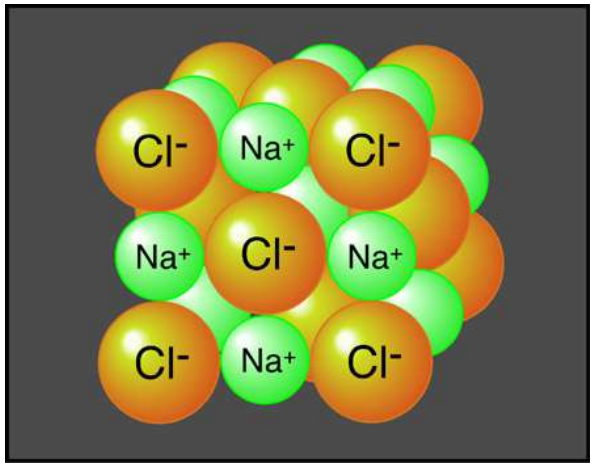
Water / H_2O

- Two or more ***different*** elements combined, with the atoms held together by ***chemical bonds***

- Formed or broken down during ***chemical*** reactions (***chemical change***)

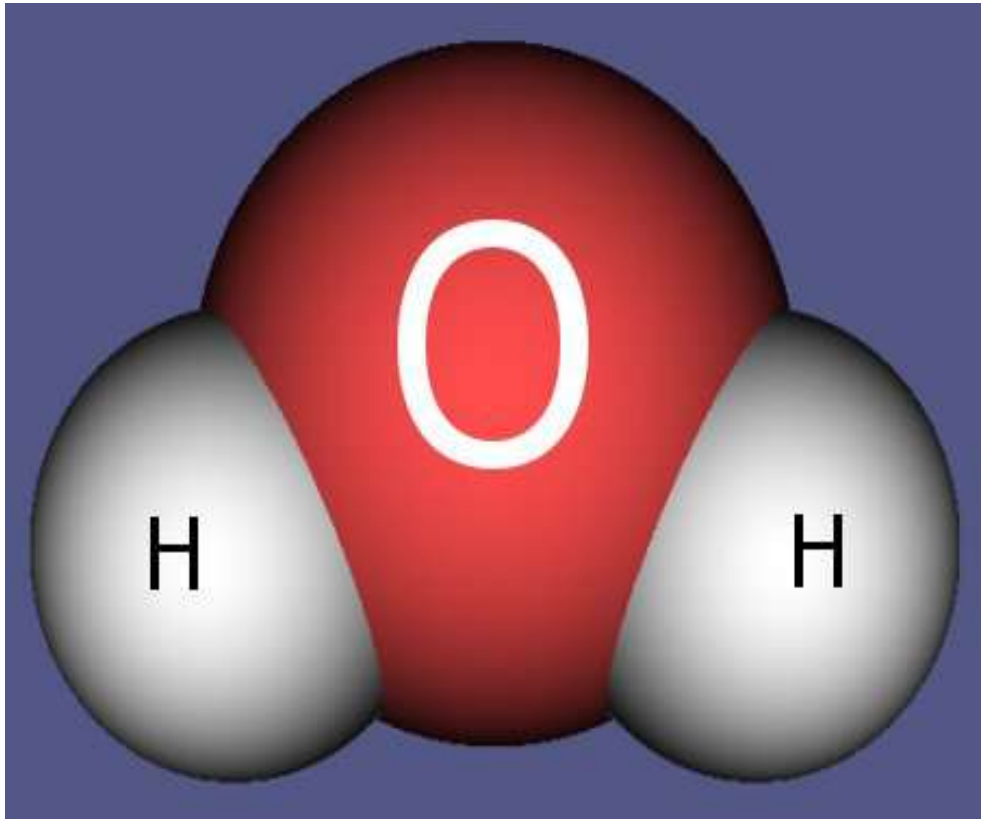
- Cannot be separated by ***physical*** means

Sodium Chloride (NaCl)

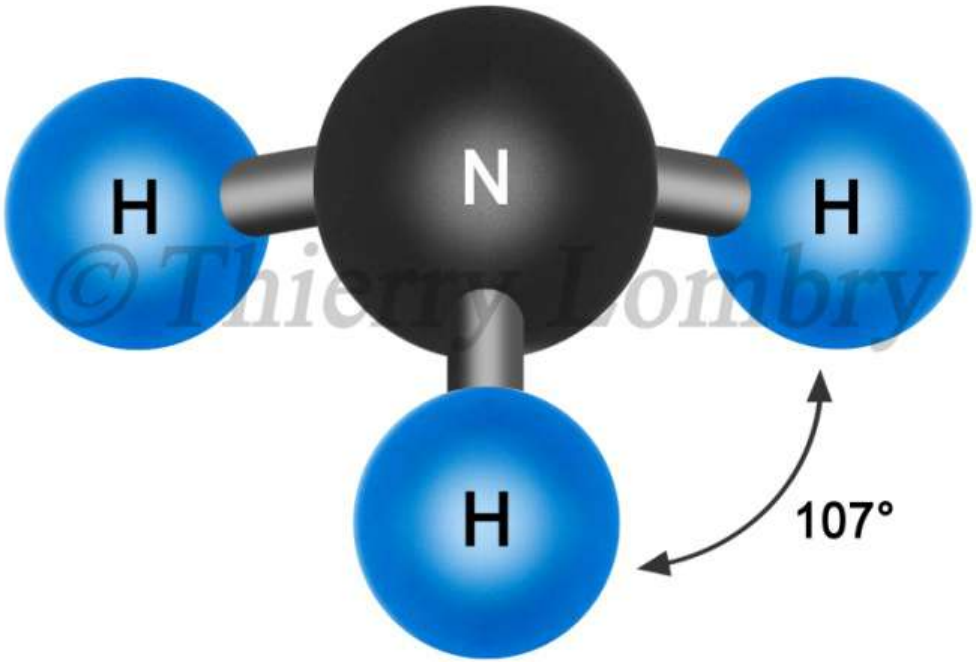


Common Table Salt

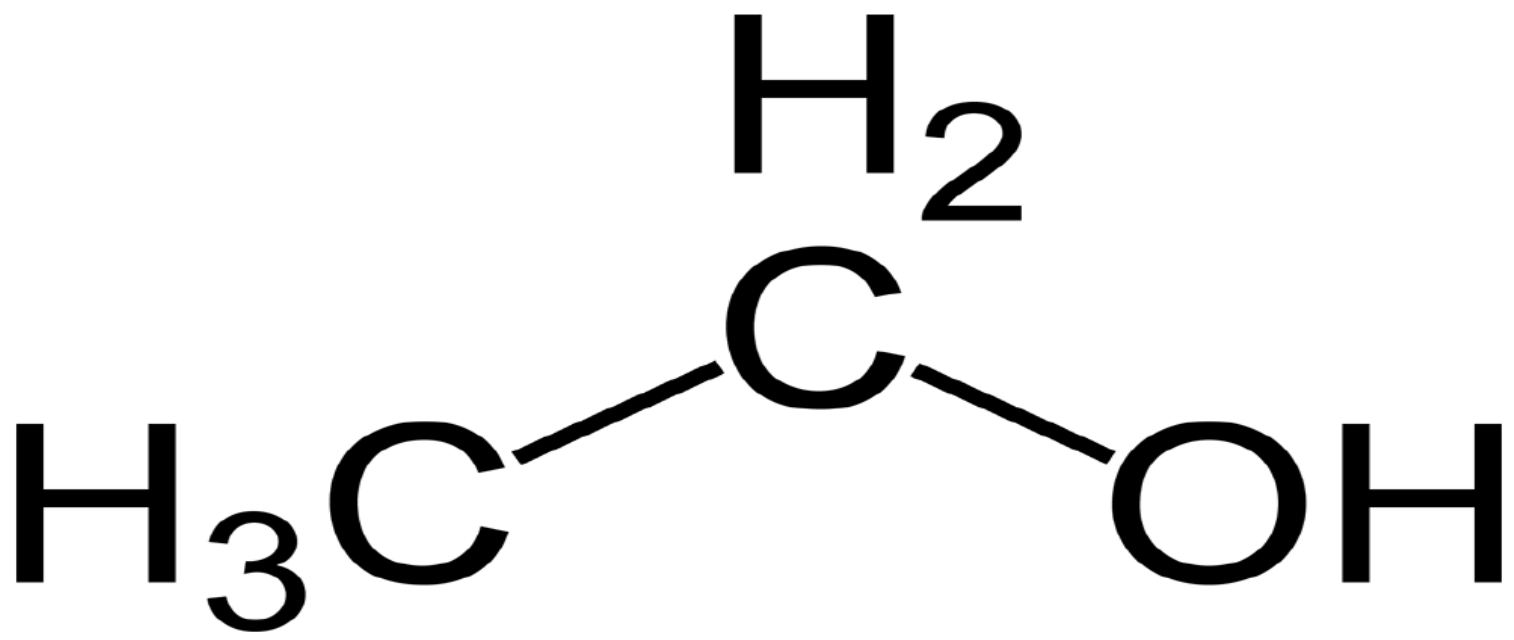
Water (H_2O)



Ammonia (NH_3)



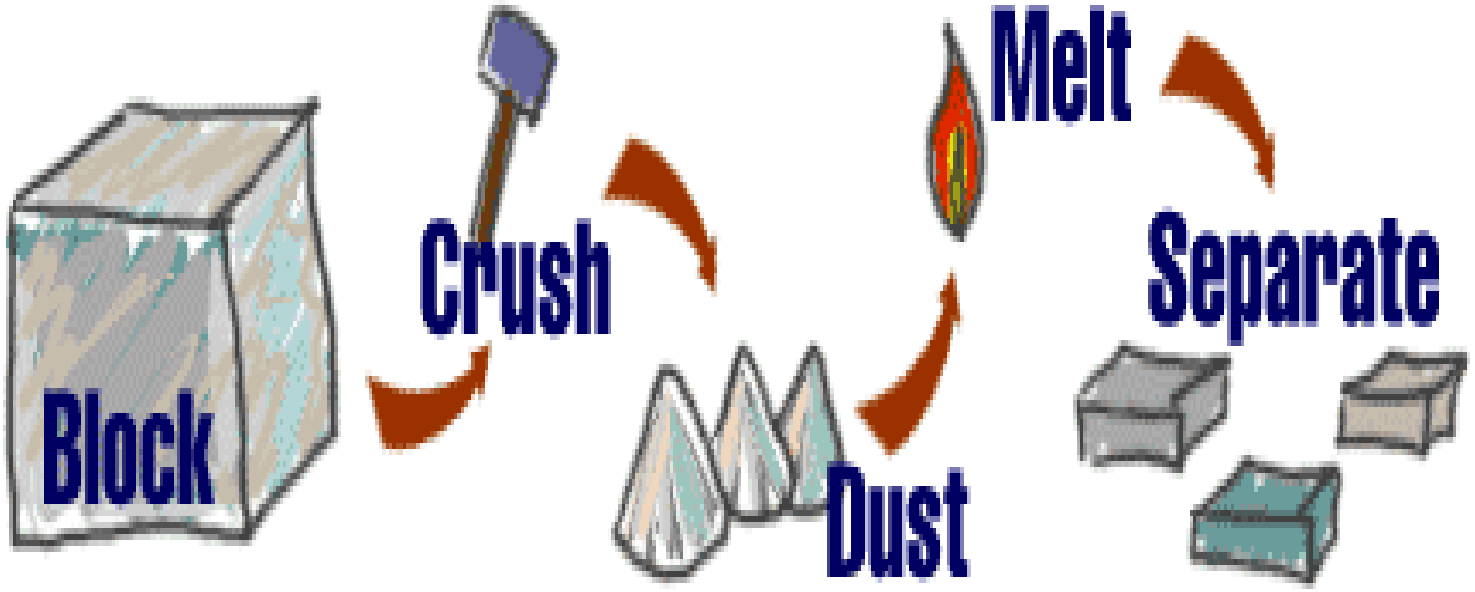
ethanol alcohol (C_2H_5OH)



Mixtures

- Two or more elements or compounds that are ***blended*** together ***without*** combining chemically so that ***each*** ingredient substance ***retains*** its own chemical ***properties*** and makeup

- ***can*** be separated by physical means



Classifications of Mixtures

- Uniformity

1. ***heterogeneous***
2. ***homogeneous***

- Composition

1. mixture of ***elements***
2. mixture of ***compounds***
3. mixture of ***elements & compounds***

Uniformity

Heterogeneous Mixture

combination of substances in which ***each*** substance can ***easily*** be identified

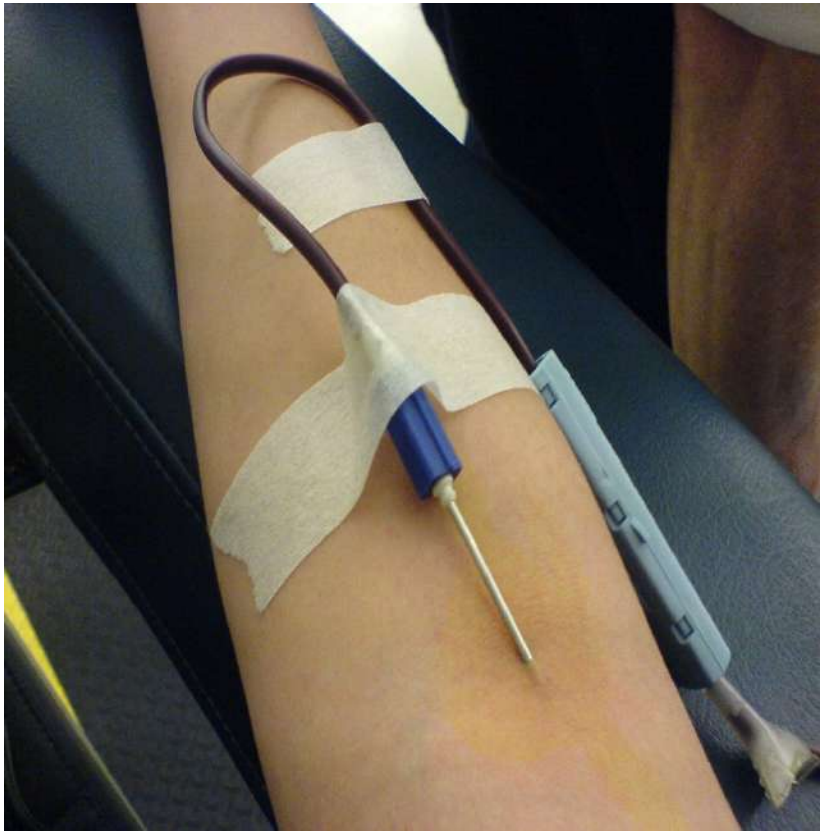
(hetero = ***different***)

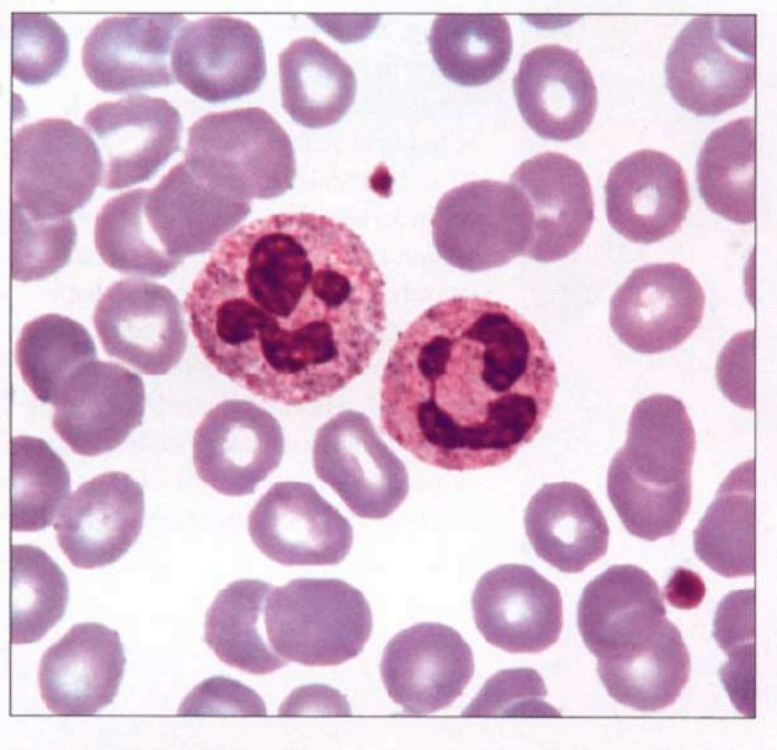
Homogeneous Mixture

- combination of substances spread ***uniformly*** (***homo*** = same) throughout

- substances, therefore, are ***not easily*** identified

Homogeneous Mixture

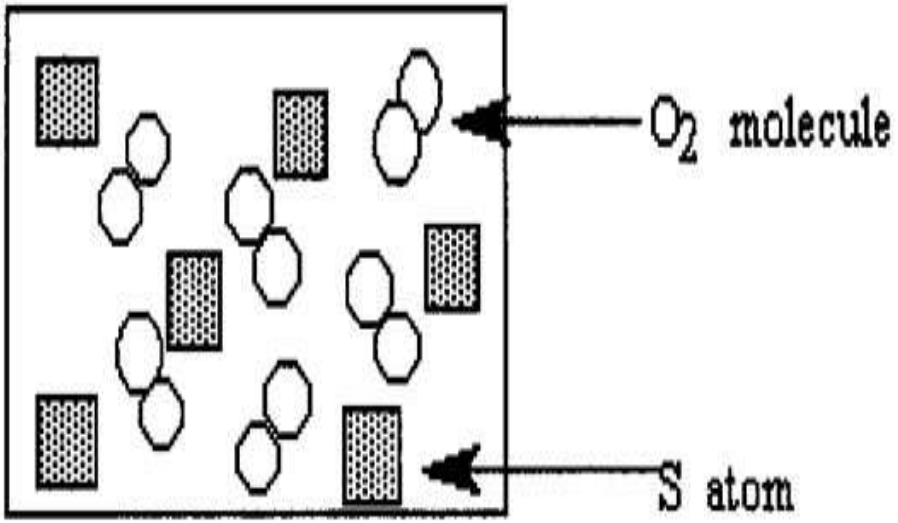




Composition

Mixture of Elements

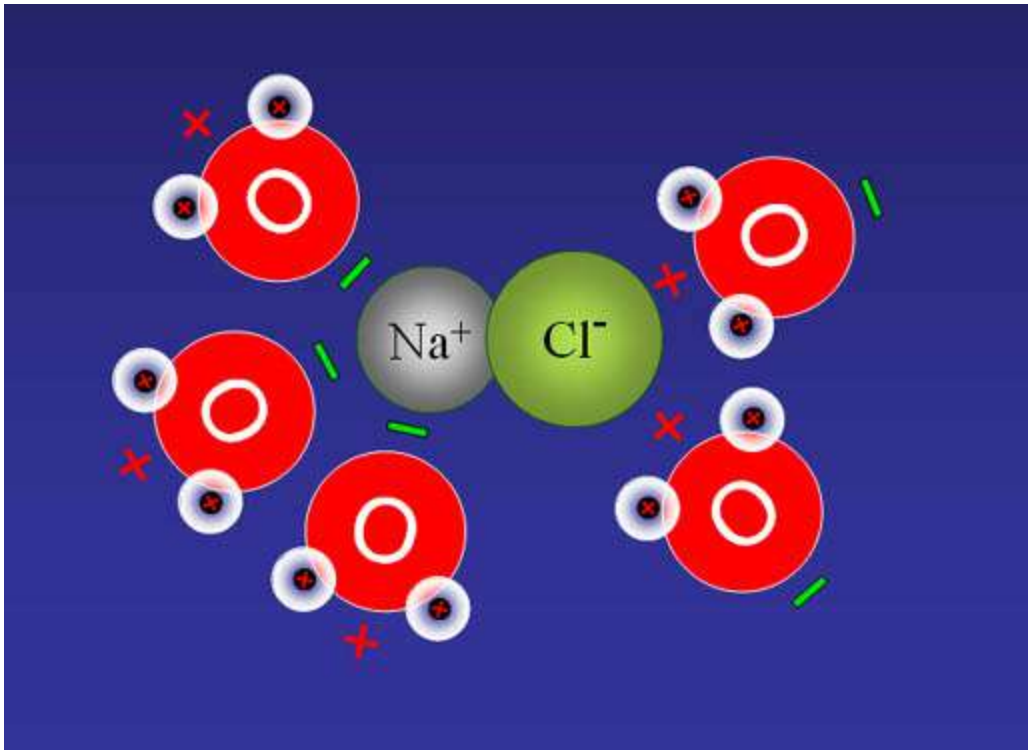
- Substance composed of ***two*** or ***more*** different ***elements*** with atoms that are ***physically*** mixed together


O_2 molecule
S atom

Mixture of Compounds

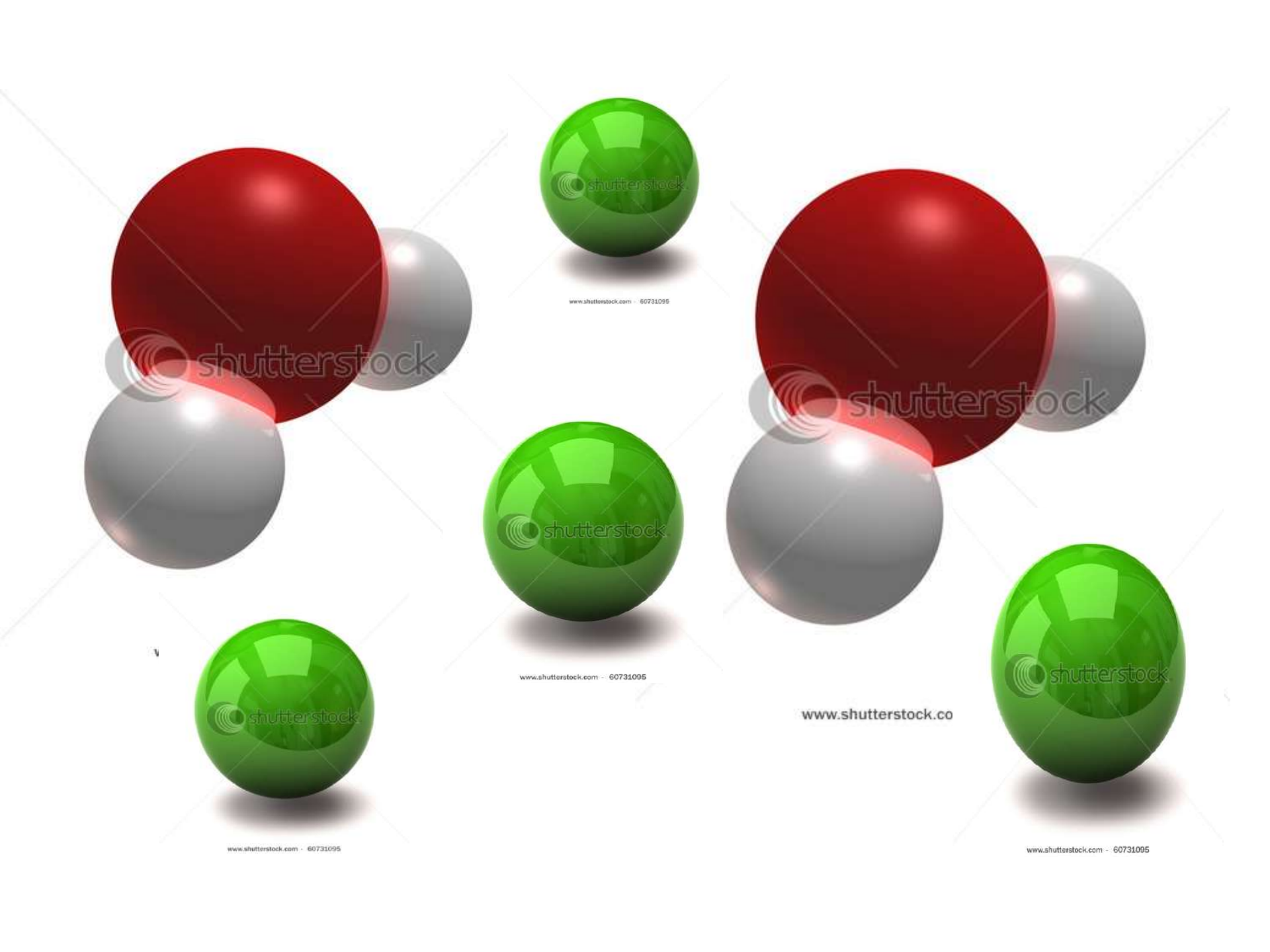
- Substance composed of ***two*** or ***more*** different ***compounds physically*** mixed together

Salt Water



Mixture of Elements & Compounds

- Substance composed of ***at least*** one ***element*** AND ***at least*** one ***compound*** physically mixed together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