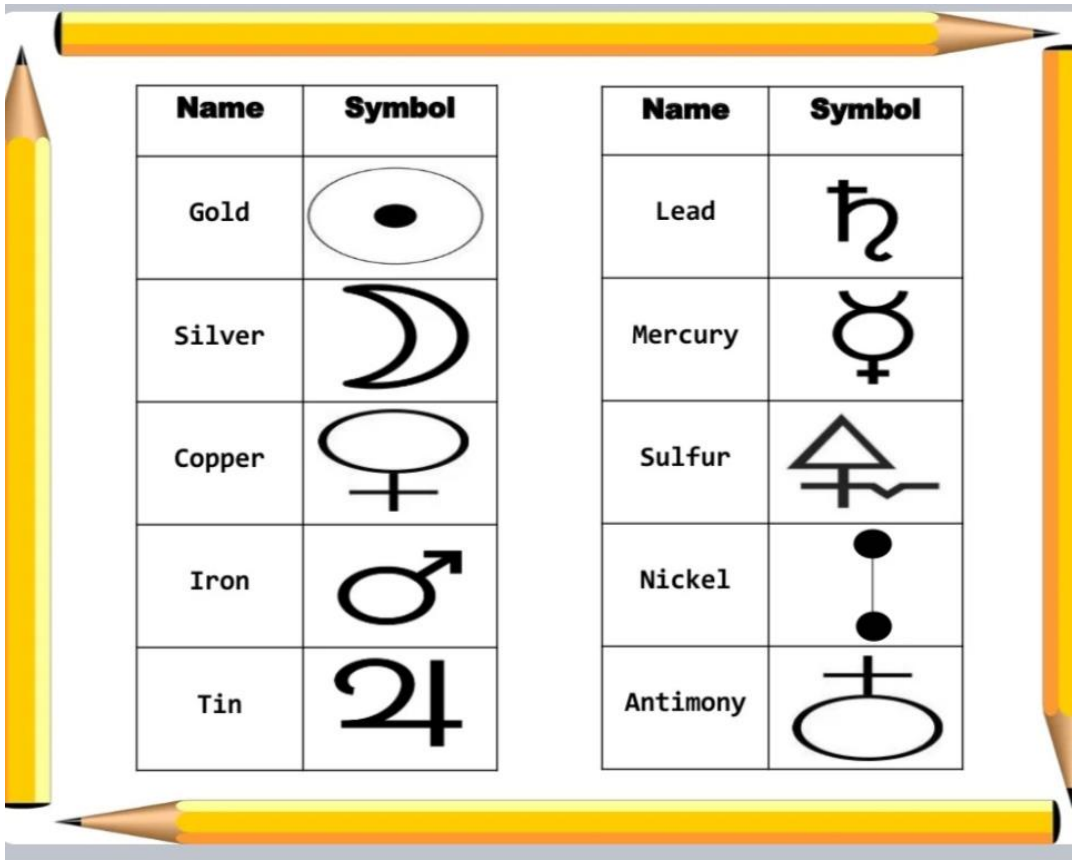
Structure of matter-2

Symbols:

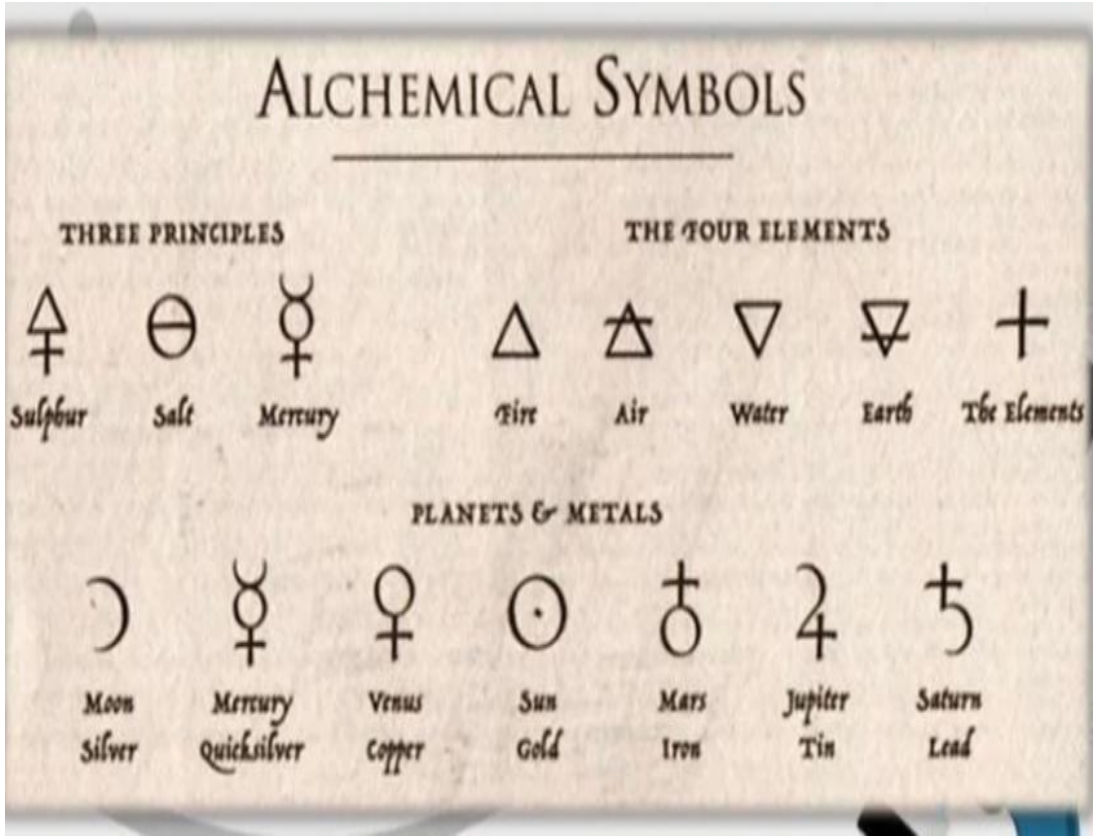
- Elements – 118
- Compounds – millions
- Elements and compounds react in number of ways
- Describing reactions by writing full names – inconvenient
- Use of symbols – represent elements

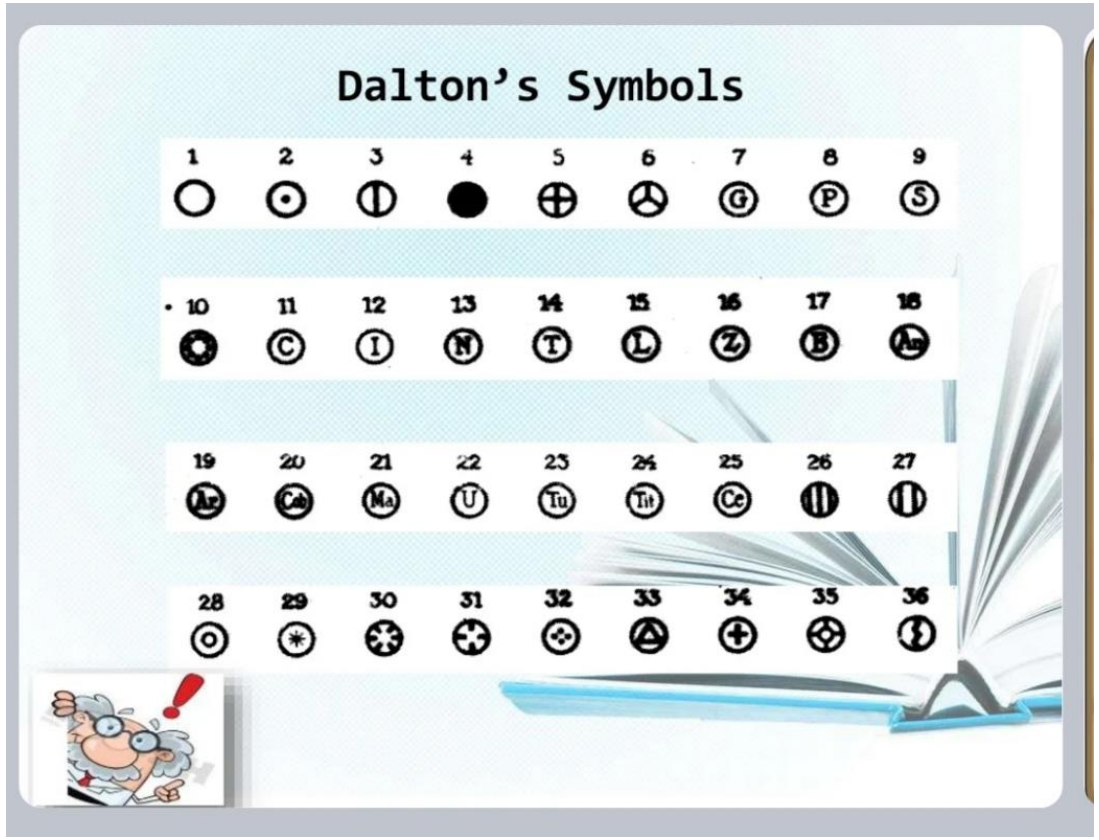


Name	Symbol
Gold	☉
Silver	☽
Copper	♀
Iron	♂
Tin	♃

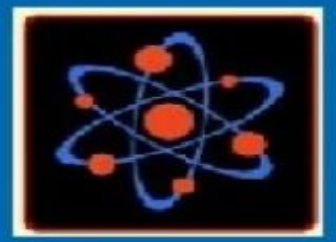
Name	Symbol
Lead	♄
Mercury	☿
Sulfur	🜍
Nickel	🜇
Antimony	🜎

Symbols:


ALCHEMICAL SYMBOLS
THREE PRINCIPLES
THE FOUR ELEMENTS
Sulphur
Salt
Mercury
Fire
Air
Water
Earth
The Elements
PLANETS & METALS
Moon
Silver
Mercury
Quicksilver
Venus
Copper
Sun
Gold
Mars
Iron
Jupiter
Tin
Saturn
Lead


Dalton's Symbols

Symbols#1

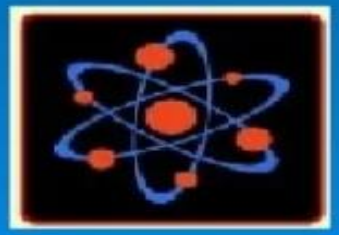


- Scientists around the world use a common set of **symbols** to represent all the different elements. In some cases the symbol of the element is the first letter of the name of the element. It is written in capital.

Symbol	Element
H	hydrogen
F	fluorine
I	iodine
B	boron
S	sulfur
O	oxygen

Symbols#2

- Several elements begin with the same letter for example Scandium and Silicon. To identify any of these as a separate element, its symbol has the first letter of the name followed by the second letter from within the name. Scandium has the symbol Sc, while silicon has the symbol Si. T he first letter is always a capital one and the second letter is in lower case.



Element	Symbol
magnesium	Mg
manganese	Mn
chlorine	Cl
calcium	Ca
beryllium	Be
bromine	Br

Symbols#3

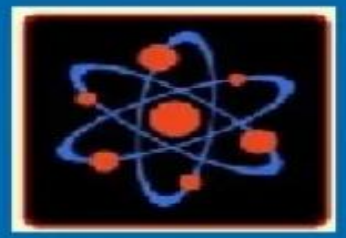
- Sometimes the symbol for an element is derived from the Latin name for that element.

Element	Symbols
Sodium	Na(natrium)
Lead	Pb(plumbum)
Iron	Fe(ferrum)
Potassium	K(kalium)

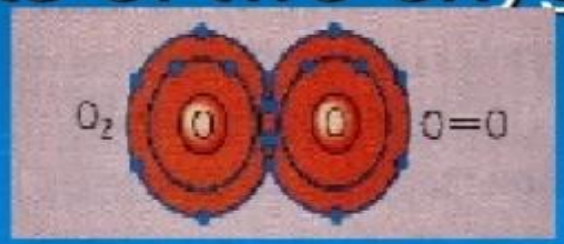
SOME ELEMENTS WHOSE DERIVED FROM THEIR LATIN NAMES

English Name	Latin Name	Symbol
Sodium	Natrium	Na
Potassium	Kalium	K
Iron	Ferrum	Fe
Copper	Cuprum	Cu
Tin	Stannum	Sn
Silver	Argentum	Ag
Antimony	Stibium	Sb
Gold	Aurum	Au
Mercury	Hydrargyrum	Hg
Lead	Plumbum	Pb

Formulae



- The compound we call water has the **formula** H_2O. This is a shorthand way of saying that every water molecule consists of two hydrogen atoms and one oxygen atom. The gas we call oxygen has the formula O_2. This means that an oxygen molecule consists of two oxygen atoms joined together.



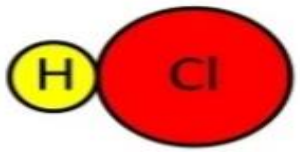
Oxygen molecule

Formulas:

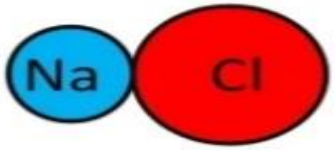
- Used to represent a group of elements that are connected (a compound/molecule).
- Tells us what kind of atoms are connected and how many of each atom (element) are present.
- The order of atoms in the combination is NOT known from the formula.

HCl **NaCl**

HCl

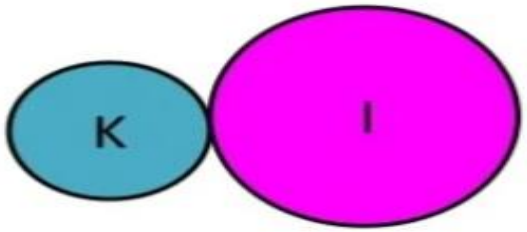


NaCl



LiF

KI



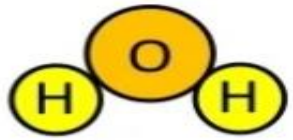
Coefficient:

- The number found in front of a symbol or formula.
- Indicates the number of copies (or usually molecules) there are.
- The atoms/molecules/compounds are separate/not connected!

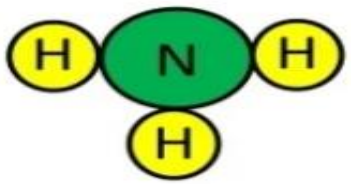
$5CO_2$ $10C_{12}H_{22}O_{11}$ $4MgCl_2$

CO_2

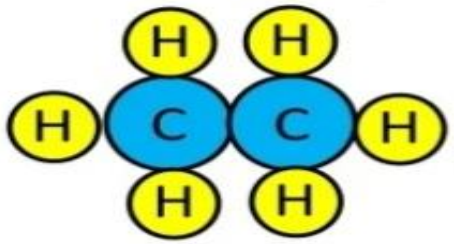
H_2o



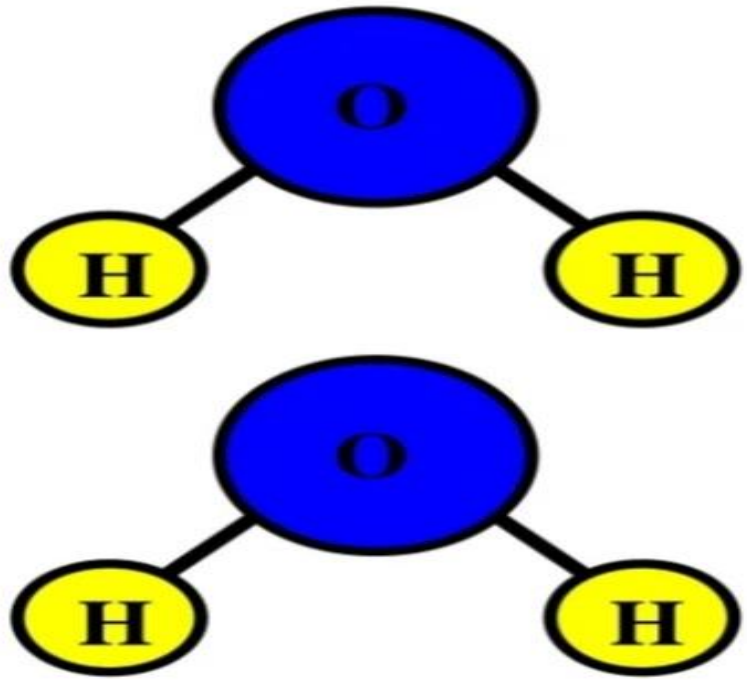
NH_3



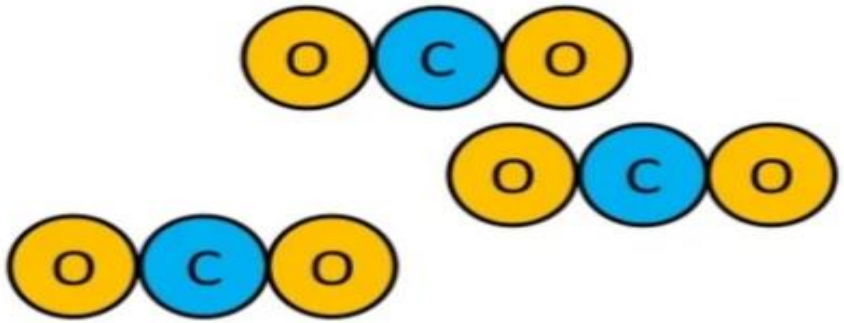
C_2H_6



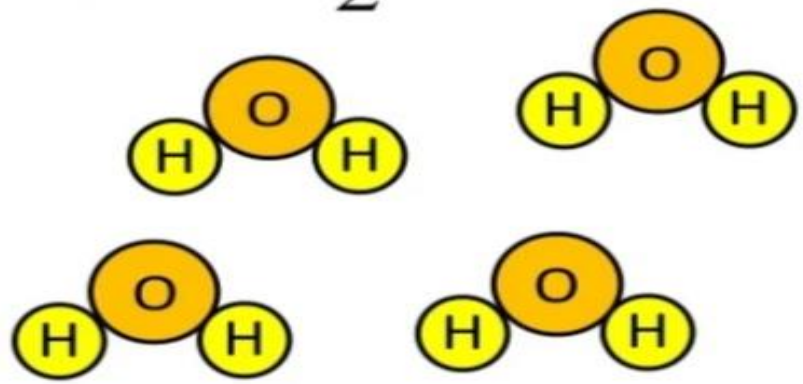
$2\ H_2O$



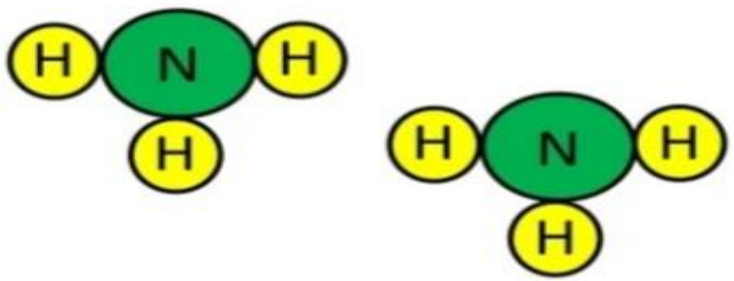
3 CO_2



4 H_2O



2 NH_3



2 C_2H_6