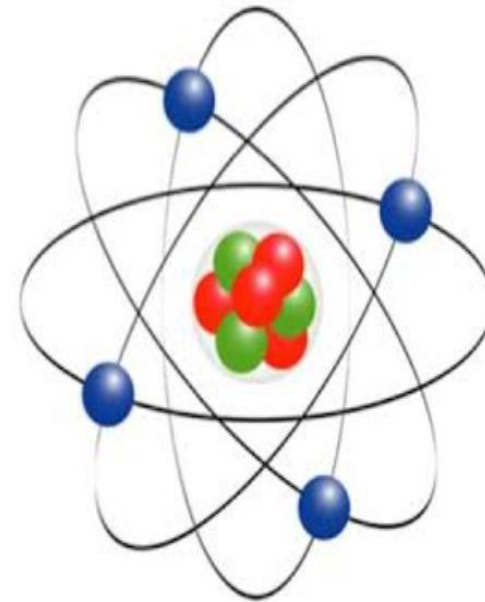


Ch-3 Structure of matter

Atom

- All matter is made up of atoms
- Building blocks of matter
- Scientists – structure of atoms – experiments
- The smallest unit (particle) of an element that has all of the properties of that element



Modern Periodic Table

Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Period 1	1 H																	2 He
Period 2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
Period 3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
Period 4	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
Period 5	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
Period 6	55 Cs	56 Ba	* 71 Lu	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
Period 7	87 Fr	88 Ra	* 103 Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og
			* 57 La	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		
			* 89 Ac	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		

ATOMIC NUMBER

Number of Protons present in the atom

Characteristics/Properties of Elements



Reactive capacity



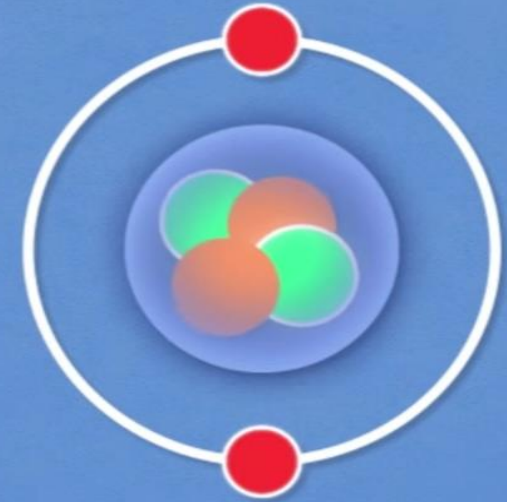
(Depends on)

Number of Electrons



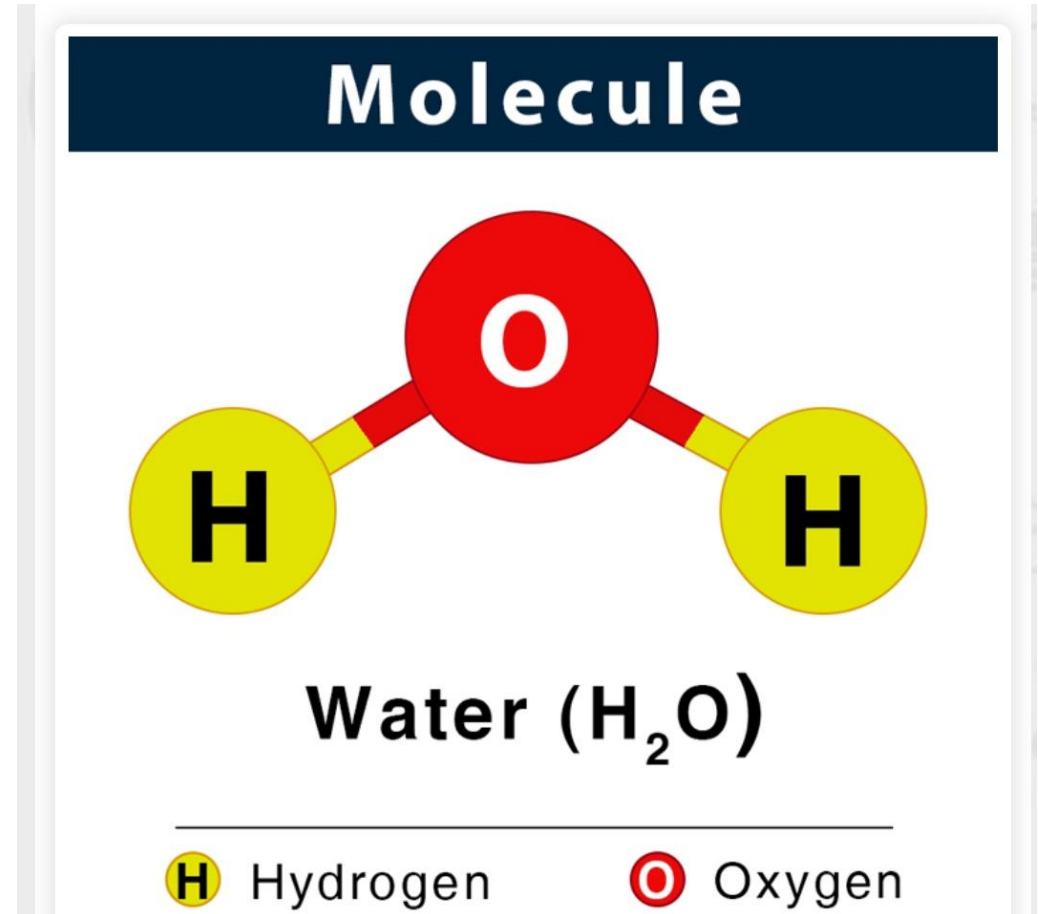
(Same as)

Number of Protons *(Atomic Number)*



Molecules

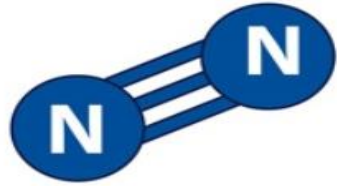
- Two or more atoms held together by attractive forces known as covalent (chemical) bonds
- Atoms of different elements combine together to form molecules.
- Examples: water, sugar, carbon dioxide



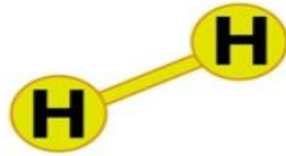
Examples of Molecule



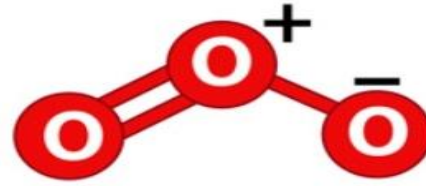
Oxygen
(O_2)



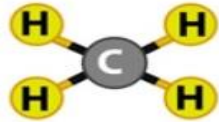
Nitrogen
(N_2)



Hydrogen
(H_2)



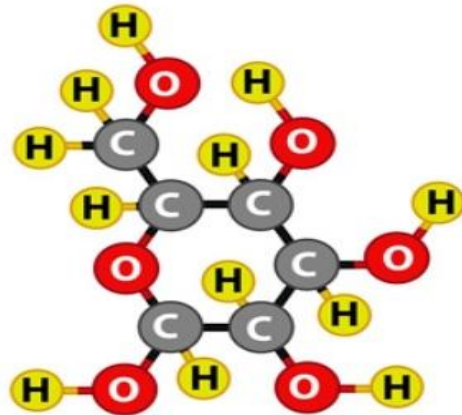
Ozone
(O_3)



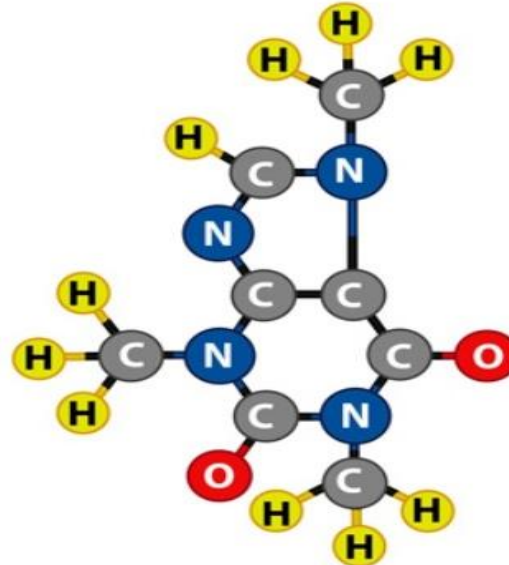
Methane
(CH_4)





Ammonia
(NH_3)





Glucose
($C_6H_{12}O_6$)



Caffeine
($C_8H_{10}N_4O_2$)

 Carbon
 Oxygen

 Hydrogen
 Nitrogen

Molecules of Compounds:

- Molecules of compounds contain fixed number of atoms of different elements joined together chemically

Compounds:

- Elements combine each other to form compounds
- Few elements occur in free state in nature like carbon, nitrogen and gold.
- Pure elements can be obtained by breaking up a compound into its constituent elements.
- Electrolysis of water

Properties of compounds:

- Compound can be broken down into its constituent elements by chemical methods.
- Compound always contain the same number of elements combined together chemically in a fixed ratio.
- Properties of a compound are different from those of its constituent elements.

Mixtures:

- Elements or compounds mixed together physically but not chemically
- No new molecules are formed here
- Example: Air, tap water

Activity 1:

- Aim:
 - To separate elements present in the mixture
- Materials required:
 - Powdered iron and sulphur
 - China dish
 - Magnet

Activity 2:

- Aim:
 - Elements that combined chemically cannot be separated again into its constituent elements.
- Materials Required:
 - 8 g of sulphur
 - 14 g of iron
 - China dish