Falcon Academy 3rd Term Chemistry Note's for Grade 7 Students

Unit – 4
The structure of substances

4.1 Historical development of the atomic nature of substances

- The ancient Greek philosophers described continuous or desecrate let as see some philosopher to describe matter.
- Democritus (460 – 370 B.c)
- The described a pieces" is reached where for there division of any material is impossible matter is discrete
- He called these particles are called atoms
- The word atom has its origin from the Greek word Atoms which mean indivisible
  - Aristotle /384 – 322 B.C)
- He argued that matter is continuous these mean that any material can be divided with out limitation
  - The comparison between the discrete and continuous theory of matter.

*Discreteness of matter (Democritus)	* Continuity of matter /Aristotle
Matter is discrete	* matter is continous
There is a limited to which matter is broken	* matter is infinitely divisible
He believed in the existence of atoms	* He rejected the idea of atoms

Activity

1. How was the word "Atom" introduces to the study of chemistry?
2. What would you obtain if you continually divide a piece of chalk?
3. What do you mean when you say a substances is continuous?
4. Which theory led to the concept of atoms?
5. Explain the comparison between the democrats and Aristotle theory of matter
6. Who was the discovery of an atom for the first time?
7. What are the fundamental sub atomic particles of matter?
8. Explain the difference between atoms and ions?
9. Explain the difference between molecules and atoms?
10. Explain the different between mono atomic and diatomic molecules?

4.2 Atomic Theory

- There are three main theory's to explain the atom they are
  I. Atomic theory
  II. Mendeleev atomic theory
  III. Modern atomic theory
- Dalton's Atomic theory (1766 – 1844)
  - ✓ The real father of modern chemistry and the proposed of atomic theory was established by john Dalton

- ✓ He was observed to ides to explain the atoms
  - I. The low of conservation of atoms (mass)
  - II. The law of definite proportion of atoms

❖ Dalton's explanation of these experimented finding led to the revival of democrats atomic view of matter

❖ The main ideas (points) f Dalton's atomic theory are shown below:-

1. Matter consists of very small particles called atoms
2. Atoms are indivisible
3. All atoms of a given elements are identical the y have the same mass and properties
4. Atoms of one elements are different from atoms of other elements in mass and other properties
5. During a chemical reaction involves only the separation combination or rearrangements of atoms it does not the result of their creation or destruction
6. In a given chemical rx^{n} atoms combine in a fixed small whole number ratio to from a compound

e.g 21.$\overset{O}{C}$ a CO_2 it contains 1 atoms of 'C' & 2 atoms of oxygen in a ratio <u>1:2</u>

21 $H2_O$ ⇒ <u>2:1</u>

❖ **<u>Short comings (limitations) of Dalton's Atomic theory</u>**

✓ Dalton's atomic theory has a certain limitations. Because of the discovery of the sub atomic particles (proton electron and neutron there for Dalton's atomic theory was <u>amended</u>

His limited are

1. Atoms are indivisible this statement is wrong because atoms can be divided in to sub
   atomic particles
2. Atoms of the same element have the same mass

❖ Mendeleev's Atomic theory

- He discovered with 65 elements He accepted Daltons atomic theory

❖ Activity 2

1. What are the limitation of Daltons of Dalton's atomic theory?
2. List the seven diatomic elements?
3. Write at list three main ideas included in Daltons atomic theory?
4. According to Dalton all atoms of carbon must have the Same
   _____
5. According to the modern atomic theory , atoms of the same element may have different?
6. What is the difference between mass number and atomic mass?
7. All atoms of oxygen have the same mass is this statement true to day?
8. Explain how the law of observation (conservation) of mass in obeyed according to Daltons atomic theory?
9. How many atoms of 'H' are required for every atom of "O" to from water ? to which point Daltons atomic theory do you relate this?

10. What are the two main parts of an atom?