GRADE EIGHT N S NOTES

Matter and Materials

In Primary School we learnt that matter is made up of particles. Now we learn that those particles are atoms or molecules.

ATOMS

They form the smallest unut of matter. They have a nucleus and levels of electrons.The nucleus contains positive protons and neutral neutrons. Together they form the mass of the atom.The negative electrons are found in levels around the nucleus. They form the volume of the atom. All atoms are neutral as they hyave the same number of protons and electrons . We know that if we add posive 3 and negative 3 then the sum will be 0 .Both electrons and protons are sub atomic particles . All elements contain atoms. When youdraw an atom of an element it must be scientifically correct. The Periodic Table of Elements will give us the number of protons and electrons for each element.

Periodic Table

It contains elements that are found in vertical columns called Groups and horizontal rows called Periods. There are

118 elements found in 18 Groups and 7 Periods. In grade 8 we need to study the first 20 elements. You will notice that Hydrogen is number 1. It is found in Period 1 but it can not be in group 1 as all the other elements in that Group are metals. Hydrogen is a gas and there are no metal gases. Mercury is a liquid metal, but all other metals are solids. Look at the Periodic Table on page 69 of your text book and generate a table of the first twenty elements . Use the following column headings. Number 1- 20, Symbol of element. Name of element, Number of protons, Number of electrons. Each element will either be a Metal, Semi Metal or Non Metal, Each element will also be a solid or a gas. There are no liquids in the first 20 elements. In fact we only need to know about Mercury, the metal liquid and Bromine the non Metal liquid.

2) Write down the Group and Period position of each of the elements in number 1

3) Are any of 1-20 in the Groups 3-12?

4)Are all of these elements Metals ?

5) Find the symbols for these elements: Manganese, Iron, Copper, Zinc, Silver, Tin, Bromine, Gold, Lead and Uranium.

6) Draw an atom of Carbon. It has 6 protons in the nucleus and 2 electron levels. Two electrons are found in the first level and 4 electrons in the 2^{nd} level.

7) Find out two uses of or interesting facts about element 1-20 and any 5 of the other elements mentioned in this note.

Pure and Impure Substances

All elements are pure substances as they have a specific make up. When you join elements together they form molecules ,which are also Pure as they also have a specific make up. The two types of molecules are Diatomic molecules aka molecules of atoms and Compound molecules. Diatomic molecules form when two atoms of the same element join chemically and Compouds form when two elements join chemically. Oxygen and Nitrogen gas are diatomic molecules while Carbon dioxide and Water vapour are both compound molecules. To draw a diatomic molecule you would draw 2 same size circles touching each other to represent the two atoms. To draw a compound molecule you would draw circles of different sizes to represent the different elements. In water the two Hydrogen atoms could be smaller and above the bigger Oxygen atom. This could help you to remember that water conducts an electric current. With the carbon dioxide, the carbon would be in the middle so that both oxygen atoms touch it. It could also be a different colour.

1) Write the chemical formula for water, carbon dioxide, sodium chloride, magnesium oxide and calcium chloride.
2) Draw molecules of sodium chloride and calcium chloride
3) Draw a molecule of Hydrogen gas

   Impure substances incude all mixtures as they do not have a specific make up and they can be physically separated. Air and muddy water are mixtures. What can we find in air? Will it be the same on a beach and in the middle of an Industrial are? How would we separate the sand and water in muddy water?Would sea water be a mixture or a compound? Explain your previous answer. How could you reclaim the sait from the sea water?If you wanted the salt and the water what further processes would you use in order to do so.D

   DECOMPOSITION OF COMPOUND

   Decomposition is the process of breaking down molecules to form atoms or compounds to form elements. Methods include electrolysis and heating of the compound.

   Read through the experiment on page 73 and 74 of your text book

   If an electrolyte is a chemical solution through which you pass an electric current then answer these questions

   1) What is the electrolyte in Activity 4,3?
   2) What is the name given to the negative electrode?
   3) What is the name of the positive electrode?
   4) Would the experiment work if you used a material that does not conduct electricity as an electrode
   5) Which electrode is coated with copper
   6) Which electrode has bubbles of chlorine gas formimg
   7) Why should the electrodes not touch
   8) What do we call a number of electric cells joined together
   9) What do we call the two ends of the battery
   10) Why should you do this experiment in a well ventilated place