

Chapter 2 Matter  
Notes

Name: \_\_\_\_\_

What is matter?

*Chemical changes in matter are essential to all life processes.*

What are elements?

What are examples of elements?

ATOMS

Definition of an atom:

Structure of an atom

*INSIDE the nucleus:*

*Protons:*

*The atomic number of an element is always the same as the number of protons that it has.*

*Neutrons:*

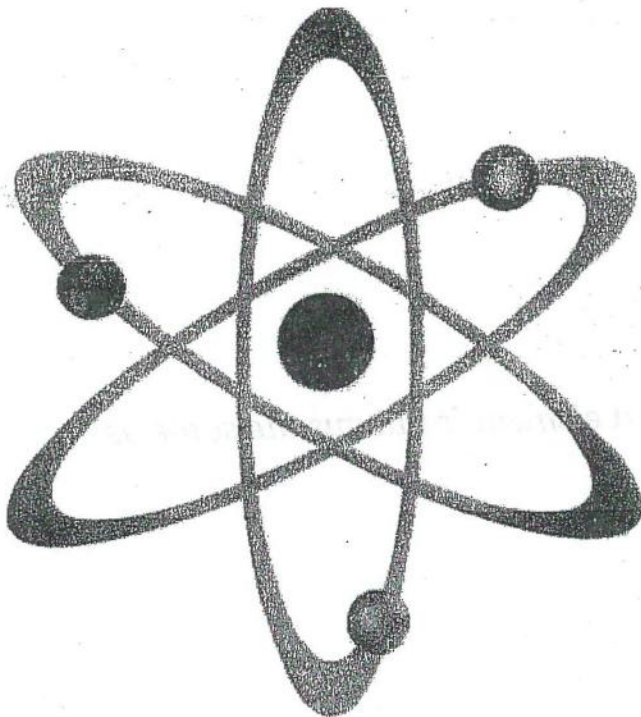
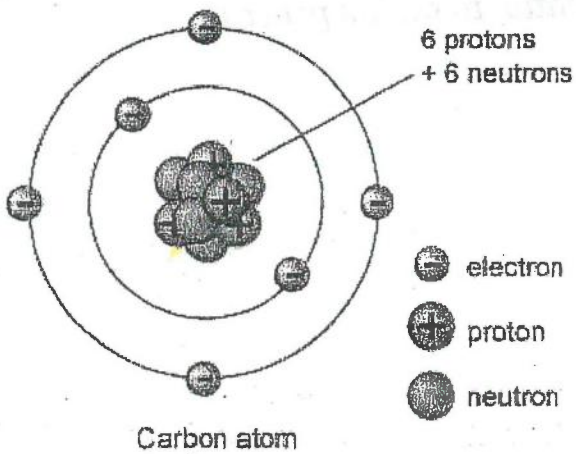
*OUTSIDE the nucleus:*

*Electrons:*

Electrons rotate around the nucleus on different \_\_\_\_\_ or \_\_\_\_\_.

The first shell holds \_\_\_\_\_ electrons.

The outer shell holds \_\_\_\_\_ electrons.



*ATOMS continued (VERY IMPORTANT!)*

*All atoms want to be happy (stable).*



*In order to be happy, they need \_\_\_\_\_.*

*What will the atom do in order to fill its outer shell with electrons and feel happy?*

*Example:*

*1. Look back at the picture of the carbon atom.*

*How many electrons are in the OUTER shell? \_\_\_\_\_*

*So how many electrons does carbon need to be happy? \_\_\_\_\_*

*How many bonds then can this carbon form with other atoms? \_\_\_\_\_*

*2. Nitrogen*

*How many electrons are in the OUTER shell? \_\_\_\_\_*

*So how many electrons does carbon need to be happy? \_\_\_\_\_*

*How many bonds then can this carbon form with other atoms? \_\_\_\_\_*

*3. Oxygen*

*How many electrons are in the OUTER shell? \_\_\_\_\_*

*So how many electrons does carbon need to be happy? \_\_\_\_\_*

*How many bonds then can this carbon form with other atoms? \_\_\_\_\_*

## COMPOUNDS

Definition:

Example:  $H_2O$

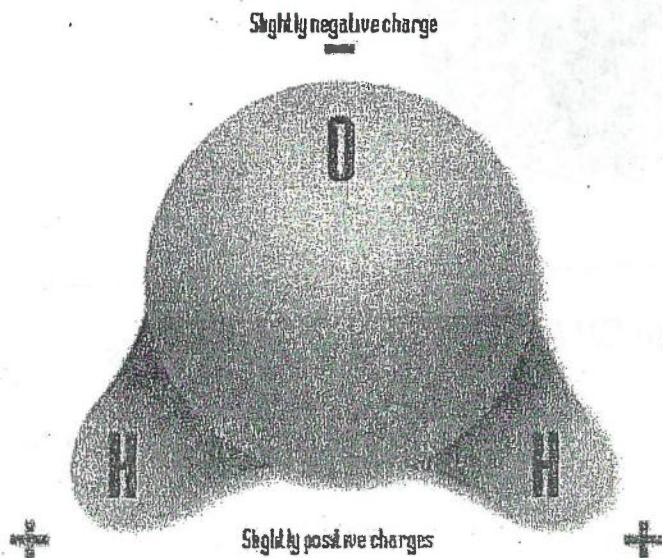


Figure 1: Structure of polar covalent water molecules. Polarity of the water molecule is a result of the asymmetrical arrangement of the atoms within it.

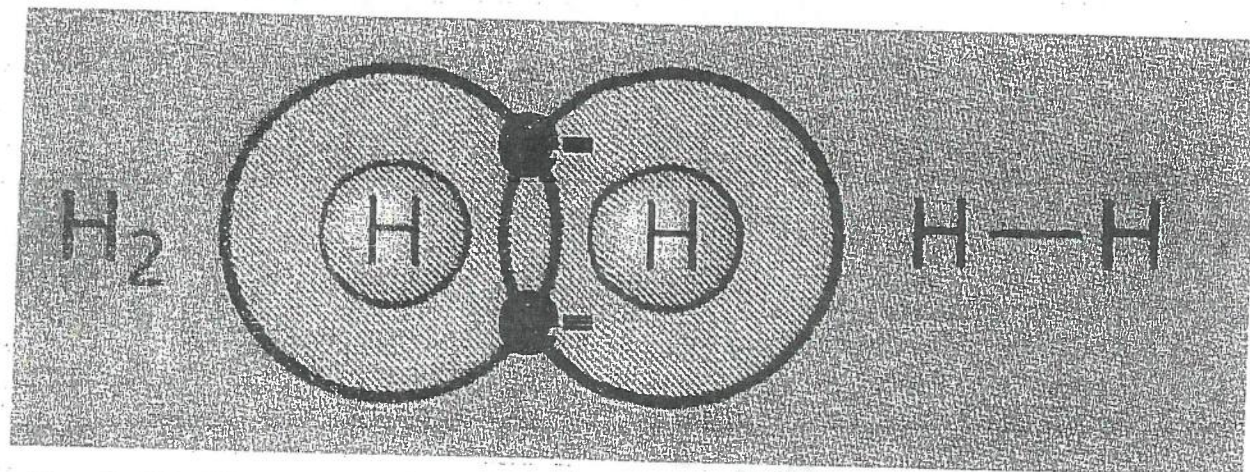
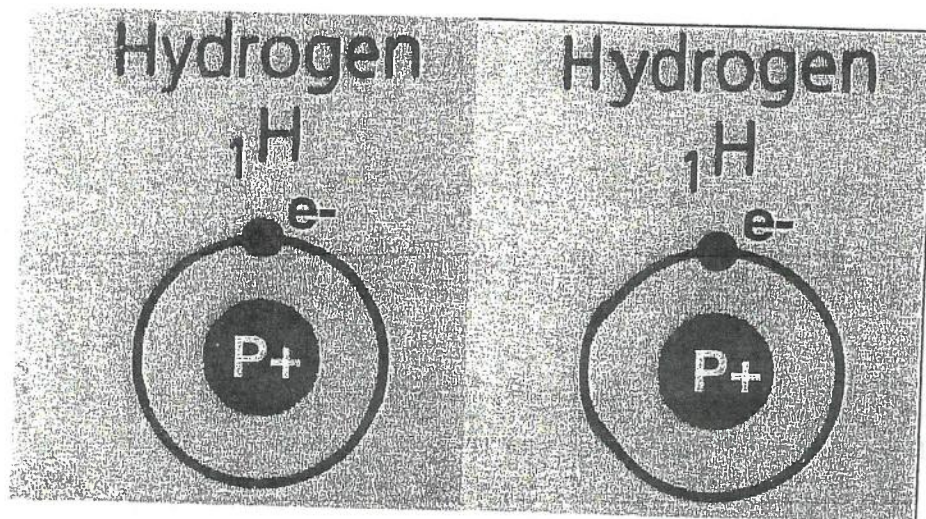
In order to form the compound, the atoms form \_\_\_\_\_ that join the atoms and cause the atoms to become stable.

## TYPES OF CHEMICAL BONDS

### 1. COVALENT BONDS:

Covalent bonds help atoms become stable and happy and form a \_\_\_\_\_ when in their simplest state.

Example: 2 H atoms form a hydrogen gas molecule.



Explanation:

Draw the the oxygen atom and the 2 hydrogen atoms with how they bond to each other and form this compound:

## IONIC BONDS

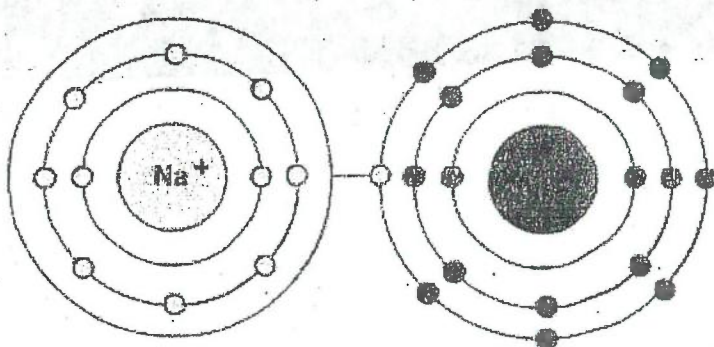
*Definition:*

*Example: NaCl*

*Na (sodium) has 11 protons and 11 electrons*

*Cl (chlorine) has 17 protons and 17 electrons*

*What do they do to become NaCl and form an ionic bond?*



*Ions:*

*What happens when you put a positively charged atom and a negatively charged atom together?*

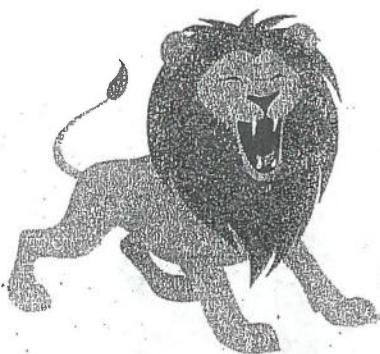
**REDOX REACTIONS**  
*Reduction Oxidation Reactions*

*Defintion:*

*Reduction Reaction: Gain electrons*

*Oxidation Reaction: Lose electrons*

*How can you remember this?*



**LEO ---- GER**

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