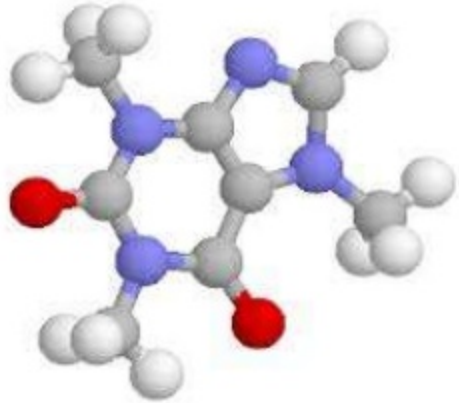
CHAPTER 2

BASIC CHEMISTRY

WHY ARE WE REVIEWING CHEMISTRY?

WE ARE REVIEWING CHEMISTRY BECAUSE:

- your entire body is made up of chemicals
- chemical processes underlie all body processes
- the food you eat, the medicines you take, it's all chemistry!



CHEMISTRY IS…

- chemistry: the science that deals with the composition and properties of substances and various elementary forms of matter.

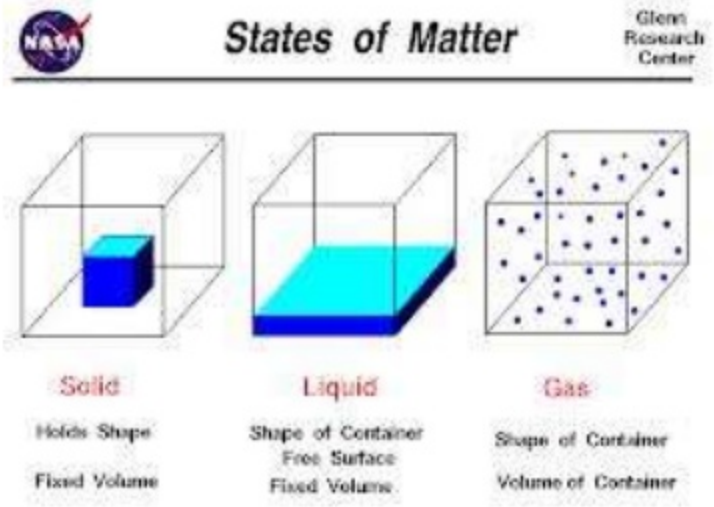
- biochemistry: the chemistry of living material

CONCEPTS OF MATTER AND ENERGY

- matter: anything that has mass and takes up space
- it is the "stuff" of the universe
- chemistry studies the nature of matter

THREE STATES OF MATTER

- three main states of matter
  - 1. solid – definite shape, definite volume
  - 2. liquid – no definite shape, definite volume (fits to the size of its container)
  - 3. gas – no definite shape, no definite volume (expands to fill available space)



THREE STATES OF BODY MATTER

- Bodily examples:
  - 1. solid – bones, teeth
  - 2. liquid – blood, urine
  - 3. gas – air, digestive byproducts

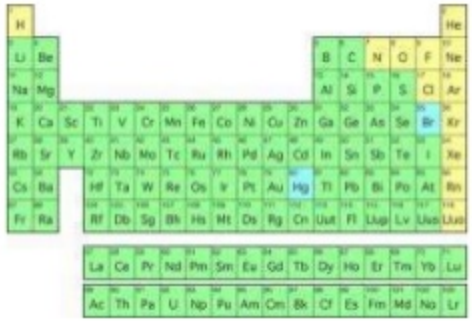
ELEMENTS

- Element: substances that cannot be broken down into simpler substances

- Can you name some examples?
- (Please say yes!)

PERIODIC TABLE

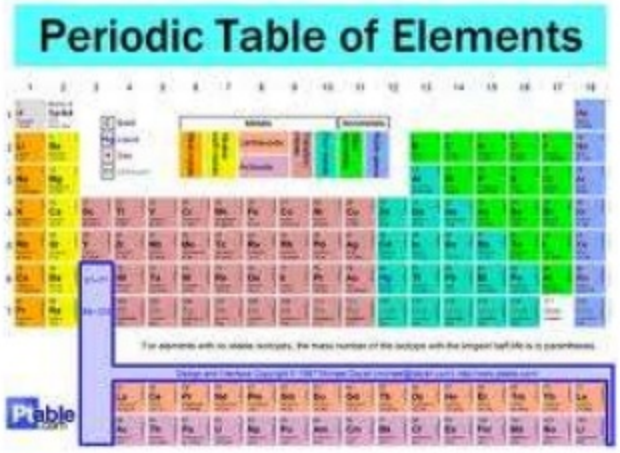
- A complete listing of all the elements appears in the Periodic Table
- It is called periodic because it repeats
- The modern Periodic Table was developed in 1869 by a Russian scientist named Dimitri Mendeleev



PERIODIC TABLE

PERIODIC TABLE BASICS

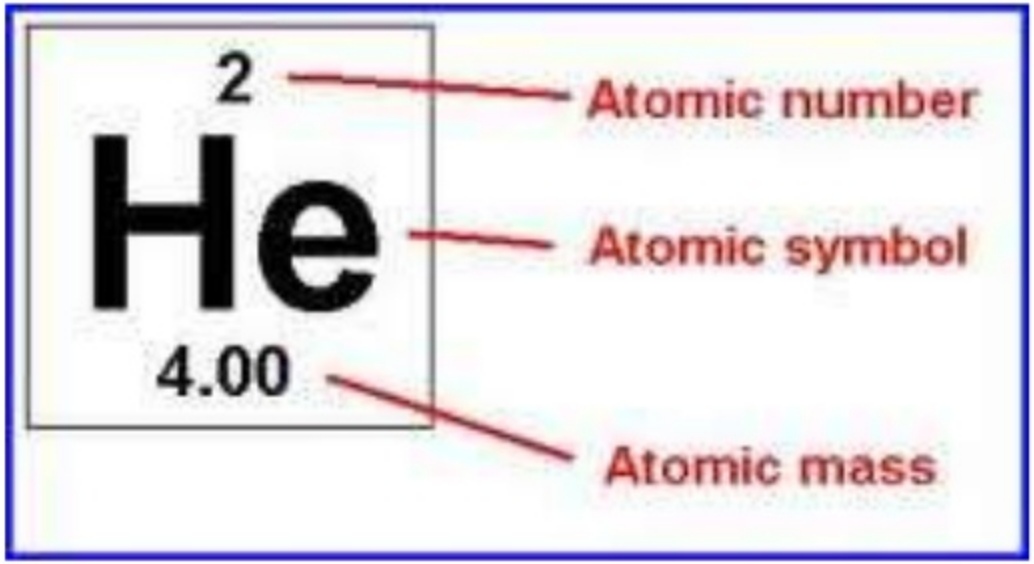
- A vertical column is called a group or a family
  - These groups usually contain the same number of valence electrons
- A horizontal row is called is called a period or a series
  - These periods show similarities in ionization and activation energy



PERIODIC TABLE BASICS

- On the left hand side are the metals
  - Usually solid, shiny, good conductors of heat and electricity
- On the right hand side are the non-metals
  - Usually gaseous, dull, poor conductors of heat and electricity
- In the diagonal space between metals and non-metals are the metalloids
  - Some characteristics of both metals and non-metals

OK, SO NOW HOW TO READ THIS THING



READING THE PERIODIC TABLE

- Review: (fingers crossed here)
- All elements are made up of only one type of atom
- Atom: the smallest part of an element, indivisible by normal chemical means

SUBATOMIC PARTICLES

- Every atom is composed of three types of subatomic particles:
- 1. Protons (P^+) positively charged, found in the nucleus, has mass
- 2. Neutrons (N^0) neutrally charged, found in the nucleus, has mass
- 3. Electrons (E^-) negatively charged, found outside the nucleus, had negligible mass

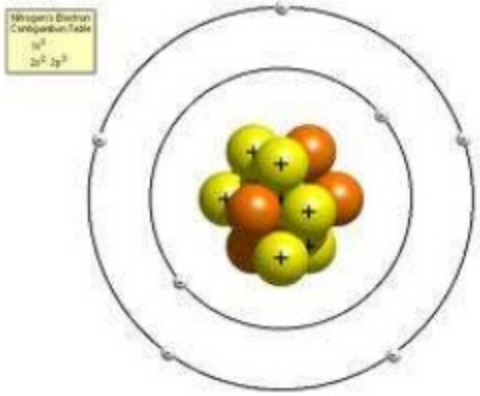
READING THE PERIODIC TABLE

- The Chemical/Elemental Name of the element is given

- The abbreviated symbol related to the name of the element is called the Chemical/Elemental symbol

READING THE PERIODIC TABLE

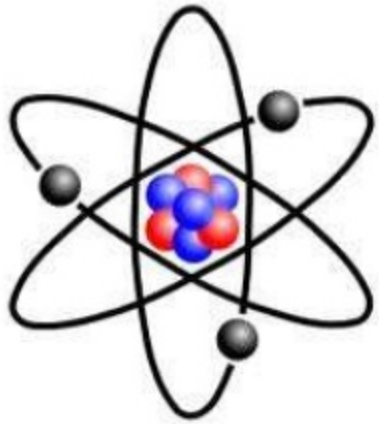
- The atomic number is the number of electrons
- And in a balanced atom, the number of electrons is equal to the number of protons
- Think here, - = + means no charge!



READING THE PERIODIC TABLE

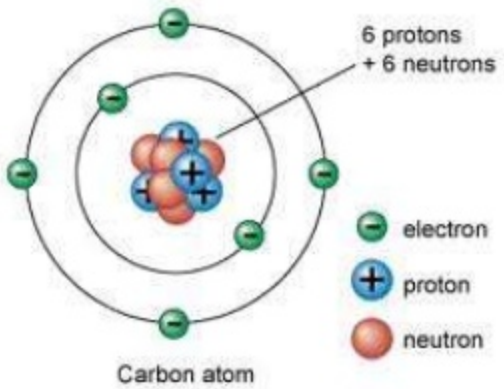
- Then the atomic mass is equal to the mass of the nucleus (protons + neutrons)

- Remember, neutrons add mass but have no charge!

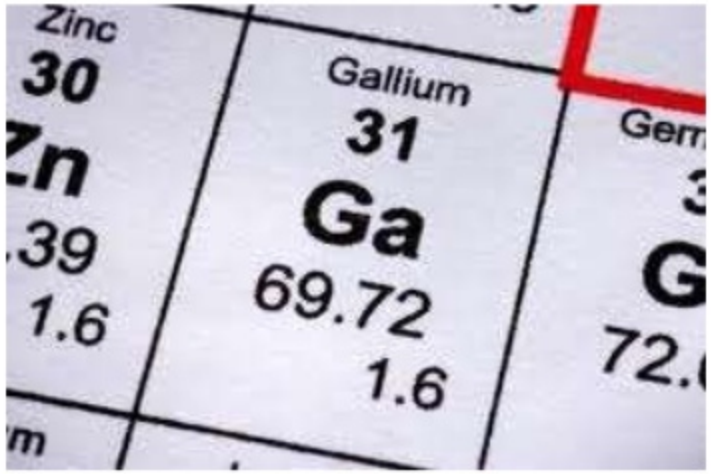


NUMBER OF NEUTRONS

- To find the number of neutrons all you must do is:
- Atomic mass – atomic number
- (protons + neutrons) – protons = neutrons
- Easy!



SO WHEN YOU READ THIS:



- You should be able to tell me the chemical symbol, chemical name, atomic mass, atomic number, number of protons, neutrons and electrons.