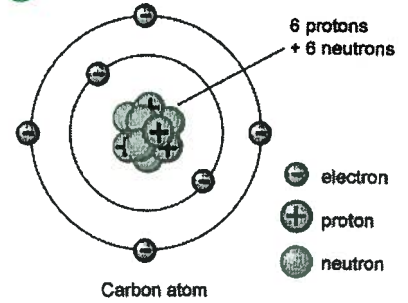


Atoms are the building block of matter. Living & nonliving things are made of matter.

Structure of an ATOM

3 parts

1. **PROTONS** + charge in the nucleus
2. **NEUTRONS** no charge in nucleus
3. **ELECTRONS** - charge orbit the nucleus in energy/valence levels
 - 1st energy level can hold 2 electrons
 - 2nd energy level can hold 8 electrons
 - 3rd energy level can hold 18 (2,8,8) electrons



The Periodic Table identifies the atomic mass and atomic number of an element.

Atomic Mass	➔	12.01	Round to nearest whole number.
		C	
Atomic Number	➔	6	Periodic table is aligned by atomic number

To calculate how many protons, neutrons, and electrons an atom or a given element has use the following:

Atomic Number = # PROTONS = # ELECTRONS

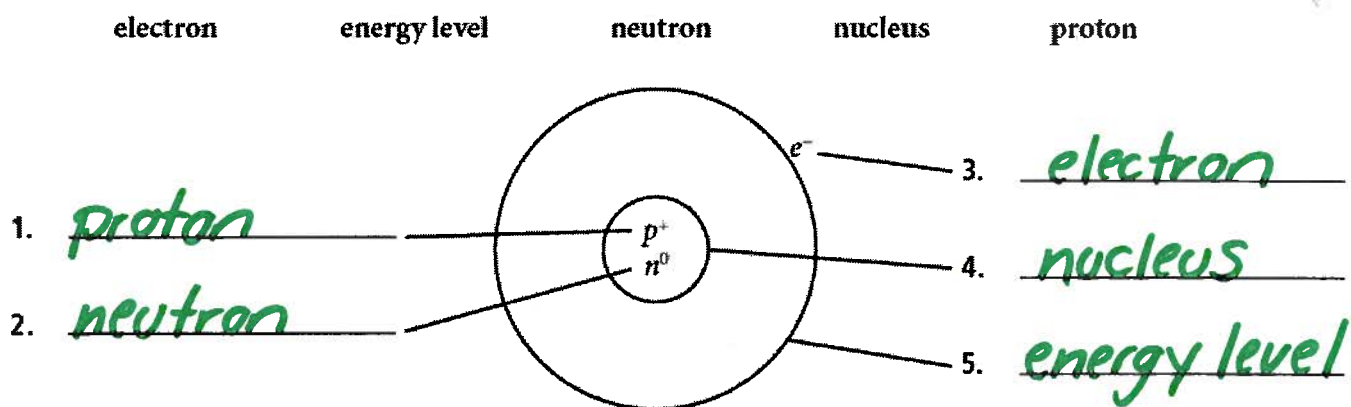
Atoms are neutral/have NO CHARGE there for the number of protons and electrons are Equal

Atomic weight/mass - Atomic Number = # NEUTRONS (Round the atomic weight/mass before calculating the number of neutrons.)

For each element, identify the Protons, Electrons, & Neutrons then, draw the atom.

Nitrogen <i>N</i>	Oxygen <i>O</i>	Lithium <i>Li</i>
<p><i>A# : 7 AM: 14.007</i> <i>(14)</i></p> <p><i>• P: 7</i> <i>e E: 7</i> <i>o N: 14 - 7 = 7</i></p>	<p><i>A# : 8 AM: 15.999</i> <i>(16)</i></p> <p><i>• P: 8</i> <i>e E: 8</i> <i>o N: 8 (16 - 8)</i></p>	<p><i>A# 3 AM: 6.941</i> <i>(7)</i></p> <p><i>• P: 3</i> <i>e E: 3</i> <i>o N: 4 (7 - 3)</i></p>

Fill in diagram and chart below.



Statement	Electron	Neutron	Proton
1. Positively charged particle			X
2. Located outside the nucleus	X		
3. Can be shared by two atoms	X		
4. Has no charge		X	

Atoms with different number of neutrons are Isotopes.

Notice the type of notation used for atoms:

$$\begin{matrix} A \\ Z \end{matrix} X$$

X = chemical symbol of the element

Z = "atomic number"

A = "mass number"

${}^{12}_6\text{C}$, ${}^{13}_6\text{C}$, and ${}^{14}_6\text{C}$ are notations that represent isotopes of carbon.

${}^1_1\text{H}$, ${}^2_1\text{H}$ and ${}^3_1\text{H}$ are notations that represent isotopes of hydrogen.

How many neutrons are in each of the Carbon notations above?

${}^{12}\text{C}$
has 6: N

${}^{13}\text{C}$
has 7: N

${}^{14}\text{C}$
has 8: N

List the Six most common elements found in living things.

Carbon
Hydrogen
Nitrogen
Oxygen
Phosphorus
Sulfur
'CHNOPS'



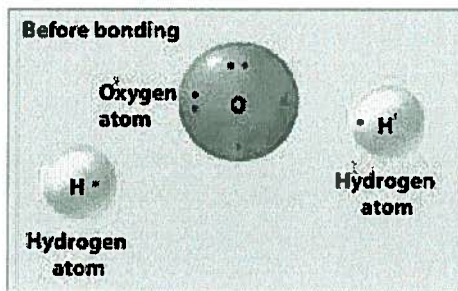
What do atoms bond together?

Atoms bond together to fill their valence electrons to become Stable. When atoms bond they form compounds.

Water is a compound. 2 hydrogens combine with 1 oxygen. H_2O .

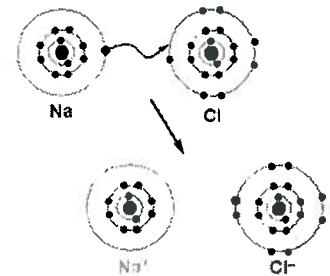
TYPES OF BONDING

Covalent Bonds -share electrons and form molecules. Example water molecule.

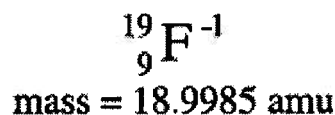
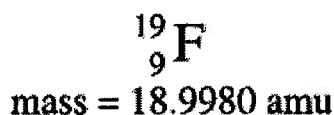
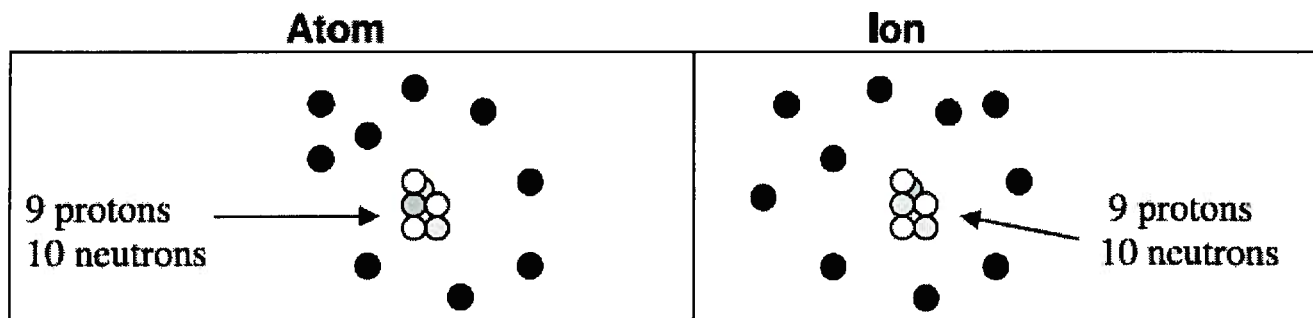


Copyright © 2007 Pearson Education, Inc., publishing as Pearson Addison-Wesley

Ionic Bonds -is the attractive force between two ions of different charges
Ion - charged particle/atom
If an atom gives up an electron it becomes a Positively charged ion Na^+
If an atom accepts electrons it becomes a Negatively charged ion Cl^-
 $NaCl$ (table salt) is formed by an ionic bond.



Atom becomes positively charged when it loses an electrons
negatively charged when it Gains an electrons

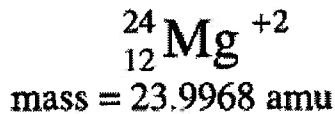
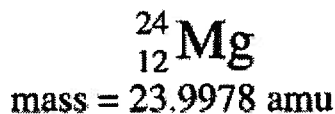
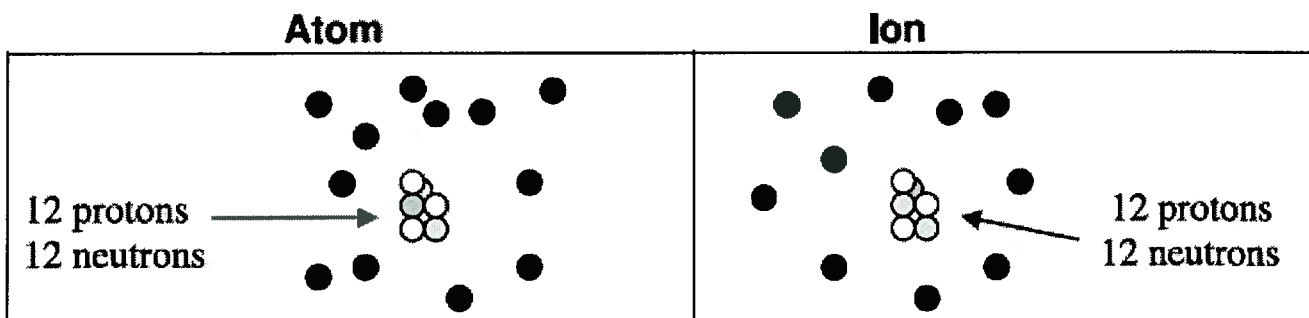


How many protons, neutrons and electrons does the Fluorine ATOM have??

9 10 9

What is different in the Fluorine ION?

Has one more electron (10), instead of 9, creating a - charge.



How many protons, neutrons and electrons does the Magnesium ATOM have??

12 12 12

What is different in the Magnesium ION?

The ion has 2 less electrons, 10, not 12 like the atom. This creates a positive charge.