ATOMIC STRUCTURE

Name _____

An atom is made up of protons and neutrons (both found in the nucleus) and electrons (in the surrounding electron cloud). The atomic number is equal to the number of protons. The mass number is equal to the number of protons plus neutrons. In a neutral atom, the number of protons equals the number of electrons. The charge on an ion indicates an imbalance between protons and electrons. Too many electrons produces a negative charge, too few, a positive charge.

This structure can be written as part of a chemical symbol.

Example: $^{15}_{7}N^{+3}$

mass number ↓ 15

charge ↙ +3

atomic number ↗ 7

7 protons
8 neutrons (15 – 7)
4 electrons

Complete the following chart.

Element/ Ion	Atomic Number	Atomic Mass AVERAGE	Mass Number	Protons	Neutrons	Electrons
H			3			
H^+					0	
$^{12}_{6}C$						
$^{7}_{3}Li^+$						
$^{35}_{17}Cl^-$						
$^{39}_{19}K$						
$^{24}_{12}Mg^{2+}$						
As^{3-}			76			
Ag			108			
Ag^{+1}					59	
S^{-2}					17	
U			240			

Name_____ Date_____ Period_____

ION Chart

Directions: Complete the following table.

Ion Symbol	Protons	Electrons	Charge
S^{2-}			
K^{1+}			
Ba^{2+}			
Fe^{3+}			
Fe^{2+}			
F^{1-}			
O^{2-}			
P^{3-}			
Sn^{4+}			
Sn^{2+}			
N^{3-}			
Br^{1-}			
Mg^{2+}			
Cu^{1+}			
Cu^{2+}			
U^{6+}			
Mn^{5+}			
Cl^{1-}			
Se^{2-}			

ATOMIC STRUCTURE AND THE PERIODIC TABLE
CHAPTER 4 WORKSHEET

PART A

Given the following isotopes, determine the atomic number, the mass number, the number of protons, electrons and neutrons.

Isotope Symbol	Atomic Number	Mass Number	Protons	Electrons	Neutrons	Isotope Name
$^{131}_{53}I$						
$^{35}_{16}S$						
$^{4}_{2}He$						
$^{27}_{13}Al$						
$^{81}_{36}Kr$						
$^{81}_{37}Rb$						

PART B

Complete the following chart by writing the symbol for the isotope of the following elements. In addition, give the number of protons, electrons, mass number and atomic number and complete the element name.

Element Name	Neutrons	Protons	Electrons	Mass Number	Atomic Number	Isotope Symbol
Uranium-187	145					
Chlorine-____	28					
Oxygen-____	9					
Boron-____	6					
Beryllium-____	5					
Hydrogen-____	1					
Carbon-____	8					

Isotopes or Different Elements

In each of the following statements, you are given a pair of elements and important information about each. Use this information to determine if the pair of elements is isotopes or different elements. Indicate your answer in the space provided.

1. Element D has 6 protons and 7 neutrons.
   Element F has 7 protons and 7 neutrons. _____

2. Element J has 27 protons and 82 neutrons.
   Element L has 27 protons and 83 neutrons. _____

3. Element X has 17 protons and 18 neutrons.
   Element Y has 18 protons and 17 neutrons. _____

4. Element Q has 56 protons and 81 neutrons.
   Element R has 56 protons and 82 neutrons. _____

5. Element T has an atomic number of 20 and a mass number of 40. _____
   Element Z has an atomic number of 20 and a mass number of 41.

6. Element W has 8 protons and 8 neutrons.
   Element V has 7 protons and 8 neutrons. _____

7. Element P has an atomic number of 92 and a mass number of 238.
   Element S has 92 protons and 143 neutrons. _____