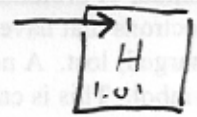
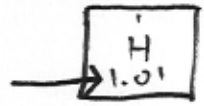


# Practice - Atoms

Key 12-13

Fill in the following table:

Number	What Does It Mean?	How Do You Find It?
Atomic Number	Number of $p^+$ in the nucleus of a given atom.	Periodic Table 
Atomic Mass	Average mass (in u) of 1 atom of a given element.	Periodic Table 
Mass Number	Total # of nucleons in most abundant isotope.	Round atomic mass to nearest whole # to find mass # of most common isotope
Number of Protons	A count of how many protons are in the nucleus of an atom.	Same as atomic number.
Number of Neutrons	A count of how many neutrons are in the nucleus of an atom.	Mass number (A) minus atomic number (Z) - or - $A - Z = \#n^0$
Number of Electrons (in a neutral atom)	A count of how many electrons are in a neutral atom.	Same as # of $p^+$ , atomic #, $Z$ - or - $\#e^- = Z$
Ionic Charge	electrical charge of an atom (ion)	Upper right of chemical symbol - or - $i.c. = -(\#e^- - Z)$
Number of Electrons (in an ion)	A count of how many electrons an ion contains.	Atomic # minus ionic charge. - or - $Z - i.c. = \#e^-$

Fill in the following table:

	Nitrogen	Carbon	Oxygen
Chemical Symbol	N	C	O
Atomic Number	7	6	8
Number of Protons	7	6	8
Atomic Mass	14.01 u	12.01 u	16.00 u
Mass Number	14	12	16
Total Number of Nucleons	14	12	16
Number of Electrons (when neutral)	7	6	8
Number of Neutrons?	7	6	8

1. Which of the above numbers is responsible for the identity of an atom? In other words, which number cannot be changed without changing the atom to a different element? (circle the right answer)

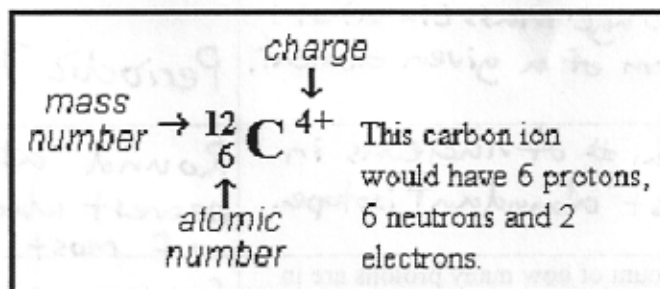
- a. The # of  $e^-$  in the atom      **(b) The # of  $p^+$  in the atom**      c. The # of  $n^0$  in the atom

2. What is the difference between atomic number, mass number, and atomic mass?

Atomic # is # of  $p^+$ , mass # is  $p^+ + n^0$ , and atomic mass is average mass of 1 atom of element.

## Symbolic Notation

An atom is made of protons and neutrons, which are in the nucleus, and electrons, which are in the electron cloud surrounding the atom. The atomic number equals the number of protons. The electrons in a neutral atom equal the number of protons. The mass number equals the sum of the protons and neutrons. The charge indicates the number of electrons that have been lost or gained. A positive charge indicates the number of electrons (which are negatively charged) lost. A negative charge indicates the number of electrons gained. All of this can be written around a chemical symbol. This is called symbolic notation.



Fill in the boxes below with the correct values.

Symbol	Atomic Number	Mass Number	Number of Protons	Number of Neutrons	Number of Electrons	Ionic Charge
$^{28}_{14}\text{Si}$	14	28	14	14	14	0
$^{39}_{19}\text{K}$	19	39	19	20	19	0
$^{226}_{88}\text{Ra}$	88	226	88	138	88	0
$^{75}_{33}\text{As}$	33	75	33	42	33	0
$^{31}_{16}\text{S}^{2-}$	16	31	16	15	18	2-
$^{40}_{20}\text{Ca}^{2+}$	20	40	20	20	18	2+
$^{80}_{35}\text{Br}^{-}$	35	80	35	45	36	1-
$^1_1\text{H}^{+}$	1	1	1	0	0	1+
$^2_1\text{H}$	1	2	1	1	1	0
$^{31}_{15}\text{P}$	15	31	15	16	15	0
$^{27}_{13}\text{Al}^{3+}$	13	27	13	14	10	3+