KEY

Basic Atomic Structure Worksheet

1. The 3 particles of the atom are:
   a. protons (+)
   b. electrons (-)
   c. neutrons (0)

   Their respective charges are:
   a. positive
   b. negative
   c. neutral

2. The number of protons in one atom of an element determines the atom's **symbol**, and the number of electrons determines the **charge** of the element.

3. The atomic number tells you the number of **protons** in one atom of an element. It also tells you the number of **electrons** in a neutral atom of that element. The atomic number gives the "identity" of an element as well as its location on the periodic table. No two different elements will have the **same** atomic number.

4. The **mass** of an element is the average mass of an element's naturally occurring atom, or isotopes, taking into account the **neutrons** of each isotope.

5. The **mass** of an element is the total number of protons and neutrons in the **nucleus** of the atom.

6. The mass number is used to calculate the number of **neutrons** in one atom of an element. In order to calculate the number of neutrons you must subtract the **number** from the **mass**. (mass - number)

7. Give the symbol of and the number of protons in one atom of:

Lithium	Li, $3p^+$	Bromine	Br, $35p^+$
Iron	Fe, $26p^+$	Copper	Cu, $29p^+$
Oxygen	O, $8p^+$	Mercury	Hg, $80p^+$
Krypton	Kr, $36p^+$	Helium	He, $2p^+$

8. Give the symbol of and the number of electrons in a neutral atom of:

Uranium	U, $92e^-$	Iodine	I, $53e^-$
Boron	B, $5e^-$	Xenon	Xe, $54e^-$
Chlorine	Cl, $17e^-$		

9. Give the symbol of and the number of neutrons in one atom of:

   (Mass numbers are ALWAYS whole numbers...show your calculations)

Barium	Ba; 138 - 56 = 82n°	Bismuth	Bi, 209 - 83 = 126n°
Carbon	C, 12 - 6 = 6n°	Hydrogen	H, 1 - 1 = 0n°
Fluorine	F, 19 - 9 = 20n°	Magnesium	Mg, 24 - 12 = 12n°
Europium	Eu, 152 - 63 = 89n°	Mercury	Hg; 201 - 80 = 121n°

10. Name the element which has the following numbers of particles:

a. 26 electrons, 29 neutrons, 26 protons Iron

b. 53 protons, 74 neutrons Iodine

c. 2 electrons (neutral atoms) helium

d. 20 protons Calcium

e. 86 electrons, 125 neutrons, 82 protons Lead

f. 0 neutrons Hydrogen

11. If you know ONLY the following information can you ALWAYS determine what the element is? (Yes/No)

a. Number of protons Yes

b. Number of neutrons No

c. Number of electrons in a neutral atom Yes

d. Number of electrons No

12. Fill in the missing items in the table below.

NAME	SYMBOL	Z (atomic #)	A (atomic mass)	# PROTONS	# ELECTRONS	# NEUTRONS	ISOTOPIC SYMBOL
a. Sodium	Na	11	23	11	11	23-11=12	$^{23}_{11}Na$
b. Chlorine	Cl	17	35	17	~~18~~ 17	35-17=18	$^{35}_{17}Cl$
c. Potassium	K	19	39	19	19	39-19=20	$^{39}_{19}K$
d. Phosphorous	P	15	31	15	15	31-15=16	$^{31}_{15}P$
e. Iron	Fe	26	56	26	~~24~~ 26	56-26=30	$^{56}_{26}Fe$
f. Iodine	I	53	127	53	53	127-53=74	$^{127}_{53}I$
g. Silver	Ag	47	108	47	47	108-47=61	$^{108}_{47}Ag$
h. Krypton	Kr	36	84	36	36	84-36=48	$^{84}_{36}Kr$
i. Tungsten	W	74	184	74	74	184-74=110	$^{184}_{74}W$
j. Copper	Cu	29	64	29	29	64-29=35	$^{64}_{29}Cu$
k. Indium	In	49	115	49	49	115-49=66	$^{115}_{49}In$
l. Gold	Au	79	197	79	~~78~~ 79	197-79=118	$^{197}_{97}Au$
m. Sulfur	S	16	32	16	~~18~~ 16	32-16=16	$^{32}_{16}S$