Dougherty Valley HS Chemistry
Atomic Numbers and Isotopes 2

Worksheet #3

Name: **Period:** **Seat#:**

Complete the following chart and answer the questions below:

1) The 3 particles of the atom are: _____ _____ _____

2) Their respective charges are: _____ _____ _____

3) The number of protons in one atom of an element determines the atom's _____, and the number of electrons determines the _____ of an element.

4) The atomic number tells you the number of _____ in one atom of an element. It also tells you the number of _____ 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 _____ number.

5) The _____ of an element is the average mass of an element's naturally occurring atom, or isotopes, taking into account the _____ of each isotope.

6) The _____ of an element is the total number of protons and neutrons in the _____ of the atom.

7) The mass number is used to calculate the number of _____ in one atom of an element. In order to calculate the number of neutrons you must subtract the _____ from the _____.

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

8) Lithium	**9)** Iron	**10)** Oxygen	**11)** Kyrpton
12) Bromine	**13)** Copper	**14)** Mercury	**15)** Helium

Give the symbol and number of electrons in one atom of:

16) Uranium	**17)** Boron	**18)** Antimony
19) Chlorine	**20)** Iodine	**21)** Xenon

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

22) Barium	**23)** Bismuth	**24)** Carbon	**25)** Mercury
26) Magnesium	**27)** Hydrogen	**28)** Fluorine	**29)** Europium

Name the element which has the following number of particles

30) 26e, 29n, 26p	**31)** 53p, 74n	**32)** 2e (neutral atom)
33) 20p	**34)** 86e, 125n, 82p (charged atom)	**35)** Zero neutrons

How many protons, electrons, and neutrons does each element or ion have (list in that order). Assume the most abundant isotope (use the rounded mass from the periodic table).

36) Ca^{2+}	**37)** F^{-}	**38)** Fe^{3+}
39) O^{2-}	**40)** N^{3-}	**41)** Br^{-}

If you know ONLY the following information, can you determine what the element is? Yes or No?

42) The number of protons	**43)** The number of neutrons	**44)** The number of electrons in a neutral atom	**45)** The number of electrons

A typical isotopic symbol takes this form:

$${}^{A}_{Z}X$$

Example: Fluorine

$${}^{19}_{9}F$$

Key:
X = element symbol
A = mass number [# of protons (p) + # neutrons (n)]
Z = atomic number [# of protons]
N = # of neutrons
A - Z = N

Fill in the missing items in the table below:

	Name	Symbol	#'s		Isotopic Symbol
46)		Na	Z		
			A		
			# p		
			# e		
			# n		
47)			Z		
			A		
			# p	**75**	
			# e		
			# n		
48)	Potassium		Z		
			A		
			# p		
			# e		
			# n		

Need/Want some more practice???

https://phet.colorado.edu/en/simulations/build-an-atom	https://phet.colorado.edu/en/simulations/isotopes-and-atomic-mass	https://phet.colorado.edu/en/simulations/build-a-nucleus