

Atomic Structure Worksheet

Name the three particles of the atom and their respective charges are:

- a. _____
- b. _____
- c. _____

1. The number of protons in one atom of an element determines the atom's _____, and the number of electrons determines _____ of an element.
2. 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 _____ atomic number.
3. The _____ of an element is the average mass of an element's naturally occurring atoms, or isotopes, taking into account the _____ of each isotope.
4. The _____ of an element is the total number of protons and neutrons in the _____ of the atom.
5. 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 _____.
6. Give the symbol and number of protons in one atom of:
 - Lithium _____ Bromine _____
 - Iron _____ Copper _____
 - Oxygen _____ Mercury _____
 - Arsenic _____ Helium _____

7. Give the symbol and number of electrons in a neutral atom of:
Uranium _____ Chlorine _____
Boron _____ Iodine _____
Antimony _____ Argon _____

8. Give the isotope symbol and number of neutrons in one atom of the following elements. Show your calculations.

Barium – 138 _____ Sulfur – 32 _____
Carbon – 12 _____ Hydrogen – 1 _____
Fluorine – 19 _____ Magnesium – 24 _____
Silicon – 28 _____ Mercury – 202 _____

9. Name the element which has the following numbers of particles. Be specific. (Include charges and mass numbers where possible.)

26 electrons, 29 neutrons, 26 protons _____

53 protons, 74 neutrons _____

2 electrons (neutral atom) _____

20 protons _____

86 electrons, 125 neutrons, 82 protons (charged atom) _____

0 neutrons _____

10. If you know **ONLY** the following information can you always determine what the element is? (Yes/No).

number of protons _____

number of neutrons _____

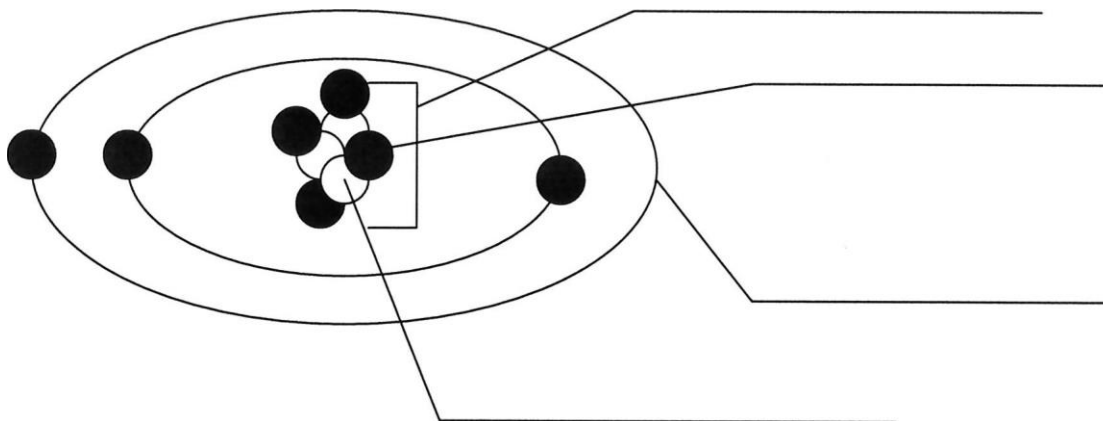
number of electrons in a neutral atom _____

number of electrons _____

Name: _____

On the Inside

Part 1: Label the parts of this atom (nucleus, protons, electrons, neutrons)



Part 2: Answer these:

1. The subatomic particle with no electrical charge is the 2. The subatomic particle with a positive charge is the 3. The subatomic particle with a negative charge is the 4. There are the same number of these two particles in an atom _____ & _____ 5. The atomic number is the same as the number of

6. Where is most of the mass of an atom located?

7. Which particles account for the mass of the atom? (Atomic mass or mass number) and

8. Complete the following table

Symbol	Atomic Number	Number of Protons	Number of Neutrons	Number of Electrons	Mass
	9				

9. The atomic number is the number of _____ in one atom of an element. It is also the number of _____ in a neutral atom of that element. The atomic number gives the "identity" of an element.

No two different elements will have the atomic number.

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

11. In order to calculate the number of neutrons you must _____ subtract the from the _____

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

Lithium _____

Mercury _____

Iron _____

13. Complete the table below.

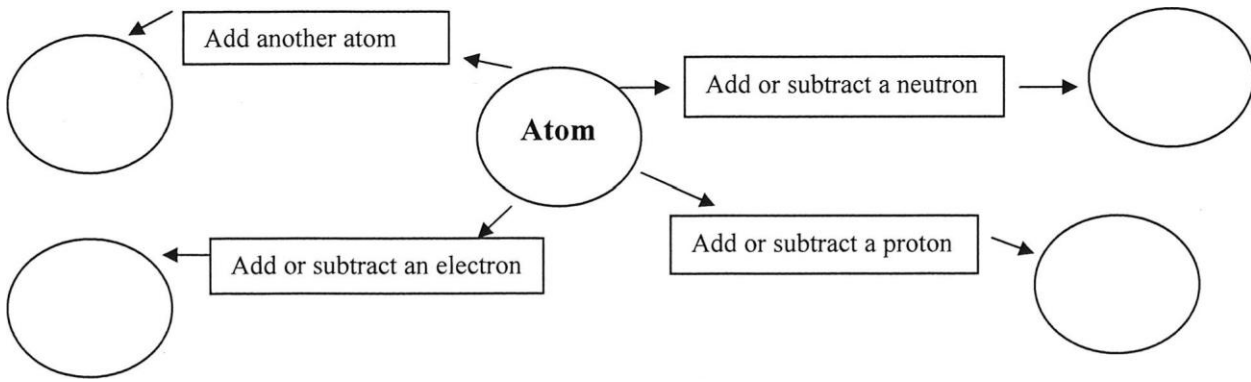
Symbol	Atomic Number	Mass Number	Number of Protons	Number of Electrons	Number of Neutrons
²³					
		39		19	
			38	38	50
	20	40			
Ions					
⁺²					
⁻¹					
Isotopes					
		110	47		
^{36S}					
^{26M}					

14. Draw a Bohr model for the following:

Argon (18)

Magnesium (12)

15. Complete the following with the terms "new element", ion, isotope, or molecule.



$\overline{\text{N}}$ 	P = ____ N = ____ E = ____
Bohr Diagram	
N	

$\overline{\text{Al}}$ 	P = ____ N = ____ E = ____
Bohr Diagram	
Al	

$\overline{\text{F}}$ 	P = ____ N = ____ E = ____
Bohr Diagram	
F	

$\overline{\text{Ar}}$ 	P = ____ N = ____ E = ____
Bohr Diagram	
Ar	

$\overline{\text{Si}}$ 	P = ____ N = ____ E = ____
Bohr Diagram	
Si	

$\overline{\text{Na}}$ 	P = ____ N = ____ E = ____
Bohr Diagram	
Na	

Directions: Give the total number of electrons and the number of valence electrons for each element listed below.

- | | |
|--------------|--------------|
| 1. Hydrogen | 2. Lithium |
| 3. Beryllium | 4. Carbon |
| 5. Fluorine | 6. Neon |
| 7. Magnesium | 8. Chlorine |
| 9. Arsenic | 10. Krypton |
| 11. Barium | 12. Tin |
| 13. Iodine | 14. Aluminum |

Directions: Give the element names for the element in the given period with the given number of valence electrons.

- | | |
|---|---|
| 15. 2 nd period, 5 valence electrons | 16. 5 th period, 1 valence electron |
| 17. 3 rd period, 7 valence electrons | 18. 6 th period, 8 valence electrons |
| 19. 4 th period, 3 valence electrons | 20. 3 rd period, 6 valence electrons |