

Chapter 4 Review Worksheet.

True-False Classify each of the following statements as always true, **AT**; sometimes true, **ST**; or never true, **NT**.

1. According to Dalton's atomic theory, atoms are composed of protons, electrons, and neutrons.
2. Atoms of elements are electrically neutral.
3. The mass of an electron is equal to the mass of a neutron.
4. The charge on all protons is the same.
5. The atomic number of an element is the sum of the protons and electrons in the atom.
6. The atomic number of an element is the whole number that decreases as you read across each row of the periodic table from left to right.
7. An atom of nitrogen has 7 protons and 7 neutrons.
8. The number of neutrons in the nucleus can be calculated by subtracting the atomic from the mass number.

9. Complete the following table

Element	Symbol	Number of Protons	Number of electrons	Number of neutrons	Atomic Number	Mass Number
Manganese	Mn				25	53
Sodium						23
	Br					80
Yttrium			39		39	89
Arsenic	As				33	75
Actinium	Ac					227

10. Fill in the following Table

Element	Symbol	Atomic Number	Mass Number	Number of neutrons
nitrogen-15				
	${}_{10}^{22}\text{Ne}$			
		4	9	

11. Use the following information to determine the atomic mass of chlorine. Two isotopes are known: chlorine-35 (mass = 35.0 amu) and chlorine-37 (mass = 37.0 amu). The relative abundance's are 75.4% and 24.6%, respectively.

12. Given the relative abundance of the following naturally occurring isotopes of oxygen, calculate the average atomic mass of oxygen:

- oxygen- 16: 99.76%
- oxygen- 17: 0.037%
- oxygen-18: 0.204%

- Describe the motion of electrons, according to Bohr.
- What is an energy level?
- What is a quantum?
- Electrons are closer to the nucleus when they are found on a _____ energy level, and are _____ from the nucleus when they are on a higher energy level.
- What does the quantum mechanical model determine?
- What is an atomic orbital?
- What is the shape of the 's' orbital? the 'p' orbital? Differentiate between the p_x , p_y and p_z orbital.
- Complete the following table :

Principal Energy Level:	Number of Sublevels:	Type of Sublevel:
n = 1		
n = 2		
n = 3		
n = 4		

- What is an electron configuration?
- Differentiate between the following:
 - Aufbau principle
 - Pauli Exclusion principle
 - Hund's rule
- Write electron configuration for the following atoms:
 - Atomic number: 4
 - Atomic number : 17
 - Scandium
 - Strontium
 - Phosphorous
 - Potassium
- What is meant by $2p^6$?
- What is the maximum number of electrons that can go into each of the following sublevels?

a. 2s	e. 4p
b. 3p	f. 5s
c. 4s	g. 4f
d. 3d	h. 5p
- Arrange the sublevels in order of increasing energy: 4s, 3p, 3d, 2s.