**Section i – Vocabulary**

1. \_\_\_\_\_\_\_ Scientist who hypothesized that all atoms are exactly alike
2. \_\_\_\_\_\_\_ Chemical compounds always contain the same elements in the same proportions
3. \_\_\_\_\_\_\_ Created the “plum-pudding” model
4. \_\_\_\_\_\_\_ Did the “gold foil experiment”, figured out mass was contained in center of atom
5. \_\_\_\_\_\_\_ Small particles that come together to form an atom
6. \_\_\_\_\_\_\_ The number of \_\_\_\_\_\_\_\_\_\_\_\_ defines the element
7. \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ atoms have no net charge
8. \_\_\_\_\_\_\_ Occurs when an atom gains or loses an electron
9. \_\_\_\_\_\_\_ Force that holds the protons and neutrons together in the center of the atom
10. \_\_\_\_\_\_\_ Force that keeps the electrons orbiting around the center of the atom
11. \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the total number of subatomic particles in the nucleus
12. \_\_\_\_\_\_\_ Elements with same number of protons but different number of neutrons
13. \_\_\_\_\_\_\_ Number of neutrons = mass number - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ number
14. \_\_\_\_\_\_\_ Number of electrons that can be held in the “S” orbital
15. \_\_\_\_\_\_\_ Number of electrons that can be held in the “D” orbital
16. \_\_\_\_\_\_\_ The highest energy electron orbital (shell)
17. \_\_\_\_\_\_\_ Another term for the “normal” energy state of an electron
18. \_\_\_\_\_\_\_ A \_\_\_\_\_\_\_\_\_\_\_ can “excite” an electron
19. \_\_\_\_\_\_\_ Form of measurement used when measuring very small particles
20. \_\_\_\_\_\_\_ Scientist that created the first Periodic Table
21. \_\_\_\_\_\_\_ Created the Periodic Table we use today
22. \_\_\_\_\_\_\_ The term given for rows on the periodic table
23. \_\_\_\_\_\_\_ The term given for columns on the periodic table
24. \_\_\_\_\_\_\_ The modern day Periodic Table is arranged by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
25. \_\_\_\_\_\_\_ Electrons in the outermost shell
26. \_\_\_\_\_\_\_ Formation of an ion
27. \_\_\_\_\_\_\_ Group # of elements most likely to gain an electron
28. \_\_\_\_\_\_\_ When unstable nuclei emit particles to become stable
29. \_\_\_\_\_\_\_ Type of nuclear radiation with a +2 charge
30. \_\_\_\_\_\_\_ Type of nuclear radiation that cannot ionize other particles
31. \_\_\_\_\_\_\_ Type of nuclear radiation that is not made of matter
32. \_\_\_\_\_\_\_ Type of nuclear radiation that can be either positively or negatively charged
33. \_\_\_\_\_\_\_ Can be used to predict the age of fossils and rocks
34. \_\_\_\_\_\_\_ Location on Periodic Table of elements with the smallest mass
35. \_\_\_\_\_\_\_ Location on Periodic Table of elements with 8 valence electrons

A. Mass number

1. Dalton
2. Mendeleev
3. Electric
4. Protons
5. Beta particle
6. Ground
7. Nuclear
8. Valence
9. Ionization
10. Period
11. Group
12. Thomson
13. Far right
14. 10
15. Gamma
16. Isotopes
17. Rutherford
18. Mosely
19. Neutron radiation
20. F
21. Ionization
22. Dalton
23. Mole
24. 2
25. Atomic number
26. Photon
27. Upper left
28. Neutral
29. Radiation
30. Half life
31. Subatomic
32. Alpha particle
33. Atomic
34. 7

**Section ii – Drawing**

1. On the diagram to the right, draw a Carbon atom

**Section iii – Labeling (use diagram to the right)**

1. Electron
2. Proton
3. P Orbital
4. S Orbital
5. D Orbital

**Section iv – Fill in the blank (use diagram to the right)**

1. # of protons: \_\_\_\_\_\_\_\_\_\_
2. # of neutrons: \_\_\_\_\_\_\_\_\_\_
3. # of electrons: \_\_\_\_\_\_\_\_\_\_
4. # of valence electrons: \_\_\_\_\_\_\_\_\_\_

**Section v – Fill in the blank**

**79**

**2**

46. 47. 48. 49. 50.

**\_\_**

**\_\_\_\_\_\_**

**\_\_**

**\_\_\_\_\_\_**

**O**

oxygen

**\_\_**

**\_\_\_\_\_\_**

**Ar**

\_\_\_\_\_\_\_\_\_

**238**

**Section v –Short response questions**

1. Which group of elements is most likely to donate (give up) an electron and why?
2. Two molecules of Carbon can have different atomic masses. How can this occur?
3. When an atom loses a neutron does it become a different element? Why or why not? **EXPLAIN.**
4. How did Mendeleev organize the first periodic table? How is his method of organizing the periodic table different from the one we use today?
5. Explain how you can use the periodic table to quickly identify the number of valence electrons. Why is the number of valence electrons so important when determining the properties of elements?
6. In your own words, define the term ionization **and** explain how this can occur.
7. List the 4 types of nuclear radiation and briefly describe each.

1. Which type of nuclear radiation can travel the farthest and **why**?



1. On the periodic table to the right, color in and label elements that are: metals, nonmetals, and semiconductors. (Use a different color for each)
2. Sodium has a half-life of 15 hours. How much Sodium-24 will remain in an 12 gram sample after 45 hours? **Show all work**
3. Polonium-214 has a relatively short half-life of 164 seconds. How many seconds would it take for 8 grams of this isotope to decay to 3.25 grams? **Show all work**
4. In 5.49 seconds, 1.2 grams of Argon-35 decay to leave only 0.15 grams. What is the half-life of Argon-35? **Show all work**
5. Convert 200 grams of Ca to moles. **Show all work**
6. Convert 8.25 moles of Fe to grams. **Show all work**
7. How many protons does U-238 have? **Show all work**