

**Circle the letter of the correct answer choice.**

1. List the 5 most abundant elements on earth?
2. List the 5 most abundant elements in the human body?
3. State the Law of Constant Composition.
4. State the Law of Conservation of Matter
5. State the Law of Conservation of Energy
6. The law of constant composition applies to
  - A. heterogeneous mixtures
  - B. homogeneous mixtures
  - B. metalloids
  - D. compounds
  - E. metals
7. Define Compound.
8. Define Element
9. How many total hydrogen atoms are indicated by the formula  $\text{H}_2\text{C}_8\text{H}_4\text{O}_2$ ?
  - A. 4
  - B. 6
  - C. 12
  - D. 16
  - E. 20
10. The chemical formula  $\text{Al}_2\text{O}_3$  indicates
  - A. six atoms of each element
  - B. five atoms of each element
  - C. three atoms of aluminum and two atoms of oxygen
  - D. two atoms of aluminum and three atoms of oxygen

E. the chemical formula does not tell you the number of atoms

11. Which sub atomic particle determines the chemical behavior of the atom?

12. Which particle has the smallest mass?

13. How many protons, electrons and neutrons does  $^{127}_{53}\text{I}$  have?

- A. 53 protons, 53 electrons and 74 neutrons
- B. 53 protons, 74 electrons and 53 neutrons
- C. 53 protons, 53 electrons and 127 neutrons
- D. 74 protons, 74 electrons and 53 neutrons

14. Define ISOTOPE.

15. How do you calculate the mass number (atomic mass) of an isotope?

16. The atomic number of an atom equals

- A. the number of neutrons plus number of protons
- B. the number of neutrons
- C. the mass number of the atom
- D. the number of protons

17. Which pair has **approximately** the same mass?

- A. electron and proton
- B. electron and neutron
- C. proton and neutron

18. Which pair has exhibits opposite charge characteristics?

- A. electron and proton
- B. electron and neutron
- C. proton and neutron

19. Who is responsible for discovering the “nuclear atom”?

20. Who defined the term ELEMENT?

21. Who used the “gold foil experiment”?

22. What was discovered in the Gold Foil Experiment?

23. The man who first described the concept of an atom with his atomic theory is

A. Boyle

B. Chadwick

C. Dalton

D. Rutherford

24. State the Atomic Theory of 1808.

25. The man responsible the layout/design of the periodic table is

A. Chadwick

B. Dalton

C. Mendeleev

D. Thomson

26. Which of the following statements is true:

I. The number of protons in an element is the same for all neutral atoms of that element.

II. The number of electrons in an element is the same for all neutral atoms of that element.

III. The number of neutrons in an element is the same for all neutral atoms of that element.

A. Only II and III are true

B. Only I and II are true

C. Only I and III are true

D. All are true

**Please fill in the appropriate element Name for the following symbols.**

27. What element is represented by the symbol Na? \_\_\_\_\_
28. What element is represented by the symbol Pt? \_\_\_\_\_
29. What element is represented by the symbol S? \_\_\_\_\_
30. What element is represented by the symbol Hg? \_\_\_\_\_

**Please match the following: Note Choices on the right will be used multiple times to fill in the left.**

31. Sodium \_\_\_\_\_
32. Antimony \_\_\_\_\_
33. Oxygen \_\_\_\_\_
34. Iron \_\_\_\_\_
35. Boron \_\_\_\_\_
36. Aluminum \_\_\_\_\_
37. Helium \_\_\_\_\_

- A. Metal
- B. Non Metal
- C. Metalloid

**Complete the following with a word or phrase.**

38. The Group 8 elements are known by the family name \_\_\_\_\_.
39. The Group 2 elements are known by the family name \_\_\_\_\_.
40. The Group 1 elements are known by the family name \_\_\_\_\_.
41. The Group 7 elements are known by the family name \_\_\_\_\_.
42. The elements in the center of the periodic table (short columns between group 2 and 3) are known by the family name \_\_\_\_\_.
43. One of the rows of elements set off to the bottom of the periodic table is known by the family name \_\_\_\_\_.
44. Provide an example for the family listed in Question 38. \_\_\_\_\_
45. Provide an example for the family listed in Question 39. \_\_\_\_\_
46. Provide an example for the family listed in Question 40. \_\_\_\_\_
47. Provide an example for the family listed in Question 41. \_\_\_\_\_

48. Provide an example for the family listed in Question 42. \_\_\_\_\_
49. Provide an example for the family listed in Question 43. \_\_\_\_\_

50. Please draw a representation of the model of an atom before the concept of the nuclear atom was proven. (Note: Label your parts)

51. Write the chemical formula for a compound containing two iron atoms and three oxygen atoms.

52. Write the chemical formula representing a compound containing one carbon atom and four oxygen atoms.

53. Write the chemical formula for a compound containing half as many magnesium ions as fluorine atoms.

54. Write the chemical formula for a compound containing equal numbers of sodium and nitrogen atoms but three times as many oxygen atoms as there are sodium atoms.

Fill in the following chart based on your knowledge of isotopes.

Name	Symbol	Atomic Number	Mass Number	Number of Neutrons
55.	56.	<b>23</b>	<b>27</b>	57.
<b>Calcium</b>	58.	59.	60.	<b>21</b>

For the following describe the number of protons, neutrons and electrons present.

	Number of Protons	Number of Neutrons	Number of Electrons
${}^{65}_{30}\text{Zn}^{+2}$	61.	62.	63.
${}^{78}_{34}\text{Se}^{-2}$	64.	65.	66.

For each of the following indicate, by circling the correct answer, how the atom will form an ion.

67. Magnesium      GAIN ELECTRONS      LOSE ELECTRONS  
68. Sulfur      GAIN ELECTRONS      LOSE ELECTRONS

Please indicate **how many** electrons would be gained/lost in the following equations.



Please fill in the correct ion symbol in the following equations.



73. Write the atomic symbol (Hint: A,Z,X) for an isotope of Selenium with a mass number of 79.

74. Write the atomic symbol (Hint: A,Z,X) for atomic number 38, with 50 neutrons.

75. Write the chemical formula for a compound made from Potassium and Fluorine ions.

76. Write the chemical formula for a compound made from  $\text{Mn}^{2+}$  and  $\text{P}^{3-}$ .

77. Explain why a solution of sodium chloride in water conducts an electric current, but a solution of sugar does not conduct an electric current.

78. Why does an ionic compound conduct electricity when it is melted, but not when it is solid?

79. Name an element that is a liquid at room temperature.

80. Name an element that is a monatomic gas at room temperature.

81. Explain what a diatomic molecule is and give an example on one.

82. Explain what an allotrope is and give an example (hint: carbon has allotropes)

Please fill in the following chart with the correct relative charges and masses of the three sub atomic particles discovered in the early 1900's by Rutherford and Chadwick.

	Relative Charge	Relative Mass	Location
Proton	83.	84.	85.
Neutron	86.	87.	88.
Electron	89.	90.	91.

92. Name 3 properties of a metal.

93. Name 3 properties of a non metal

Name the following ions

94.  $\text{I}^-$

95.  $\text{Na}^+$

## Practice Test Chapter 4

On the periodic table below label the following groups:

96. Group 1

97. Group 2

98. Group 3

99. Group 4

100. Group 5

101. Group 6

102. Group 7

103. Group 8

104. On your periodic table draw in the line that separates the metals from the non metals.

105. Circle one element that is a liquid at 25°C.

106. Draw a star on one of the noble metals.

107. Shade an element that is a monatomic gas.

The Periodic Table of the Elements

1 <b>H</b> Hydrogen 1.00794																	2 <b>He</b> Helium 4.003				
3 <b>Li</b> Lithium 6.941	4 <b>Be</b> Beryllium 9.012182															5 <b>B</b> Boron 10.811	6 <b>C</b> Carbon 12.0107	7 <b>N</b> Nitrogen 14.00674	8 <b>O</b> Oxygen 15.9994	9 <b>F</b> Fluorine 18.9984032	10 <b>Ne</b> Neon 20.1797
11 <b>Na</b> Sodium 22.989770	12 <b>Mg</b> Magnesium 24.3050															13 <b>Al</b> Aluminum 26.981538	14 <b>Si</b> Silicon 28.0855	15 <b>P</b> Phosphorus 30.973761	16 <b>S</b> Sulfur 32.066	17 <b>Cl</b> Chlorine 35.4527	18 <b>Ar</b> Argon 39.948
19 <b>K</b> Potassium 39.0983	20 <b>Ca</b> Calcium 40.078	21 <b>Sc</b> Scandium 44.955910	22 <b>Ti</b> Titanium 47.867	23 <b>V</b> Vanadium 50.9415	24 <b>Cr</b> Chromium 51.9961	25 <b>Mn</b> Manganese 54.938049	26 <b>Fe</b> Iron 55.845	27 <b>Co</b> Cobalt 58.933200	28 <b>Ni</b> Nickel 58.6934	29 <b>Cu</b> Copper 63.546	30 <b>Zn</b> Zinc 65.39	31 <b>Ga</b> Gallium 69.723	32 <b>Ge</b> Germanium 72.61	33 <b>As</b> Arsenic 74.92160	34 <b>Se</b> Selenium 78.96	35 <b>Br</b> Bromine 79.904	36 <b>Kr</b> Krypton 83.80				
37 <b>Rb</b> Rubidium 85.4678	38 <b>Sr</b> Strontium 87.62	39 <b>Y</b> Yttrium 88.90585	40 <b>Zr</b> Zirconium 91.224	41 <b>Nb</b> Niobium 92.90638	42 <b>Mo</b> Molybdenum 95.94	43 <b>Tc</b> Technetium (98)	44 <b>Ru</b> Ruthenium 101.07	45 <b>Rh</b> Rhodium 102.90550	46 <b>Pd</b> Palladium 106.42	47 <b>Ag</b> Silver 107.8682	48 <b>Cd</b> Cadmium 112.411	49 <b>In</b> Indium 114.818	50 <b>Sn</b> Tin 118.710	51 <b>Sb</b> Antimony 121.760	52 <b>Te</b> Tellurium 127.60	53 <b>I</b> Iodine 126.90447	54 <b>Xe</b> Xenon 131.29				
55 <b>Cs</b> Cesium 132.90545	56 <b>Ba</b> Barium 137.327	57 <b>La</b> Lanthanum 138.9055	72 <b>Hf</b> Hafnium 178.49	73 <b>Ta</b> Tantalum 180.9479	74 <b>W</b> Tungsten 183.84	75 <b>Re</b> Rhenium 186.207	76 <b>Os</b> Osmium 190.23	77 <b>Ir</b> Iridium 192.217	78 <b>Pt</b> Platinum 195.078	79 <b>Au</b> Gold 196.96655	80 <b>Hg</b> Mercury 200.59	81 <b>Tl</b> Thallium 204.3833	82 <b>Pb</b> Lead 207.2	83 <b>Bi</b> Bismuth 208.98038	84 <b>Po</b> Polonium (209)	85 <b>At</b> Astatine (210)	86 <b>Rn</b> Radon (222)				
87 <b>Fr</b> Francium (223)	88 <b>Ra</b> Radium (226)	89 <b>Ac</b> Actinium (227)	104 <b>Rf</b> Rutherfordium (261)	105 <b>Db</b> Dubnium (262)	106 <b>Sg</b> Seaborgium (263)	107 <b>Bh</b> Bohrium (262)	108 <b>Hs</b> Hassium (265)	109 <b>Mt</b> Meitnerium (266)	(269)	(272)	(277)										
58 <b>Ce</b> Cerium 140.116	59 <b>Pr</b> Praseodymium 140.90765	60 <b>Nd</b> Neodymium 144.24	61 <b>Pm</b> Promethium (145)	62 <b>Sm</b> Samarium 150.36	63 <b>Eu</b> Europium 151.964	64 <b>Gd</b> Gadolinium 157.25	65 <b>Tb</b> Terbium 158.92534	66 <b>Dy</b> Dysprosium 162.50	67 <b>Ho</b> Holmium 164.93032	68 <b>Er</b> Erbium 167.26	69 <b>Tm</b> Thulium 168.93421	70 <b>Yb</b> Ytterbium 173.04	71 <b>Lu</b> Lutetium 174.967								
90 <b>Th</b> Thorium 232.0381	91 <b>Pa</b> Protactinium 231.03588	92 <b>U</b> Uranium 238.0289	93 <b>Np</b> Neptunium (237)	94 <b>Pu</b> Plutonium (244)	95 <b>Am</b> Americium (243)	96 <b>Cm</b> Curium (247)	97 <b>Bk</b> Berkelium (247)	98 <b>Cf</b> Californium (251)	99 <b>Es</b> Einsteinium (252)	100 <b>Fm</b> Fermium (257)	101 <b>Md</b> Mendelevium (258)	102 <b>No</b> Nobelium (259)	103 <b>Lr</b> Lawrencium (262)								