

Name: _____

Unit 2 Study Guide (Chapter 4, 5, and 6)

***Chapter 4:** **Study all vocabulary for Chapter 4!**

1. What did J. J. Thomson discover?
2. What did Eugen Goldstein discover?
3. What did James Chadwick discover?
4. The vertical columns on the periodic table are called _____.
5. The horizontal rows on the periodic table are called _____.
6. Briefly describe a cathode ray tube and how it was used to discover electrons and protons.
7. Briefly describe Rutherford's experiment. Include the setup, the expected outcome, and his conclusions.
8. What is an isotope? Would isotopes have the same atomic number? Would isotopes have the same mass number?
9. How many neutrons are in $^{127}_{53}\text{I}$?
10. Fill in the following charts.

Subatomic Particle	Charge	Relative Mass	Location

element	protons	neutrons	electrons	atomic number	mass number
Hydrogen		0			
		7	7		
		20			39
	79				197

11. Element Z has two isotopes Z-35 and Z-37. The atomic mass of Z-35 is 34.969amu with a relative abundance of 75.77%. The atomic mass of Z-37 is 36.965amu with a relative abundance of 24.23%. What is the average atomic mass? Identify element Z.

***Chapter 5:** **Study all vocabulary for Chapter 5!**

12. What does Aufbau's Principle state?
13. What does the Pauli Exclusion Principle state?

14. What does Hund's Rule state?
15. Draw a picture of the following sublevels: s, p, and d (draw 2 pictures for the d sublevel).
16. Draw the four atomic models and label the creators of each.
17. Write the arrow electron configuration for the following elements:
 - a. Mn
 - b. C
 - c. Cu
18. Write the standard configuration for the following elements:
 - a. Se
 - b. Cr
 - c. Tc
19. When can an electron emit light?

Chapter 6:**Study all vocabulary for Chapter 6!*

20. How is the modern periodic table arranged?
21. Who created the first periodic table, how was it arranged, and why was it considered useful?
22. Why do elements in the same group have similar properties?
23. Know the different groups from the periodic table that you colored. What are the group 17 elements called?
24. What does the periodic law state?
25. Most elements on the periodic table are _____.
26. What does ductile mean?
27. Is silicon a metal, nonmetal, or metalloid?
28. Is aluminum a metal, nonmetal, or metalloid?
29. What are the 5 characteristics of metals and nonmetals? (Be specific)
30. Which atom is larger – aluminum or barium?
31. What are the trends for atomic radius going across and down the periodic table?
32. **Explain** the trend for atomic size as you move down a group.
33. **Explain** the trend for atomic size as you move across a period.
34. What is ionization energy?
35. Which element has the lower ionization energy – sodium or phosphorus?
36. What are the trends for ionization energy going across and down the periodic table?
37. **Explain** the trend for ionization energy as you move down a group.

38. **Explain** the trend for ionization energy as you move across a period.
39. Cations are _____ than their parent atoms, and anions are _____ than their parent atoms.
40. Which is larger – Ca^{+2} or Ca ?
41. What is electronegativity?
42. Which is more electronegative – arsenic or sulfur?
43. What are the trends for electronegativity going across and down the periodic table?
44. **Explain** the trend for electronegativity as you move down a group.
45. **Explain** the trend for electronegativity as you move across a period.