

Name: \_\_\_\_\_

Period: \_\_\_\_\_  
Study Guides

## ATOM & PERIODIC TABLE STUDY GUIDE

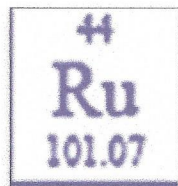
1. What charges do each of these sub-atomic particles have, what is their mass, and where they are found?

	<u>Charge</u>	<u>Mass</u>	<u>Location</u>
a. Proton			
b. Neutron			
c. Electron			

2. Mendeleev published the first periodic table. He arranged all the known elements in order of increasing \_\_\_\_\_

3. Moseley rearranged the elements by increasing \_\_\_\_\_; this is the way the modern periodic table is still arranged.

4. Label this square from the periodic table with the following and define each term:



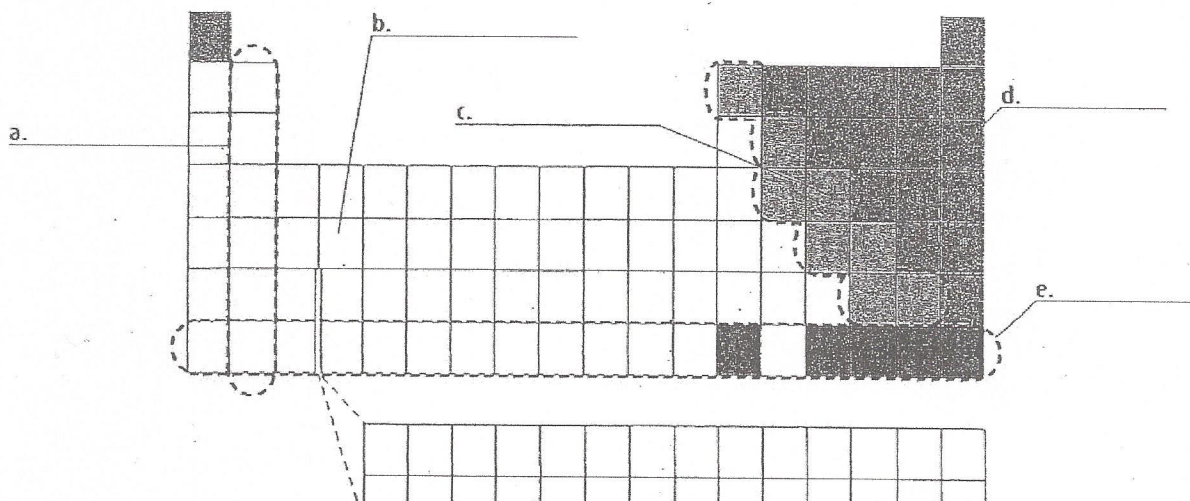
- a. Atomic number =
- b. Average atomic mass =
- c. Element symbol =

	1																	18
1		2										13	14	15	16	17		
2												I						
3													J				E	
4		B								G				F			H	
5																D		
6					C													
7	A																	

5. Write the letter for each one:

- |  |   |
|--|---|
| a. element with 4 valence electrons: _____                 | e. element with 5 energy levels: _____                |
| b. element with 2 energy levels: _____                     | f. element that is the most reactive metal: _____     |
| c. element with 7 valence electrons: _____                 | g. elements that are transition metals: _____ & _____ |
| d. element with complete set of 8 valence electrons: _____ |   |

6. Label the periodic table outline below.



7. This group of elements from the periodic table share some characteristics. Answer the following questions.

4 Be 9.012182
12 Mg 24.3050
20 Ca 40.078
38 Sr 87.62
56 Ba 137.327
88 Ra (226)

- Which element has atomic number 12? \_\_\_\_\_
- Which element has atomic number 56? \_\_\_\_\_
- How many neutrons does Be have? \_\_\_\_\_
- How many electrons does Ca have? \_\_\_\_\_
- How many electrons does Sr have? \_\_\_\_\_
- Which element would be the most reactive? \_\_\_\_\_
- Which element would have the fewest electron shells? \_\_\_\_\_
- Which element has the most subatomic particles? \_\_\_\_\_

Write the formula for calculating the number of neutrons in an atom.

$$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

8. What are the names of the following families on the periodic table?

- Group 1: \_\_\_\_\_
- Group 2: \_\_\_\_\_
- Group 17: \_\_\_\_\_
- Group 18: \_\_\_\_\_

9. Which group from question# 8 would be the least reactive, or most stable, group? \_\_\_\_\_

Why? \_\_\_\_\_

# Periodic Table of the Elements

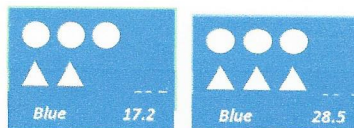
Period	Alkali metals										Alkaline Earth metals										Transition elements										Halogens					Noble gases		
	Group 1A	Group 2A									Group 3A	Group 4A	Group 5A	Group 6A	Group 7A	Group 8A																						
1	H 1.00794																				B 10.811	C 12.0107	N 14.00674	O 15.9994	F 18.9984032	Ne 20.1797												
2	Li 6.941	Be 9.012182																			Al 26.981538	Si 28.0855	P 30.973761	S 32.065	Cl 35.4527	Ar 39.948												
3	Na 22.989770	Mg 24.3050																			K 39.0983	Ca 40.078	Sc 44.955912	Ti 47.867	V 50.9415	Cr 51.9961	Mn 54.938044	Fe 55.845	Co 58.933200	Ni 58.6934	Cu 63.546	Zn 65.39	Ga 69.723	Ge 72.61	As 74.92160	Se 78.96	Br 79.904	Kr 83.80
4	Rb 85.4678	Sr 87.62	Y 88.90585	Zr 91.224	Nb 92.90638	Mo 95.94	Tc (98)	Ru 101.07	Rh 102.90550	Pd 106.42	Ag 107.8682	Cd 112.411	In 114.818	Sn 118.710	Sb 121.760	Te 127.60	I 126.90447	Xe 131.29																				
5	Cs 132.90545	Ba 137.327	La 138.9055	Hf 178.49	Ta 180.9479	W 183.84	Re 186.207	Os 190.23	Ir 192.227	Pt 195.078	Au 196.96655	Hg 200.59	Tl 204.3833	Pb 207.2	Bi 208.98038	Po (209)	At (210)	Rn (222)																				
6	Fr (223)	Ra (226)	Ac (227)	Rf (261)	Db (262)	Sg (263)	Bh (262)	Hs (265)	Mt (268)	110	111 (272)	112 (277)	114 (289)	116 (287)	118 (289)																							
7																																						

Lanthanides										Actinides																	
58	59	60	61	62	63	64	65	66	67	68	69	70	71	Ce 140.116	Pr 140.90768	Nd 144.24	Pm (145)	Sm 150.36	Eu 151.964	Gd 157.25	Tb 158.92534	Dy 162.50	Ho 164.93032	Er 167.26	Tm 168.93421	Yb 173.04	Lu 174.967
90	91	92	93	94	95	96	97	98	99	100	101	102	103	Th 232.0381	Pa 231.03588	U 238.0289	Np (237)	Pu (244)	Am (243)	Cm (247)	Bk (247)	Cf (251)	Es (252)	Fm (257)	Md (258)	No (259)	Lr (262)

10. Which element is in the same family with Pd & Pt? \_\_\_\_\_ With Au & Cu? \_\_\_\_\_

11. Which subatomic particles are found in the nucleus of an atom? \_\_\_\_\_

12. Describe the puzzle piece that would come next in this pattern?



Color? \_\_\_\_\_

# circles? \_\_\_\_\_

# triangles? \_\_\_\_\_

Atomic mass? \_\_\_\_\_

13. Which side of the periodic table are the metals? \_\_\_\_\_ Nonmetals? \_\_\_\_\_

14. Define each of these terms and what do they tell you about an atom?

- a. Atomic number
- b. Mass number
- c. Period number
- d. Group/family number

15. What are the outermost electrons of an atom called? \_\_\_\_\_

16. Elements in the same group or family have the same number of \_\_\_\_\_.

17. What are the characteristics of nonmetals. \_\_\_\_\_

18. Find the element **Chlorine (Cl)** on the periodic table.

a. Atomic # \_\_\_\_\_

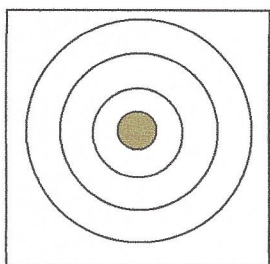
b. # of protons \_\_\_\_\_

c. # of electrons \_\_\_\_\_

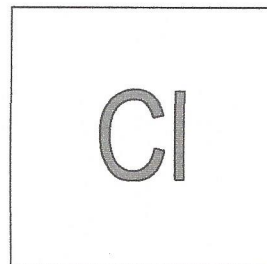
d. # of energy levels (period #) \_\_\_\_\_

f. # of valence electrons (group?) \_\_\_\_\_

g. **Draw the Lewis Electron Dot Diagram**



e. **Draw the Bohr's Model of electrons**



h. Atomic Mass \_\_\_\_\_

i. # of neutrons \_\_\_\_\_

19. Where is most of the mass of an atom? \_\_\_\_\_

20. What are atoms of the same element called that have different numbers of neutrons? \_\_\_\_\_

21. An element with atomic number 15 has a mass of 37 amu, how many neutrons does it have? \_\_\_\_\_

22. If an isotope of element 15 (from Question 21) has 3 more neutrons, what is its atomic mass? \_\_\_\_\_

23. An element with atomic number 19 has how many electrons total? \_\_\_\_\_

24. Define these terms which are used to describe metals:

a. Ductile = \_\_\_\_\_

b. Malleable = \_\_\_\_\_

c. Luster = \_\_\_\_\_

25. Which direction are each of the following on the periodic table, *horizontal rows* or *vertical columns*?

a. Groups/Families \_\_\_\_\_ b. Periods \_\_\_\_\_

26. Why are the columns of elements called families? \_\_\_\_\_

27. Why are the rows of elements called periods? \_\_\_\_\_

Isotope/Ion Name	atomic #	mass #	# of protons	# of neutrons	# of electrons
Lithium-7	3				
Boron-11					5
Neon-20			10		
Mg <sup>+2</sup>			12	24	

Isotope name	atomic #	mass #	# of protons	# of neutrons	# of electrons
Boron-10	5				
B <sup>-3</sup>		11			
Calcium-39	20				
Ca <sup>+1</sup>		21			
Calcium-42					
Strontium-84	38				
Sr <sup>+2</sup>		85			
Strontium-87					
Sr <sup>-3</sup>		88			
Uranium-235	92				
U <sup>+3</sup>		237			
			38		36
			30		32
	52				52

