Name: _____ Pd_____ Date_____

REVIEW:

1. List the 4 points of Dalton's atomic theory:

   A)

   B)

   C)

   D)

2. Name the person who helped discover….
   A) the nuclear structure of an atom — w/ what experiment?
   B) the electron — w/ what experiment?
   C) the proton
   D) the neutron

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3. Explain the two parts of quantum theory:

4. Define a quantum:

5. Draw (in relative scale) one representative orbital of the subshell described by the following principle (shell) and azimuthal (subshell) quantum numbers.

A) n= 2, l=1

B) n=5, l = 0

C) n=3, l=2

D) n=7, l=3

E) n=1, l=0

F) n=6, l=1

G) n=4, l=2

6. Looking at the orbitals drawn in question 5, give the name of each and decide which of the following pairs is larger? On what basis did you make your decision?

A) A) or F)?
B) B) or E)?
C) C) or G)?

7. Each of the subshells has a certain number of orbitals that can be represented with a line (or sometimes a box). A diagram showing these orbitals and the energies each subshell occupies is called an atomic orbital diagram.

   Get some practice drawing the proper number of orbitals for each subshell before we put them in their proper energy order and fill them with electrons. Also fill in the 1st and 2nd quantum number, as well as the possibility for the 3rd quantum number (the magnetic or orbital quantum number).

	Subshell	**Orbitals**	**Shell**	**Subshell**	**Possible orbitals**	**# of values for m?**
Ex.	5 f	___ ___ ___ ___ ___ ___ ___	n=5	l=3	m= -3,-2,-1,0,1,2,3	(7 possible values)
	3p		n=	l=	m=	(__possible values)
	1s		n=	l=	m=	(__possible values)
	4d		n=	l=	m=	(__possible values)
	2s		n=	l=	m=	(__possible values)
	4f		n=	l=	m=	(__possible values)
	2p		n=	l=	m=	(__possible values)
	3p		n=	l=	m=	(__possible values)

   IN AN ATOMIC ORBITAL DIAGRAM….
   When you have a s subshell, you always draw _____ line because there is _____ orbital in a s subshell.

   When you have a p subshell, you always draw _____line because there are _____ orbitals in a p subshell.

   When you have a d subshell, you always draw _____ line because there are _____ orbitals in a d subshell.

   When you have a f subshell, you always draw _____line because there are _____orbitals in a f subshell.

8. Let's review the rules for quantum numbers:

   n= l = m= s =

Look at the following sets and check to see if each set of quantum numbers is possible. If not, state the rule violated. Number given in the following format: {n,l, m, s}

{0,0,0,1/2) {1,-1,0, -1/2} {2,1,-1,1/2} {3,2,3,-1}

9. Draw the atomic orbital diagram for Ac (element 89) sideways, or you'll run out of room.

Circle the e- that the following quantum #'s describe: {n=3,l= 2,m=-1, 0, or +1,s= 1/2}

10. Write the full e- configuration for the following:

A) Fe

B) La

C) Na^{+} which is isoelectronic with….

D) Se^{2-} which is isoelectronic with….

11. Write the abbreviated e- configuration for the following:

A) Na

B) Ca^{+2}

12. Describe in plain English what quantum numbers do and what the point is of writing atomic orbital diagrams and electron configurations. Full sentences with proper/ coherent grammar—I will ask you to read these to the class.