Name:_____ Period :_____

Atomic Structure and Periodicity Practice

1. The 3 particles of the atom are: Their charges are:

   a. _____ a. _____

   b. _____ b. _____

   c. _____ c. _____

2. The number of protons in one atom determines the _____

3. The number of protons also tells you the number of _____ in a neutral atom of that element.

4. The _____ of an element is the average mass of an element's naturally occurring atom, or isotopes.

5. The _____ of an element is the total number of protons and neutrons in the atom.

6. The mass number is used to calculate the number of _____ in one atom of an element.

7. How did the view of the atomic model change after Rutherford's 'gold foil' experiment?

8. Calculate the average atomic mass of Sodium if 68% of its mass is 23.031 amu, 17.5% of mass 20.046 amu and 14.5% of mass is 21. 023 amu. Show your work:

   _____ amu

9. If you know only the following information can you always determine what the element is? Answer Yes or No.

   a. number of protons _____ b. number of neutrons_____

   c. number of electrons_____ d. mass number _____

10. Finish the table on the following atoms.

Atom	Number	Mass	Protons	Neutrons	Electrons
N	7	14	_____	_____	_____
O	8	16	_____	_____	_____
C	6	12	_____	_____	_____
Ca	_____	40	_____	_____	20
Ar	_____	44	_____	_____	18

11. Fill in the blanks for each quantum level:

Quantum level 1 has 1 suborbital
and it is called the _____ orbital

Quantum level 2 has 2 suborbitals
and they are called the _____ and _____ orbitals

Quantum level 3 has 3 suborbitals
and they are called the ____ ____ and ____ orbitals

Quantum level 4 has 4 suborbitals
and they are called the ____ ____ ____ and_____ orbitals

Quantum level 5 has 5 suborbitals
and they are called the ____ ____ ____ ____ and _____ orbitals

12. What are the symbols for all the elements with the following outer configurations?

a) s^1

b) s^2p^4

c) s^2d^{10}

13. Explain why fluorine has a smaller atomic radius that both oxygen and chlorine?

14. Which element, in each pair, is more electronegative? (circle your answer)

a) Cl, F

b) C, N

c) Mg, Ne

d) As, Ca

15. Which particle has the larger radius in each atom/ion pair? (circle your answer)

a) Na, Na^+

b) S, S^{2-}

c) I, I^-

d) Al, Al^{3+}

16. Arrange the following elements in order of increasing ionization energy

a) Be, Mg, Sr

b) Bi, Cs, Ba

c) Na, Al, S

17. The ions S^{2-}, Cl^-, K^+, Ca^{2+} and Sc^{3+} have the same total number of electrons as the noble gas argon. How would you expect the radii of these ions to vary?

18. Name the element which has the following numbers of particles:

a. 26 electrons, 29 neutrons, 26 protons _____

b. 53 protons, 74 neutrons _____

c. 2 electrons (neutral atoms) _____

d. 20 protons _____

e. 86 electrons, 125 neutrons, 82 protons (charged atom) _____

f. 0 neutrons _____

19. Fill in the blank for the number of electrons that each quantum suborbital can hold:

1s can hold up to ____ electrons

6p can hold up to ____ electrons

5s can hold up to ____ electrons

3d can hold up to ____ electrons

The entire 1st quantum level can hold up to ____ electrons

The entire 2nd quantum level can hold up to ____ electrons

The entire 3rd quantum level can hold up to ____ electrons

20. Compare/contrast the Dalton, JJ Thomson, Rutherford, Bohr and Quantum Atomic Models: