Name _____Per. _____Date _____

CST Review Worksheet #1: Atoms, Periodic Table and Nuclear Review (Stds. 1 & 11)

1. How is the periodic table arranged? By increasing _____.
2. What is the group number for alkali metals, alkaline earth metals, halogens and noble gases?
3. Label metals, semi-metals (metalloids), and non-metals on the periodic table below.
4. Most of an atom's mass is contained in the _____.
5. Most of an atom's volume is taken up by the _____.
6. If you change the number of _____ an atom, you change it's identity. If you change the number of _____, the atom becomes an ion.
7. Isotopes have the same atomic _____ but different atomic _____.
8. From left to right, what happens to the following (increase or decrease)?

Ionization Energy _____ Electronegativity _____ Atomic size _____

9. From top to bottom, what happens to the following (increase or decrease)?

Ionization Energy _____ Electronegativity _____ Atomic size _____

10. Rank the following in order of increasing size:

a. Cr, Mn, Fe, Zn b. Sb, N, P, As c. $Na^+$, Ar, $S^{2-}$, $Cl^-$ d. $F^-$, Ne, $O^{2-}$, $Mg^{2+}$

11. How many valence electrons do the following elements have?

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Na | ____ | Li | ____ | O | ____ | Si | ____ | Ne | ____ |
| Ca | ____ | Cs | ____ | P | ____ | Ge | ____ | Al | ____ |

11. What two types of particles make up the nucleus and what are their charges?
12. Nuclei are held together by this force: _____
13. Why does it take so much energy to hold a nucleus together? How does this explain the amount of energy released in nuclear reactions?
14. What equation relates energy to mass?
15. Most isotopes known to man are _____, which means that they are _____.
16. What are the three nuclear particles and what are their symbols?
17. Which particle can be stopped by a piece of paper?
18. Through beta-decay, how does the nucleus change?
19. Through alpha decay, how does the nucleus change?
20. Which particle penetrates the most things? the least things?
21. Complete the following nuclear equations and identify them as fission, fusion, alpha decay or beta decay.

a. $^{239}_{92}U$ ---> _____ + $^{0}_{-1}\beta$

b. $^{226}_{88}Ra + {}^{1}_{0}n$ ---> _____ + $^{223}_{86}Rn$

c. $^{2}_{1}H + {}^{3}_{1}H$ ---> $^{4}_{2}He$ + _____