Name:_____ Hour:_____

Atomic Structure Basic Review Worksheet

1. What is an element?
   simplest form of matter, basically same as an atom.
2. What are the three fundamental particles that compose all atoms?
   Protons, Neutrons, Electrons

   Indicate the electrical charge and relative mass of each of these particles.
   Protons - positive, 1 amu Neutrons - neutral, 1 AMU, Electron - negative, 0 amu

   Where is each type of particle found in the atom?
   Protons & neutrons are in the nucleus
   Electrons are outside the nucleus
3. What is meant by the term *nuclear atom?*
   nuclear atom refers to the nucleus, protons & neutrons
4. What are *isotopes?*
   atoms with a different number of neutrons than protons
5. What are *ions?*
   atoms with a different number of electrons than protons

   How are ions formed from atoms?
   Cations - lose electrons Anions - gain electrons

   To what do the terms *cation* and *anion* refer?
   cations are positive ions anions are negative ions
6. Write the *symbol* and *atomic number* for each of the following elements: magnesium, tin, lead, sodium, hydrogen, chlorine, and silver.

H	Cl	Ag	Mg	Sn	Pb	Na
1	17	47	12	50	82	11

7. Write the *name* and *atomic number* for each of the following elements:

a. He	b. Se	c. P	d. B	e. Ba	f. Sr
Helium	Selenium	Phosphorus	Boron	Barium	Strontium
2	34	15	5	56	38

8. Write the *name* and *chemical symbol* for each of the following elements:

a. 19	b. 1	c. 82	d. 12	e. 6	f. 2
K-Potassium	H-Hydrogen	Pb-lead	Mg-Magnesium	C-Carbon	

9. What is a compound? Give examples.
   2 or more elements chemically combined, new chemical and physical properties than the elements that made it up. water H_2O, CO_2, NaCl
10. Describe the points of Rutherford's model for the nuclear atom and how he tested this model.
    Rutherford's model - dense nucleus, positive nucleus, atom mostly empty space
    gold foil experiment
11. Based on his experiments, how did Rutherford envision the structure of the atom?
    Nucleus contain positive protons, very dense, very small. electrons orbited the nucleus
12. How did Rutherford's model for atomic structure differ from Thomson's "plum pudding" model?
    Thomson's model didn't have a nucleus,

Hydrogen-2
↖ mass number

13. To what do the *atomic number* and the *mass number* of an isotope refer? How are specific isotopes indicated symbolically? Give an example and explain. atomic number is the number of proto
mass number is the sum of protons and neutrons. → $^{2}_{1}H$ ← #1 ← net charge
mass number ↑ ↑ atomic number

14. In terms of subatomic particles, how is a cation related to the atom from which it is formed?
cations have fewer electrons than protons

An anion?
anions have more electrons than protons

Does the nucleus of an atom change when an atom is converted into an ion?
NO!!

15. Write the *symbol* and *atomic number* for each of the following elements: potassium, calcium, bromine, neon, aluminum, gold, mercury, and iodine.
K-19 Ca-20 Br-35
Ne-10 Al-13 Au 79 Hg 80 I 53

16. Indicate the number of protons, neutrons, and electrons in isolated atoms having the following nuclear symbols:

a. $^{79}_{35}Br$ P 35 N 44 E 35

b. $^{238}_{92}U$ P-92 N=146 E-92

c. $^{1}_{1}H$ P-1 N-0 E-1

17. For each of the following simple ions, indicate the number of protons and electrons the ion contains.

a. H^+ P-1 E-0

c. N^{3-} 7P 10E

e. F^- 9P 10E

b. Ca^{2+} P-20 E-18

d. Na^+ 11P 10E

f. O^{2-} 8P 10E

18. Indicate the number of protons, neutrons, and electrons in isolated ions having the following nuclear symbols:

a. $^{19}_{9}F^-$ 9P 10N 10E

b. $^{24}_{12}Mg^{2+}$ 12P 12N 10E

c. $^{56}_{26}Fe^{3+}$ 26P 30N 23E

19. For each of the following simple ions, indicate the number of protons and electrons the ion contains.

a. Rb^+ 37P 36E

c. H^- 1P 2E

e. Cl^- 17P 18E

b. Fe^{2+} 26P 24E

d. Al^{3+} 13P 10E

f. O^{2-} 8P 10E