Unit 1 Review Sheet

Name:_____

1. The overall charge of an atom is neutral if the number of protons and electrons are the same.
2. In the nucleus there are two particles the protons and the neutrons.
3. Moving around the nucleus are electrons.
4. What makes one atom different from another is the number of protons in the nucleus of the atom.
5. The atomic number is the number of protons.
6. Protons are found in the nucleus and have a positive charge.
7. Neutrons are found in the nucleus and have neutral charge
8. Electrons are found in energy levels and have a negative charge.
9. What is the atomic number of Cl? 17
10. How many protons and electrons for chlorine? 17 (if neutral)
11. How many neutrons for chlorine? 35.45 → most abundant isotope would be ^{35}Cl, so 35-17= 18
12. The Mass Number is number of protons and neutrons.

Supply the missing information needed to complete the table below.

Element	Atomic number	Mass number	Number of protons	Number of neutrons	Number of electrons
13. sodium	11	23	11	12	11
14. hydrogen	1	1	1	0	1
15. neon	10	20	10	10	10
16. fluorine	9	19	9	10	9
17. uranium	92	238	92	146	92
18. aluminum	13	27	13	14	13

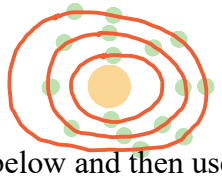
19. ~~An isotope is~~ Isotopes are atoms of same element w/ different masses.
20. Write the symbol $(^{A}_{Z}X)$ for the isotope having 11 p^+, 12 n^0, and 10 e^- $^{23}Na^+$
21. An ion is atom w/ a charge. An atom is a + ion of the number of protons is greater than the number of electrons. It is a − ion if the number of protons is less than the number of electrons.
22. The atomic mass is not a whole number because it is based on an average (weighted) of all the isotopes of an element.
22. Niels Bohr discovered that electrons travel in certain energy levels or orbits around the nucleus
23. Electrons that are closer to the nucleus have less energy than electrons that are farther from the nucleus.
24. The atomic # tells you the # of protons in the nucleus.

25. To find the number of neutrons you subtract the atomic number from the mass #.

26. 2 electrons fill the first energy level, 8 fill the 2nd energy level and 18 fill the 3rd energy level.

27. Draw a Bohr Model for sulfur.

2e⁻ in n=1
8e⁻ in n=2
6e⁻ in n=3



28. Fill in the table below and then use it to figure out what is happening during each type of decay- – alpha (α), beta (β), and gamma (γ)

Parent Isotope	Particle emitted	New, Daughter isotope	Alpha, Beta, or gamma Decay?	# of protons lost or gained by "parent"	Change in mass number
a. $^{226}_{88}Ra$	→	$^{4}_{2}He$ + $^{222}_{86}Rn$	*Alpha*	*Lost 2*	*minus 4*
b. $^{214}_{84}Po$	→	$^{4}_{2}He$ + $^{210}_{82}Pb$	alpha	lost 2	minus 4
c. $^{47}_{20}Ca$	→	$^{0}_{-1}e-$ + $^{47}_{21}Sc$	beta −	gain 1	no change
d. $^{148}_{64}Gd$	→	$^{4}_{2}He$ + $^{144}_{62}Sm$	alpha	lost 2	minus 4
e. $^{14}_{6}C$	→	$^{0}_{-1}e-$ + $^{14}_{7}N$	beta −	gain 1	no change
f. $^{148}_{64}Gd$	→	$^{0}_{0}Y$ + $^{148}_{64}Gd$	gamma	no change	no change

29. Complete the following nuclear equations. Indicate the new element formed during these reactions. Name the nuclear particle emitted.

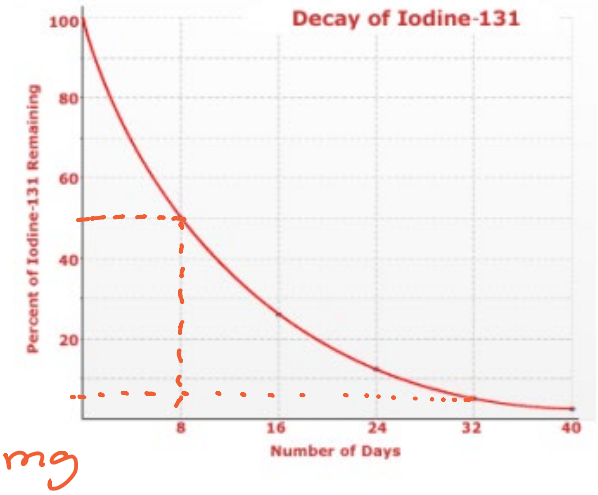
a. $^{22}_{11}\text{Na} \rightarrow ? + {}^{0}_{-1}e$ $^{22}_{12}Mg$

b. $^{66}_{29}\text{Cu} \rightarrow ? + {}^{0}_{-1}e$ $^{66}_{30}Zn$

c. $^{208}_{84}\text{Po} \rightarrow ? + {}^{4}_{2}\text{He}$ $^{204}_{82}Pb$

d. $^{27}_{14}\text{Si} \rightarrow ? + {}^{0}_{+1}e$ $^{27}_{13}Al$

30. The following graph shows the radioactive decay curve for Iodine-131. This radioisotope is used in medicine to help diagnose issues with the thyroid such as cancer and hyperthyroidism. Use the graph for questions.



a. What percent of the isotope remains after 32 days? (be exact) (4 half lives)
6.25%.

b. What is the ½ life of Iodine-131?
8 days

c. A patient administered 20 mg of iodine-131. How many mg of this radioactive isotope will remain the body after 24 days? (show work)
was
24 days = 3 half lives = $\frac{1}{8} \times 20 = 2.5$mg

31. How is fission different than fusion?
fission
splitting
nuclear power plants
atomic bomb

fusion
combining
stars
hydrogen bomb

32. What type of nuclear reaction is shown below?

combining = fusion