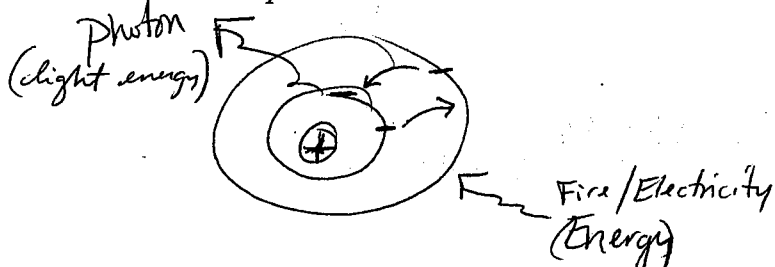


Name \_\_\_\_\_  
Teacher \_\_\_\_\_  
Class \_\_\_\_\_ Block \_\_\_\_\_  
Date \_\_\_\_\_

### Ch. 3 and 11 Review WS

- Color and label the columns of your periodic table with the family names.
  - Alkali metals-1—Do not include hydrogen
  - Alkaline earth metals-2
  - Transition metals-3 through 12
  - Lanthanides-4f block
  - Actinides-5f block
  - Metalloids-B, Si, Ge, As, Sb, Te, and Po
  - Halogens-column 17
  - Diatomic molecules-H, N, O, F, Cl, Br, and I
  - Noble gases-18
- What are allotropes? *same element / different structures*
- Give the 3 allotropes of carbon.  
*diamond, coal, graphite*
- Pg. 75 Review should be done if you want extra practice.
- List the electromagnetic spectrum in order from least energy to most energy.  
*ROYGBIV*
- Draw the shapes of the s, p, and d orbitals in Schrodinger's wave mechanical model.  
*sphere / peanut / daisy or donut*
- What is the Pauli exclusion principal?  
*speed / position aren't both known*
- Where are valence electrons located? What columns? What blocks?  
*outer energy level / all columns 1, 2, 13-18 / s, p*
- Where are core electrons located? What energy level(s)?  
*lower energy levels (inside)*
- What are the main group elements? What columns? What blocks?  
*1, 2, 13-18 s, p*
- How many sublevels are in energy levels 1? 2? 3? And 4?  
*s / sp / sp<sup>2</sup> / sp<sup>3</sup>*
- When gases give off the emission spectrum, does the gas have to be hot or cold?
- Does the gas have to be dense or thin?

14. Draw and explain the Bohr Model of the atom.



- ① Absorb energy
- ② electron jumps from ground state to excited state
- ③ e- drops from ex. state to gr. state
- ④ Photon of light emitted

15. What replaced the Bohr Model of the Atom?

Schrodinger

s, p, d, f orbitals

$$\boxed{\text{Energy Absorbed} = \text{Energy Emitted}}$$

16. The Bohr model states that the energy levels in an atom are quantized. What does that mean?

Number

17. Every element in column 1 ends with  $s^1$ . Explain why each of these atoms gets a charge of 1+ when they become ions. Describe the connection to noble gases.

1 electron is lost  
to behave like nobles

18. Every element in column 17 has  $s^2 p^5$  somewhere in its electron configuration. Explain why each of these atoms gets a charge of 1- when they become ions. Describe the connection to noble gases.

1 e- is gained  
 $7+1=8 = \text{nobles}$

19. Review the More Electron Orbital Practice WS and the Nuclear Symbol WS.

20. The transition metals and the lanthanides and actinides do not lie in the main group element columns. What do you think the charge for these elements could be?

$2^+$  d & f are in lower energy levels

21. Explain, considering they are right after the s block.

outer energy level is s block & has 2 e-

22. Give 3 sources for names of chemical elements. For each source, give an example of an element.

People, Places, Latin/Greek languages

23. What has changed in Dalton's original Atomic Theory? Isotopes are variations of the same element

24. What did Thomson discover? How? Electrons - Cathode Ray Tube

25. What did Rutherford discover? How? Protons - Gold Foil Experiment  
The nucleus is VERY small and in the center of the atom.

26. What did Chadwick discover?

Neutrons

27. How does the mass of the proton compare to the neutron? Same  $1=1$

28. How does the mass of the proton compare to the electron? proton = 1 / electron = 0

29. Give the nuclear symbol for polonium-207.



30. How many electrons does it have? 84

31. Protons?

84

32. Neutrons?  $\begin{matrix} 207 \\ -84 \\ \hline 123 \end{matrix}$
33. What is its mass number? 207
34. What is its atomic number? 84
35. What is the atomic mass for polonium on the periodic table? 209 amu
36. What is the unit for #33? amu (atomic mass units)
37. What is the molar mass for polonium? 209 g
38. What is the unit for #35? g (grams)
39. What is a mole?  $6.022 \times 10^{23}$  of anything = 1 mole  
(a counting #)
40. What is Avogadro's number?  $6.022 \times 10^{23}$
41. Convert 4.5 g of Cu into atoms.  $4.5 \text{ g} \times \frac{6.022 \times 10^{23} \text{ atoms}}{63.546 \text{ g}} = 4.26 \times 10^{22} = 4.3 \times 10^{22} \text{ atom Cu}$
42. Convert  $4.5 \times 10^{45}$  atoms of Cu into g.  $4.5 \times 10^{45} \text{ atom} \times \frac{63.546 \text{ g}}{6.022 \times 10^{23} \text{ atoms}} = 4.7 \times 10^{23} \text{ g Cu}$
43. Convert 4.5 mol Cu into g.  $4.5 \text{ mol} \times \frac{63.546 \text{ g}}{1 \text{ mol}} = 290 \text{ g Cu}$
44. Convert 4.5 mol Cu into atoms.  $4.5 \text{ mol} \times \frac{6.022 \times 10^{23} \text{ atom}}{1 \text{ mol}} = 2.7 \times 10^{24} \text{ atom}$
45. Give 4 physical properties of metals.  
conduct electricity, malleable, ductile, sea of electrons, conduct heat
46. Fill out this table.

### Why Does the Periodic Table Have Trends?

<u>Property</u>	<u>Trend</u>	<u>Why?</u>
Atomic Radii	Periodic → decreases	There are more <u>protons</u> in the nucleus, so they pull harder on the <u>electrons</u>
	Group ↓ increases	Each energy level <u>adds</u> another layer to the outside edge of the <u>atom</u> . The pulling strength <u>decreases</u> as you move farther away.
Ionization Energy	Periodic → increases	It's easier to pull away <u>one</u> or <u>two</u> electrons than it is to <u>give/have/pull</u> away six or seven electrons.
	Group ↓ decreases	The <u>electrons</u> that are farther away are not held as <u>tightly</u> as the ones in <u>lower</u> energy levels.