Name: _____ **Block:** _____

Electromagnetic Radiation Worksheet

1. What is meant by "quanta?"

2. Sketch the entire electromagnetic (EM) spectrum with the highest energy on the left. Label each region; gamma, x-ray, ultraviolet (UV), visible etc. Label the highest and lowest energy regions. Label the highest and lowest frequency regions. Label the longest and shortest wavelength regions. Does it make sense that UV is to the left of visible? Explain. Which has a longer wavelength, blue or red light? Which has a higher frequency, blue or red light? Which has a higher energy, blue or red light?

3. What is meant by "ROY G BIV?"

4. What is the color of light that has a wavelength of 532 nm? What is the frequency of this light? What is the energy of one photon of this frequency? What is the energy of one mole (what's a mole?) of photons of this frequency?

6. What is the most dangerous region of UV? UVA (315-400 nm), UVB (290-315 nm), or UVC (100-290 nm)? Why?

7. What is the wavelength, in nanometers, of light that has an energy content of 508 kJ/mol photons?

Electron Configurations Worksheet

Write the complete ground state electron configurations for the following:

1) lithium

2) oxygen

3) calcium

4) titanium

5) rubidium

Write the abbreviated ground (Noble Gas) state electron configurations for the following:

6) helium

7) nitrogen

8) chlorine

9) iron

10) zinc

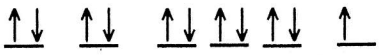
ELECTRON CONFIGURATION (LEVEL ONE)

Name _____

Electrons are distributed in the electron cloud into principal energy levels (1, 2, 3, ...), sublevels (s, p, d, f), orbitals (s has 1, p has 3, d has 5, f has 7) and spin (two electrons allowed per orbital).

Example: Draw the electron configuration of sodium (atomic #11).

Answer: $1s^2$ $2s^2$ $2p^6$ $3s^1$



Draw the electron configurations of the following atoms.

1. Cl

2. N

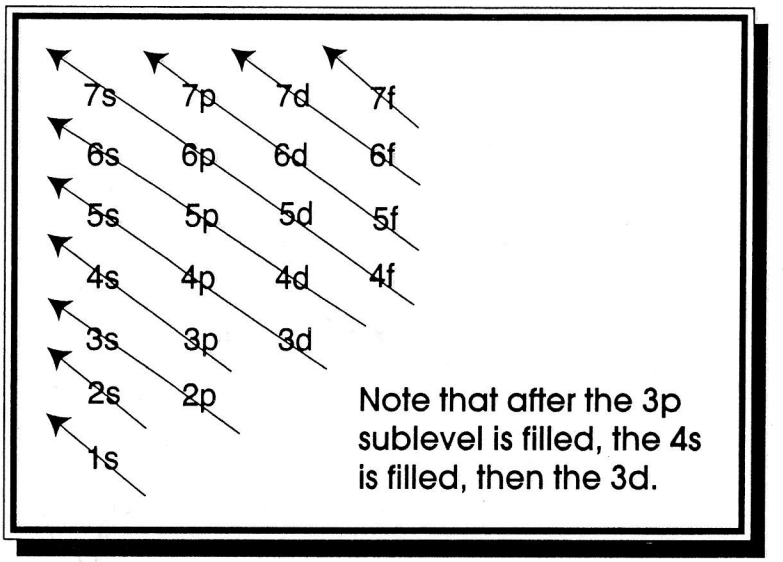
3. Al

4. O

ELECTRON CONFIGURATION (LEVEL TWO)

Name _____

At atomic number greater than 18, the sublevels begin to fill out of order. A good approximation of the order of filling can be determined using the diagonal rule.



Draw the electron configurations of the following atoms.

1. K
2. V
3. Co
4. Zr

VALENCE ELECTRONS

Name _____

The valence electrons are the electrons in the outermost principal energy level. They are always "s" or "s and p" electrons. Since the total number of electrons possible in s and p sublevels is eight, there can be no more than eight valence electrons.

Determine the number of valence electrons in the atoms below.

Example: carbon
Electron configuration is $1s^2$ $\boxed{2s^2\ 2p^2}$.
Carbon has 4 valence electrons.

1. fluorine _____
2. phosphorus _____
3. calcium _____
4. nitrogen _____
5. iron _____
6. argon _____
7. potassium _____
8. helium _____
9. magnesium _____
10. sulfur _____
11. lithium _____
12. zinc _____
13. carbon _____
14. iodine _____
15. oxygen _____
16. barium _____
17. aluminum _____
18. hydrogen _____
19. xenon _____
20. copper _____