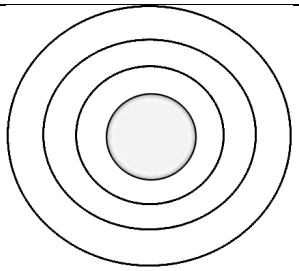
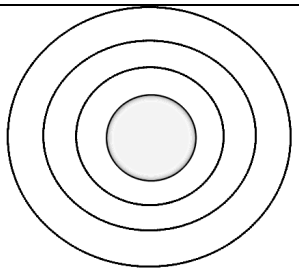
Unit 7 Quest Review **Name _____**

Date _____ Block _____

Bohr Diagrams, Lewis Structures

Standard Nuclear Notation	Subatomic Particles	Bohr Diagram	# Valence Electrons	Lewis Structure
$^{11}_{5}B$	# protons= # neutrons= # electrons=			
$^{23}_{11}Na^{+1}$	# protons= # neutrons= # electrons=			

Electromagnetic Radiation, Waves, Ground vs Excited State

1. Compare the two waves below. Which one has a higher frequency? Longer wavelength? Higher energy?

2. Use your notes to answer the following questions:
   a. Which type of radiation has the lowest frequency? How do you know?

   b. When comparing infrared and visible waves, which has the longest wavelength? Why?

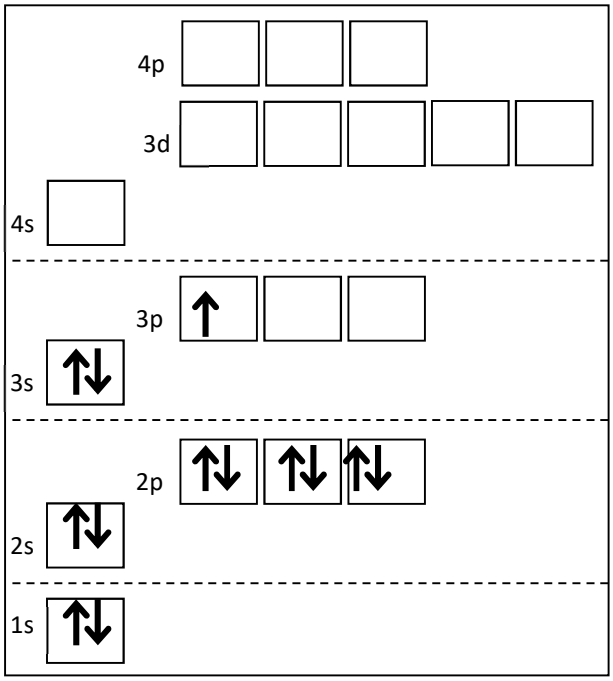
3. *Complete the following table and show your work in the space below the table.*

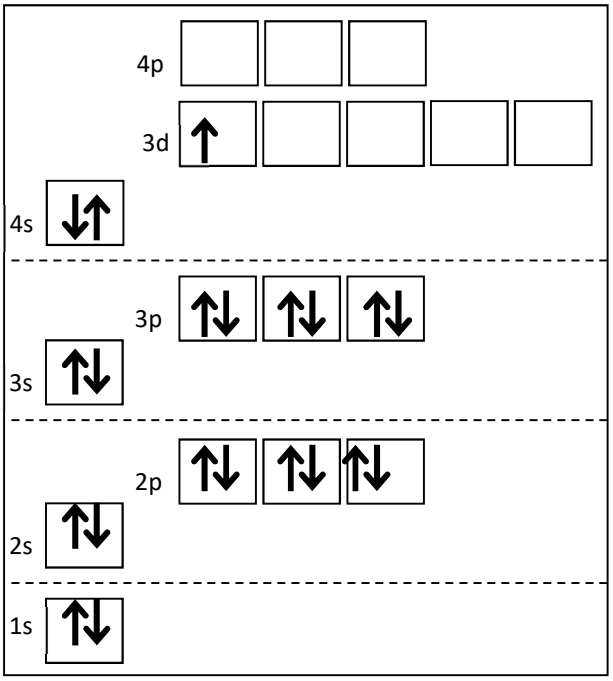
Energy	Frequency	Wavelength
		6.85×10^{-7} m
3.71×10^{-25} J	560,000,000 Hz	

2. Explain how the flame test results in different spectra for different elements. Please include **ground state, excited state, and energy** in your response.

Orbital Diagrams and Electron Configuration

3. Look at the following orbital diagrams. Which neutral atom does each of these represent?





atom: _____ atom: _____

E.C.: _____ E.C.: _____

4. Write the chemical symbol and name for the following electron configurations:

a. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^3$

b. $1s^2 2s^2 2p^6 3s^2 3p^3$

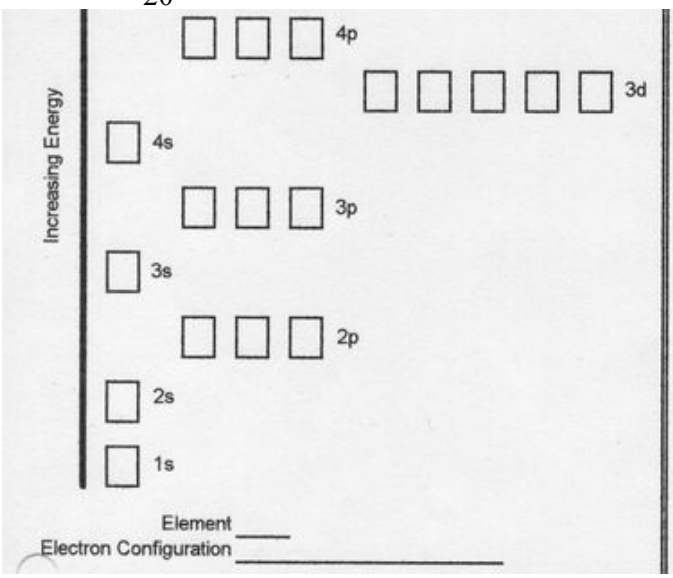
c. $1s^2 2s^2 2p^4$

d. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6$

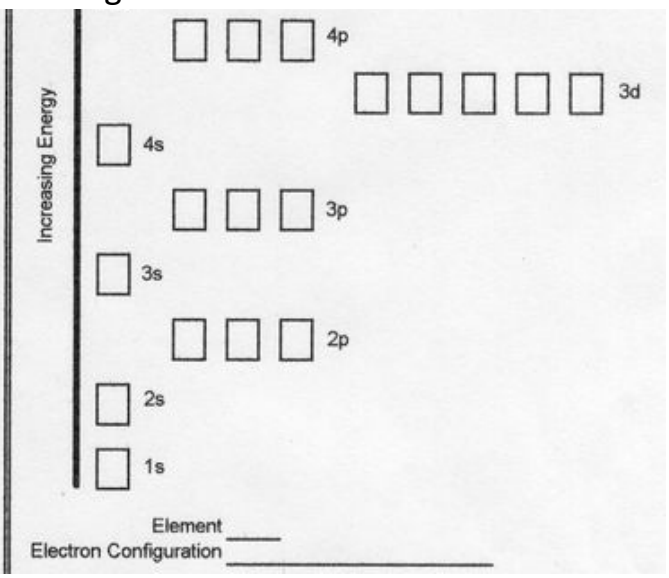
e. $1s^2 2s^1$

5. Draw the Orbital Diagrams & write the electron configuration for the following ground state elements:

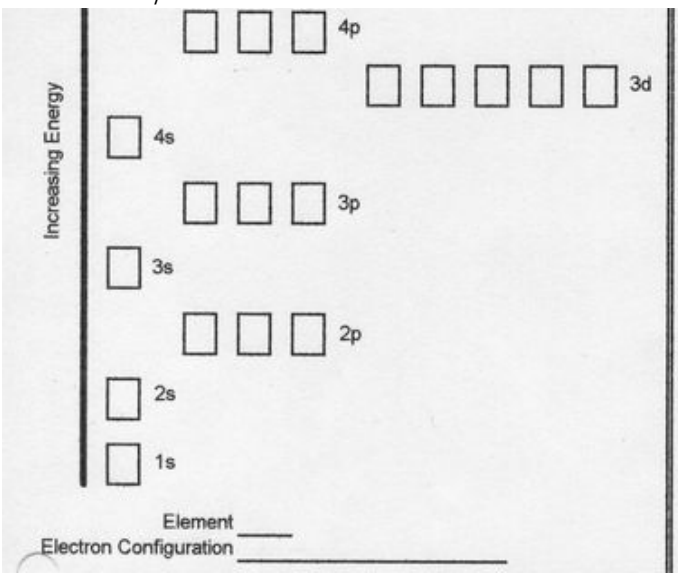
a. $^{40}_{20}Ca$



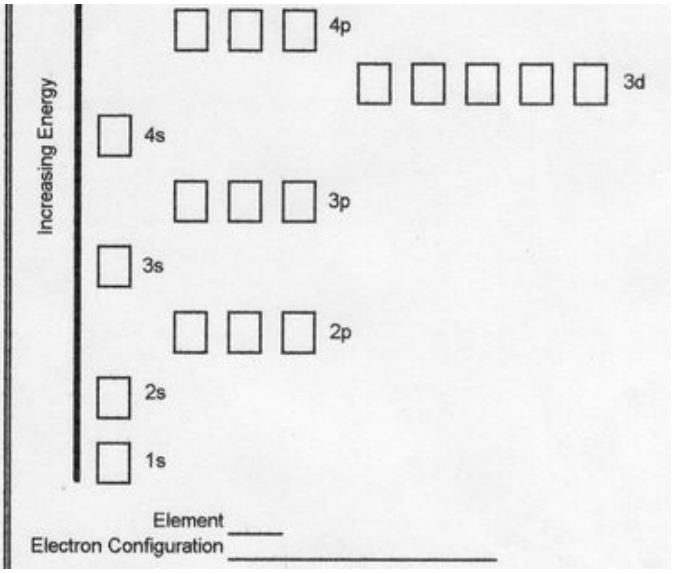
b. Magnesium-26



c. $^{15}_{7}N$

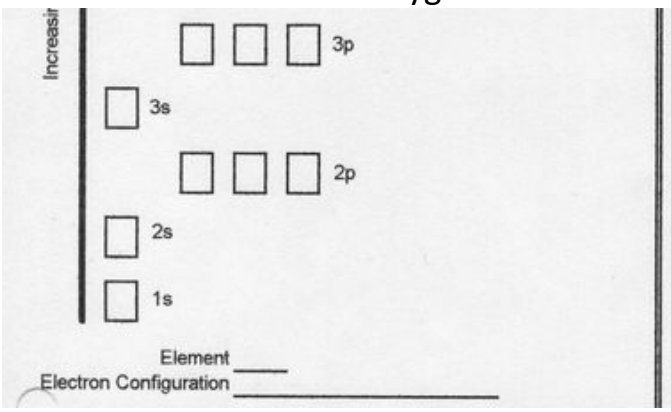


d. Cobalt

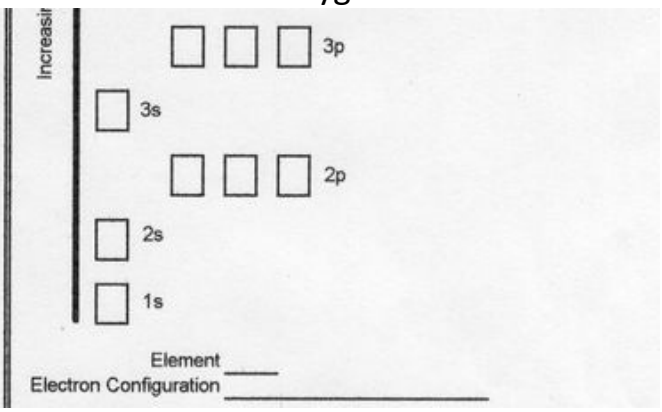


6. Draw the orbital diagram and write the E.C. for the following elements

a. Ground state Oxygen



b. **Excited state** Oxygen



7. Complete electron configurations for each of the following elements or ions.

Element	# of e^-	Long-form Electron Configuration	Noble Gas Abbreviation	# Valence electrons
Silicon				
Na^{+1}				
O^{-2}				
Bromine				

8. The sodium ion and oxygen ion above are isoelectronic to which noble gas?

9. For each of the configurations below, indicate whether they are valid or invalid and explain.
   a. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^4$

   b. $[Kr]4d^3 5s^2 5p^1$

   c. $[Ne]3s^2 3p^2$

   d. [Ar]

   e. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^{10} 4p^5$