

Electrons and Periodic Table Review

1. Label the periodic table below with the areas named below. Include the entire area for each group.

**Careful! H is not an alkali metal*

The diagram shows a standard periodic table with the following handwritten annotations:

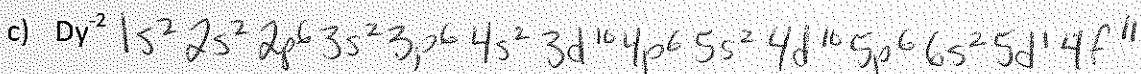
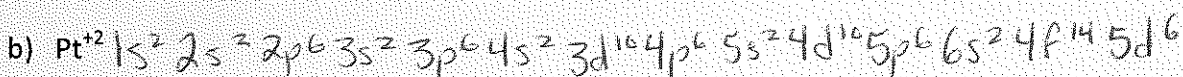
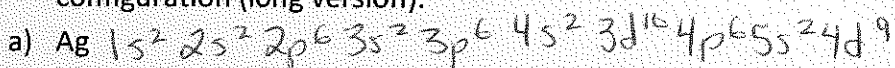
- d**: Points to the first column (Group 1).
- e**: Points to the second column (Group 2).
- f**: Points to the transition metal block (Groups 3-10).
- g**: Points to the halogen group (Group 17).
- h**: Points to the noble gas group (Group 18).
- non-metals**: An arrow points to the upper right portion of the table (Groups 13-18).
- i**: Points to the Lanthanide series.
- j**: Points to the Actinide series.

- | | |
|---|---|
| <ul style="list-style-type: none"> a. Metalloids b. Non-metals c. Metals d. Alkali Metals e. Alkaline Earth Metals f. Transition Metals | <ul style="list-style-type: none"> g. Halogens h. Noble Gases i. Lanthanides j. Actinides |
|---|---|

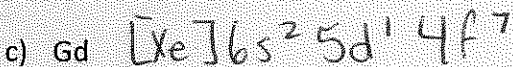
2. Explain how the appearance (and even the existence) of the periodic table may have been influenced by the culture of its creators?

- created by Europeans
- Europeans tend to use rows, columns, straight lines & groups. Have a rectilinear world view.
- ∴ P.T. has rows, columns, straight lines & groups

5. For each of the atoms or ions below, use the periodic table to write the electron configuration (long version).

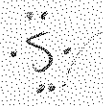


6. For each of the atoms or ions below, use the periodic table to write the abbreviated electron configuration.



7. Draw the Lewis Dot Structures for the elements below.

a) Selenium b) Lithium c) Phosphorus d) Helium e) Sulphur f) Boron



8. Explain what is meant by the following as it pertains to the periodic trends:

a) Sucking Power of the Nucleus: as we go across, we add protons to the nucleus. This increases its sucking power & it pulls e^- in closer & holds them tighter.

b) Shells: as we go down, electrons are added to shells further from the nucleus. Outer e^- do not feel the pull of the nucleus as much and are more loosely held.

c) Shielding: as we go down, shells are added. Outer electrons are shielded from the sucking power of the nucleus. Outer electrons are more loosely held.

d) Octet Rule: elements on the left of the periodic table want to lose electrons while elements on the right want to gain. Electrons become harder & harder to remove, & easier and easier to gain from another element.

9. Define the following terms:

- a) Orbital: regions in space where we are most likely to find an electron.
- b) Shell: tells us how far an electron is from the nucleus
- c) Hund's Rule: when e^- are filling orbitals of equal energy, they will fill singly first, then double up.
- d) Periodic Law: when elements are arranged according to increasing atomic number, properties repeat themselves periodically.
- e) Isoelectronic: elements or ions that have the same electrons \therefore the same electron structure.
- f) Octet Rule: elements will either lose or gain electrons in order to have a full outer shell of electrons
- g) Valence Electrons: the electrons in the shell farthest from the nucleus
- h) Core Electrons: the electrons that are not in the valence shell, are closer to the nucleus
- i) Ionization Energy: is the energy it takes to remove an electron from an atom.
- j) Atomic Radius: is the size of the atom
- k) Electronegativity is the ability of an element to bring electrons to itself in a bond