Periodic Trends Guided Note Sheet

Fill in the blanks. Some blanks have word choices written after them to help you. Refer to the drawings and questions from the first page to help you with the fill in the other pages.

I. Atomic Radius in a Group
   A. As you move down a group, the nucleus becomes ___________ (stronger, weaker) because more ___________ (electrons, protons) are being added to it. This stronger nucleus can pull the electrons in more tightly, making the atoms smaller; however.
   B. ___________ (Protons, Electrons) are also added to the atom but are added to ___________ (larger, smaller, the same) energy levels resulting in larger atoms.
   C. The increased number of inner electrons shield (or block) the ___________ (positive, negative) pull of the nucleus.
   D. So, electron shielding ___________ (increases, decreases) causing the electrons on the outermost energy levels to be even farther from the nucleus than expected.
   E. This causes the atoms at the bottom of a Group to be even ___________ (larger, smaller) than expected.
   F. Therefore, atomic radius ___________ (increases, decreases) as you move down a group

II. Atomic Radius in a Period
   A. As you move right across a Period, the nucleus becomes ___________ (stronger, weaker) because more ___________ (electrons, protons) are being added to it.
   B. ___________ (Protons, Electrons) are also added but they are added to ___________ (the same, a larger, a smaller) energy level.
   C. This causes the amount of electron shielding from electrons on inner energy levels to remain ___________ (constant, varied).
   D. Therefore, electrons are pulled in ___________ (more, less) tightly because they feel the pull from nucleus more strongly.
   E. This causes the atoms on the right of the Periodic Table to be ___________ (larger, smaller) than those on the left.
   F. So, atomic radius ___________ (increases, decreases) as you move across a Period from left to right.

III. Sizes of an Ion Versus Sizes of an Atom (Digital Textbook—Section 13.3)
   A. Metal cations are _______ (smaller, larger) than the neutral atoms
   B. because __________________________________________
   C. Nonmetal anions are _______________ (smaller, larger) than the neutral atoms
   D. because __________________________________________

IV. Ionization Energy in a Group
   A. Ionization energy is the energy required to ___________ the outermost electron from an atom
   B. As you move down a Group, the nucleus becomes ___________ (stronger, weaker) because there are ___________ (more, fewer) protons in it.
   C. However, as you move down a group, there are ___________ (fewer, more) energy levels making the atom ___________ (larger, smaller).
   D. In atoms at the top of a group, the outermost electrons are closer to the nucleus so the electrons can feel the pull of nucleus ___________ (more, less) strongly.
   E. The outermost electrons also feel the pull of the nucleus less strongly because there is ___________ (less, more) electron shielding from the ___________ (decreased, increased) number of inner electrons.
   F. Therefore, ___________ (more, less) energy is required to remove the outermost electron from a larger atom.
G. For these reasons, ionization energy _____________ (increases, decreases) as you move down a Group

V. Ionization Energy in a Period
   A. Ionization energy is the energy required to remove the outermost electron from an atom
   B. As you move to the right in the Period, the nucleus becomes _____________ (stronger, weaker) because there are __________ (more, fewer) protons in it.
   C. There are also __________ (more, less) electrons but they are added to __________ (the same, a larger, a smaller) energy level so electron shielding from inner energy levels remains ____________ (constant, varied).
   D. Therefore, the atoms on the right of the Table are ________________ (smaller, larger).
   E. For these reasons, the electrons feel the pull from the nucleus _______ (more, less) strongly so ____________ (more, less) energy is required to remove an electron.
   F. Therefore, ionization energy _____________ (increases, decreases) to the right in a Period

VI. Electronegativity in a Group
   A. Electronegativity is the ability of a nucleus to attract the _____________ (electrons, protons) in a bond
   B. As you move down a Group, the nucleus becomes ____________ (stronger, weaker) because there are ________ (more, fewer) protons in it.
   C. As you move up a Group, there are ______ (more, fewer) energy levels making the atom smaller.
   D. There is also ______ (more, less) electron shielding from the ________ (increased, decreased) number of inner electrons as you move down a Group.
   E. As a result, the electrons in the bond feel the pull of nucleus _______ (more, less) strongly.
   F. For these reasons, electronegativity ____________ (increases, decreases) down a Group

VII. Electronegativity in a Period
   A. Electronegativity is the ability of a nucleus to attract the _____________ (electrons, protons) in a bond
   B. As you move to the right in the Period, the nucleus becomes ___________ (stronger, weaker) because there are __________ (more, fewer) protons in it.
   C. As you move to the right in a Period, electrons are also being added but they are added to ___ _________ (the same, a larger, a smaller) energy level
   D. so electron shielding from inner energy levels remains ____________ (constant, varied) resulting in a _____________ (smaller, larger) atom.
   E. For these reasons, the electrons in the bond feel the pull of nucleus _______ (more, less) strongly
   F. And electronegativity _____________ (increases, decreases) to the right in a Period
   G. Note: The ______________ (halogens, noble gases) are not included in the electronegativity trend because they don’t attract or donate electrons
Draw Periodic Trend arrows as shown by your instructor.

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* Lanthanides

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