Name: Key Date: _____ Block: _____

Periodic Trends Worksheet

1. Discuss the importance of Mendeleev's periodic law.
   Organized based on ATOMIC MASS. Saw repeating properties when it was set-up in this way.

2. Identify each element as a metal, metalloid, or nonmetal:
   a. Fluorine — non-metal
   b. Germanium — metalloid
   c. Zinc — metal
   d. Phosphorous — non-metal
   e. Lithium — metal

3. Give two examples of elements for each category:
   a. Noble gases — He, Ne, Ar, Kr, Xe, Rn (Group 18)
   b. Halogens — F, Cl, Br, I, At (Group 17)
   c. Alkali Metal — Li, Na, K, Rb, Cs, Fr (Group 1)
   d. Alkali Earth — Be, Mg, Ca, Sr, Ba, Ra (Group 2)

4. What trend in atomic radius do you see as you go down a group/family on the periodic table?
   Atomic Radius increases down group.

5. What trend in atomic radius do you see as you go across a period/row on the periodic table? What causes this trend? Radius decreases. Due to greater attraction of electrons to nucleus.

6. Circle the atom in each pair that has the largest atomic radius.

a.	(Al)	B	c.	(S)	O	e.	(Br) Cl
b.	(Na)	Al	d.	(O)	F	f.	Mg (Ca)

7. Define ionization energy:
   The ability of an atom to "hold" onto its outermost electrons.

8. Is it easier to form a positive ion with an element that has a high ionization energy or an element that has a low ionization energy? Explain. HONORS ONLY
   Easier w/ a low ionization energy b/c positive ions are formed when electrons are removed. It is easier to remove electron w/ low ionization energy.

9. What trend in ionization energy do you see as you go down a group/family on the periodic table? What causes this trend?

Ionization energy decreases b/c the size of the atom is getting larger. Therefore, the nucleus has a harder time holding onto the electrons

10. What trend in ionization energy do you see as you go across a period/row on the periodic table? What causes this trend?

Ionization energy increases b/c the size of the atom increases & electrons are closer to the nucleus

11. Circle the atom in each pair that has the greater ionization energy.

a. Li (Be) c. (Na) K e. Cl (Si)
b. (Ca) Ba d. P (Ar) f. (Li) K

12. Define electronegativity:

Ability of an atom to steal electrons from other atoms. They are "electron thiefs"

13. What trend in electronegativity do you see as you go down a group/family on the periodic table? What causes this trend?

Electronegativity decreases as you go down b/c the atom is getting bigger.

14. Rank the atoms from smallest to largest atomic radius:

a. Li, C, F — F, C, Li
b. Li, Na, K — Li, Na, K
c. Ge, P, O — O, P, Ge

15. Rank the ions from smallest to largest for ionic radius:

Honors ONLY

a. Mg^{2+}, Si^{4-}, S^{2-} — S^{2-}, Si^{4-}, Mg^{2+}
b. F^-, Cl^-, Br^- — F^-, Cl^-, Br^-
c. Ba^{2+}, Cu^{2+}, Zn^{2+} — Zn^{2+}, Cu^{2+}, Ba^{2+}

16. Rank the atoms from lowest to highest in terms of ionization energy:

a. Mg, Si, S — Mg, Si, S
b. F, Cl, Br — Br, Cl, F
c. Ba, Cu, Ne — Ba, Cu, Ne

17. Rank the atoms from lowest to highest electronegativity:
    a. Li, C, N — Li, C, N
    b. C, O, Ne — C, O, Ne
    c. K, Mg, P — K, Mg, P

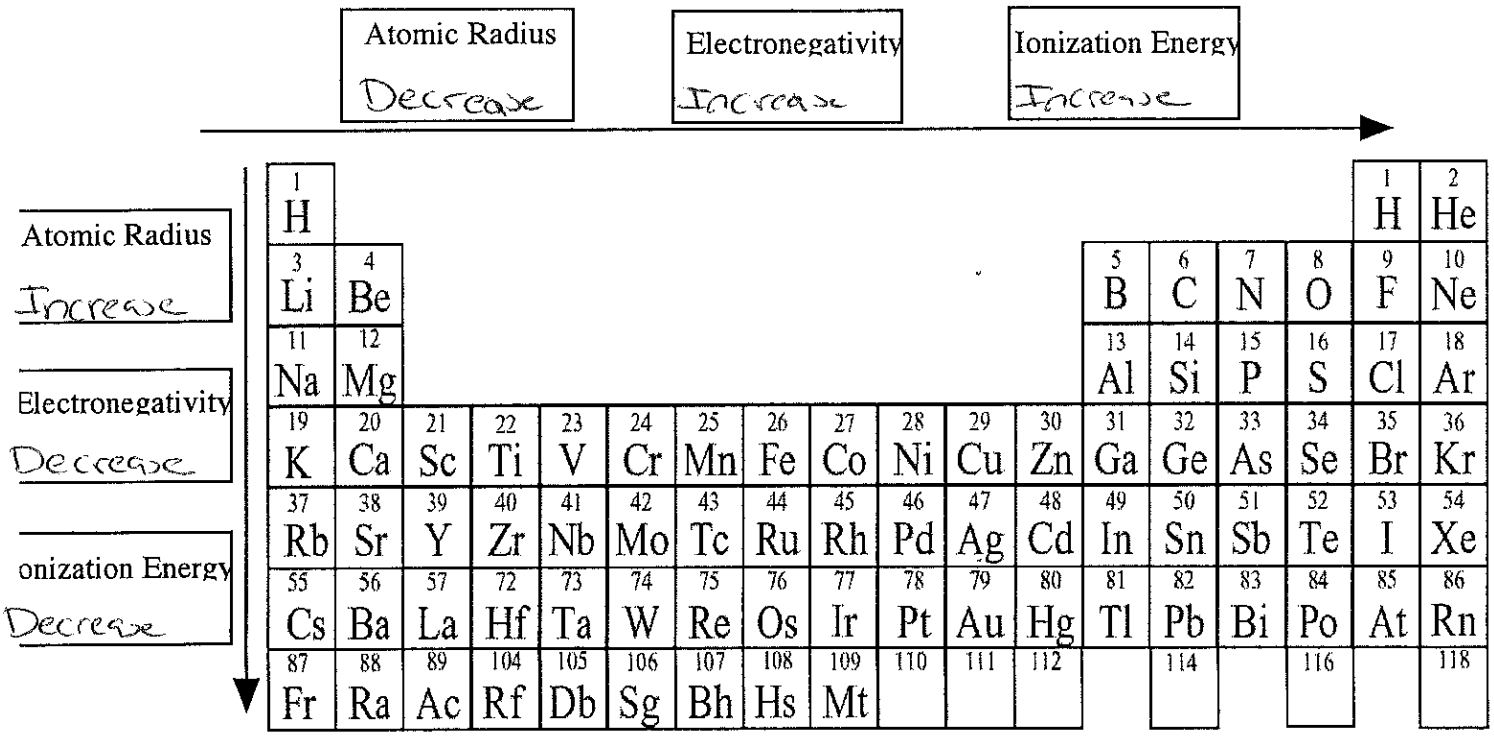
18. What is the difference between electron affinity and ionization energy?
    ★ SKIP - CP & HONORS
    ★ We did not discuss Electron Affinity

19. Why does fluorine have a higher ionization energy than iodine?
    Fluorine is smaller than Iodine. Its electrons are closer to the nucleus and, therefore, harder to remove.

ate:

Periodic Trends

1.



2.For each set of atoms tell which atom has the biggest atomic radius:

Atom 1	Atom 2	Atom 3	Atom 4	Largest in Set
Lithium	Carbon	Nitrogen	Fluorine	Li
Calcium	Beryllium	Radium	Magnesium	Ra
Krypton	Zinc	Calcium	Bromine	Ca
Polonium	Sulfur	Oxygen	Tellurium	Po

3.For each set of atoms tell which atom has the highest electronegativity:

Atom 1	Atom 2	Atom 3	Atom 4	Highest Electronegativity
Chlorine	Sulfur	Aluminum	Magnesium	Cl
Boron	Indium	Aluminum	Gallium	B
Nitrogen	Oxygen	Fluorine	Calcium	F
Lithium	Calcium	Francium	Silicon	Li

*Lithium b/c it is smaller than Si in terms of the number of energy levels.

Date:

Periodic Trends

4. For each set of atoms tell which atom has the lowest ionization energy.

↑ make sure to pay attention!

Atom 1	Atom 2	Atom 3	Atom 4	Lowest Ionization Energy
Nitrogen	Fluorine	Oxygen	Carbon	C
Iodine	Bromine	Fluorine	Chlorine	I
Lithium	Beryllium	Boron	Carbon	Li
Aluminum	Silicon	Phosphorus	Sulfur	Al

☆ HONORS ONLY ☆

5. Which would be larger the ionic radius or the atomic radius?

a. Calcium's Atomic Radius or Ionic Radius

↓ metal

Atomic Radius

b. Fluorine's Atomic Radius or Ionic Radius

↓ non-metal

Ionic Radius

c. Bromine's Atomic Radius or Ionic Radius

↓ non-metal

Ionic Radius

d. Potassium's Atomic Radius or Ionic Radius

↓ metal

Atomic Radius

★ Cations - Metals
- Loose electrons
- Smaller than parent

★ Anions - Nonmetals
- gain electrons
- bigger than parent