Full Name _____ Date _____ Per ____

Periodic Trends Practice

1. Identify each element as a metal, metalloid, or nonmetal

   germanium _____ phosphorous _____

   zinc _____ lithium _____

2. Give two examples of elements for each category

   noble gases _____

   halogens _____

   alkali metals _____

   alkaline earth metals _____

   transition metals _____

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

4. What trend in atomic radius do you see as you go across a period/row on the periodic table?

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

   A. Al B C. Br Cl E. O F

   B. S O D. Na Al F. Mg Ca

6. Rank the following elements by increasing atomic radius:
   carbon, aluminum, oxygen, potassium.

   _____<_____<_____<_____

7. Define ionization energy.

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

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

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

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

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

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

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15. Circle the atom in each pair that has the greater electronegativity

A. Ca Ga	C. Li O	E. Cl S
B. Br As	D. Ba Sr	F. O S

16. Rank the following elements by increasing electronegativity: sulfur, oxygen, neon, aluminum

17. Arrange the following atoms in order of decreasing atomic radius. Na Al P Cl Mg

_____<_____<_____<_____

18. Which is the largest atom in Group 4A? _____

19. Which is the smallest atom in Group 7A? _____

20. Which is the smallest atom in period 5? _____

21. For each of the following pairs, which of the two species is larger?
    A. N^{3-} or F^{-}_____
    B. Mg^{2+} or Ca^{2+}_____
    C. Fe^{2+} or Fe^{3+}_____

22. For each of the following pairs, which of the two species is smaller?
    A. K^{+} or Li^{+}_____
    B. Au^{+} or Au^{3+}_____
    C. P^{3-} or N^{3-}_____

23. Order the following groups from largest to smallest radii.
    A. C, Al, F, Si_____
    B. Na, Mg, Ar, P_____
    C. I^{-}, Ba^{2+}, Cs^{+}, Xe_____
    D. Ar, Cl^{-}, K^{+}, S^{2-}_____

24. The elements characterized as nonmetals are located in the periodic table at the
    (A) far left; (B) bottom; (C) center; (D) top right

25. Which is the atomic number of an alkali metal?
    (A) 10; (B) 11; (C) 12; (D) 13.

26. Which element is a halogen?
    (A) iron; (B) nitrogen; (C) iodine; (D) neon

27. Given the same conditions, which of the following Group 7A elements has the least tendency to gain electrons?
    (A) fluorine; (B) iodine; (C) bromine; (D) chlorine.

28. The alkaline earth element having the largest atomic radius is found in Period
    (A) 1; (B) 2; (C) 6; (D) 7.

29. Which of the following atoms will lose an electron most readily?
    (A) potassium; (B) calcium; (C) rubidium; (D) strontium

30. Which element in Group 16 (6A) has the greatest tendency to gain electrons?
    (A) Te; (B) Se; (C) S; (D) O.

31. The elements known as the alkali metals are found in Group
    (A) 1 (1A); (B) 2 (2A); (C) 13 (3A); (D) 17 (7A).

32. The element in Period 3 that has the highest ionization energy is
    (A) an inert gas; (B) a halogen; (C) an alkali metal; (D) an alkaline earth metal

33. Which element in Period 3 has both metallic and nonmetallic properties?
    (A) Na; (B) Mg; (C) Si; (D) Ar.

34. Which ion would have the smallest radius?
    (A) Ba^{2+} ; (B) Ca^{2+} ; (C) Mg^{2+} ; (D) Sr^{2+}

35. The most active metals are in Group
    (A) 1 (IA); (B) 15 (VA); (C) 13 (IIIA); (D) 17 (VIIA).

36. Which is an example of a metalloid?
    (A) sodium; (B) strontium; (C) silicon; (D) sulfur.

37. Which Period contains four elements which are gases at STP?
    (A) 1; (B) 2; (C) 3; D) 4.

38. An atom in the ground state with eight valence electrons would most likely be
    (A) an active metal; (B) an inactive metal; (C) a noble gas; (D) a halogen.

39. The atomic number of a metalloid in Period 4 is
    (A) 19; (B) 26; (C) 33; (D) 36.

40. Which element is a liquid at STP?
    (A) K; (B) I; (C) Ag; (D) Hg.

41. All elements whose atoms in the ground state have a total of 7 electrons in their outermost energy level
    (A) noble gases; (B) metalloids; (C) halogens; (D) alkaline earth metals.

42. Which of the following elements has the highest electronegativity?
    (A) phosphorous; (B) sulfur; (C) oxygen; (D) sodium.

43. Which element has the highest ionization energy?
    (A) barium; (B) magnesium; (C) calcium; (D) strontium.

44. Which is an alkaline earth metal?
    (A) Na; (B) Ca; (C) Ga; (D) Ta.

45. As one proceeds from left to right across a given period on the Periodic Table the electronegativities of the elements generally
    (A) decrease; (B) increase; (C) remain the same.

46. As one proceeds from flourine to astatine in Group VIIA the electronegativity
    (A) decreases and the atomic radius increases;
    (B) decreases and the atomic radius decreases;
    (C) increases and the atomic radius decreases;
    (D) increases and the atomic radius increases