

Periodic Trends Review Worksheet

1. For each of the following sets of atoms, rank the atoms from smallest to largest atomic radius.

a.) Li, C, F _____ < _____ < _____

b.) Li, Na, K _____ < _____ < _____

c.) Ge, P, O _____ < _____ < _____

d.) C, N, Al _____ < _____ < _____

e.) Al, Cl, Ga _____ < _____ < _____

Draw arrows to show the trend for the direction of increasing Atomic Radii.

• What two properties control the size of the atom? _____

• Which is the largest atom? _____ Which is the smallest atom? _____

2. For each of the following sets of ions and atoms **circle** which is larger.

a.) Mg^{+2} or Mg Mg^{+2} Mg

b.) N^{-3} or N N^{-3} N

c.) K^{+1} or Fr^{+1} K^{+1} Fr^{+1}

d.) O^{-2} or N^{-3} O^{-2} N^{-3}

e.) F^{-1} or F F^{-1} F

Draw arrows to show the trend for the direction of increasing Ionic Radii.

• Why are ions larger or smaller than their original atoms? _____

• Which is the largest cation? _____ Which is the smallest cation? _____

• Which is the largest anion? _____ Which is the smallest anion? _____

3. For each of the following sets of atoms, rank them from lowest to highest ionization energy.

a.) Mg, Si, S ____ < ____ < ____

b.) Mg, Ca, Ba ____ < ____ < ____

c.) F, Cl, Br ____ < ____ < ____

d.) Ca, Cu, Kr ____ < ____ < ____

e.) C, Si, Sn ____ < ____ < ____

Draw arrows to show the trend for the direction of increasing Ionization Energy.

The periodic table shows the following trends for ionization energy:

- Increases from left to right across each period.
- Increases from bottom to top within each group.
- Helium (He) has the highest ionization energy.
- Francium (Fr) has the lowest ionization energy.

- What does Ionization Energy measure? _____

- Which element has the lowest IE? _____ Which has the highest IE? _____

4. For each of the following sets of atoms, rank them from lowest to highest electronegativity.

a.) Li, C, N ____ < ____ < ____

b.) C, O, Ne ____ < ____ < ____

c.) C, Si, Pb ____ < ____ < ____

d.) Cs, Ni, F ____ < ____ < ____

e.) S, F, He ____ < ____ < ____

Draw arrows to show the trend for the direction of increasing Electronegativity.

The periodic table shows the following trends for electronegativity:

- Increases from left to right across each period.
- Increases from bottom to top within each group.
- Fluorine (F) and Oxygen (O) have the highest electronegativity.
- Francium (Fr) has the lowest electronegativity.

- Why are metals less electronegative than nonmetals? _____

- Which element has the lowest EN? _____ Which has the highest EN? _____

5. For each of the following sets of atoms, rank them from least to greatest in terms of metallic properties.

a.) Li, B, N ____ < ____ < ____

b.) Li, Na, K ____ < ____ < ____

c.) Si, P, S ____ < ____ < ____

d.) Pb, Po, Rn ____ < ____ < ____

e.) Ra, Sr, Mg ____ < ____ < ____

Draw arrows to show the trend for the direction of increasing Metallic Properties

The periodic table shows the trend for increasing metallic properties. Arrows indicate the direction from the top-right (nonmetals) towards the bottom-left (metals).

• What are some properties of metals? _____

• Which element is least metallic? ____ Which is most metallic? ____

6. Indicate greater than, less than, or equal to in order to compare the shielding effect of the following atoms.

a.) Li, B, N Li B N

b.) Li, Na, K Li Na K

c.) Si, P, S Si P S

d.) Cu, Ag, Au Cu Ag Au

e.) Ra, Sr, Mg Ra Sr Mg

Draw arrows to show the trend for the direction of increasing Shielding Effect

The periodic table shows the trend for increasing shielding effect. Arrows indicate the direction from the top-left (small atoms) towards the bottom-right (large atoms).

• Why is shielding constant across a period? _____

• Why does shielding increase down a group? _____

• Which elements have the most shielding? _____

• Which elements have the least shielding? _____

7. What determines an elements chemical properties? _____

8. List the number of valence electrons above each group for the **s** and **p block** elements.

		Group 1																				Group 18															
Period	1	<div>1.00794 H 1 Hydrogen</div>																				<div>4.002602 He 2 Helium</div>															
	2	<div>6.941 Li 3 Lithium</div>		<div>9.01218 Be 4 Beryllium</div>		Transition Elements										<div>10.81 B 5 Boron</div>		<div>12.0111 C 6 Carbon</div>		<div>14.007 N 7 Nitrogen</div>		<div>15.9994 O 8 Oxygen</div>		<div>16.99943 F 9 Fluorine</div>		<div>20.179 Ne 10 Neon</div>											
	3	<div>23.8927 Na 11 Sodium</div>		<div>24.305 Mg 12 Magnesium</div>												<div>26.98154 Al 13 Aluminum</div>		<div>28.0855 Si 14 Silicon</div>		<div>30.97376 P 15 Phosphorus</div>		<div>32.06 S 16 Sulfur</div>		<div>35.453 Cl 17 Chlorine</div>		<div>39.948 Ar 18 Argon</div>											
	4	<div>39.0983 K 19 Potassium</div>		<div>40.078 Ca 20 Calcium</div>		<div>44.9559 Sc 21 Scandium</div>		<div>47.88 Ti 22 Titanium</div>		<div>50.9415 V 23 Vanadium</div>		<div>51.996 Cr 24 Chromium</div>		<div>54.938 Mn 25 Manganese</div>		<div>55.847 Fe 26 Iron</div>		<div>58.9332 Co 27 Cobalt</div>		<div>58.9332 Ni 28 Nickel</div>		<div>63.546 Cu 29 Copper</div>		<div>65.38 Zn 30 Zinc</div>		<div>72.59 Ga 31 Gallium</div>		<div>72.59 Ge 32 Germanium</div>		<div>74.9216 As 33 Arsenic</div>		<div>78.96 Se 34 Selenium</div>		<div>79.904 Br 35 Bromine</div>		<div>83.80 Kr 36 Krypton</div>	
	5	<div>85.4678 Rb 37 Rubidium</div>		<div>87.62 Sr 38 Strontium</div>		<div>88.9059 Y 39 Yttrium</div>		<div>91.224 Zr 40 Zirconium</div>		<div>90.94 Nb 41 Niobium</div>		<div>92.906 Mo 42 Molybdenum</div>		<div>92.906 Tc 43 Technetium</div>		<div>101.07 Ru 44 Ruthenium</div>		<div>101.07 Rh 45 Rhodium</div>		<div>106.42 Pd 46 Palladium</div>		<div>107.868 Ag 47 Silver</div>		<div>112.411 Cd 48 Cadmium</div>		<div>114.818 In 49 Indium</div>		<div>118.710 Sn 50 Tin</div>		<div>121.757 Sb 51 Antimony</div>		<div>127.60 Te 52 Tellurium</div>		<div>126.905 I 53 Iodine</div>		<div>131.29 Xe 54 Xenon</div>	
	6	<div>132.905 Cs 55 Cesium</div>		<div>137.33 Ba 56 Barium</div>		<div>138.905 La 57 Lanthanum</div>		<div>178.49 Hf 72 Hafnium</div>		<div>180.948 Ta 73 Tantalum</div>		<div>183.85 W 74 Tungsten</div>		<div>186.207 Re 75 Rhenium</div>		<div>186.207 Os 76 Osmium</div>		<div>192.22 Ir 77 Iridium</div>		<div>195.08 Pt 78 Platinum</div>		<div>196.967 Au 79 Gold</div>		<div>200.59 Hg 80 Mercury</div>		<div>204.383 Tl 81 Thallium</div>		<div>207.2 Pb 82 Lead</div>		<div>208.98 Bi 83 Bismuth</div>		<div>209 Po 84 Polonium</div>		<div>(210) At 85 Astatine</div>		<div>(222) Rn 86 Radon</div>	
	7	<div>(223) Fr 87 Francium</div>		<div>(226) Ra 88 Radium</div>		<div>(227) Ac 89 Actinium</div>		<div>(261) Rf 104 Rutherfordium</div>		<div>(262) Db 105 Dubnium</div>		<div>(263) Sg 106 Seaborgium</div>		<div>(264) Bh 107 Bohrium</div>		<div>(265) Hs 108 Hassium</div>		<div>(267) Mt 109 Meitnerium</div>		110		Mass numbers in parentheses are those of the most stable or commonest isotopes.															
	Lanthanoid Series										Actinoid Series										Metals → Nonmetals																
	<div>Ce 58 Cerium</div> <div>Pr 59 Praseodymium</div> <div>Nd 60 Neodymium</div> <div>Pm 61 Promethium</div> <div>Sm 62 Samarium</div> <div>Eu 63 Europium</div> <div>Gd 64 Gadolinium</div> <div>Tb 65 Terbium</div> <div>Dy 66 Dysprosium</div> <div>Ho 67 Holmium</div> <div>Er 68 Erbium</div> <div>Tm 69 Thulium</div> <div>Yb 70 Ytterbium</div> <div>Lu 71 Lutetium</div>										<div>Th 90 Thorium</div> <div>Pa 91 Protactinium</div> <div>U 92 Uranium</div> <div>Np 93 Neptunium</div> <div>Pu 94 Plutonium</div> <div>Am 95 Americium</div> <div>Cm 96 Curium</div> <div>Bk 97 Berkelium</div> <div>Cf 98 Californium</div> <div>Es 99 Einsteinium</div> <div>Fm 100 Fermium</div> <div>Md 101 Mendelevium</div> <div>No 102 Nobelium</div> <div>Lr 103 Lawrencium</div>																										

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9. List the names for the following groups:

- **Group 1** _____
- **Group 2** _____
- **Group 17** _____
- **Group 18** _____

10. List examples of chemical changes: _____

11. Define Ionic Bonding: _____

12. Define Covalent Bonding: _____