## Periodic Table WS #2

|   | PERIODIC TABLE OF THE ELEMENTS  |                                 |   |  |                                       |   |                                       |                                    |                                       |                                   |  |  |  |                                    |  |   |                                       |                                  |  |
|---|---|---------------------------------|---|--|---------------------------------------|---|---------------------------------------|------------------------------------|---------------------------------------|-----------------------------------|--|--|--|------------------------------------|--|---|---------------------------------------|----------------------------------|--|
| 1   | Hydrogen<br>1<br>H<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>0<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1 | 2<br>2A                         | ,   | Element Hydrogen<br>Atomic Number 1 State of M<br>Symbol H |                                       |   |                                       |                                    |                                       |                                   | Me<br>Me<br>Nor                            | tal<br>talloid<br>nmetal               | (<br>13<br>3A                          | Liquic<br>Solid<br>Synth           | 17<br>7A                               |   |                                       |                                  |  |
| 2   | Lithium<br>3<br>Li<br>6.941   | Beryllium<br>4<br>Be<br>9.012   | Boron         Carbon         Nitrogen         Oxygen         Fluorine         Fl |  |                                       |   |                                       |                                    |                                       |                                   |  |  |  |                                    |  | Neon<br>10<br>Ne<br>20.180                      |                                       |                                  |  |
| 3   | Sodium<br>11<br>Na<br>22.990  | Magnesium<br>12<br>Mg<br>24.305 | 3<br>38   | 4<br>48  | 5<br>58                               | 6<br>6B                                 | 7<br>7B                               | 8<br>- 8B                          | 9                                     | 10                                | 11<br>18                                   | 12<br>28                               | Aluminum<br>13<br>Al<br>26.982         | Silicon<br>14<br>Si<br>28.086      | Phosphorus<br>15<br>P<br>30.974        | Sulfur<br>16<br>5<br>32.066                     | Chlorine<br>17<br>Cl<br>35.453        | Argon<br>18<br>Ar<br>39.948      |  |
| 4   | Potassium<br>19<br>K<br>39.098  | Calcium<br>20<br>Ca<br>40.078   | Scandium<br>21<br>5c<br>44.956  | Titanium<br>22<br>Ti<br>47.88                              | Vanadium<br>23<br>V<br>50.942         | Chromium<br>24<br>Cr<br>51.996          | Manganese<br>25<br>Mn<br>54.938       | Iron<br>26<br>Fe<br>55.847         | Cobalt<br>27<br>Co<br>58.933          | Nickel<br>28<br>Ni<br>58.693      | Copper<br>29<br>Cu<br>63.546               | Zinc<br>30<br>Zn<br>65.39              | Gallium<br>31<br>Ga<br>69.723          | Germanium<br>32<br>Ge<br>72.61     | Arsenic<br>33<br>As<br>74.922          | Selenium<br>34<br>Se<br>78.96                   | Bromine<br>35<br>Br<br>79.904         | Krypton<br>36<br>Kr<br>83.80     |  |
| 5   | Rubidium<br>37<br><b>Rb</b><br>85.468   | Strontium<br>38<br>5r<br>87.62  | Yttrium<br>39<br>Y<br>88.906  | Zirconium<br>40<br>Zr<br>91.224                            | Niobium<br>41<br>Nb<br>92.906         | Molybdenum<br>42<br>Mo<br>95.94         | Technetium<br>43<br>Tc<br>97.907      | Ruthenium<br>44<br>Ru<br>101.07    | Rhodium<br>45<br><b>Rh</b><br>102.906 | Palladium<br>46<br>Pd<br>106.42   | Silver<br>47<br>Ag<br>107.868              | Cadmium<br>48<br>Cd<br>112.411         | Indium<br>49<br>In<br>114.82           | Tin<br>50<br>5n<br>118.710         | Antimony<br>51<br><b>Sb</b><br>121.757 | Tellurium<br>52<br>Te<br>127.60                 | lodine<br>53<br>1<br>126.904          | Xenon<br>54 Xe<br>131.290        |  |
| 6   | Cesium<br>55<br><b>Cs</b><br>132.905  | Barium<br>56<br>Ba<br>137.327   | Lanthanum<br>57<br>La<br>138.906  | Hafnium<br>72<br>Hf<br>178.49                              | Tantalum<br>73 1<br>Ta<br>180.948     | Tungsten<br>74 🗍<br>W<br>183.84         | Rhenium<br>75<br>Re<br>186.207        | Osmium<br>76<br>0s<br>190.2        | Iridium<br>77 🗂<br>Ir<br>192.22       | Platinum<br>78<br>Pt<br>195.08    | Gold<br>79<br>Au<br>196.967                | Mercury<br>80<br>Hg<br>200.59          | Thallium<br>81<br>Tl<br>204.383        | Lead<br>82<br>Pb<br>207.2          | Bismuth<br>83<br>Bi<br>208.980         | Polonium<br>84<br>Po<br>208.982                 | Astatine<br>85<br>At<br>209.987       | Radon<br>86<br>Rn<br>222.018     |  |
| 7   | Francium<br>87<br>Fr<br>223.020   | Radium<br>88                    | Actinium<br>89<br>Ac<br>227.028   | Rutherfordium<br>104<br>Rf<br>(261)                        | Dubnium<br>105 ()<br>Db<br>(262)      | Seaborgium<br>106<br><b>Sg</b><br>(263) | Bohrium<br>107<br><b>Bh</b><br>(262)  | Hassium<br>108<br>Hs<br>(265)      | Meitnerium<br>109<br>Mt<br>(266)      | Ununnilium<br>* 110<br>Uun<br>269 | Unununium<br>* 111<br>Uuu<br>272           | Unumbium<br>* 112<br>Uub<br>277        |  | Ununquadium<br>* 114<br>Uuq<br>285 |  | Ununhexium<br><b>*</b> 116<br><b>Uuh</b><br>289 |                                       | Ununodium<br>* 118<br>Uuo<br>293 |  |
| * Names not officially assigned. Discovery of elements 114, 116, and 118 recently reported. Further information not yet a |   |                                 |   |  |                                       |   |                                       |                                    |                                       |                                   | ion not yet avails                         | eble.                                  |  |                                    |  |   |                                       |                                  |  |
|   | La  | nthanide                        | Series  | Cerium<br>58<br>Ce<br>140.115                              | Praseodymium<br>59 1<br>Pr<br>140.908 | Neodymium<br>60<br>Nd<br>144.24         | Promethium<br>61<br>Pm<br>144.913     | Samarium<br>62<br>5m<br>150.36     | Europium<br>63                        | Gadolinium<br>64<br>Gd<br>157.25  | Terbium<br>65<br><b>Tb</b><br>158.925      | Dysprosium<br>66<br>Dy<br>162.50       | Holmium<br>67<br>Ho<br>164.930         | Erbium<br>68<br>Er<br>167.26       | Thulium<br>69<br>Tm<br>168.934         | Ytterbium<br>70<br><b>Yb</b><br>173.04          | Lutetium<br>71<br>Lu<br>174.967       |                                  |  |
|   |   | Actinide                        | Series  | Thorium<br>90 1<br>Th<br>232.038                           | Protactinium<br>91<br>Pa<br>231.036   | Uranium<br>92<br>U<br>238.029           | Neptunium<br>93<br>0<br>Np<br>237.048 | Plutonium<br>94 0<br>Pu<br>244.064 | Americium<br>95<br>Am<br>243.061      | Curium<br>96<br>Cm<br>247.070     | Berkelium<br>97 ()<br><b>Bk</b><br>247.070 | Californium<br>98 (o)<br>Cf<br>251.080 | Einsteinium<br>99 (o)<br>Es<br>252.083 | Fermium<br>100<br>Fm<br>257.095    | Mendelevium<br>101<br>Md<br>258.099    | Nobelium<br>102 ()<br>No<br>259.101             | Lawrencium<br>103 ()<br>Lr<br>260.105 |                                  |  |

**KEY** 

- 1. How many elements are listed in the periodic table? (the one Dr. Hart gave you...) 118
- 2. What is the atomic number of selenium? \_\_\_\_34\_\_\_\_\_
- 3. What is the symbol for palladium? \_\_\_\_Pd\_\_\_\_\_
- 4. What is the atomic mass of strontium? \_\_\_87.62 amu or g\_\_\_\_\_
- How are elements that are gases at room temperature designated in this periodic table?
   \_\_\_\_their boxes contain a red balloon\_\_\_\_\_
- 6. How many columns of elements does the periodic table contain? \_\_\_\_18\_\_\_\_
- 7. What is another name for a column of elements? \_\_group or family\_\_\_\_\_
- What two group numbers can be used to designate elements in the second column of the periodic table? \_\_\_\_group 2A or group 2\_\_\_\_\_
- 9. How many rows of elements does the periodic table contain? \_\_\_7\_\_\_\_
- 10. What is another name for a row of elements? \_\_\_\_period\_\_\_\_\_
- 11. Which period contains the least number of elements? \_\_\_\_period 1\_\_\_\_\_
- 12. What element is found in period 4, group 7B? \_\_manganese\_\_\_\_\_
- 13. How are metals designated in this periodic table? <u>boxes are tinted blue</u>
- 14. How are metalloids designated in this periodic table? <u>boxes are tinted green</u>
- 15. How are nonmetals designated in this periodic table? <u>boxes are tinted yellow</u>

16. What can be said about the electron configurations of all the elements in a group? \_their valence electron configurations are identical\_\_\_\_\_

## The s-, p-, d-, and f-Block Elements

|                 |                 |                 |                  |                  |                 |                |                          |                 |                   |                 |                 |                 |                 |                         |                         |                 | s <sup>2</sup>  |
|-----------------|-----------------|-----------------|------------------|------------------|-----------------|----------------|--------------------------|-----------------|-------------------|-----------------|-----------------|-----------------|-----------------|-------------------------|-------------------------|-----------------|-----------------|
| s b             | lock-           |                 |                  |                  |                 |                |                          |                 |                   |                 |                 |                 |                 |                         |                         |                 | 2<br><b>He</b>  |
| 1<br>H          | s <sup>2</sup>  |                 |                  |                  |                 |                |                          |                 |                   |                 |                 | p <sup>1</sup>  | p <sup>2</sup>  | —p bl<br>p <sup>3</sup> | lock—<br>p <sup>4</sup> | p <sup>5</sup>  | p <sup>6</sup>  |
| 3<br>Li         | 4<br>Be         |                 |                  |                  |                 |                |                          |                 |                   |                 |                 | 5<br><b>B</b>   | 6<br><b>C</b>   | 7<br>N                  | 8<br>0                  | 9<br>F          | 10<br><b>Ne</b> |
| 11<br><b>Na</b> | 12<br>Mg        | d <sup>1</sup>  | d²               | d³               | d <sup>4</sup>  | —db<br>d⁵      | lock —<br>d <sup>6</sup> | d <sup>7</sup>  | d <sup>8</sup>    | d9              | d <sup>10</sup> | 13<br>Al        | 14<br>Si        | 15<br>P                 | 16<br><b>S</b>          | 17<br><b>Cl</b> | 18<br><b>Ar</b> |
| 19<br><b>K</b>  | 20<br><b>Ca</b> | 21<br><b>Sc</b> | 22<br>Ti         | 23<br>V          | 24<br>Cr        | 25<br>Mn       | 26<br><b>Fe</b>          | 27<br><b>Co</b> | 28<br>Ni          | 29<br><b>Cu</b> | 30<br><b>Zn</b> | 31<br><b>Ga</b> | 32<br><b>Ge</b> | 33<br>As                | 34<br><b>Se</b>         | 35<br>Br        | 36<br>Kr        |
| 37<br><b>Rb</b> | 38<br>Sr        | 39<br><b>Y</b>  | 40<br><b>Zr</b>  | 41<br>Nb         | 42<br>Mo        | 43<br>Tc       | 44<br>Ru                 | 45<br>Rh        | 46<br><b>Pd</b>   | 47<br><b>Ag</b> | 48<br>Cd        | 49<br>In        | 50<br><b>Sn</b> | 51<br>Sb                | 52<br>Te                | 53<br>1         | 54<br>Xe        |
| 55<br><b>Cs</b> | 56<br><b>Ba</b> | 71<br>Lu        | 72<br>Hf         | 73<br><b>Ta</b>  | 74<br>W         | 75<br>Re       | 76<br><b>Os</b>          | 77<br>Ir        | 78<br>Pt          | 79<br><b>Au</b> | 80<br>Hg        | 81<br>TI        | 82<br>Pb        | 83<br>Bi                | 84<br><b>Po</b>         | 85<br>At        | 86<br><b>Rn</b> |
| 87<br><b>Fr</b> | 88<br><b>Ra</b> | 103<br>Lr       | 104<br><b>Rf</b> | 105<br><b>Db</b> | 106<br>Sg       | 107<br>Bh      | 108<br>Hs                | 109<br>Mt       | 110<br><b>Uun</b> | 111<br>Uuu      | 112<br>Uub      |                 |                 |                         |                         |                 |                 |
|                 |                 | fblock          |                  |                  |                 |                |                          |                 |                   |                 |                 |                 |                 |                         |                         |                 |                 |
|                 |                 | 11              | f1               | f <sup>2</sup>   | f <sup>3</sup>  | f <sup>4</sup> | f <sup>5</sup>           | f <sup>6</sup>  | f <sup>7</sup>    | f <sup>8</sup>  | f9              | f <sup>10</sup> | f <sup>11</sup> | f <sup>12</sup>         | f <sup>13</sup>         | f <sup>14</sup> |                 |
|                 |                 |                 | 57<br>La         | 58<br><b>Ce</b>  | 59<br><b>Pr</b> | 60<br>Nd       | 61<br><b>Pm</b>          | 62<br><b>Sm</b> | 63<br>Eu          | 64<br><b>Gd</b> | 65<br><b>Tb</b> | 66<br><b>Dy</b> | 67<br><b>Ho</b> | 68<br><b>Er</b>         | 69<br><b>Tm</b>         | 70<br><b>Yb</b> |                 |
|                 |                 | ,               | 89<br><b>Ac</b>  | 90<br><b>Th</b>  | 91<br><b>Pa</b> | 92<br>U        | 93<br><b>Np</b>          | 94<br><b>Pu</b> | 95<br><b>Am</b>   | 96<br><b>Cm</b> | 97<br><b>Bk</b> | 98<br>Cf        | 99<br><b>Es</b> | 100<br><b>Fm</b>        | 101<br>Md               | 102<br>No       |                 |

- 1. What are the four sections, or blocks, of the periodic table? \_\_\_s-, p-, d-, f- blocks
- 2. What does each block represent? the energy sublevel being filled by valence electrons
- 3. What do elements in the s-block have in common? valence electrons only in the s orbitals
- 4. What is the valence electron configuration of each element in group 1A? \_\_s<sup>1</sup>\_\_\_\_
- 5. What is the valence electron configuration of each element in group 2A? \_\_\_s<sup>2</sup>\_\_\_\_
- 6. Why does the s-block span two groups of elements? the single s orbital can hold a maximum of two valence electrons
- 7. Why does the p-block span six groups of elements? The three p orbitals can each hold a maximum of two electrons, resulting in a maximum of six valence electrons, which corresponds to the six columns spanned by the p-block.
- 8. Why are there no p-block elements in period 1? The p sublevel does not exist for the first principal energy level.
- 9. What is the ending of the electron configuration of each element in group 4A?  $p^2$
- 10. What is the electron configuration of neon? [He]2s<sup>2</sup>2p<sup>6</sup>
- 11. In what period does the first d-energy sublevel appear? Period 4
- 12. Why does the d-block span ten groups of elements? The five d orbitals can each hold a maximum of two electrons, resulting in a total of ten possible valence electrons.
- 13. What is the ending of the electron configuration of each element in group 3B? \_d<sup>1</sup>\_\_\_\_\_
- 14. What is the noble gas configuration of titanium? \_\_[Ar]4s<sup>2</sup>3d<sup>2</sup>\_\_\_\_\_
- 15. In what period does the first f-energy sublevel appear? \_\_period 6\_\_\_\_\_
- 16. Determine the group, period, and block for the element having the electron configuration [Xe]4f<sup>14</sup>5d<sup>10</sup>6s<sup>2</sup>6p<sup>3</sup>.
  a. group\_5A or 15\_ b. period \_6\_ c. block \_p\_