



Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Notes: Electron Configurations

Define **valence electrons**: \_\_\_\_\_

**Li      O      C      P      Mg      N      Ne      K**

What are electrons organized into around the nucleus? \_\_\_\_\_

What is a **period**? \_\_\_\_\_

What do elements in a period have in common? \_\_\_\_\_

### Sublevels:

\_\_\_\_\_ holds up to \_\_\_\_\_ electrons  
\_\_\_\_\_ holds up to \_\_\_\_\_ electrons  
\_\_\_\_\_ holds up to \_\_\_\_\_ electrons  
\_\_\_\_\_ holds up to \_\_\_\_\_ electrons

### Energy Levels:

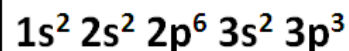
1<sup>st</sup> Energy Level holds \_\_\_\_\_ electrons  
2<sup>nd</sup> Energy Level holds \_\_\_\_\_ electrons  
3<sup>rd</sup> Energy Level holds \_\_\_\_\_ electrons  
4<sup>th</sup> Energy Level holds \_\_\_\_\_ electrons

Why is the periodic table shaped the way it is? \_\_\_\_\_

What do scientists use to show the arrangement of electrons into energy levels and sublevels?  
\_\_\_\_\_

What do the **coefficients** represent? \_\_\_\_\_

What do the **letters** represent? \_\_\_\_\_



What do the **superscripts** represent? \_\_\_\_\_

What element has the electron configuration  $1s^2 2s^2 2p^6 3s^1$ ? \_\_\_\_\_

What element has the electron configuration  $1s^2 2s^2 2p^5$ ? \_\_\_\_\_

What important fact about the order that electrons fill the sublevels do you need to remember?  
\_\_\_\_\_

What element has the electron configuration  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$ ? \_\_\_\_\_

What element has the electron configuration  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$ ? \_\_\_\_\_

### Determine which element is being represented by the electron configurations below.

$1s^2 2s^2 2p^6 3s^2$  \_\_\_\_\_

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^8$  \_\_\_\_\_

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$  \_\_\_\_\_

$1s^2 2s^2 2p^6 3s^2 3p^4$  \_\_\_\_\_

$1s^2 2s^2 2p^4$  \_\_\_\_\_

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$  \_\_\_\_\_

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^4$  \_\_\_\_\_

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$  \_\_\_\_\_

**Challenge:** What element is being represented by the electron configuration below?

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10}$  \_\_\_\_\_

How do you know which row to look in? \_\_\_\_\_

What is **noble gas configuration**? \_\_\_\_\_

What element has the configuration **[Ar] 4s<sup>2</sup> 3d<sup>10</sup> 4p<sup>2</sup>**? \_\_\_\_\_

Why do we use noble gases? \_\_\_\_\_

**Determine which element is being represented by the electron configurations below.**

**[Ar] 4s<sup>2</sup> 3d<sup>5</sup>** \_\_\_\_\_

**[Ne] 3s<sup>2</sup> 3p<sup>2</sup>** \_\_\_\_\_

**[He] 2s<sup>2</sup> 2p<sup>3</sup>** \_\_\_\_\_

**[Ar] 4s<sup>2</sup> 3d<sup>3</sup>** \_\_\_\_\_

**[Kr] 5s<sup>2</sup> 4d<sup>10</sup> 5p<sup>2</sup>** \_\_\_\_\_

**[Xe] 6s<sup>2</sup>** \_\_\_\_\_

**[Ar] 4s<sup>2</sup> 3d<sup>9</sup>** \_\_\_\_\_

**[Kr] 5s<sup>2</sup> 4d<sup>10</sup> 5p<sup>5</sup>** \_\_\_\_\_

How do you find the noble gas to complete a configuration? \_\_\_\_\_

**Write the symbol of the Noble Gas that completes each of the electron configurations below.**

**Barium:** [?] 6s<sup>2</sup> \_\_\_\_\_

**Vanadium:** [?] 4s<sup>2</sup> 3d<sup>3</sup> \_\_\_\_\_

**Rhodium:** [?] 5s<sup>2</sup> 4d<sup>7</sup> \_\_\_\_\_

**Francium:** [?] 7s<sup>1</sup> \_\_\_\_\_

**Antimony:** [?] 5s<sup>2</sup> 4d<sup>10</sup> 5p<sup>3</sup> \_\_\_\_\_

**Sulfur:** [?] 3s<sup>2</sup> 3p<sup>4</sup> \_\_\_\_\_

**Which of the following is the electron configuration of Cobalt?**

**A**  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$

**C**  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^8$

**B**  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^7$

**D**  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^5$

**Determine which electron configuration matches the element in the question.**

\_\_\_\_\_ silver

**a.** [Kr] 5s<sup>2</sup> 4d<sup>2</sup>

\_\_\_\_\_ zirconium

**b.**  $1s^2 2s^2 2p^6 3s^2 3p^6$

\_\_\_\_\_ gallium

**c.**  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^8$

\_\_\_\_\_ neodymium

**d.** [Ar] 4s<sup>2</sup> 3d<sup>10</sup> 4p<sup>5</sup>

\_\_\_\_\_ palladium

**e.**  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^3$

\_\_\_\_\_ bromine

**f.**  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^1$

\_\_\_\_\_ argon

**g.**  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^9$

\_\_\_\_\_ arsenic

**h.**  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^4$