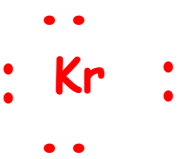
Name _____ Date _____ Physical Science Period _____

# Chapter 6: Chemical Bonds Review Answer Key

1. What is the most stable group on the Periodic Table? Why is this group stable?
   **Noble Gases (Group 18) because they have 8 valence electrons which means their outer energy level is full.**
2. Name the most reactive group(s) on the Periodic Table? Why are they reactive?
   **Alkali Metals (Group 1) & Halogens (Group 17); Alkali Metals want to lose one valence electron in order to become stable and Halogens want to gain one valence electron to be stable.**

3. In the boxes below draw the Electron dot diagrams for:

| Sodium | Calcium | Boron | Chlorine | Krypton |
|---|---|---|---|---|
|  |  |  |  |  |

4. Name the three (3) types of chemical bonds:
   **Ionic bonds** **Covalent bonds** **Polyatomic**

5. Define ionic bond:
   **The force that holds cations and anions together.**

6. Define covalent bond:
   **A chemical bond in which two atoms share a pair of valence electrons.**

7. Define polyatomic ion:
   **A covalently bonded group of atoms that has a positive or negative charge and acts as a unit.**

8. In an ionic bond, electrons are **transferred**.

9. Who are the participants in an ionic bond? **Metals and nonmetals**

10. An ion with a positive charge is a **cation**; an ion with a negative charge is an **anion**.

11. In a covalent bond, electrons are **shared**.

12. Who are the participants in a covalent bond? **Two nonmetals**

13. Identify whether the following compounds are **covalent** (two nonmetals), **ionic** (a nonmetal and a metal), or **polyatomic** (both).
    a. $CaCl_2$ **IONIC (transferred)**
    b. $H_2O$ **COVALENT (shared)**
    c. $BaSO_4$ **POLYATOMIC both)**
    d. $CH_4$ **COVALENT (shared)**
    e. LiBr **IONIC (transferred)**
    f. $NH_4Cl$ **POLYATOMIC (both)**
    g. KI **IONIC (transferred)**

14. Fill in the missing spaces in the chart below:

| Number | Prefix | Number | Prefix |
|---|---|---|---|
| 1 | mono | 6 | hexa |
| 2 | di | 7 | hepta |
| 3 | tri | 8 | octa |
| 4 | tetra | 9 | nona |
| 5 | penta | 10 | deca |

*** When writing the names of covalent compounds, you must use prefixes.***
*** When writing the names of ionic compounds, you do NOT use prefixes.***
*** Polyatomic ions follow the rules for ionic naming.***

15. Complete the oxidation chart below.

| Group # | 1 | 2 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|
| Valence $e^-$ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Oxidation # | 1- | 2- | 3- | +/-4 | 3- | 2- | 1- | 0 |

16. Write the formulas for the following ionic compounds using the Criss-Cross method.

| Chemical Name | Ions | Chemical Formula |
|---|---|---|
| Potassium fluoride | $K^{+1}$ , $F^{-1}$ | KF |
| Magesium nitride | $Mg^{+2}$ , $N^{-3}$ | $Mg_3N_2$ |
| Barium oxide | $Ba^{+2}$ , $O^{-2}$ | BaO |
| Aluminum phosphate | $Al^{+3}$ , $PO_4^{-3}$ | $Al(PO_4)$ |

17. Mixed practice. *Write the chemical formulas for the following compounds:*
    a. Carbon dioxide $CO_2$
    b. Diphosphorus pentachloride $P_2Cl_5$
    c. Nitrogen monoxide NO
    d. Cesium sulfide $Cs_2S$
    e. Beryllium oxide BeO
    f. Sulfur hexachloride $SF_6$

18. Mixed practice. *Write the chemical name for the following compounds:*
    $CCl_4$ Carbon tetrachloride
    $PBr_3$ Phosphorus tribromide
    $N_2O_3$ Dinitrogen trioxide
    $H_2O$ Dihydrogen monoxide