Name: ANSWERS

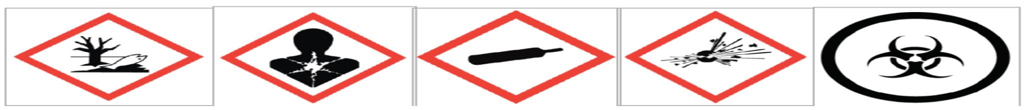
SNC2DI

# Chemistry Study Sheet

☐ Lab safety→ know the safety rules of our science classroom

☐ WHMIS→ be familiar with the 3 components of WHMIS

**Flame over circle** (for oxidizers) | **Flame** | **Exclamation mark** Less serious effects | **Skull & crossbones** Immediate death/harm | **Corrosion**

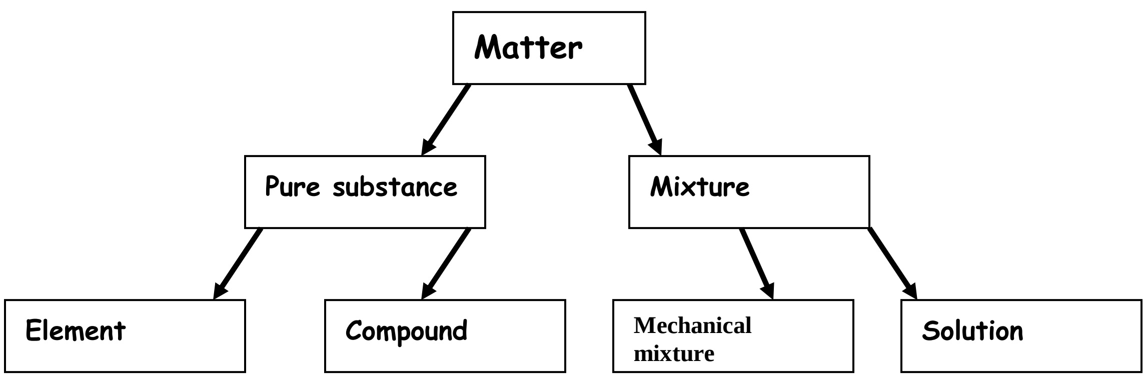


**Environment** | **Health Hazard** | **Gas cylinder** Compressed gas | **Exploding bomb** Exploding/reactive | **Biohazardous/Infectious materials**

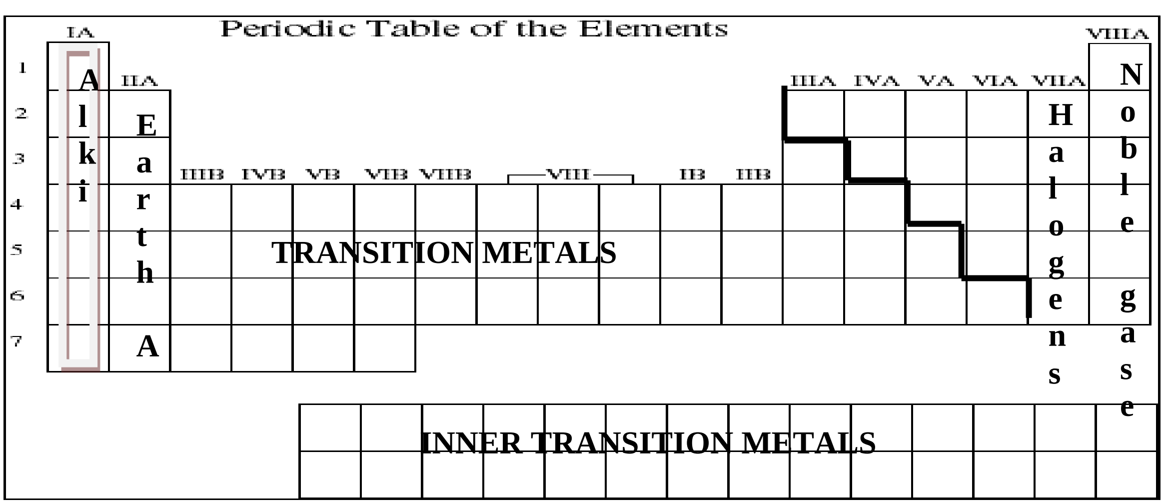
☐ HHPS→ recognize the 4 household hazardous product symbols and the 3 shapes that can surround them

**Warning, poisonous** | **Danger, flammable** | **Caution, explosive** | **Danger, corrosive**

☐ Classifying Matter→ define matter:




☐ Periodic Table→be familiar with how the periodic table is organized (i.e. atomic #'s, periods, groups) and locate various groups (i.e. metals, non-metals, metalloids; main group elements, transitional and inner transitional metals; & the 4 families with names: Alkali, Alkaline Earth Metals, Halogens and Noble gases)



☐ Atoms over the years→explain the changing model of the atom and people involved in each from the billiard ball to raisin muffin, to nuclear and finally the planetary model

| **DALTON** | **THOMPSON** | **RUTHERFORD** | **BOHR** |
|---|---|---|---|
| - **Billiard ball model** (atoms bump into each Other like billiard balls) | **- Raisin bun model** electrons move around atom | **- Gold foil experiment** 1. Atom mostly empty space 2. Nucleus is small, dense, and positive. | **- planetary** $e^-$ move in shells |

☐ Atoms & their composition→ understand how to determine the number of protons, electrons and neutrons in each element when neutral and when ions are formed

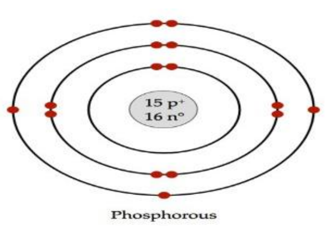
$^{40}_{20}Ca$ $p^+$ = **20_** $e^-$ = **20_** $n^o$ = _**20**

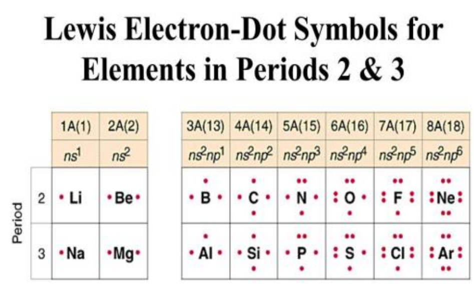
$^{207}_{82}Pb^{+4}$ $p^+$ = **82_** $e^-$ = **78_** $n^o$ = **125_**

$^{80}_{35}Br^{-1}$ $p^+$ = **35_** $e^-$ = **36_** $n^o$ = _**45**

☐ How to draw atoms→ be able to draw the Bohr-Rutherford and Lewis Dot Diagrams (aka: E.D.D) for the first 20 elements; also be familiar with the E.D.D for all main group elements

**BRD for** $^{31}_{15}P$




☐ Classifying compounds→ understand how to classify

$P_2O_5$ = **COVALENT**

$NO_2$ = **COVALENT**

$MgCO_3$ = **IONIC**

$Ba_2C$ = **IONIC**

$FeCl_2$ = **IONIC**

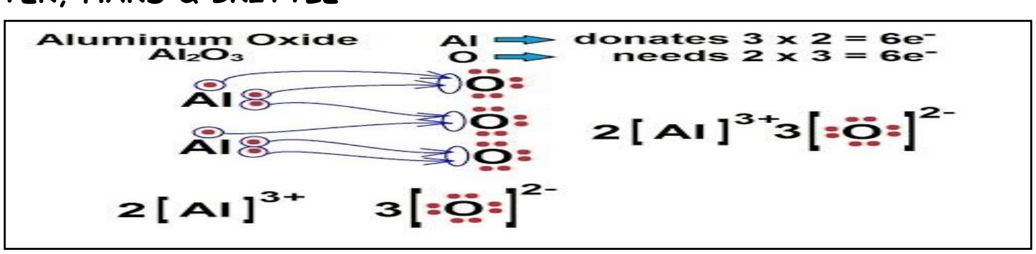
ICl = **COVALENT**

CO = **COVALENT**

$(NH_4)_3PO_4$ = **IONIC** (polyatomic IONS!!)

☐ Ionic compounds→ know the properties of ionic compounds and be able to use E.D.D to show how they bond, the ions formed and the chemical formulas of each

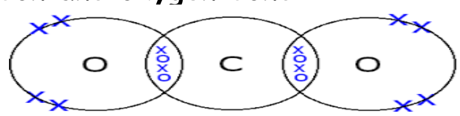
**Properties: CRYSTALLINE SOLIDS, HIGH MELTING POINTS, CONDUCT ELECTRICITY IN WATER, HARD & BRITTLE**

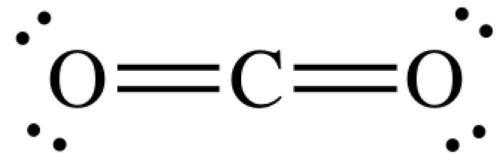


☐ Covalent compounds→ know the properties of covalent compounds and be able to use E.D.D and structural diagrams to show how they bond and the chemical formulas of each

**Properties: (S), (L), (G), LOW MELTING POINTS, NON-CONDUCTORS,**

**Show how carbon and oxygen bond:**





☐ Nomenclature and Writing Chemical Formulas→ be familiar with the rules in naming and writing chemical formulas for binary ionic and molecular compounds as well as those including polyatomics

**$He_{(g)}$ = HELIUM GAS**

**$SO_{3(g)}$ = SULPHUR TRIOXIDE**

**$GaCl_3$ = GALIUM CHLORIDE**

**$CoPO_4$ = COBALT(III)PHOSPHATE**

**Tetracarbon octahydride = $C_4H_8$**

**nickel(III)chlorate = $Ni(ClO_3)_3$**

☐ Chemical Reactions→ recognize the different types of chemical equations (i.e. word and skeleton, and be able to go from one type to the other) and know the clues that indicate a chemical change (as opposed to a physical change) has occurred

☐ Balancing Equations→ understand why equations must be balanced (The Law of Conservation of Mass) and know how to balance both skeleton and word equations

☐ Types of Reactions→be able to classify reactions as either synthesis, decomposition, single or double displacement and knowing this be able to predict the products formed, given the reactants; know how to use the activity series of metals or halogens for single displacement rxns

**Write the balanced chemical equation with states and then indicate the type of reaction:**

1. solid aluminum plus oxygen gas yields
   **_4_$Al_{(s)}$ + _3_$O_{2(g)}$ → _2_ $Al_2O_{3\ (s)}$** **SYNTHESIS**

2. tetracarbon decahydride gas plus oxygen gas yields
   **_2_ $C_4H_{10(g)}$ + _13_ $O_{2(g)}$ → _8_ $CO_{2(g)}$ + _10 $H_2O_{(l)}$** **COMBUSTION**

3. solid lithium plus aqueous gold(III)nitrate yields
   **_3_ $Li_{(s)}$ + ____ $Au(NO_3)_{3(aq)}$ → _3_ $LiNO_{3(aq)}$ + ____ $Au_{(s)}$** **SINGLE DISPLACEMENT**

4. aqueous phosphoric acid plus aqueous magnesium hydroxide yields
   **_2_ $H_3PO_{4(aq)}$ + _3_ $Mg(OH)_{2(aq)}$ → ____ $Mg_3(PO_4)_{2(aq)}$ + _6_ $H_2O_{(l)}$ DOUBLE DISPLACEMENT**

5. solid ammonium chloride when heated produces gaseous nitrogen trihydride and aqueous hydrochloric acid
   **____ $NH_4Cl_{(s)}$ → ____ $NH_{3(g)}$ + ____ $HCl_{(aq)}$** **DECOMPOSITION**

☐ Rates of Reactions→know the 4 factors that affect the rates of reactions and how they effect it; also be able to explain how catalysts can affect the rates of reactions and why they are used

**4 factors: CONCENTRATION TEMPERATURE SURFACE AREA PRESSURE**

**Catalysts: LOWER ACTIVATION ENERGY AND HELP ALIGN MOLECULES FOR MORE EFFECTIVE COLLISIONS**

☐ Acids and Bases→be familiar with: the properties of acids and bases; the various indicators (red and blue litmus paper, pH paper, phenolphthalein, bromothymol blue and cabbage juice) we used to test and the results of each in determining whether a substance is an acid or base; the difference between concentration and strength of acids and bases what determines each

| PROPERTY | ACIDS | BASES |
|---|---|---|
| **Litmus paper** | **BLUE TO RED** | **RED TO BLUE** |
| **phenolphthalein** | **STAYS CLEAR** | **TURNS PINK** |
| **Bromothymol Blue** | **TURNS YELLOW** | **STAYS BLUE** |
| **Conductivity** | **YES** | **YES** |
| **Taste** | **SOUR** | **BITTER** |
| **Feel** | **NONE** | **SLIPPERY** |
| **Reaction with carbonates** | **YES = $CO_{2(g)}$** | **NO** |

**pH of a concentrated acid = 0-3**
**pH of a concentrated base = 11-14**

**pH of a 2 is <u>10 000 000</u> x more concentrate than a pH of 9.**

☐ Oxides→ understand what an oxide is and how different types are used to make acids & bases

$$\_\_\_\ Na_2O_{(s)} + \_\_\_\ H_2O_{(l)} \rightarrow \_2\_\ NaOH_{(aq)}$$
$$\_\_\_\ SO_{3(g)} + \_\_\_\ H_2O_{(l)} \rightarrow \_\_\_\ H_2SO_{4(aq)}$$

☐ Neutralization→ write a balanced equation of hydrosulphuric acid reacting barium hydroxide

$$\_\_\_\ H_2S_{(aq)} + \_\_\_\ Ba(OH)_{2(aq)} \rightarrow \_\_\_\ BaS_{(aq)} + \_2\_\ H_2O_{(l)}$$