

MONDAY, MARCH 11th

DO NOW

Know: $\text{CaO} + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{heat}$

Asked: What is the reactant in the above reaction?

A: $\text{CaO} + \text{CO}_2$

B: Heat

C: CaCO_3

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
 - Today's **QP** = REDEFINE the term "Ion" then use your Jot-Down Notes to SKETCH Lewis Diagrams for the following IONS; Sodium (with one less Electron) and Oxygen (with two extra Electrons)!
2. Open books, **WORK** on today's **AO**!
3. ***HW** = Read & Do Pg. 220-223!

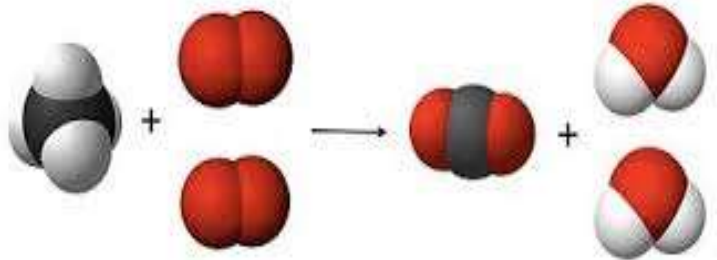
TODAY'S ACADEMIC OBJECTIVE

Today you will **BALANCE** and **EQUATE** the Elements and Molecules involved in Chemical **REACTIONS**!


How to Balance Chemical Equations – Jot This Down!

- Chemical Elements often REACT in nature to produce a PRODUCT!
 - We can describe how the Reactants in a Chemical Reaction change into Products by writing a “Chemical Equation”!
- “Chemical Equations” are a lot like Math Equations, just with \rightarrow (YIELD) instead of $=$ (EQUALS)!
- Due to the LAW of Conservation of Mass all Chemical Equations MUST be BALANCED!
 - To Balance a Chemical Equation, one must first COUNT up the number of Atoms of each Element on EACH SIDE of the Equation!
 - Then, if the numbers on both sides do not match we must write in COEFFICIENTS to increase the number of a Chemical Element until it is EQUAL to the number of the other side!
 - WARNING! THIS IS TRICKIER THAN IT SEEMS!

Chemical reactions




$\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$



LAB INVESTIGATION
 $\text{Na} + \text{Cl}_2 \rightarrow \text{NaCl}$

Law of Conservation of Mass



Matter cannot be created or destroyed - it can only be changed!

Reactants yields **Products**

Balancing Chemical Equations Practice

Step 1 – Take inventory of the elements and atoms on the product and reactant side.

Step 2 – Is it balanced?

Step 3 – If unbalanced, change coefficients until it's balanced.

Balanced!

$\text{CH}_4 + 4\text{Cl}_2 \rightarrow \text{CCl}_4 + 4\text{HCl}$
C - 1 = C - 1
H - 4 \neq H - 4
Cl - 8 \neq Cl - 5 8

TUESDAY, MARCH 12th

DO NOW

- In your notebooks, to be checked, solve this problem...

There are 2 Oxygen in 1 Sulfur Dioxide (SO_2) and 3 Oxygen in 1 Sulfur Trioxide (SO_3). These are units of Covalent Compounds!

Know:



Asked: How many Oxygen Atoms can be found in 19 Molecules of SO_3 ?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!

- Today's **QP** = QP QUIZ PREP = BALANCE the Following Chemical Equations; $\text{___ S}_8 + \text{___ O}_2 \rightarrow \text{___ SO}_2$
 $\text{___ SO}_2 + \text{___ O}_2 \rightarrow \text{___ SO}_3$

2. Open books, **WORK** on today's **AO**!

3. ***HW** = Read the SGS and BRING me your QUESTIONS!

TODAY'S ACADEMIC OBJECTIVE

Today you will **REVIEW** the Science of Chemical Equations in order to **DEVISE** a plan to **ACE** our upcoming **QUIZ**!

WEDNESDAY, MARCH 13th

DO NOW

Know: System 1 & 2 are hosting a Reaction.

Time (min)	Mass of System 1 (g)	Mass of System 2 (g)
0	16.60	16.66
1	16.57	16.66
2	16.54	16.66

Asked: What law is System 1 violating?

A: Law of Conservation of Energy

B: Law of Conservation of Mass

C: Law of Conservation of Momentum

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!

- Today's **QP** = QP QUIZ PREP = Take out your SGS (STUDY GUIDE SLIDE) and ANSWER two questions from it; ONE from the DO column and ONE from the KNOW column!

2. Open books, **WORK** on today's **AO**!

3. ***HW** = STUDY FOR CHEM QUIZ!!!

TODAY'S ACADEMIC OBJECTIVE

Today you will **REVIEW** the Science of Chemical Equations in order to **DEVISE** a plan to **ACE** our upcoming **QUIZ**!

THURSDAY, MARCH 14th

DO NOW

Know: WRAP UP your last minute studying and GET READY to ace our quiz!

Asked: WRAP UP your last minute studying and GET READY to ace our quiz!

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
 - Today's **QP** = QP QUIZ BONUS = WRITE the name of the Compounds Na₂O and N₂O₃ and then WRITE the name of who came up with the LAW of Conservation of Mass!
2. Open books, **WORK** on today's **AO!**
3. ***HW** = List & SKETCH 5 things that are "Organic" and 5 "Inorganic"!

TODAY'S ACADEMIC OBJECTIVE

Today you will **RISE UP** and conquer the **BASICS** of Chemical Bonding by **ACING** our latest **CHEMISTRY Quiz!**

FRIDAY, MARCH 15th

DO NOW

• In your notebooks, to be checked, solve this problem...
There is 1 Calcium in 1 $\text{Ca}(\text{OH})_2$ and 3 Calcium in 1 $\text{Ca}_3(\text{PO}_4)_2$. These are units of Chemistry!

Know:



Asked: How many $\text{Ca}(\text{OH})_2$ Molecules can be made from 6 Molecules of $\text{Ca}_3(\text{PO}_4)_2$?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!

▪ Today's **QP** = In Chemistry we NAME Compounds using a system of naming rules (Ex: NaCl is "Sodium Chloride", CO_2 is "Carbon Dioxide")! Using this idea, try to CREATE names for the following: NaF, CaBr_2 , N_2O , SO_2 , N_2O_3 !

2. Open books, **WORK** on today's **AO**!

3. ***HW** = Finish Volab Vocab Terms!

TODAY'S ACADEMIC OBJECTIVE

Today you will **INITIATE** the completion of your Chemical Knowledge by **ACQUIRING** the lexicon related to Chemical **FIELDS**!

FRIDAY, MARCH 15th

DO NOW

Know: Atoms with 1 or 7 Valence Electrons tend to be most reactive since its easier to gain or lose just 1 Valence Electron.

Asked: Which Element is most likely to form bonds with other Atoms?

A: Sodium (Na)

B: Calcium (Ca)

C: Chlorine (Cl)

TODAY'S PLAN

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TODAY'S ACADEMIC OBJECTIVE

Today you will **INITIATE** the completion of your Chemical Knowledge by **ACQUIRING** the lexicon related to Chemical **FIELDS**!

THE SGS - STUDY GUIDE SLIDE – CHEMICAL BONDS QUIZ

• Students must KNOW:

1. What happens when substances undergo Chemical Reactions, what can cause these Reactions, and WHY do certain Elements prefer to react with each other?
2. What is a Valence Electron? How many Valence Electrons does an Atom need to be “happy”?
3. How and Why do Atoms become Ions?
4. What kinds of Elements form Covalent Bonds & which form Ionic Bonds?
5. How are Chemical Formulas & Reactions written, what are the parts of each, and why/how must Reactions be Balanced?

• Students must be able to DO:

1. Differentiate between the “Bohr Model”, “Electron Cloud”, and “Space-Filling” Models for drawing Atoms
2. Draw Bohr Models & Lewis Dot Diagrams for Elements in Periods 1-4.
3. Compare & Contrast Molecules and Compounds.
4. Predict the number of Valence Electrons, Reactivity, and Properties of an Element based off of its Family/Group Name on the Periodic Table.
5. Compare & Contrast Ionic, Covalent, and Metallic Bonding/Compounds and the Properties of Each.



THE SGS - STUDY GUIDE SLIDE - CHEMICAL BONDS QUIZ

• Students must KNOW:

1. Atoms are rearranged, since bonds are just broken and reformed. Heat, collisions, concentration, and “catalysts” can cause reactions. Endothermic Reactions take in heat, Exothermic ones release it. Elements prefer to react with an Element that will give them 8 Valence Electrons.
2. The outermost Electrons. Atoms need 8 Valence Electrons to be happy aka have a full outermost energy level.
3. By losing or gaining Electrons. Atoms do this to become more stable aka to get 8 Valence Electrons. Neutral Atoms have equal numbers of Protons and Electrons. Ions bonded together make “Ionic Compounds”.
4. Nonmetal + Nonmetal = Covalent. Metal + Nonmetal = Ionic
5. Formulas show a ratio of Atoms. Formulas can have Subscripts (little # after a symbol), Coefficients (big # before a symbol), and Parentheses. Reactions are written to show “Reactant” chemicals on the left turning into “Products” on the right. Reactions are written as Equations, they use Math Symbols, but the “Yield” Arrow (\rightarrow) instead of the = sign. Reactions must be balanced due to the Law of Conservation of Energy, and to balance them just add Coefficients before each Atom/Molecule.

• Students must be able to DO:

1. Bohr shows the Valence Electrons and can help predict how Atoms bond, the Electron Cloud is the most accurate representation of an Atom, and the Space-Filling is good for showing food molecules.
2. See your Jot-Down Notes on drawing Bohr and Lewis Diagrams. Note that both are good for predicting how Atoms will bond.
3. Molecule = Two or more Atoms. Compound = Two or more DIFFERENT Atoms. All Compounds are Molecules, but not vice versa.
4. Group Number can tell you the number of Valence Electrons. Groups 1-2 have 1-2 Valence Electrons, while 13-18 have the Group Number minus 10. Elements will react to get 8 valence Electrons, and whether or not an Element tends to react depends on its number of Valence Electrons (its easier to react if an Element only needs to gain or lose 1 Valence Electrons. Ex: Alkali Metals in Group 1 are very reactive, Noble gases in Group 18 are not).
5. Ionic tend to conduct electricity when dissolved in water. Covalent involve the sharing of Electrons. Metallic are good conductors since the Electrons can move around freely.



THE SGS - STUDY GUIDE SLIDE – CHEMICAL BONDS QUIZ

• Students must KNOW:

1. • Read & Complete Pg. 205-208 Unit Review!
2. • NOTE! To receive credit you MUST annotate EACH answer with an EXPLANATION or SOURCE for why you chose it!!!!
- 3.
- 4.
- 5.

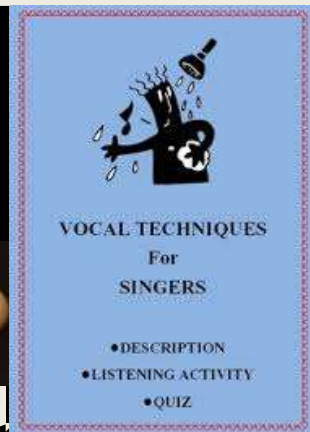
• Students must be able to DO:

1. Differentiate between the “Bohr Model” and “Shell Model” of the Atom and drawing the Bohr Model of an element using the Periodic Table of Elements and the Periodic Trends.
2. Differentiate between the “Bohr Model” and “Shell Model” of the Atom and drawing the Bohr Model of an element using the Periodic Table of Elements and the Periodic Trends.
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5. Compare & Contrast Ionic, Covalent, and Metallic Bonding/Compounds and the Properties of Each.

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SCIENCE QUIZ ALERT



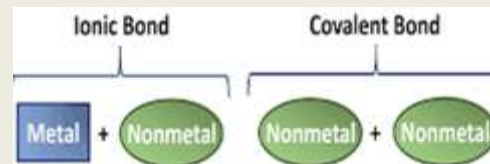
• Students, listen UP!!!

– We will be having another **VOCAL QUIZ** soon to help us LEARN how to IDENTIFY and NAME some common Ionic and Covalent Compounds!

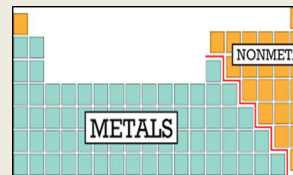


– This quiz will require you to STUDY your Jot-Down Notes on Naming Ionic and Covalent Compounds!

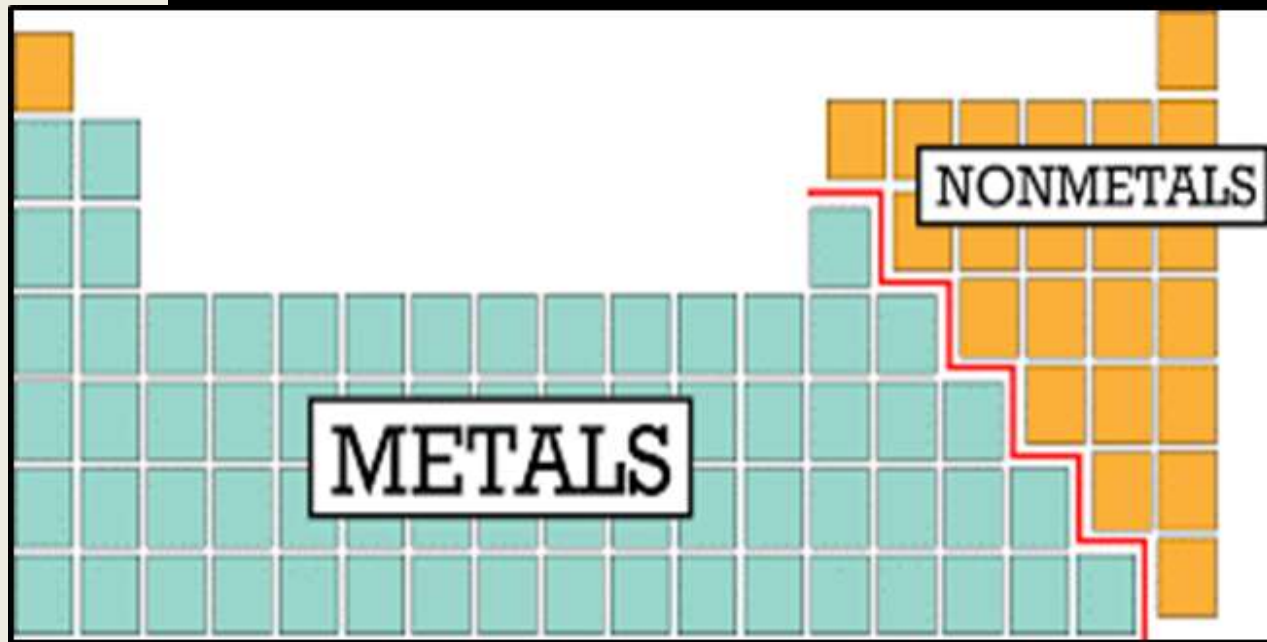
– You are responsible for learning the how to IDENTIFY if a Compound is Ionic or Covalent!



- **BONUS Points for also being able to correctly NAME the Compound!**

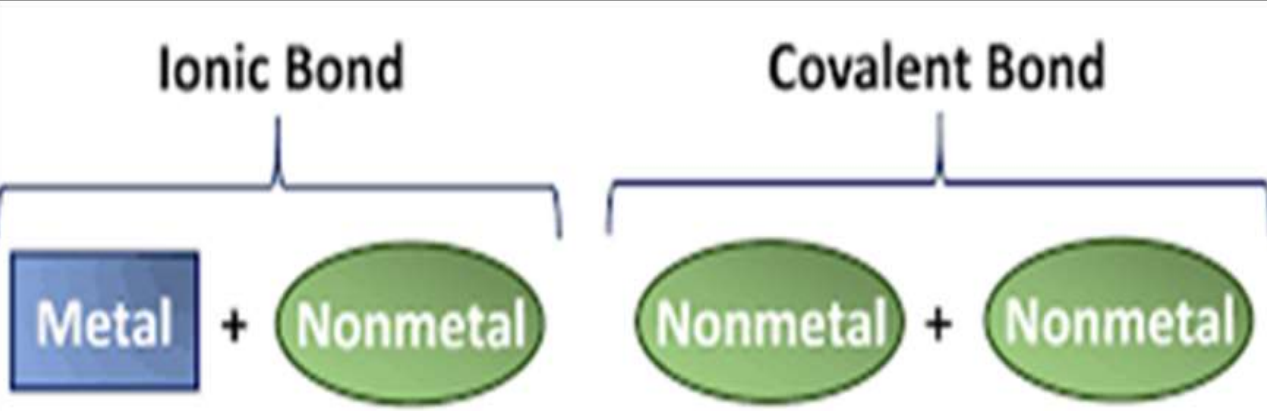
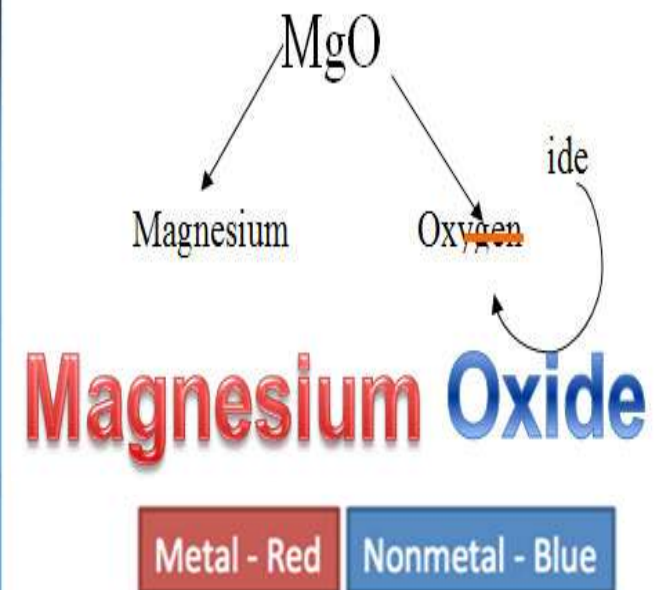


SCIENCE QUIZ ALERT



Simple Ionic Compounds

- Let's look at this example: **KBr**
- Name the metal (cation) first
 - Potassium
- Name the non-metal (anion) next, end it with **-ide**
 - Bromine becomes bromide
- Put together: **Potassium bromide**



Naming Covalent Compounds

- Steps**
 - Write the name of the **first element**.
 - Add a prefix according to the subscript.
 - EXCEPT: if the subscript is 1, don't add a prefix
 - Write the name of the **second element** (change the ending to **-ide**)
 - Add a prefix according to the subscript.

number of atoms	prefix	example
1	mono	NO nitrogen monoxide
2	di	NO ₂ nitrogen dioxide
3	tri	N ₂ O ₃ dinitrogen trioxide
4	tetra	N ₂ O ₄ dinitrogen tetroxide
5	penta	N ₂ O ₅ dinitrogen pentoxide
6	hexa	SF ₆ sulphur hexa fluoride
7	hepta	IF ₇ iodine hepta fluoride
8	octa	P ₄ O ₈ tetra phosphur decoxide
9	nona	P ₄ S ₉ tetra phusphur nona sulphide
10	deca	AS ₄ O ₁₀ tetra arsenic decoxide

Ionic Bond Naming Rules – Jot This Down!

- To name most “Ionic Compounds”, swap out the current ending syllable in the 2nd Element’s name for “-ide” and then just put it after the first Element’s name!

– Ex: For NaCl, turn “Chlorine” into “Chloride” and then add it to “Sodium” to make “Sodium Chloride”!

14

Ionic Bond = Metal + Nonmetal

Ionic Bonding

- Electrons are **transferred**

The diagram illustrates the process of ionic bonding. On the left, a Sodium atom (Na) with one valence electron and a Chlorine atom (Cl) with seven valence electrons are shown. A dashed arrow indicates the transfer of one electron from the sodium atom to the chlorine atom. On the right, the resulting Sodium ion (Na⁺) and Chloride ion (Cl⁻) are shown. The sodium ion has lost its valence electron, and the chloride ion has gained it. Below the ions, the text reads 'Sodium chloride (NaCl)'.

Na Sodium atom Cl Chlorine atom Na⁺ Sodium ion (a cation) Cl⁻ Chloride ion (an anion)

Sodium chloride (NaCl)

Simple Ionic Compounds

- Let's look at this example: **KBr**
- Name the metal (cation) first
 - Potassium
- Name the non-metal (anion) next, end it with -ide
 - Bromine becomes bromide
- Put together: **Potassium bromide**

NaF
Sodium Fluoride

Ca₃P₂
Calcium Phosphide

MgO
Magnesium Oxide

K₂S
Potassium Sulfide

Al₂O₃
Aluminum Oxide

Metal - Red

Nonmetal - Blue

Covalent Bond Naming Rules – Jot This Down!


- To name many “Covalent Compounds”, we still swap out the current ending syllable in the 2nd Element’s name for “-ide” and then put it after the first Element’s name!
- However, we must ALSO add “Number Prefixes” such as mono-, di-, tri-, tetra-, penta-, and hexa- to the beginning of each Element’s name!
 - Ex: For N_2O_3 , turn “Oxygen” into “Trioxide” and then add it to “Dinitrogen” to make “Dinitrogen Trioxide”!
 - NOTE:** We NEVER add the mono- prefix to the first Element! Ex: CO is Carbon Monoxide, NOT Monocarbon Monoxide!

14

Covalent Bond = Nonmetal + Nonmetal
 Covalent Bond = |
 Metallic Bond

$$\begin{array}{c} \cdot\cdot \\ \text{Cl} \cdot + \cdot \text{Cl} \\ \cdot\cdot \end{array} \longrightarrow \begin{array}{c} \cdot\cdot \quad \cdot\cdot \\ \text{Cl} : \text{Cl} \\ \cdot\cdot \quad \cdot\cdot \end{array}$$

chlorine atoms chlorine molecule



Chlorine atoms share a pair of electrons in a covalent bond

Naming Covalent Compounds

- Steps**
 - Write the name of the **first element**.
 - Add a prefix according to the subscript.
 - EXCEPT: if the subscript is 1, don’t add a prefix
 - Write the name of the **second element** (change the ending to -ide)
 - Add a prefix according to the subscript.

number of atoms	prefix	example
1	mono	NO nitrogen monoxide
2	di	NO ₂ nitrogen dioxide
3	tri	N ₂ O ₃ dinitrogen trioxide
4	tetra	N ₂ O ₄ dinitrogen tetraoxide
5	penta	N ₂ O ₅ dinitrogen pentaoxide
6	hexa	SF ₆ sulphur hexa fluoride
7	hepta	IF ₇ iodine hepta fluoride
8	octa	P ₄ O ₈ tetra phosphur decoxide
9	nona	P ₄ S ₉ tetra phusphur nona sulphide
10	deca	AS ₄ O ₁₀ tetra arsinic decoxide

Vocab Lab - Pg. 225 AND Pg. 241 AND Pg. 267 AND Pg. 277

- 1. Students, LISTEN UP UP UP!
 - There are 21 (TWENTY-ONE) vocabulary terms that you MUST define, using the **GLOSSARY** of your book, to get full HW credit!
 - Be sure to NUMBER your terms for when I come and check them! 😊
 - There are **TWO (2) BONUS** Terms not listed that you must also DEFINE!
 - Ion
 - Compound

Nuclear Chemistry Vocabulary

- **Radiation** - energy that is emitted from a source and travels through space.
- **Ionizing Radiation**- Has enough energy to change atoms and molecules into ions; examples: X-rays and gamma rays.
- **Nonionizing Radiation**- Does not have enough energy to ionize matter, examples: radio waves, microwaves
- Accidentally discovered by Henri Becquerel in 1896 when he was performing a lab with fluorescent screens.
- **Radioactivity** is the spontaneous emission of radiation from the nucleus of an atom.

