Topic/Objective CHAPTER: 3	NAME:
Chemistry	Pd: 1 2 4 5 other
	DATE 11/5

Essential Question

does it Matter?

pt 1

Cue: Review: Thoughts: Main Idea	NOTE Taking AREA:
Matter see text book page 73	↳ is anything that has volume and mass ↳ ALL matter on ⊕ & in the universe occurs in a certain form. ↳ as of today there are 8 forms of matter but we are going to talk mainly about 4 of them.
Forms of matter	1) Solid ↳ substance w/densely packed particles that have a definite shape (and size) and volume. ↳ Fixed position ↳ most have a CRYSTALLINE structure. e.g. ↳ wood is an example of Solid. ↳ amorphous solid: Glass is a solid example but it moves! ↳ Also have a solid, geometric Pattern.

NOTES CONTINUE ON OTHER SIDE

	Topic/Objective CHAPTER:	NAME:
		DATE

Cue: Review:
Thoughts: Main Idea

NOTE Taking AREA:

* Some solids can lack a crystalline Structure
  ↳ They are called: Amorphous Solids

↳ is a solid which lacks a crystalline structure.

e.g. - Jello - glass

Liquid

2) Liquid is another State of Matter

↳ If you increase the temperature this increases the thermal vibration of Atoms... thus turning into a liquid

↳ molecules are close together (↳ densely packed) & moving freely

↳ Take the shape of the contain & have a definite volume.

SUMMARY:

	Topic/Objective CHAPTER: 3	NAME:
	Chemistry	Pd: 1 2 4 5 other
		DATE 12

Essential Question

does it Matter? pt 2

Cue: Review: Thoughts: Main Idea

NOTE Taking AREA:

3) Gas

↳ has ~~NO~~ definite shape & volume

↳ unless restrained by a container or force of gravity. They will fill the container

↳ Molecules are freely moving & independent

4) Plasma

↳ @ extreme temperatures, collisions b/t particles are so violent that electrons are knocked away

↳ Hot, Highly ionized electrically conducting gases called: Plasma.

Other forms

5) Bose-Einstein

6) Quantum

7) Ferminonic Condensate

8) Quark-gluon plasma

NOTES CONTINUE ON OTHER SIDE

	Topic/Objective CHAPTER:	NAME:
		DATE

Cue: Review:
Thoughts: Main Idea

NOTE Taking AREA:

*Water is unique to earth b/c it can exist in all 3 states at the same time

Changes of Matter

Liquid Solid Gas

Terms to diagram ⇒

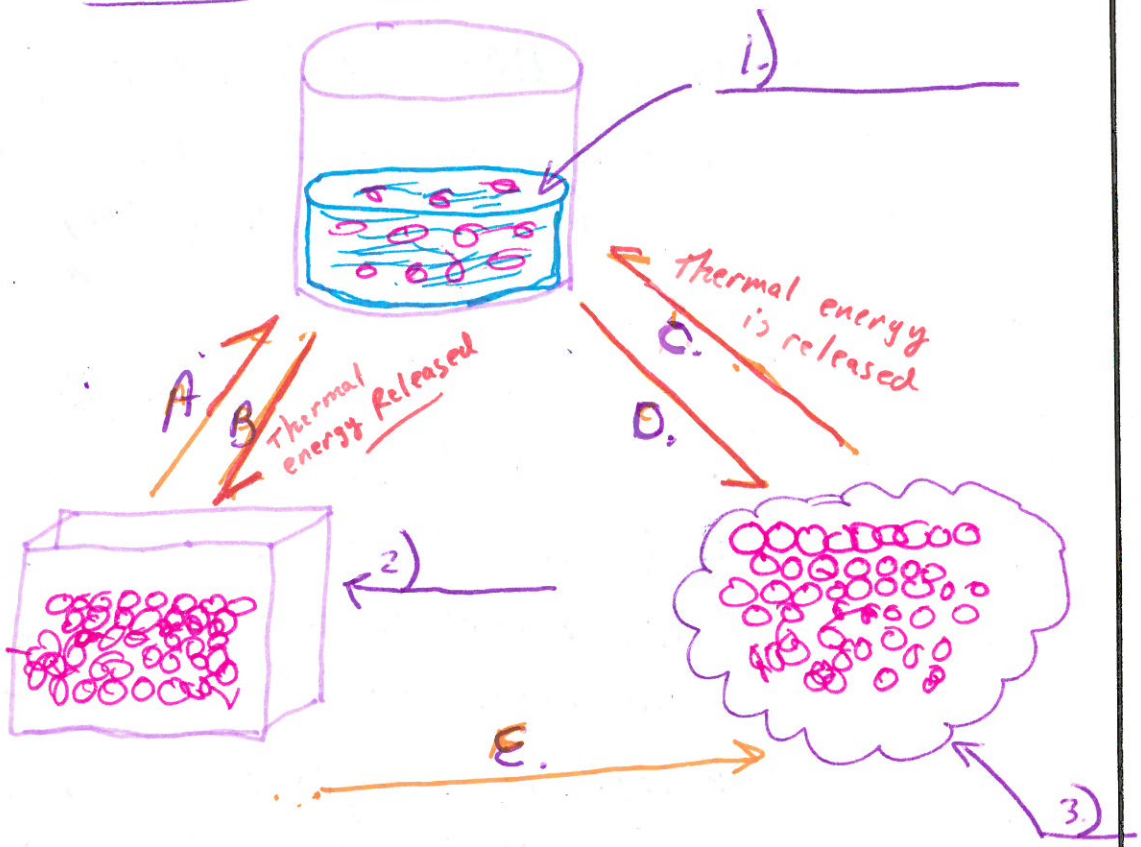
A Melting

D Vaporization

E. Sublimation

B Freezing

C Condensation



Law of Conservation of Matter:

↳ matter cannot be created or destroyed only Δ.

↖ changed

Law of Conservation of Energy

AKA the 1ST Law of Thermodynamics.

Name:_____ Period:_____

_____is anything that has mass (& volume) & takes up space. 11A

SOLID	LIQUID
GAS	PLASMA

Extra Notes:_____

	Topic/Objective CHAPTER:	NAME:
	Chemistry	Pd: 1 2 4 5 other
		DATE

Essential Question

What are Atoms & Subatomic Particles

Cue: Review: Thoughts: Main idea	NOTE Taking AREA:
Matter	↳ is anything that has mass (and volume) & takes up space
Atoms	↳ is the basic building block of ALL matter. e.g. Lego block 
	↳ smallest particle of matter having ALL of that element's characteristics.
	↳ CAN NOT be broken down Any further and still have the properties of that Matter.
What MAKes up an Atom?	↳ Atoms are made up of 3 sub-atomic particles
Sub Atomic Particles	↳ 3 Types Protons (p^+) neutrons (n) electrons (e^-)
Nucleus	↳ Center of the Atom which holds in it the Protons and neutrons. [$p^+ + n =$ MASS number]
mass #	Atomic Weight

NOTES CONTINUE ON OTHER SIDE

Topic/Objective CHAPTER:	NAME:
	DATE

Cue: Review: Thoughts: Main Idea

NOTE Taking AREA:

Protons
p^+

↳ written w/the symbol (p^+)
↳ Positively charged particles
↳ found in the nucleus
↳ has a mass of 1.675×10^{-24} g
that is equal to 1 A.M.U.

Atomic Mass Unit

1.675×10^{-24} g = 1 Atomic Mass Unit

0.00000000000000000000001675 g

Amu = to $\frac{1}{12}$ the mass of the most abundant isotope of carbon. A.K.A. Dalton

Atomic #

of p^+ (positively charge) must = the same # of negatively charged particles or the number of e^-

Neutrons
(n) or (n^0)

↳ written w/the symbol (n) or (n^0)
↳ NO charge or neutral
↳ found in the nucleus along w/the p^+
↳ Has a mass (ATOMIC MASS) = 1.675×10^{-24} g

SUMMARY:

Isotope: Atoms of the same element BUT have a different MASS # due to the different number of Neutrons.

i.e. $^{8}_{15}O_{1}$ $^{8}_{16}O_{2}$ $^{8}_{17}O_{3}$

*←Isotopes → *

Topic/Objective CHAPTER: 3	NAME:
Chemistry	Pd: 1 2 4 5 other
	DATE

Essential Question

Atoms & SubAtomic Particles pt 1

Cue: Review: Thoughts: Main Idea	NOTE Taking AREA:
Matter	↳ is any thing that has mass
Atoms	↳ Smallest particle of matter having all that element's characteristics ↳ is the basic building block of matter e.g. lego block 
	↳ Can not be broken down any further and still have the properties of that matter. AKA ↳ smallest particle of matter having ALL that element's characteristics.
What makes up an Atom?	↳ Atoms are made up of 3 sub-Atomic Particles
Sub-Atomic Particles	↳ 3 types Protons (p) neutrons (n) electrons (e) + −
Nucleus	↳ center of the Atom which holds in it the Protons and neutrons and determines the chemical behavior of elements.
Mass #	Protons plus neutrons equal Mass Number mass # = P + N

NOTES CONTINUE ON OTHER SIDE

Atomic weight = P + N

	Topic/Objective CHAPTER:	NAME:
		DATE

Cue: Review: Thoughts: Main Idea

NOTE Taking AREA:

Protons (p+)

↳ written with the symbol (p^+)

↳ positively charged particles

↳ found in the nucleus

↳ have a mass of 1.675×10^{-24} g

↳ That is equal to 1 A.M.U.

⇒ 1.675×10^{-24} g = 1 Atomic Mass Unit

0.000000000000000000000001.675 g

Need to know Atomic #

of p^+ (positive charge) must = the same number of negative charge or the # of e^-

neutrons (n) a (n°)

↳ writen with the symbol (n) (n°)

↳ NO charge or neutral

↳ found in the nucleus along with the p^+.

↳ Has a mass (Atomic Mass) = 1.675×10^{-24} g or 1. A.M.U. → A.K.A. MASS number

mass ~~##~~

SUMMARY:

Isotope : Atoms of the same element BUT have a different Mass # due to the different number of neutrons

i.e : $^{8}_{16}O_{2}$ $^{8}_{17}O_{3}$ $^{8}_{15}O_{1}$

normal on Periodic Table — Isotopes

Topic/Objective CHAPTER: 3	NAME:
Chemistry	Pd: 1 (2) 4 5 other
	DATE 2

Essential Question

Atoms what are electrons? Pt 2

Cue: Review: Thoughts: Main Idea	NOTE Taking AREA:
electrons (e^-)	↳ e^- like to have someone to talk to (Pair) ↳ found surrounding the nucleus in an orbital zone called: Electron Cloud
electron Cloud	↳ the orbital area an e^- travels around the nucleus e.g. Bees flying around a hive.
Charge of e^-	↳ are negatively charged particles (e^-)
mass of e^-	↳ has an Atomic Mass of 9.11×10^{-28} g or $\frac{1}{2000}$ A.M.U.
$p^+ = e^-$	↳ Atoms have the same number of p^+ as the do e^- ↳ other words: # of p^+ = # of e^-
If not then what?	IF they Do not equal then we call them Positive or negative Ions (cations) (anions)
	See WS Atomic Dimension WS Atomic Dimension #2 [Again]

NOTES CONTINUE ON OTHER SIDE

	Topic/Objective CHAPTER:	NAME:
		DATE

Cue: Review: Thoughts: Main Idea

NOTE Taking AREA:

electron cloud

↳ e^- travel, around the nucleus in the electron cloud or orbitals (Levels) (where they are found)

↳ to help understand this (where e^- are found) we will call these Levels or orbitals → Shells

Orbitals

↳ this idea was first created by: Neils Bohr

Neils Bohr

↳ e^- travel in different SHELLS like a mini Solar-System.

energy Shell or Level

↳ EACH Shell can only hold a maximum number of e^-

↳ each Shell may contain a sub-level to it. THERE are 7 Levels

↳ when a shell is full or "STABLE" it is unlikely to combine

Formula $2(n^2)$

↳ the Formula to determine the maximum amount is $2(n^2)$ n = level

Level	formula		max #	# want to hold	classification
1	$2(1^2)$	=	2	2	K
2	$2(2^2)$	=	8	8	L
3	$2(3^2)$	=	18	8	M
4	$2(4^2)$	=	32	16	N
5	$2(5^2)$	=	50		
6	$2(6^2)$	=	72		
7	$2(7^2)$	=	98		

SUMMARY:

WS #7 Atomic Structure of 14 elements:

Topic/Objective CHAPTER: 3

Chemistry

NAME:

Pd: 1 2 4 5 other

DATE 3

Essential Question

How do I Draw elements? pt 3

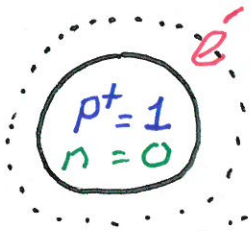
Cue: Review:
Thoughts: Main Idea

Drawing elements

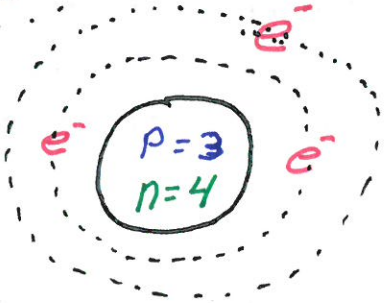
NOTE Taking AREA:

↳ Let's draw a few Shells

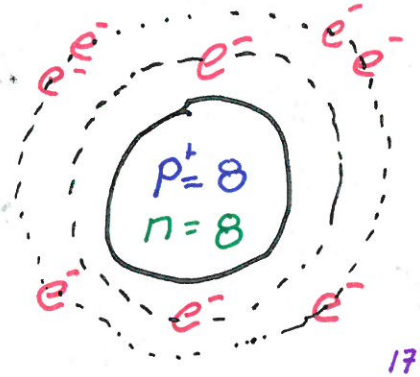
Hydrogen $^{1}_{12}H$



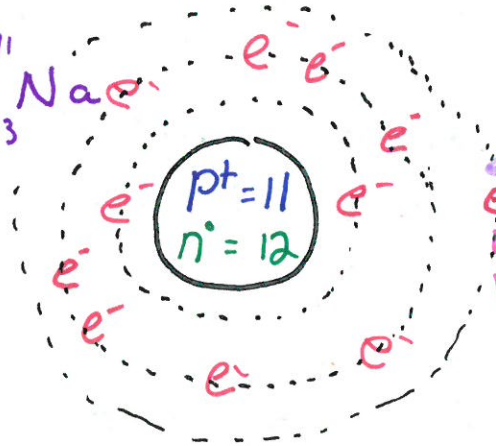
Lithium $^{3}_{7}Li$



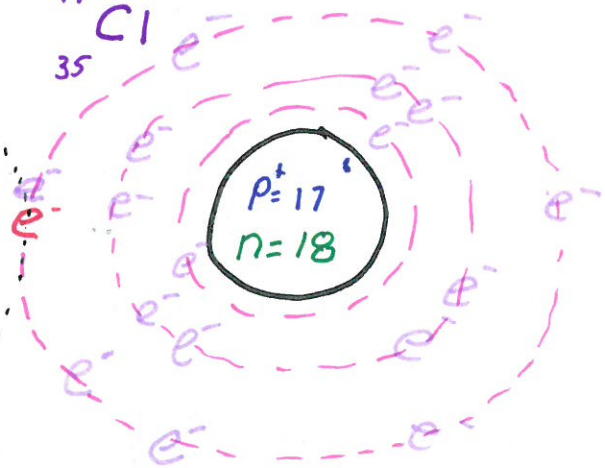
$^{8}_{16}O$



$^{11}_{23}Na$



$^{17}_{35}Cl$



Na wants to lose 1 e^- in the last Shell

Positive 1^-

Cl wants to GAIN 1 e^- in its La~~t~~ shell

Negative 1^-

opposite charges

NOTES CONTINUE ON OTHER SIDE

Topic/Objective CHAPTER:	NAME:
	DATE

Cue: Review: Thoughts: Main Idea

most important level/shell

Valance Shell

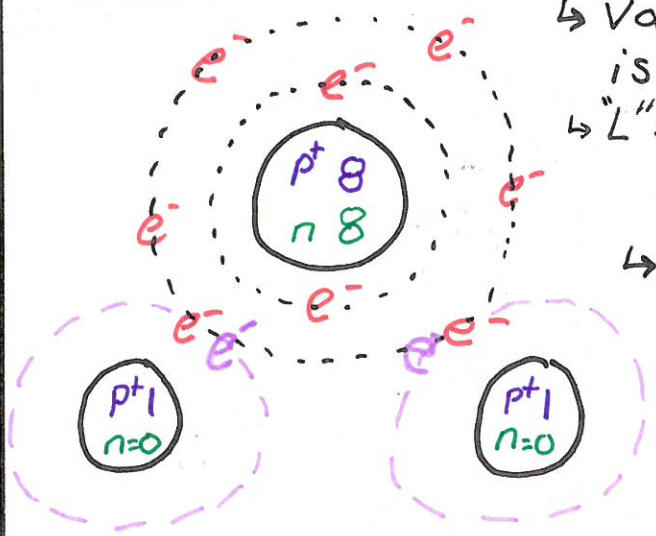
draw Water

NOTE Taking AREA:

↳ the LAST orbital or Shell is the most important. It tells you WHAT the element wants to do. [IT's Behavior]

↳ This Last Shell is called: Valance Shell

↳ is the # of electrons in the outer most shell



↳ Valance shell of Oxygen is 6 e^-

↳ "L" shell would like to have 8 e^- to be stable

↳ Hydrogen only has 1 e^- in its Valance Shell

↳ the "K" shell want 2 e^- to be stable

↳ So the Hydrogen Atom is Sharing its electron. w/o its e^- it would not be Hydrogen

SUMMARY:

↳ Oxygen is a 2^- charge
Hydrogen is a 1^+ charge
So you need 2 Hydrogen elements to make Oxygen Stable

H_2O

Topic/Objective CHAPTER: 3

Chemistry

NAME:

Pd: 1 2 4 5 other 4

DATE

pt 2

Essential Question

What are the Elements of the Periodic Table

Cue: Review: Thoughts: Main Idea

NOTE Taking AREA:

Symbol

↳ Capital letter

↳ sometimes a lower case letter has to follow it.

State of matter

↳ How an element exist @ room temperature

from Book page = 73

↳ H_2O [water] is unique to ⊕ b/c it exist in ALL 3 states @ the same time.

# of Valence electrons

↳ # of e^- in the outer most energy level or shell

i.e. $^{12}_{24}Mg^{2+}$

↳ This determines if the element will:

Transfer e^- or Share e^-

↳ Ionic

↳ opp. charges

↳ Covalent

NOTES CONTINUE ON OTHER SIDE

	Topic/Objective CHAPTER:	NAME:
		DATE

Cue: Review:
Thoughts: Main Idea

Properties of ?

NOTE Taking AREA:

Metals

- ↳ good conductors of heat & electricity
- ↳ shiny
- ↳ ductile (can be stretched into thin wires)
- ↳ Malleable (pounded into thin sheets)
- ↳ combined w/ H_2O usually results in Corrosion

Non-metals

- ↳ Poor conductors of heat & electricity
- ↳ NOT ductile & malleable
- ↳ Brittle & Break easily
- ↳ dull
- ↳ many are gases

SUMMARY:

Metalloids

- ↳ Have both Properties of Metals / Non-metals
- ↳ solid can be Shiny or dull
- ↳ they are ductile & Malleable
- ↳ can conduct heat & electricity better than nonmetals but not as good as metals

	Topic/Objective CHAPTER:	NAME:
		Pd: 1 2 4 5 other
		DATE

5

Essential Question

Elements of the Periodic table

pt 3

Cue: Review:
Thoughts: Main Idea

NOTE Taking AREA:

↳ 1869
Dmitri Mendeléev
↳ But was Δ to Atomic #

Families

↳ Families go up & down (columns)

↳ similar but not identical properties

i.e. Li, Na, K, and IA are all soft, white, shiny, metals

↳ have the same # of valence e⁻

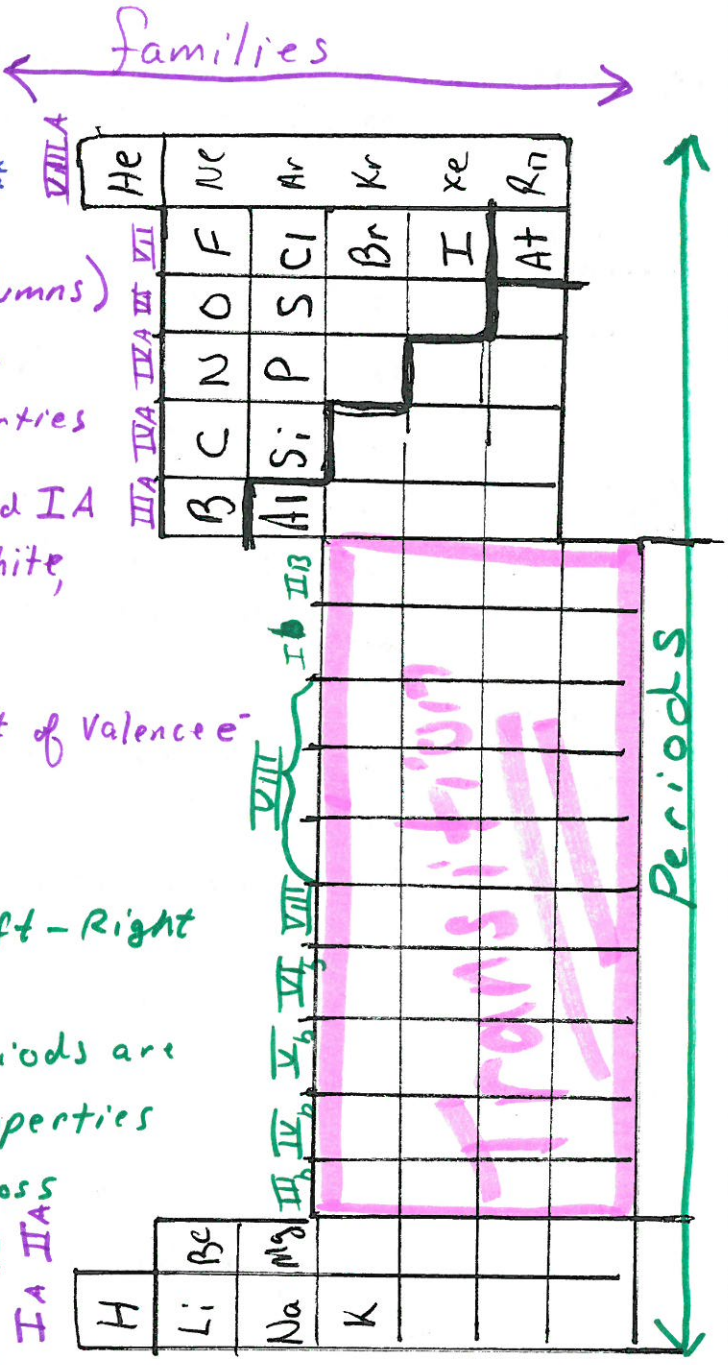
Periods

↳ Periods go Left-Right (Rows)

↳ elements in periods are not alike in properties

↳ Δ as you go across

↳ 1 element in Period is Always extremely Active solid.
Last is inactive gas



NOTES CONTINUE ON OTHER SIDE

	Topic/Objective CHAPTER:	NAME:
		DATE

Cue: Review: Thoughts: Main Idea	NOTE Taking AREA:
Hydrogen	↳ is its own class ↳ gas @ Room Temp.
Alkali IA	↳ have 1 e^- in valence shell to give ↳ Shiny, clay-like, easy to cut ↳ most Reactive metals ↳ Violenty w/H_2O ↳ Never found as Free elements in Nature always bonded w/Another element
Alkaline IIA	↳ Never found uncombinded in nature ↳ Have 2 valence e^- (give up => +2 ion) ↳ EARTH Metals
Transition Metals	↳ The "B" family ↳ good conductors of heat & electricity ↳ usually brightly colored & often in paint ↳ have properties similar to 1 another

↳ Many transition metals combine chemically w/oxygen to form compounds called: Oxides

	Topic/Objective CHAPTER:	NAME:
		Pd: 1 2 4 5 other
		DATE

Essential Question

Elements of Periodic Table

P4/

Cue: Review:
Thoughts: Main Idea

NOTE Taking AREA:

Boron
III A

↳ Named after the 1ST element in the family

↳ Atoms in this family have 3 valence electrons

↳ This family includes a metalloid (Boron) and the rest are metals.

↳ The family includes the most abundant metal in the earth's crust (Aluminum)

Carbon
IV A

↳ have 4 valence e⁻

↳ mostly non-metal, metalloids, and metals

↳ Carbon is the "Basis of life"

↳ organic chemistry is devoted to carbon compounds for life

↳ if it is involving neither organic

NOTES CONTINUE ON OTHER SIDE

	Topic/Objective CHAPTER:	NAME:
		DATE

Cue: Review: Thoughts: Main Idea	NOTE Taking AREA:
Nitrogen family VA	↳ named after the element that makes up 78% of our atmosphere ↳ This family includes nonmetal, metalloids, metals. ↳ Have 5 valence electrons which tend to share electrons.
Oxygen family VI A	↳ has 6 valence electrons ↳ most elements share electrons ↳ Most abundant element in the ⊕'s crust
Halogen family VII A	↳ have 7 valence electrons making them the most active non-metals ↳ NEVER found free in nature F, Cl, Br, I, As
SUMMARY:	↳ React w/Alkali metals to form SALTS
Noble gases VIII A	↳ extreamely unreactive → A.K.A. Inert ↳ Valence shell is Full ↳ found in small amounts in ⊕ Atmosphere He, Ne, Ar, Kr, Xe, Rn

Topic/Objective CHAPTER: 3

Chemistry

NAME:

Pd: 1 2 4 5 other 7

DATE PH

Essential Question

what are the Elements of the Periodic Table

Cue: Review: Thoughts: Main Idea	NOTE Taking AREA:
92 naturally occuring	↳ There are 92 naturally occuring elements on the Periodic Table
Naturally occuring	↳ made by nature
	↳ From these 92 elements about 28 other elements are created.
Total	↳ 118 known elements
Most Abundant	↳ Top 10 Most Abundant Elements

%		%	
46.6 (1)	Oxygen (Breathing)	2.8 (6)	Sodium (potato chips)
27.2 (2)	Silicon (computers)	2.6 (7)	Potassium (energy)
8.1 (3)	Aluminum (foil)	2.1 (8)	Magnesium (Road flares)
5.0 (4)	Iron (stronger weights)	0.4 (9)	Titanium
3.6 (5)	Calcium (Milk)	0.1 (10)	Hydrogen

NOTES CONTINUE ON OTHER SIDE

	Topic/Objective CHAPTER:	NAME:
		DATE

Cue: Review:
Thoughts: Main Idea

Atomic #

NOTE Taking AREA:

↳ Table is organized in a particular way.

↳ good accuracy of the physical & Chemical properties of the elements.

↳ Organized according to Atomic #

↳ # of Protons → Also = to the # of e^-

↳ NO 2 elements Have the same Atomic #

↳ usually how you Identify the substance

↳ EACH element is written on a square where you can find the following information.

1) Atomic #
2) Symbol
3) Atomic Mass
4) # of Valence e^-
5) State of Matter @ Room temperature.

Atomic Mass ↳ Atomic weight → Mass #

Atomic Mass = # of Protons + # of neutrons

↖ Plus

	Topic/Objective CHAPTER: Chemistry	NAME: Pd: 1 2 4 5 other 8 DATE

Essential Question

What are Elements, Compounds, Mix

Cue: Review: Thoughts: Main Idea

NOTE Taking AREA:

Matter classified

matter present in our surroundings can be classified as:

Pure substances & Mixtures

Elements & Compounds

Pure Substance

Elements

↳ is a pure substance made of only 1 kind of atom; simplest form of matter

↳ cannot be broken down into simpler substance by physical or chemical means

↳ held together by bonds

↳ See Periodic table

↳ 92 natural elements arranged by their Atomic number [Atomic #]

↳ is the # of protons$^+$ in the nucleus

↳ Broken into: METALS & NONMETALS

↳ some elements act like both and are classified as Metalloids

Compounds

↳ is a pure substance composed of 2 or more different elements

NOTES CONTINUE ON OTHER SIDE

	Topic/Objective CHAPTER:	NAME:
		DATE

Cue: Review: Thoughts: Main Idea

NOTE Taking AREA:

Properties differ between compound & Elements

Elements react chemically & form chemical bonds b/t them.

Compounds

Compounds are classified into Ionic & Covalent or molecular compounds

Ionic Compounds

Ionic Compounds are held together by opposite charge attraction

$Na^+ Cl^-$

Covalent compounds

Covalent compounds are held together by sharing electrons

Mixtures

↳ Mixture is a combination of 2 a more substances which are not chemically the same and DO NOT chemically react together.

↳ It DOES have the same properties as that of its component elements & can be separated by physical means.

↳ Classified in 2 ways

1.) Homogeneous 2) Heterogeneous

Topic/Objective CHAPTER:	NAME:
Chemistry	Pd: 1 2 4 5 other
	DATE 9

Essential Question

What are Elements Compounds Mix

Cue: Review: Thoughts: Main Idea

Classification of Mixtures

Solution

2 mixes

Suspension

Colloids

NOTE Taking AREA:

mixture are classified in 2 ways:

Homogeneous Solutions

↳ has the same uniform appearance & composition throughout.

↳ often called: **Solution**

↳ classified Based on the solvent & the solute

- Liquid in liquid
- Solid in Liquid
- gas in liquid i.e. soda water

↳ mixture of 2 or more substance in a single phase

Solvent: substance in the largest Amount

Solute: substance in the smallest Amount

Heterogeneous solutions

- Suspension
- Colloids

↳ Classified as either Suspension or Colloids

Suspension is a mixture of large (10^{-5}cm or larger) particles where the particles DO NOT dissolve but suspended throughout.
i.e. muddy water

colloids are also heterogeneous Mixtures but they appear like a homogeneous mixture
i.e. Milk

NOTES CONTINUE ON OTHER SIDE (over)

Topic/Objective CHAPTER:	NAME:
	DATE

Cue: Review: Thoughts: Main Idea

NOTE Taking AREA:

Colloid particles size are smaller than 10^{-5}cm and uniformly distributed throughout the solution.

Can not be seen with naked eye but can with an electron microscope.

To see the particles use a beam of light the light scattering effect shown by Particles in a Colloid is known as:

Tyndall Effect

[Tin-dall]

SUMMARY:

Topic/Objective CHAPTER: 3

Chemistry

NAME:

Pd: 1 2 4 5 other

DATE 10

Essential Question

What's a Molecule & the types of Bonds Pt 4

Cue: Review: Thoughts: Main Idea

NOTE Taking AREA:

Atom

↳ basic building block of matter

e.g. Oxygen

Molecule

↳ are 2 or more Atoms chemically bonded combinded

e.g. O_2 ⇒ is still oxygen but there are 2

Types of molecules

↳ 2 ways (types)

homoatomic molecule

↳ molecule made up of the same element

e.g. O_2 we breathe

O_3 ozone

Hetroatomic Molecul

↳ molecule made up of different elements

e.g. H_2O

Types of Bonds

↳ Ionic Bonds

↳ attractive force b/t 2 ions of opposite charges

Transfer

↳ Covalent Bonds

↳ attraction of 2 Atoms for a SHARED PAIR of electrons

↳ have shape

NOTES CONTINUE ON OTHER SIDE

See WS & Covalent Ionic Bonds

↳ Metallic Bond

↳ tion of a metal is attracted to ~~metal~~

↳ Hydrogen bond

↳ F, Cl, Br, I, At

↳ very explosive.

Topic/Objective CHAPTER:	NAME:
	DATE

Cue: Review: Thoughts: Main Idea

NOTE Taking AREA:

Elements

↳ is a pure substance made of only 1 kind of Atom.

e.g. See Periodic table 92 natural elements.

define *

↳ cannot be broken down into a simpler substances by physical or chemical means.

Compound

↳ is 2 or more different elements held together Chemically

e.g.

↳ have different properties from the elements of which they are composed.

↳ represented by chemical formulas that include the symbols for each element followed by a subscript number showing the # of atoms of that element in the compound

Chemical formula

"yields to produce"

$$\_\ Fe + \_\ O_2 \rightarrow \_\ Fe_2O_3$$

↑ Coefficient ↳ these can be Δ

↑ Subscript ↳ Can not be Δ

Balance equations: 1) Both side from the Arrow MUST "="

2) Can ONLY Δ the Coefficient

3) NEVER Δ Subscript #

If There is NO # insert 1

4) Balance H and O Last

W.S Identifying the Substance

W.S. Analyzing the Substance Again