

MONDAY, MARCH 25th

DO NOW

- In your notebooks, to be checked, solve this problem...
There are roughly 8 Gluons for every 1 Quark and 3 Quarks in 1 Nucleon. These are units of Elementary Particles!

Know:

$$8\text{gluons} = 1\text{quark} \quad 3\text{quarks} = 1\text{nucleon}$$

Asked: How many Gluons are in 4 Nucleons?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
 - Today's **QP** = IMAGINE if there was an entire "world" of sentient beings LIVING inside an Atom! DRAW what you think this world would look like and then LIST three possible problems they might have!
2. Open books, **WORK** on today's **AO**!
3. ***HW** = Read & Do Pg. 248-249!

TODAY'S ACADEMIC OBJECTIVE

Today you will **DRAMATIZE** phenomena within the Atomic Nucleus in order to **DISCOVER** new subatomic particles!

TUESDAY, MARCH 26th

DO NOW

Know:



Asked: What process does this animation **not** show?

A: Nuclei fusing together in Nuclear FUSION

B: A single Nuclei breaking apart in Nuclear FISSION

C: Accelerated particles smashing together

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
 - Today's **QP** = QP QUIZ PREP = REDEFINE the terms "Nuclear Fusion" and "Nuclear Fission" and then use Pg. 248 & 252 to LIST one similarity and difference of each!
2. Open books, **WORK** on today's **AO!**
3. ***HW** = Read & Do Pg. 250-253!

TODAY'S ACADEMIC OBJECTIVE

Today you will **DRAMATIZE** phenomena within the Atomic Nucleus in order to **DISCOVER** new subatomic particles!

WEDNESDAY, MARCH 27th

DO NOW

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

There are 3 quarks in 1 Nucleon and 238 Nucleons in 1 atom of Uranium-238. These are units of Nuclear Radioactivity!

Know:

$$3 \text{ quarks} = 1 \text{ nuc} \quad 238 \text{ nuc} = 1 \text{ U-238}$$

Asked: How many Quarks are in 4 Atoms of Uranium-238?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
 - Today's **QP** = Using Pg. 250 SKETCH how a Nuclear Power Plant works and then REDEFINE the term "Radioactive Decay"!
2. Open books, **WORK** on today's **AO**!
3. ***HW** = Read & Do Pg. 244-247 + HW Problems/Questions!

TODAY'S ACADEMIC OBJECTIVE

Today you will **DRAMATIZE** phenomena within the Atomic Nucleus in order to **DISCOVER** new subatomic particles!

THURSDAY, MARCH 28th

DO NOW

- In your notebooks, to be checked, solve this problem...
There are 100 Rad in 1 Gray, 100 Rem in 1 Sievert, and 37,000,000,000 Becquerels in 1 Curie. These are units of Radioactivity!

Know:

$$100rad = 1Gy \quad 100rem = 1Sv$$
$$37,000,000,000Bq = 1Ci$$

Asked: How many Gray are in 700 Rad?

TODAY'S PLAN

1. Do and review the **DO NOW** and **Qualitative Prompt (QP)**!
 - Today's **QP** = QP BOOK REVIEW = Using Pg. 245-7, 251, & 253 LIST 2 possible BENEFITS of Nuclear Fusion and Fission and then SKETCH 2 possible PROBLEMS each can cause!
2. Open books, **WORK** on today's **AO**!
3. ***HW** = Finish Subatomic Saga HW Questions!

TODAY'S ACADEMIC OBJECTIVE

Today you will **DRAMATIZE** phenomena within the Atomic Nucleus in order to **DISCOVER** new subatomic particles!

Science Artwork – HW Problems and Questions

1. Act 1 of “The Subatomic Saga” ended on a cliffhanger. WRITE at least 6 sentences (1 paragraph) describing what you think should happen in Act 2 of this saga USING these vocabulary terms; Nuclear FISSION, Nuclear FUSION, and RADIATION!
2. *DRAW what you think one (1) character from “The Subatomic Saga” looks like and then ILLUSTRATE (with words!) a scene they were in! BLUE MARK BONUS POINTS CAN BE EARNED IF COLORED!*
3. RESEARCH one of the “Elementary Particles” featured in “The Subatomic Saga” and then DESCRIBE 3 about it!

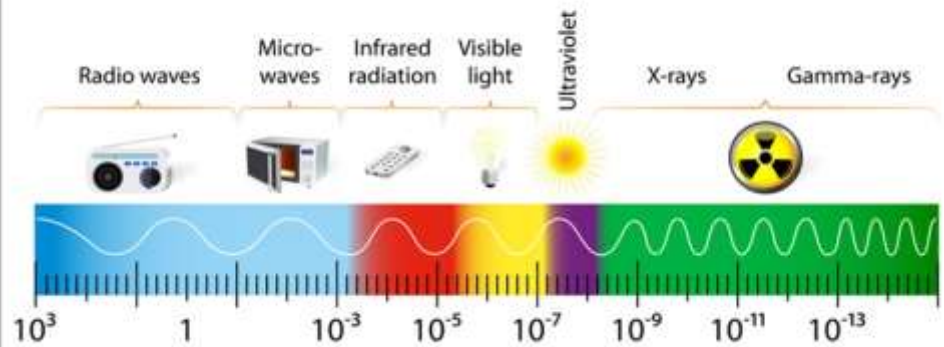


Science Artwork – HW Pr

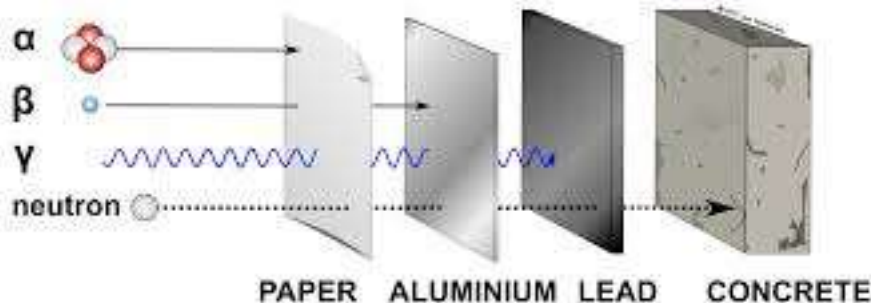
What Is Radiation?

- Radiation is energy in the form of waves or moving subatomic particles.

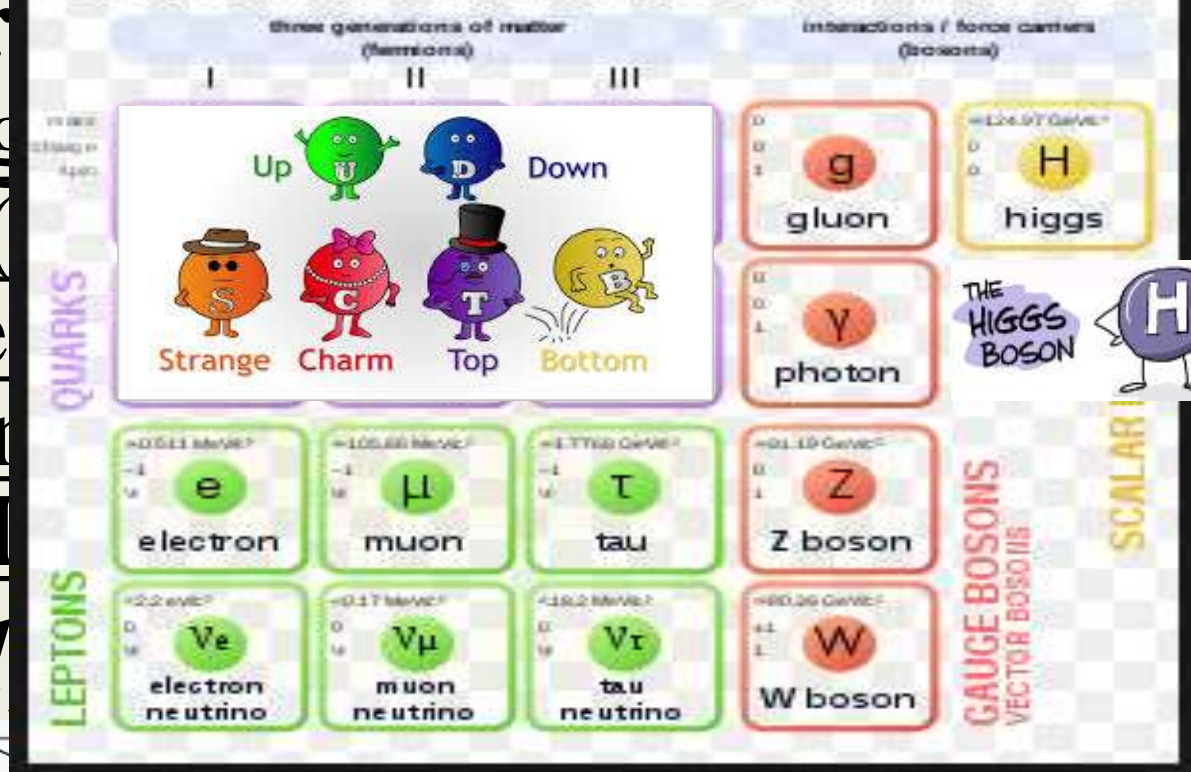
THE ELECTROMAGNETIC SPECTRUM



Ionizing Versus Non-ionizing



Standard Model of Elementary Particles



BLUE MARK IF COLORED!

“Particles” featured DESCRIBE 3



1.

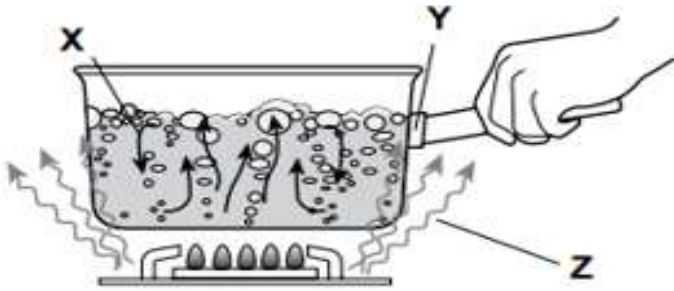
2.

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FRIDAY, MARCH 29th

DO NOW

Know:



Asked: Which statement correctly lists how to turn this pot of water into a solution?

A: Turn up the HEAT!

B: Add a pinch of SALT!

C: Toss in some ROCKS!

TODAY'S PLAN

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

- Today's **QP** = QP BOOK REVIEW = Using Pg. 268-269 LIST the parts of a "Solution" and then DESCRIBE and DRAW how you think adding SALT would affect a Solution of Water and GUMMI BEARS!

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

3. ***HW** = Read & Do Pg. 268-273

TODAY'S ACADEMIC OBJECTIVE

Today you will **RECORD** and **TRACK** real-time data in order to **TEST** the effects of various **SOLUTIONS!**

THE SGS - STUDY GUIDE SLIDE – CHEMICAL FIELDS

• Students must KNOW:

1. What is Organic Chemistry? What are the 6 (SIX!) Elements crucial to life on Earth? What are the 4 Major Biomolecules, and which ones are also “Macronutrients”?
2. What is a Solution? What are the two parts of a Solution? What is Osmosis and how does it relate to “Salt”?
3. What is Nuclear Chemistry? How do scientists discover particles smaller than Protons, Neutrons, and Electrons? What is an example of an “Elementary Particle”?

• Students must be able to DO:

1. Identify and Name Ionic and Covalent Compounds using the system of naming rules.
2. Compare and Contrast Acids and Bases, and be able to identify them by pH.
3. Compare and Contrast Nuclear Fusion and Fission and give an example of where/when each happens.



THE SGS - STUDY GUIDE SLIDE – CHEMICAL FIELDS

• Students must KNOW:

1. The study of carbon-containing compounds, which can make up living (ex: humans) or non-living (ex: PVC pipes) things. Carbon, Hydrogen, Nitrogen, Oxygen, Phosphorus, and Sulfur aka CHNOPS. Nucleic Acids, Proteins, Lipids aka Fats, and Carbohydrates. Proteins, Lipids aka Fats, and Carbohydrates.
2. A heterogeneous mixture aka a mixture in which one part fully dissolves in the other. Solute (what is dissolved) and Solvent (what does the dissolving). The movement of water from low amounts of solute to higher amounts. Salt is an example of a solute.
3. The field of chemistry focused on processes that occur in and around an atom's nucleus. They smash them together using particle accelerators/colliders. Any particle not made of smaller particles, such as Quarks, Gluons, Electrons, Muons, Tau Particles, Photons, W & Z Bosons, Neutrinos, and the Higgs Boson.

• Students must be able to DO:

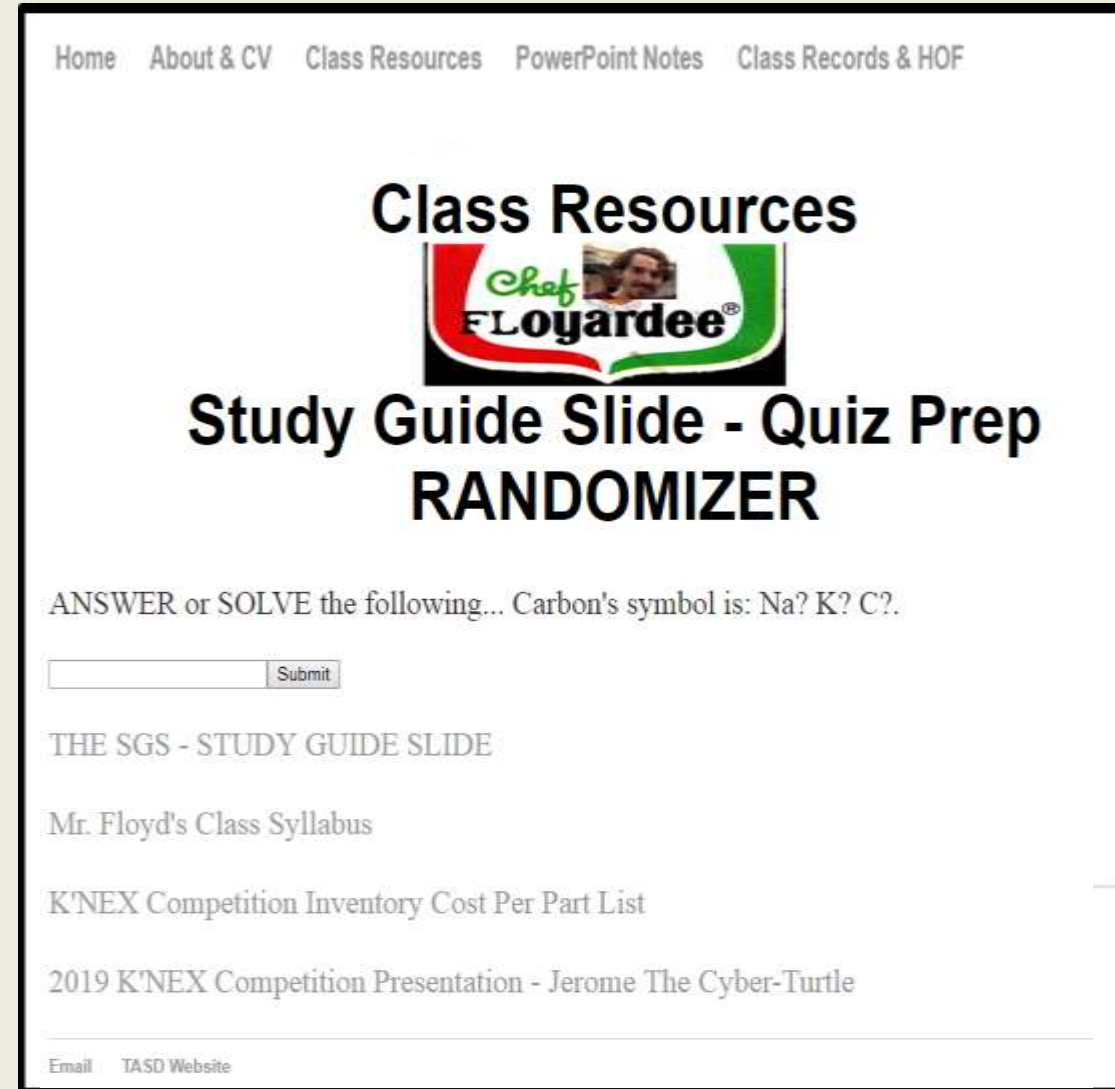
1. We were already assessed on this during our last Vocal Quiz.
2. Acids tend to be corrosive, sour-tasting, and possessing a “pH” less than 7. Bases aka Alkalines are also corrosive, but bitter/soapy-tasting, slippery, and possessing a “pH” greater than 7! pH is a measure of the acidity or basicity/alkalinity of a substance, and this scale goes from 1 (CRAZY ACIDIC) to 14 (CRAZY BASIC).
3. Nuclear Fusion occurs when two smaller nuclei fuse into a larger one, releasing a ton of energy. Nuclear Fission occurs when a larger Atomic Nucleus breaks into two smaller nuclei along with a whole lot of energy. Nuclear Fusion occurs in the sun and in some man-made devices/weapons. Nuclear Fission can be induced by Neutrons when it occurs in power plants and nuclear weapons, but it also occurs spontaneously in nature when heavy atomic nuclei undergo “radioactive decay”. Note also that “radiation” refers to the transfer of energy as particles/waves!



Mr. Floyd's Website – Study Guide


Slide Quiz Prep RANDOMIZER!

- Students! Listen UP! To make STUDYING for class more EFFICIENT and FUN, Mr. Floyd has created the STUDY GUIDE SLIDE QUIZ PREP RANDOMIZER!
- You can now study with EASE from ANY device (even phones!) by using the program found at the top of the CLASS RESOURCES page!
- The CHEF always COOKS UP the best for his students!
- **Link:**
<https://cheffloyardee.github.io/Class%20Resources>



Home About & CV Class Resources PowerPoint Notes Class Records & HOF

Class Resources



Study Guide Slide - Quiz Prep RANDOMIZER

ANSWER or SOLVE the following... Carbon's symbol is: Na? K? C?

THE SGS - STUDY GUIDE SLIDE

Mr. Floyd's Class Syllabus

K'NEX Competition Inventory Cost Per Part List

2019 K'NEX Competition Presentation - Jerome The Cyber-Turtle

Email TASD Website

Organic Chemistry – Jot This Down!

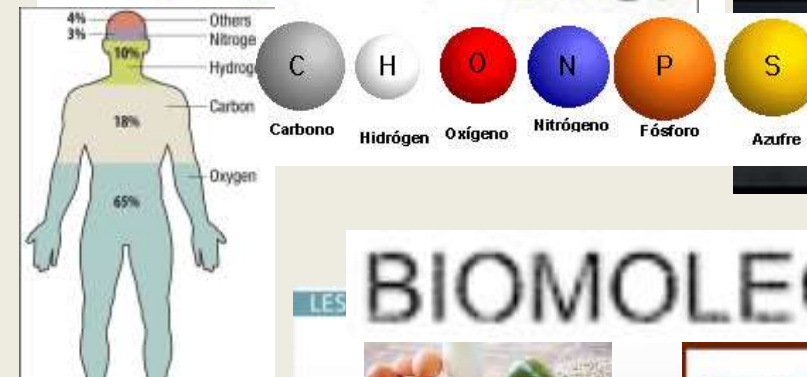
- ORGANIC Chemistry is the study of **CARBON CONTAINING COMPOUNDS!**
- There are SIX (6!) main Elements VITAL to life on Earth and thus most abundant in MOST living things!
 - CARBON (C), HYDROGEN (H), OXYGEN (O), NITROGEN (N), PHOSPHORUS (P), AND SULFUR (S) AKA **CHONPS!**
- These Elements are found BONDED inside living things as the FOUR Major Biomolecules!
 - Nucleic Acids, Carbohydrates, Proteins, and LIPIDS!
 - The last three are also known as “Macronutrients”!

Major Branches of Chemistry

Organic Chemistry

Formerly defined as the *branch of science concerned with substances derived from living things.*

$[\text{NH}_4^+][\text{NCO}^-]$



WHAT WE'RE MADE OF

Calorie Content of Macronutrients
Fat: 9 calories per gram
Protein: 4 calories per gram
Carbohydrates: 4 calories per gram

BIOMOLECULES

proteins carbohydrates lipids nucleic acids


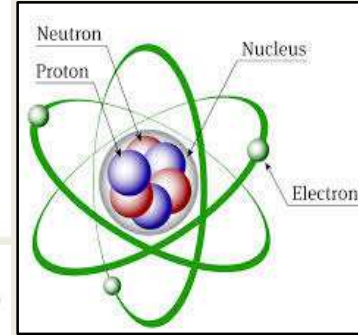
DNA and RNA

Nuclear Chemistry – Jot This Down!

- NUCLEAR Chemistry is the study of the PARTICLES making up the NUCLEUS (Protons and Neutrons!) of the ATOM!
- Scientists have used PARTICLE ACCELERATORS to SMASH APART these particles and DISCOVER a whole “zoo” of “Elementary Particles” that make up Protons and Neutrons though!
- These particles are divided into two groups; FERMIONS and BOSONS!
 - “Quarks” (6 types), “Muons”, “Tauons”, “Neutrinos”, “Electrons”, and “Positrons” (sorta!) are the “MASS-HAVING” Fermions!
 - “Photons”, “Gluons”, “Z & W Bosons”, and the famous “Higgs Boson” are the “FORCE-CARRYING” Bosons!

Major Branches of Chemistry

- **Nuclear Chemistry** – study of radioactivity, the nucleus and the changes that the nucleus undergoes
- **Radioactivity** – Spontaneous emission of particles and/or energy during nuclear decay

The PARTICLE ZOO

Standard Model of Elementary Particles

		Three generations of matter (fermions)			
		I	II	III	
QUARKS	up	u	c	t	SCALAR BOSONS
	down	d	s	b	
	electron	e	μ	τ	
LEPTONS	electron neutrino	ν_e	ν_μ	ν_τ	GAUGE BOSONS
	muon neutrino				
	tau neutrino				
		gluon	photon	Z boson	W boson
		Higgs boson			



Positron - the antimatter counterpart of the electron

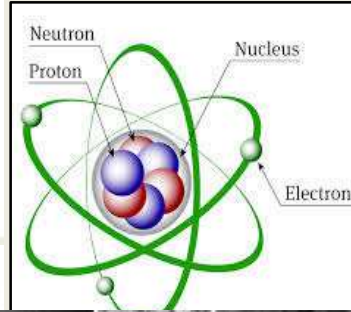

$$p^{(+)} \rightarrow n^{(0)} + e^{(-)}$$

Nuclear Fission VS Fusion – Jot This Down!

- The NUCLEUS of Atoms can undergo TWO major processes; Nuclear FISSION and Nuclear FUSION!
- Nuclear FISSION occurs when a larger Atomic Nucleus BREAKS into two smaller nuclei ALONG with a whole lot of ENERGY!
 - When this happens spontaneously it is called “Radioactive Decay”, but we humans can MAKE a nucleus undergo Fission by firing a NEUTRON into a heavy nucleus in a process called INDUCED NUCLEAR FISSION!
- Nuclear FUSION occurs when two smaller nuclei FUSE into a larger one, releasing a TON of ENERGY!
 - Nuclear FUSION of Hydrogen nuclei into Helium is the FUEL SOURCE behind stars like our SUN!

Major Branches of Chemistry

- Nuclear Chemistry – study of radioactivity, the nucleus and the changes that the nucleus undergoes
- Radioactivity – Spontaneous emission of particles and/or energy during nuclear decay



- Radiation is energy in the form of waves or moving subatomic particles.



Nuclear Fission versus Nuclear Fusion

Fission is the release of energy by splitting heavy nuclei such as Uranium-235 and Plutonium-239

Fusion is the release of energy by combining two light nuclei such as deuterium and tritium

Fission

^{235}U

^{141}Ba ^{92}Kr

Fusion

Deuterium

Tritium

Helium

Neutron

Energy

- Humans cannot yet control Nuclear Fusion, but along with Fission BOTH have been used for Nuclear WEAPONS!



Solutions, Salts, Acids, Bases, AND pH – Jot This Down!

- SOLUTIONS are “homogenous” mixtures in which one component (called the “Solute”) is DISSOLVED in another component (called the “Solvent”)!
 - SALTS, crystalline compounds that dissolve into ELECTROLYTES (Ions!) are often found as SOLUTES in a Solution where WATER is the SOLVENT!
- Water is DRAWN towards Salts in a process called “Osmosis”, and SALTS are more formally defined as a SOLID compound produced from a NEUTRALIZATION reaction between an “Acid” and a “Base”!
- ACIDS tend to be corrosive, sour-tasting, and possessing a “pH” LESS than 7!
- BASES aka ALKALINES are also corrosive, but bitter/soapy-tasting, slippery, and possessing a “pH” GREATER than 7!
 - pH is a measure of the ACIDITY or BASICITY/ALKALINITY of a substance, and this scale goes from 1 (CRAZY ACIDIC!) to 14 (CRAZY BASIC!)

The collage includes several educational elements:

- Types Of Mixtures:** A diagram showing two major types: Heterogeneous (Means "different", "You can see the different parts (phases) of the mixture easily") and Homogeneous (Means "the same", "You cannot see the different parts (phases) of the mixture"). It includes a small diagram comparing Pure Water and Salt Water Solution.
- Osmosis:** A diagram showing water molecules moving through a semi-permeable membrane from a less concentrated solution to a more concentrated one.
- Solution Formation:** A diagram showing a blue crystalline salt being added to a beaker of blue solvent, resulting in a green solution.
- Neutralization Reactions:** A diagram showing the reaction: Acid + Base → Salt + Water, with the note "Salt = Ionic Compound".
- pH scale:** A horizontal scale from 1 to 14 with color-coded boxes and icons representing various substances: 1 (battery), 2 (lemon), 3 (orange), 4 (tomato), 5 (coffee), 6 (cloud), 7 (water), 8 (egg), 9 (dish soap), 10 (bleach), 11 (bleach), 12 (bleach), 13 (bleach), 14 (bleach).

Re-Cord That – The Incredible Changing Gummi Bears!

1. First, copy down the DATA COLLECTION & RECORDING TABLE down into your Science Notebooks and then LOOK UP at; ACID vs BASE!
2. Next, grab 4 Gummi Bears from the tub, and NAME each one (Example = Jib! Chef Gumardee! Gumila! Goo Now!)! 😊
3. Then take 4 cups and WRITE “Water”, “Salt”, and “Acid OR Base” ALONG with each Gummi Bear Name on them! Next, MEASURE and RECORD the initial mass, length, PH, and COLOR of your bears!
4. Now, MEASURE and pour out 50mL of Water, Salt Water, Acid (Vinegar), and Base (Borax Solution) into each cup and PLACE 1 of your bears into each one!
5. Finally, PREDICT what will happen to each bear and then RECORD how each of your bears change once every HOUR for 24 hours & answer the HW Problems!



realtime Scientific
DATA TRACKING

Re-Cord That Real Time Data Tracker – The Incredible Changing Gummi Bears!

Gummi Bear Name ☺+ Solution Placed In →				
<i>Real Time Data Tracker</i>	Length and Observations	Length and Observations	Length and Observations	Length and Observations
Start Time + Initial Predictions =				
1 Hour Later =				
2 Hours =				
3 Hours =				
4 Hours =				
5 Hours =				
6 Hours =				
7 Hours =				
8 Hours =				
9 Hours =				
10 Hours =				
11 Hours =				
12 Hours =				
13 Hours =				
14 Hours =				
15 Hours =				
16 Hours =				
17 Hours =				
18 Hours =				
19 Hours =				
20 Hours =				
21 Hours =				
22 Hours =				
23 Hours =				
24 Hours Later = STOP + Final Length & Observations =				

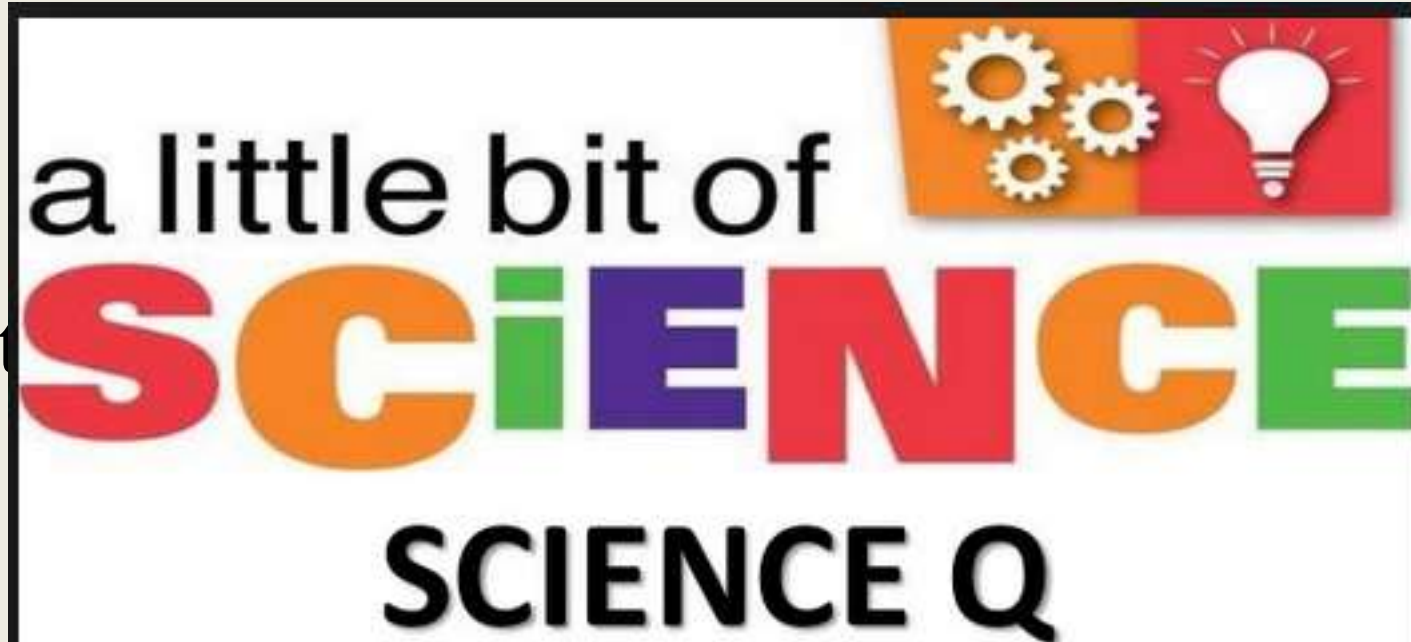
(cm/mm)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23



Bell 2 Bell

- We work what in this class?!?!?!
 - **BELL 2 BELL**
- Every single precious **SECOND** of academic instructional time is thus utilized in this classroom!
- You students will thus be vocally quizzed **EVERY DAY** until I **DISMISS** you at the end of class (with a positive greeting and a thank-you of course!).



Bell 2 Bell

- We work **BELL 2 BELL** in Mr. Floyd's class!
- I will thus quiz you about the science we learned today until the very end!
- Let us begin!

