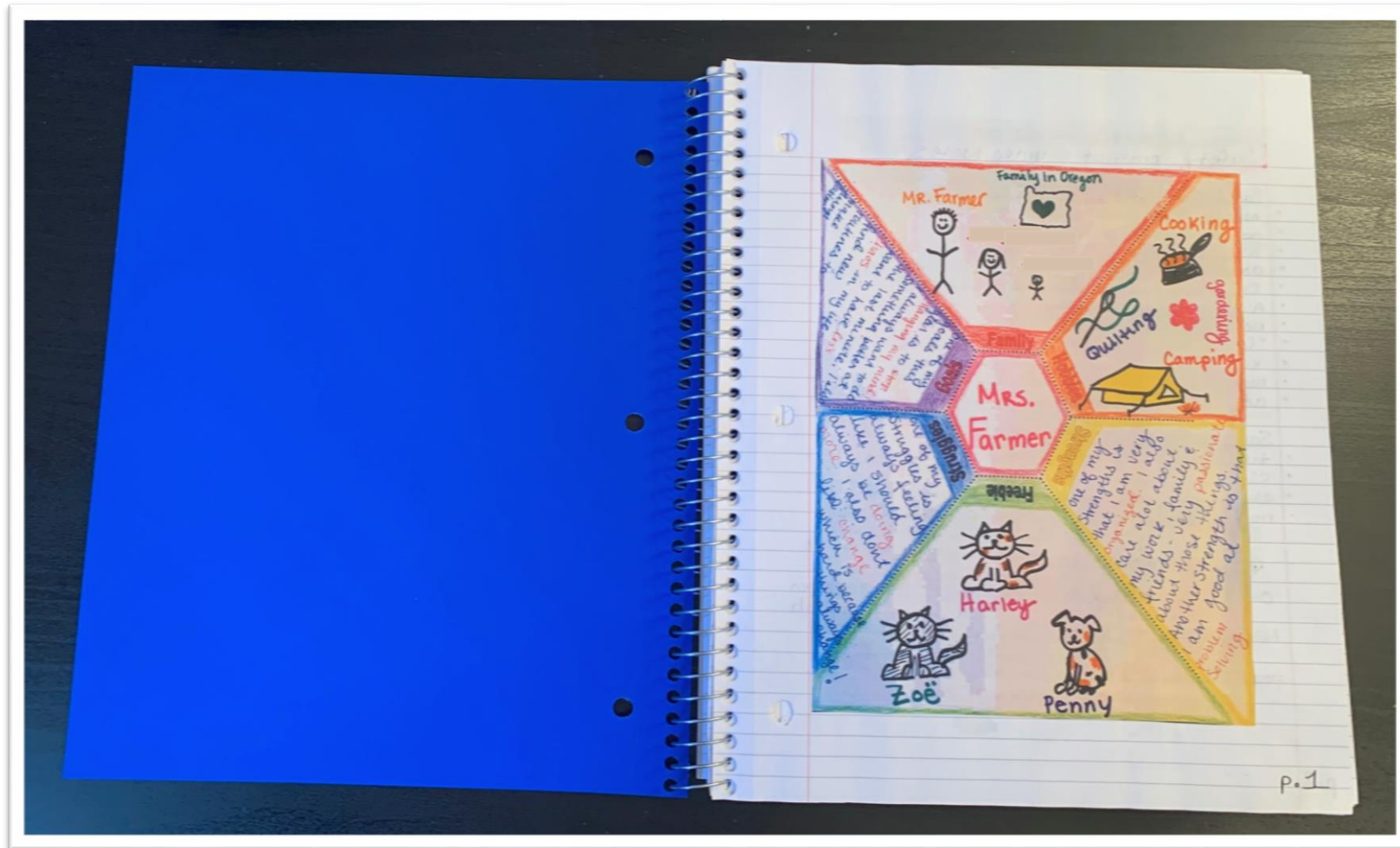


Mrs. Farmer's Example Interactive Notebook Regular Chemistry

Please note

This is just an example of what your notebook should look like. Yours may have different assignments, different notes – depends on the year. Please use this as a general guide only. Read the reference sheets in Interactive Notebook for more specifics

All About Me Page 1



Safety Work Page 2

Common Lab Equipment Page 3


Safety Contract & Video Notes

Safety Contract

- never work alone
- no eating
- use fume hood
- dont dump things down the drain
- Cnt away from your body
- Always wear goggles!
- no contact lenses
- "Code one! Code one!" if someone is hurt
- eye wash 20 min
- never put extra chemicals back
- add acid to water

Safety Video - crash course

- tie hair up
- clothes cover your body!
- always wear eye protection
- no eating, working alone




































	red flam	Fume hood waft
	blue health	pipette
	yellow react.	Chem Shower eyewash

MSDS - material safety data sheet

pour - combat! Dilution!

p.2

Common Laboratory Equipment

Safety Splash Goggles 	Beaker 	Erlenmeyer Flask 	Graduated Cylinder 	Distilled Water Wash Bottle 
Test Tubes 	Volumetric Flask 	Spatulas and Scoopulas 	Disposable Pipette 	Rubber Policeman 
Beaker Tongs 	Crucible Tongs 	Test Tube Tongs 	Hot Plate 	Bunsen Burner 
Flint Striker 	Ring Stand 	Iron Support Ring 	Wire Gauze with Clay Center 	Crucible with Lid 
Test Tube Rack 	Test Tube Brush 	Rubber Stoppers 	Glass Watch Glass 	Mortar and Pestle 
Filter Flask 	Buchner Funnel 	Aspirator for Sink 	Glass Funnel 	Evaporating Dish 
Volumetric Pipette 	Rubber Pipette Bulb 	Forceps 	Burette Clamp 	Burette 

p.3

The Left Side Page 4

The Right Side Page 5

Keeping Interactive Notebooks in Science The Left Side

The left spiral page demonstrates your understanding of the information from the right side page. You work with the input, and INTERACT with the information in creative, unique and individual ways. The left side incorporates and reflects how you learn science as well as what you learn in science.

What goes on the Left Side? *Output goes on the left side!* Left side items include:

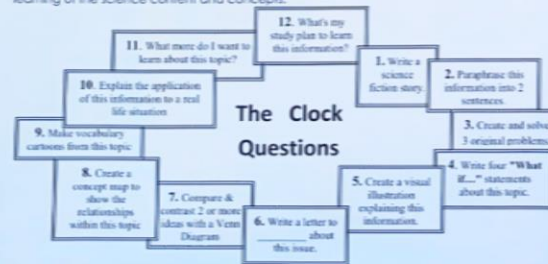
- * Brainstorming
- * Discovery headlines
- * Biography posters
- * Concepts maps
- * Riddles
- * Your questions
- * Pictographs
- * Cartoons
- * Foursquare analogies
- * Metaphors and analogies
- * Venn diagrams
- * Data and graphs you generate
- * Analysis writing
- * Reflection writing
- * Quickwrite
- * Mnemonics
- * Significant statements
- * Flowcharts
- * Graphic organizers
- * Drawings
- * Writing prompts
- * Other creative avenues for processing information
- * Poetry and songs

Things to know about left sides

- Every Left side page gets used.
- Always use color... It helps the brain learn and organize information.
- Labs, free choice assignments, drawings, etc are left side pages.
- Homework problems are left sides (but they don't take the place of processing your notes on the right side pages with color annotations and KCQ boxes!)

The Clock Questions

The 12 clock questions are just a few ideas to help focus your attention and guide your learning of the science content and concepts.



p. 4

Keeping Interactive Notebooks in Science The Right Side

Interactive notebooks will be used in this class daily to help you learn and remember important scientific concepts. Why do they work? This notebook style uses both the right and left brain hemispheres to help you sort, categorize and remember and creatively interact with the new knowledge you're gaining. The more you process information the more you begin to understand it. This leads to longer retention.

What goes on the Right Side? *Input goes on the right side!*

Input is all the information that you are supposed to learn. Some examples of input are: thrilling notes, lectures, guest speakers, text or other sources; vocabulary words; video and film notes; teacher questions; readings, questions and answers and sample problems.

- Always start the page with the Target at the top LEFT of the page in RED pen. Targets are given in class, or can be found on the Notebook tab of the class website.
- Give your notes a title on the top line. Suggested title will be given during class.
- Right sides have odd numbered pages.
- The right page is for writing down information you are given in class.
- You will usually use KCQ style notes for lecture, discussion, text, etc. Do your KCQ's the SAME DAY you took the notes! If you will be doing a different type of notes for a day you will be told in class and shown how to set up your notes KCQ is the "default" type of notes.
- For the Q section of your notes it can be a question you are thinking about during lecture, a question you think others might have, or if you should brainstorm a potential test of quiz question. You will be using "Costa's Levels of Questioning" to develop useful and complex questions. You must have two questions per Q box.
- Write legibly. Use at least three colors to make important information stand out. Your pencil or black/blue pen does not count as a color! These "color annotations" are required! Make sure you are using the color in a meaningful way. Studies have shown that our brain responds to the color even if we don't prefer the way our notes look with it. Use the color annotations to draw attention to key items/facts/info.

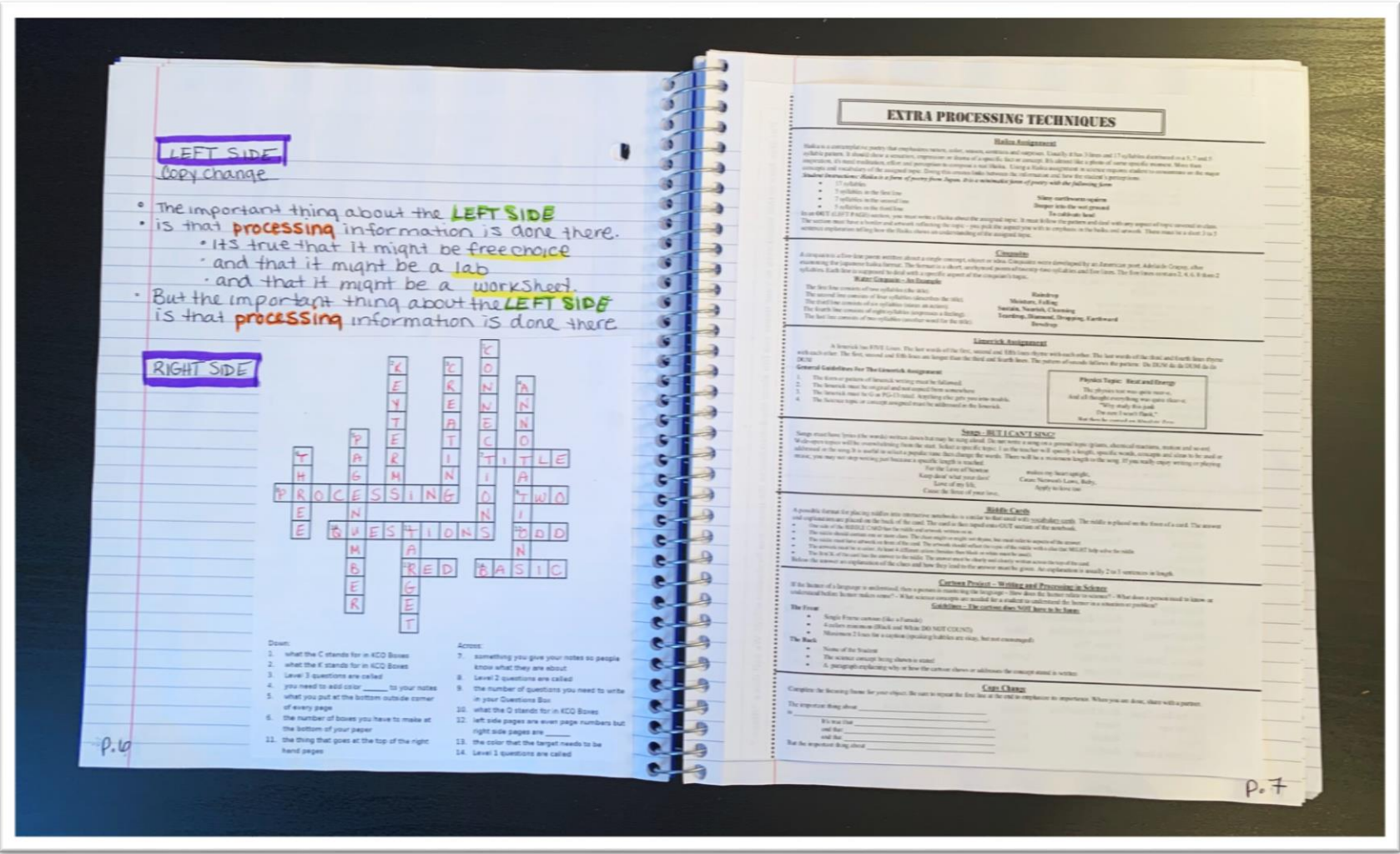
KCQ Note Template

TARGET: I can describe and rank the strengths of different intermolecular forces.		
Strength of Intermolecular Forces		
This is where you would take your class notes for the day. Your style, but must have class requirements met!		
K vocabulary and/or equations	C connections to prior content	Q questions

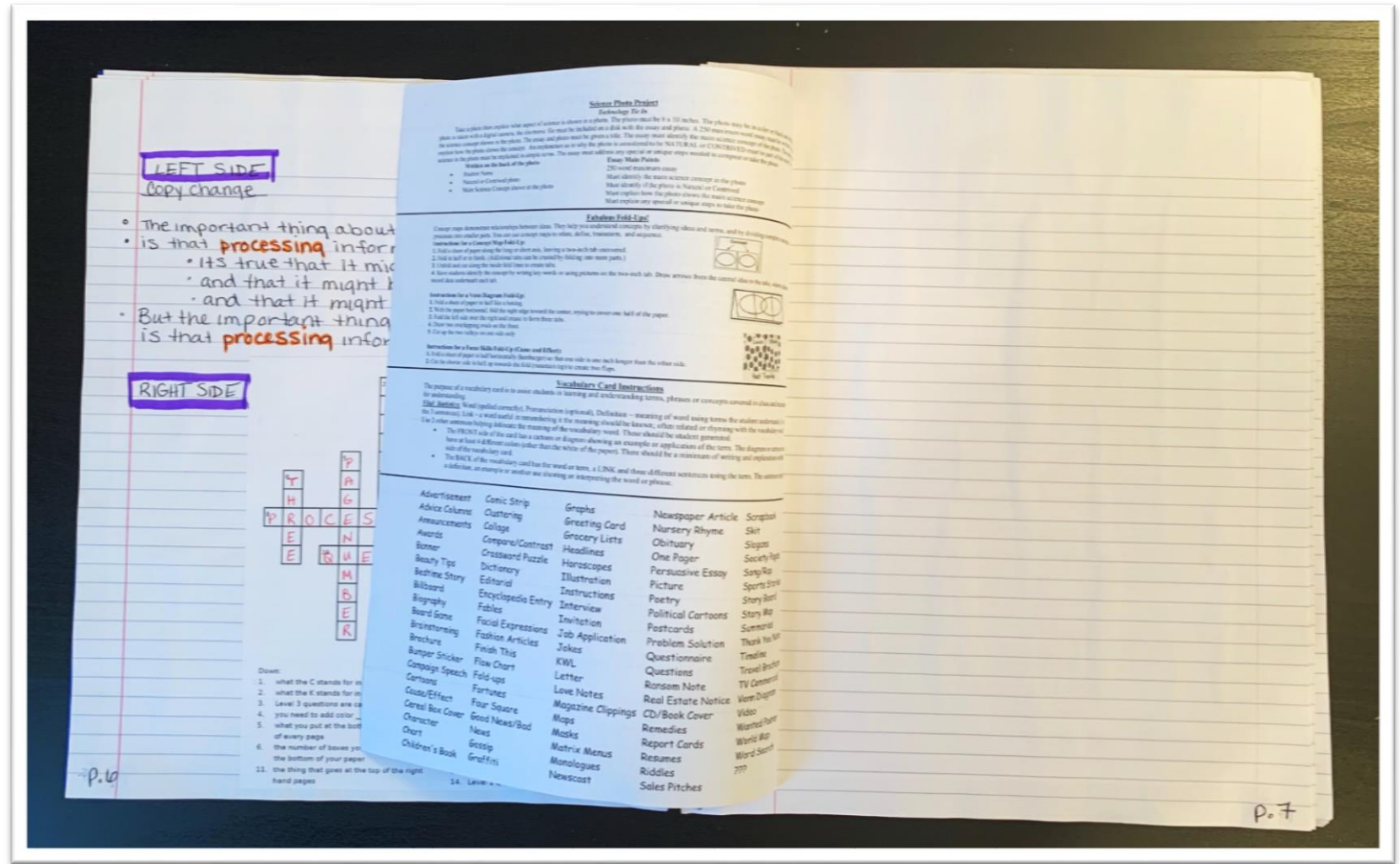
p. 5

Free Choice Processing Page 6

Processing Techniques Page 7



Some Pages are "Flippies" – you can glue just the edge down and then can flip to see the back side.



Notebook Requirements

Page 8

Example Rubrics

Page 9

OVERVIEW OF INTERACTIVE NOTEBOOK REQUIREMENTS

General

- Your name and class period is clearly visible on the front of your notebook
- Page numbers CLEARLY marked in bottom outside corners of all pages
- Your handwriting is legible enough that Mrs. Farmer can tell what you are writing!
- The pockets of your notebook are empty except for allowed materials
- Your bookmark is placed on the page Mrs. Farmer asks it to be on
- You have been nice to your notebook! It isn't beat up, torn, crumpled, etc.
- Each page can/will be graded using the 0-3 or 0-5 grading rubric. Don't forget--Above and beyond!

Right Side Pages

- Target is in red pen at the very top of every right side page
- Each set of notes has a descriptive title
- Notes are KCQ style when required
- KCQ style notes have excellent key terms, connections and higher level questioning
- Notes incorporate "color annotations" using a minimum of three additional colors in a meaningful way that adds to the learning
- Non KCQ style pages are complete and handouts are completed and glued in all the way
- Notes are not cramped--you use empty space to help add to the organization and learning
- Includes effective diagrams and pictures

Left Side Pages

- Demonstrates extensive left side processing of information--it looks like you actually are using your notebook to think and learn!
- Pages are complete and handouts are completed and glued in all the way
- Uses color in a meaningful way throughout processing activities
- Includes effective diagrams and pictures
- Uses a variety of processing techniques when allowed to demonstrate different learning styles

p. 8

EXAMPLE SCORING RUBRICS

These rubrics will give you an idea about how small assignments will be graded (such as fold-ups, diagrams, notes, worksheets etc). Not all assignments will be 3 or 5 points, but the general categories will hold true for all assignments. In order to earn full points you must turn in a "WOW product." You will not earn an A by simply meeting the requirements, you must exceed the requirements.
Δ is for "Above and beyond!"

THREE POINT SCORING RUBRIC	FIVE POINT SCORING RUBRIC
3 Points - (a WOW product) <ul style="list-style-type: none">all of the requirements are evident and EXCEEDEDthe product is VERY neatly done and EXTREMELY well organizedthe product shows LOTS of creativity and is colorfully illustratedcompleted on time	5 Points - (a WOW product) <ul style="list-style-type: none">all of the requirements are evident and EXCEEDEDthe product is VERY neatly done and EXTREMELY well organizedthe product shows LOTS of creativity and is colorfully illustratedcompleted on time
2 Points - (What is EXPECTED) <ul style="list-style-type: none">the requirements are evidentthe product is neatly done and organizedthe product shows some creativity and is illustratedcompleted on time	4 Points - (What is EXPECTED) <ul style="list-style-type: none">all of the requirements are evidentthe product is neatly done and well organizedthe product shows creativity and is colorfully illustratedcompleted on time
1 Point - (One or More parts is missing) <ul style="list-style-type: none">few of the requirements are evidentthe product is fairly neatly done and partly organizedthe product shows little creativity and few illustrationscompleted on time	3 Points - (Almost What is EXPECTED) <ul style="list-style-type: none">the requirements are evident (maybe 1 or 2 are missing)the product is neatly done and organizedthe product shows some creativity and is illustratedcompleted on time
0 Points - (Does not meet Standards) <ul style="list-style-type: none">Unscorable or no product	2 Points - (Sort of What is EXPECTED) <ul style="list-style-type: none">the requirements are evident (maybe 3 or 4 are missing)the product is done and sort of organizedthe product shows little creativity and is illustratedcompleted on time
	1 Point - (Two or More parts is missing) <ul style="list-style-type: none">MANY of the requirements are NOT PRESENTthe product is VERY POORLY done and POORLY organizedthe product shows little TO NO creativity and the illustrations IS POORLY DONEcompleted on time
	0 Points - (Does not meet Standards) <ul style="list-style-type: none">Unscorable or no product

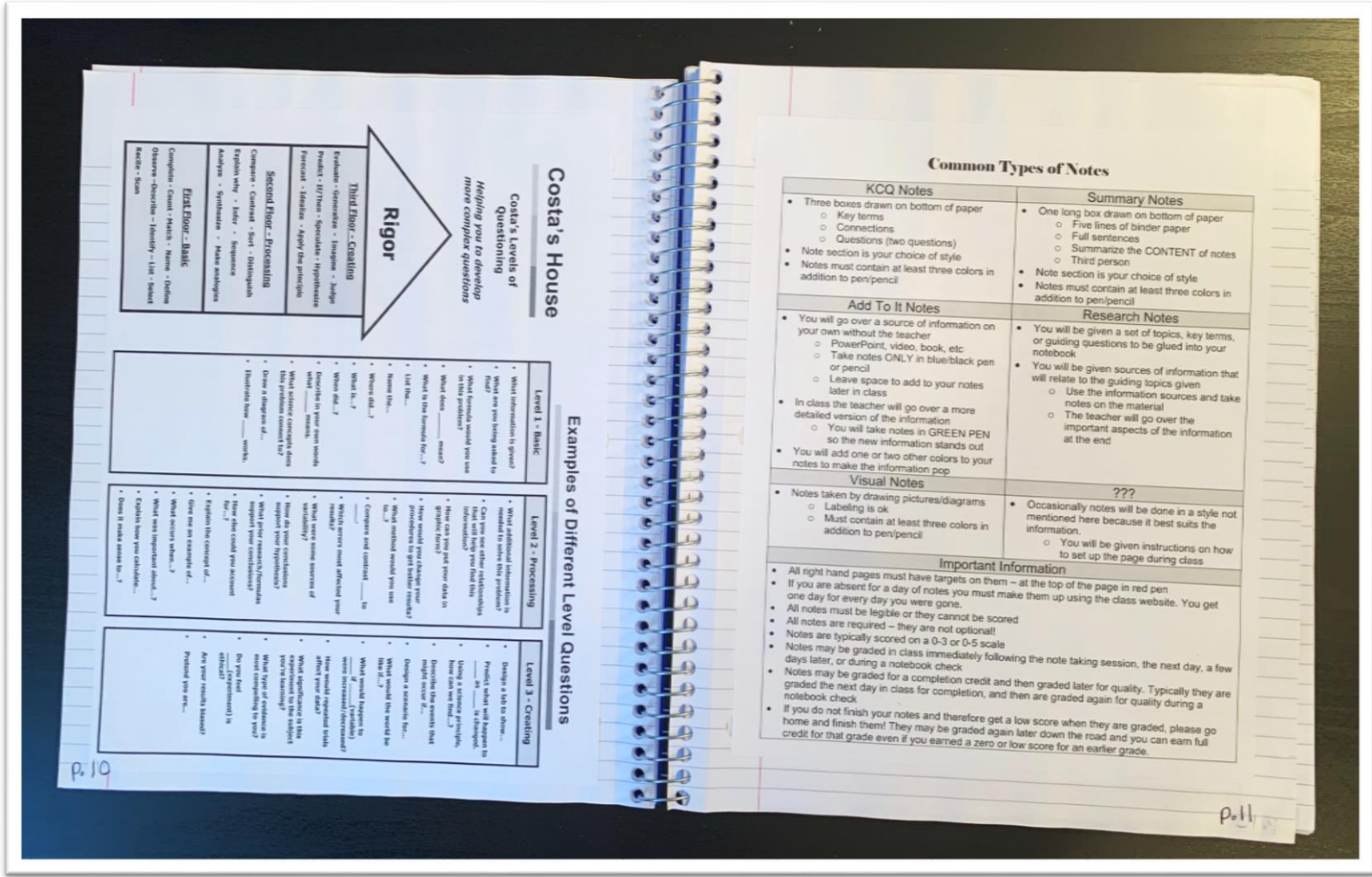
p. 9

Levels of Questions

Page 10

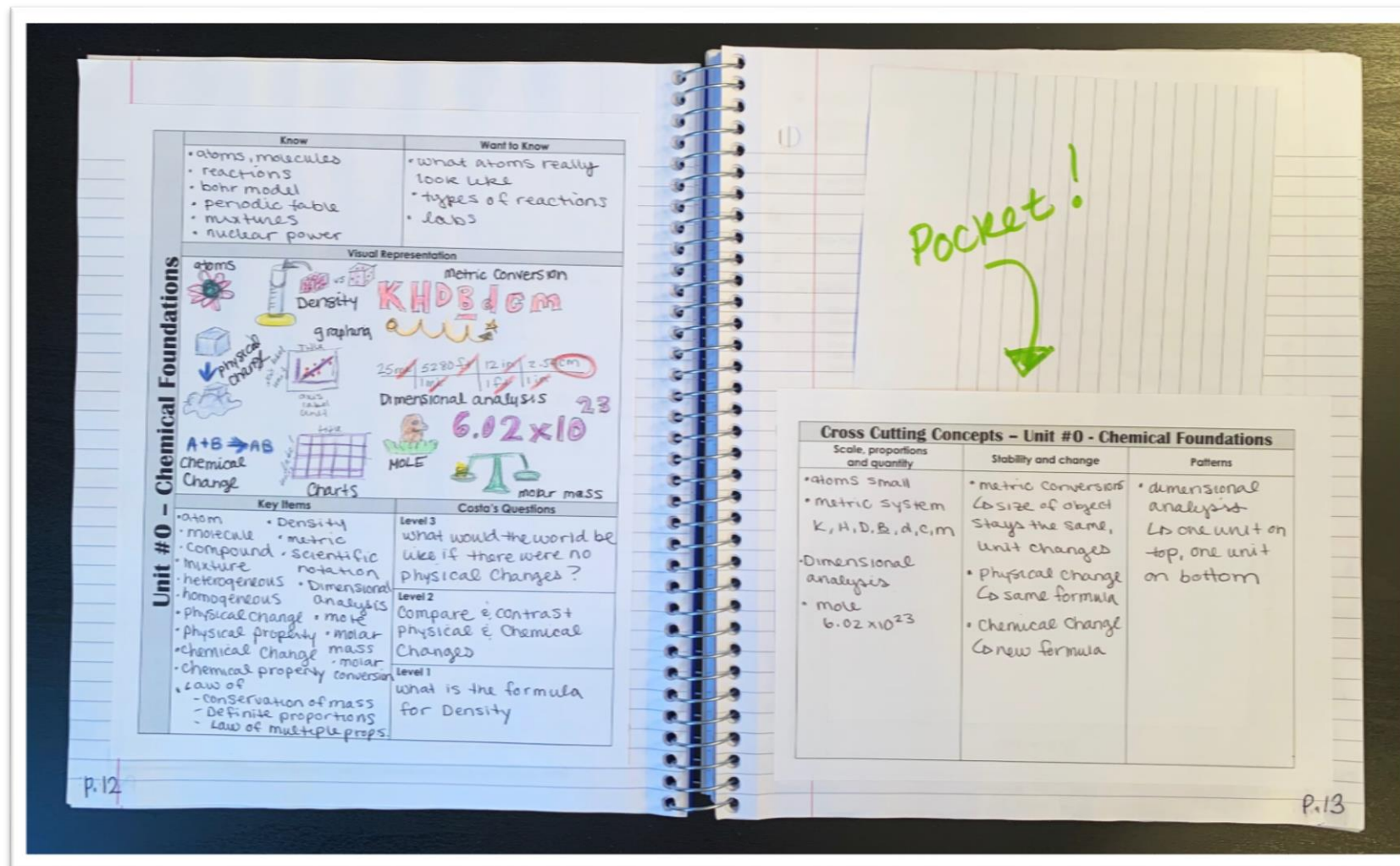
Types of Notes

Page 11



Unit Intro
Page
Page 12

Cross Cutting
Concept
Pocket
Page 13



Worksheet Page 14

KCQ Notes Page 15

Types of Matter Worksheet

1) Define the following:

a. Element -	d. Mixture -
b. Molecule -	e. Homogeneous mixture -
c. Compound -	f. Heterogeneous mixture -

2) What did the marshmallows represent in this activity? What did the toothpicks represent?

3) The element section did not have any toothpicks. Why?

4) What is the difference between a molecule and a compound?

5) If you were looking at the particles, a drawing, or a model of a compound, what are some things you would notice?

6) If you were looking at the particles, a drawing, or a model of a molecule, what is one thing you could see that you would not see in a compound?

7) In the mixture section, why didn't you connect the water and the salt with a toothpick?

8) Look at the particles of the following substances. Determine if it is an element, compound, or mixture.

Pure Gold (Au)	Carbonic Acid	Sugar (C ₆ H ₁₂ O ₆)	Ammonia (NH ₃)	Kool Aid
Mystery Substance	Nitrogen	H ₂ O ₂	Air	Silver (Ag)

p. 14

I can classify the different types of matter

Types of Matter

Matter: Anything that takes up space & has mass

Elements: 1 kind of atom

Molecules: more than 1 atom bonded together
↳ same # of protons

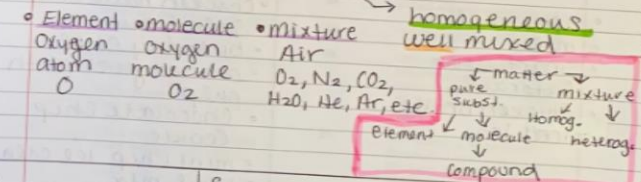
Compounds: more than 1 different types of elements bonded together



★ all compounds are molecules
NOT all molecules are compounds

Mixtures: multiple things
NOT bonded

- ↳ Heterogeneous: not well mixed
- ↳ Homogeneous: well mixed

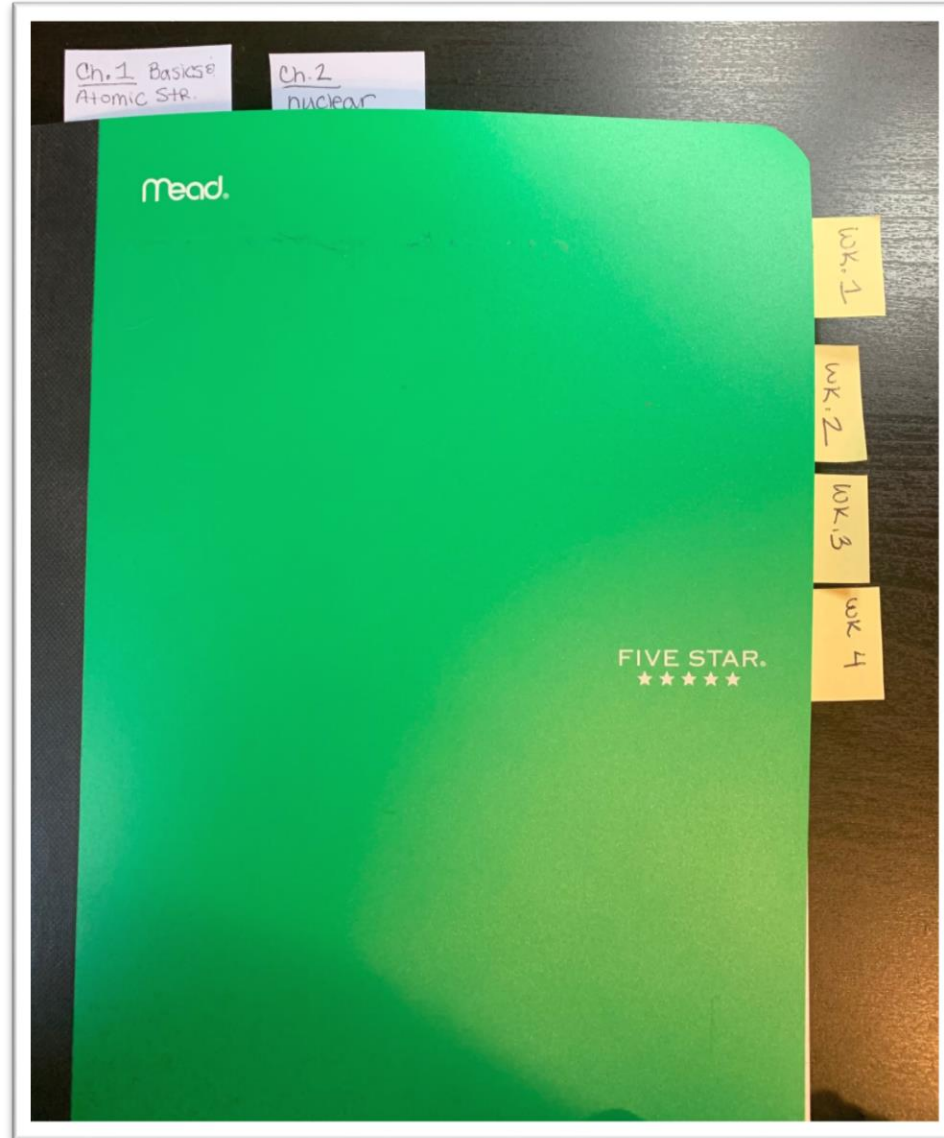


↳ matter elements: homogeneous, heterogeneous
molecules, compounds, mixtures

↳ there are lots of kinds of mixtures in cooking, some are well mixed like salt water to boil pasta in, some are not like minestrone

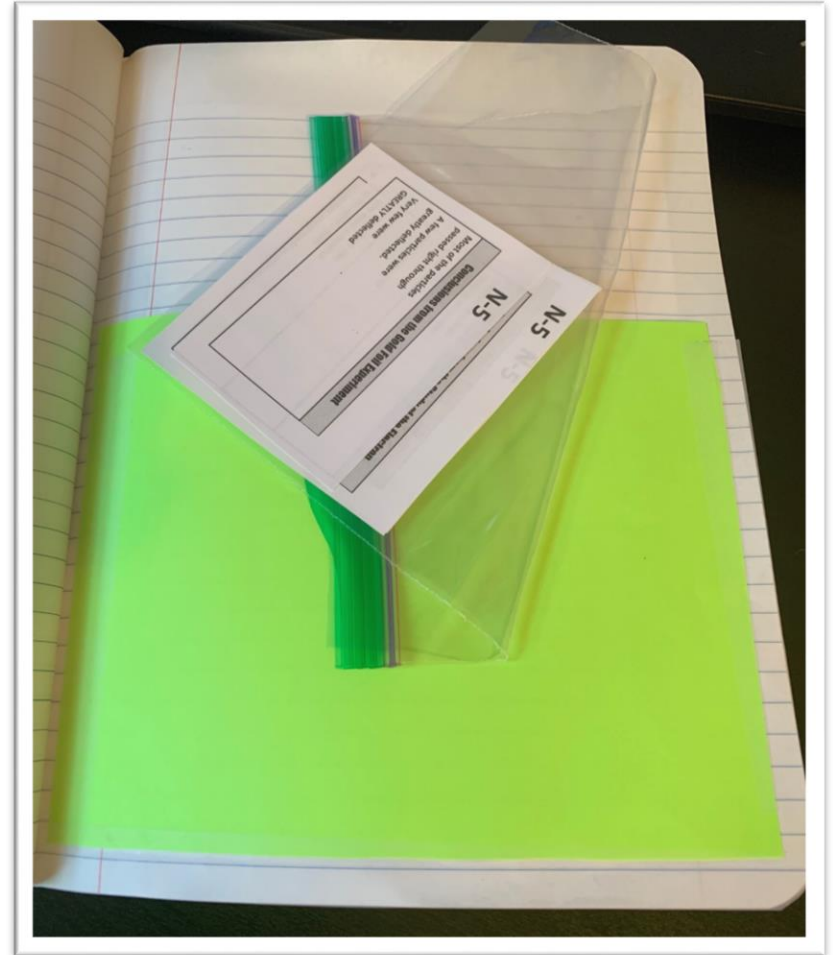
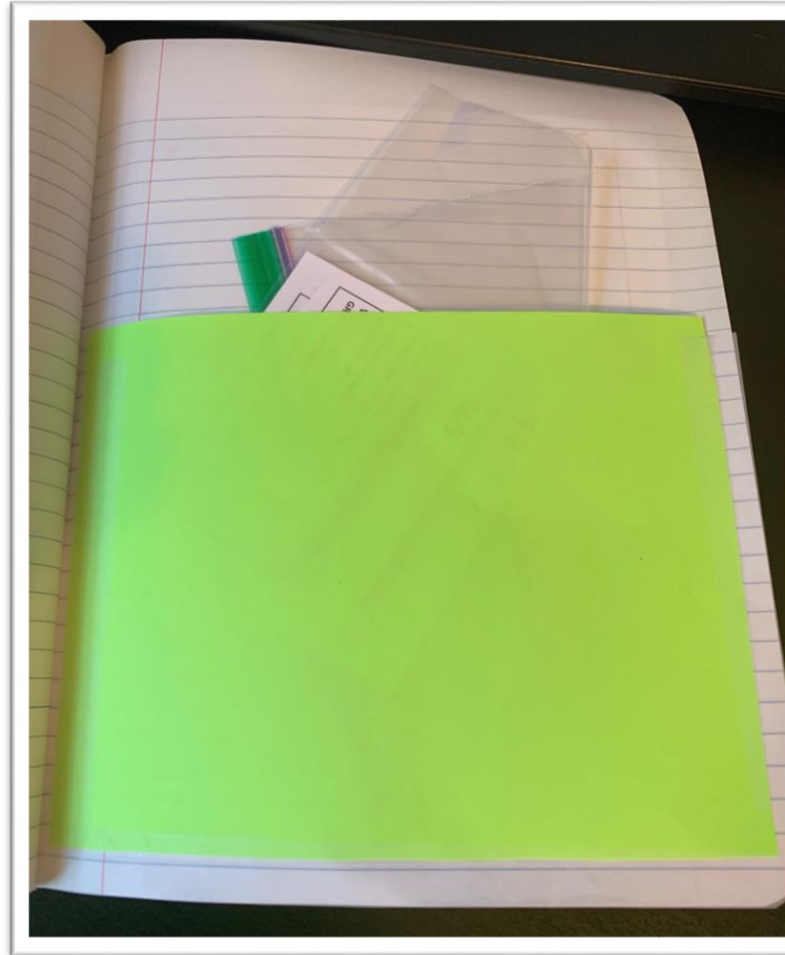
Q
① what is a compound?
② compare & contrast molecules & compounds
p. 15

Feel Free to
add tabs,
bookmarks,
etc to your
notebook!
Make it work
for you!



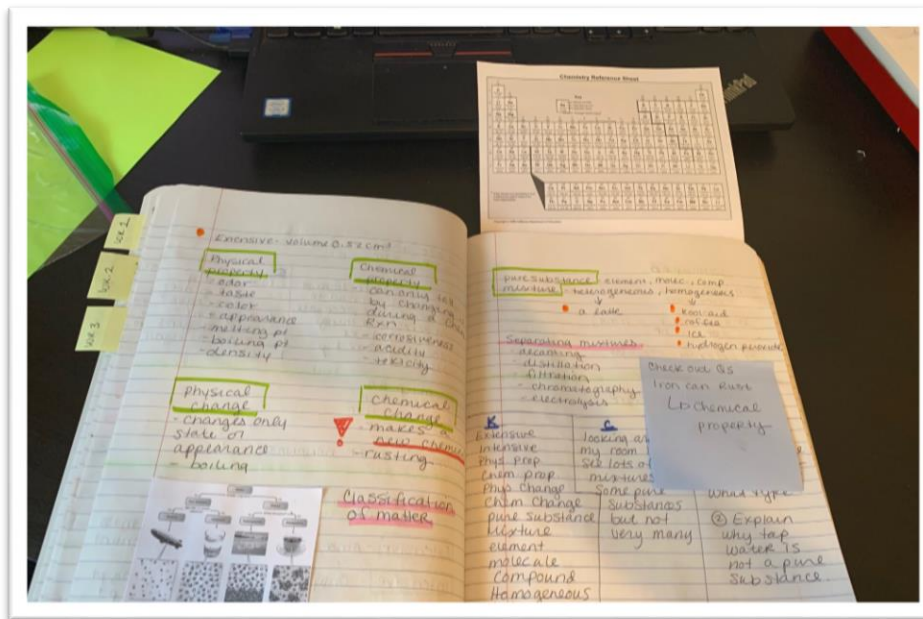
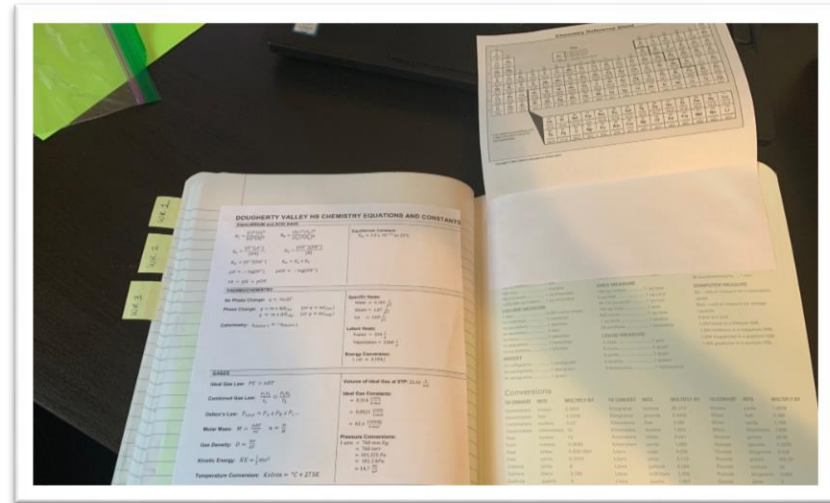
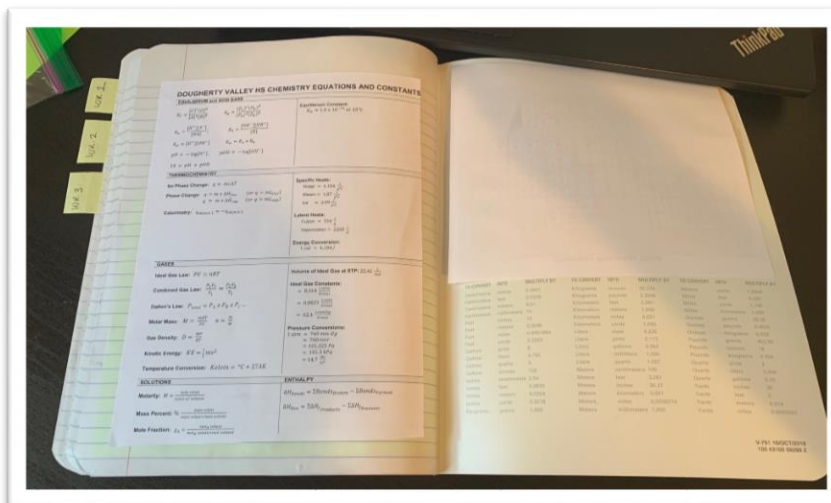
**Yes, I know this is a composition book, this example photo is from my Honors class and they use Composition Notebooks instead of spiral ones. The idea still applies! 😊*

I like to make a pocket in the back to hold a little ziplock bag filled with my Glue Ins for my notes. That way I can print them all at once, cut them to size, and not lose them!



**Yes, I know this is a composition book, this example photo is from my Honors class and they use Composition Notebooks instead of spiral ones. The idea still applies! 😊*

I like to print a small periodic table (you can shrink it down to 75% in the print menu) and then I glue/tape it onto the back inside cover so it flips out of my notebook! Very handy!



*Yes, I know this is a composition book, this example photo is from my Honors class and they use Composition Notebooks instead of spiral ones. The idea still applies! 😊

The next set of slides are just examples of the first few weeks of worksheets and notes. Try to look for the following things.

- Large clear numbering on outside, bottom page corners
- Large clear title for the notes
- Target at the top in RED pen (our brain behaves differently when it sees red!)
- Space left in the notes around important points
 - do not crowd your notes! We have lots of space in our notebooks, use it!
- KCQ Boxes on the bottom
- Practice problems done in the notes
- Color annotations added

The next set of slides are just examples of the first few weeks of warmups and notes. Try to look for the following things.

- **Color Annotations adding a minimum of three additional colors to the notes.**
- **Color Annotations done in a meaningful way – I didn't just scribble the background or highlight every word a different color.**
- **More is not always better!**
- **Be careful to not focus on “decorating” or “coloring” your notes – you are supposed to be doing color “annotations.” Sometimes people have beautiful notes but they spent more time on what they look like than thinking about what the notes say!**

The next set of slides are just examples of the first few weeks of warmups and notes. Try to look for the following things.

- **KCQ Boxes** added to the end of each set of notes
- **Make the boxes fit the work that needs to be in them, don't draw the boxes and then squeeze in the information! Use as much space as needed. You can always make little flippies if you need to**
- **All key terms, not just words that're new to you!**
- **Connections can be to previous classes, things you saw on TV etc – but they should be specific. Don't just write "7th grade"**
- **Questions – two questions, one lower level, one higher level. You do not have to answer them!**

GROCERY LIST

ATOMS

- Pencil lead = Carbon
- Aluminum foil/cans

MOLECULES

- salt = NaCl
- water = H_2O
- hydrogen peroxide = H_2O_2
- Baking Soda = NaHCO_3
- Sugar = $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
- Bleach = NaClO

HOMOGENEOUS MIXTURE

- Apple juice
- milk
- Smart water
- Gatoraid
- Chicken broth
- iced tea

HETEROGENEOUS MIXTURE

- Chicken noodle soup
- Salad mix
- birthday cake
- orange juice with pulp
- Chocolate chip cookie
- mint chip ice cream
- trail mix
- lucky charms
- Crunchy peanut butter

p. 16

I can assess my knowledge of different types of matter

Types of Matter and Mixtures - Check your understanding!

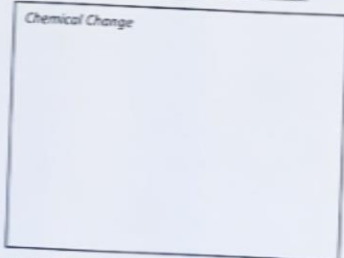
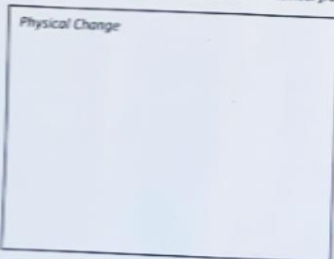
True or False? Answer these questions as a group. Check your answers when done. Don't peek at the answers ahead of time! ☺

1. Oxygen (O_2) is a mixture.
2. Air is a molecule.
3. An element is made out of only one kind of atom.
4. The atoms in a pure element are not bonded together.
5. The atoms in a molecule are not bonded together.
6. When looking at drawings of a molecule, the "spheres" often represent molecules, & lines or sticks represent the bonds connecting them.
7. A molecule could be made of the same atoms or different atoms that are bonded together.
8. Ozone (O_3) is made of three oxygen atoms and is a compound.
9. Water, salt and carbon dioxide are all molecules.
10. Water, salt, and carbon dioxide are all compounds.
11. NaCl is made out of four different kinds of atoms.
12. H_2O_2 is made up of 2 hydrogen atoms and 2 oxygen atoms.
13. Ammonia (NH_3) is a compound.
14. A water molecule is in the shape of a triangle.
15. A carbon dioxide molecule has a single bond.
16. Bonds are formed when the electrons in the outer shell are shared or transferred.
17. Atoms are the building blocks of elements, molecules, compounds, and mixtures.
18. Sodium Chloride, or table salt, is a compound.
19. Air is a mixture of many different gas molecules.
20. Pizza is a heterogeneous mixture.
21. Salt water is a heterogeneous mixture.
22. A solution is when one substance dissolves in another.
23. In Kool-Aid, water is the solute.
24. In Kool-Aid, the sugar is the solute.
25. Another word for air is oxygen.
26. Often when you look at the drawing of a compound, you will notice that there are different colored "spheres" bonded together.
27. Tap water has many things dissolved in water. This means that tap water is a homogeneous mixture.
28. Solutions are homogeneous mixtures.
29. Pure water (H_2O) is a compound and a molecule.

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Phases and Changes Worksheet

Draw particulate diagrams to model what is happening on the atomic level during a physical change versus a chemical change. Use things such as labels, keys/legend, color, size, showing passage of time, etc to make your model detailed and understandable. If you would like more space you can always make a flippy! Big or small!
Video on particulate diagrams if you don't remember from previous science classes: <https://www.youtube.com/watch?v=17y92n1w0E>



Determine whether the following things are physical properties (PP), physical changes (PC), chemical properties (CP), or chemical changes (CC). Refer to your chart of information for help! When done, check answers!
Hint: Changes are things that are happening. Properties are things that can happen
Example: Iron rusting = chemical change. Iron rusts = chemical property.

#	Physical/Chemical Property/Change	Answer
1	Burning a log	
2	Bending a wire of Aluminum	
3	TNT reacts very, very fast when ignited	
4	The table top is black	
5	Boiling water	
6	Melting copper	
7	A decaying tree trunk	
8	Vinegar smells sour	
9	Iron rusting	
10	Acid reacts with water and gives off heat	
11	Water evaporating from sugar water	
12	Glucose and yeast ferment to make alcohol	
13	Ice freezes at 0°C and boils at 100°C Celsius	

#	Physical/Chemical Property/Change	Answer
14	Digesting your lunch	
15	Grinding sand	
16	Freezing water to make ice	
17	Iron metal rusts when exposed to oxygen	
18	Zinc reacts with HCl and produces a gas	
19	Wood and alcohol are flammable	
20	Milk sours	
21	Water is absorbed by a paper towel	
22	Salt dissolves in water	
23	The density of an object is 5.2 g/mL	
24	A pellet of sodium hydroxide is sliced in two	
25	The metal object is hard, while the pillow is soft	
26	Li is put in water, catches fire and makes LiOH	

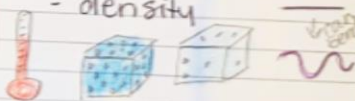
p. 18

I can identify different types of phases & changes

Physical & Chemical Changes / Properties

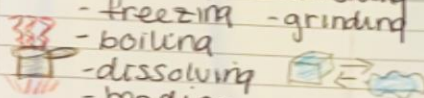
Physical Property

- Can be measured or seen by observation
 - color
 - temperature
 - malleable
 - density



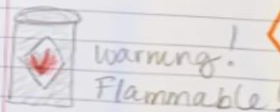
Physical Changes

- Changes in phys props but same formula
 - Heating
 - cooling
 - melting
 - freezing
 - boiling
 - dissolving
 - bending
 - evaporating
 - crushing
 - grinding



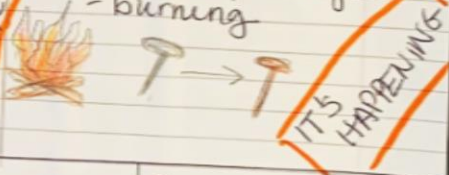
Chemical Property

- Can be observed when one substance changes to another
 - can rust
 - can react
 - can burn



Chemical Changes

- When one substance turns into another
 - rusting
 - mixing baking soda & vinegar
 - burning



- physical property
- physical change
- chemical changes
- chemical property

we see all of these in real life. Chewing is physical change but digestion is chemical change

① what is a physical change.
② How are chem changes & properties the same and different? p. 19

Signs of a Chemical Reaction Lab

- While wearing goggles, carefully add chemicals in the combinations shown in the table below. **DO NOT MIX ANYTHING OTHER THAN IN THE COMBINATIONS SHOWN!!!!!!**
- As you mix, record your observations and indicate whether a reaction took place or not, and if it did, what type of sign you saw. They should all be obvious! If you are unsure ask Mrs. Farmer!

Run #	Combine	Observations	Run or No Run?	If Run - what sign?	Clean up
1	RED A + B Zinc + HCl	https://youtu.be/A4XITCZ25uk			Rinse down the drain with lots of water.
2	ORANGE C + D Iron + CuSO ₄	https://youtu.be/OrG6HzvGS			Paper clip in trash. LIQUID MUST GO IN WASTE JUG UP FRONT!! Rinse test tube with DI water into jug up front!
3	YELLOW E + F Na ₂ CO ₃ + CaCl ₂	https://youtu.be/k0Ng0Hvlgm			Rinse down the drain with lots of water.
4	GREEN G + H KCl + Na ₂ CO ₃	No video - two clear liquids mixed together and nothing observable happens.			Rinse down the drain with lots of water.
5	BLUE I + J HCl + Water "YOU MUST ADD THE ACID TO THE WATER! ADD I to J NOT THE OTHER WAY AROUND!"	https://youtu.be/M-QM-J-IMb2			Rinse down the drain with lots of water.
6	PURPLE Snap one of the sticks and shake!	https://youtu.be/wJnTeRvVhDa			None - Do "Rock Paper Scissors Lizard Spock" to see who takes glow stick with them ☺

Give an example of real life experiences that show each of the five signs of a reaction.

Temp change	Light given off	Gas is formed	Precipitate formed	Color change

Draw a small "pictogram" that represents each of the five signs of a reaction.

Temp change	Light given off	Gas is formed	Precipitate formed	Color change

P.20

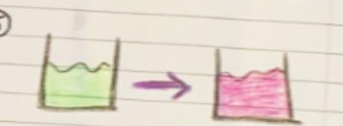
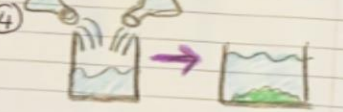
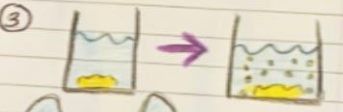
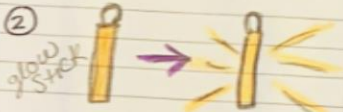
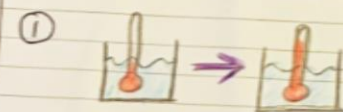
I can identify the signs of a chemical reaction

SIGNS OF A CHEMICAL REACTION

NOTES

- Temperature change
Exothermic - release
Endothermic - absorb
- Light
another form of energy
- Gas formed
bubbles appear
- precipitate formed
two liquids mix
& a solid appears
- Color change
new molecule has
a new color to it

VISUAL



K
Endothermic
exothermic
precipitate

C
At halloween we use glow sticks which glow when you crack the capsule inside & it reacts

Q
① What is the solid that forms when two liquids react?
② Design a lab for chemical changes being observed p. 21

Three Fundamental Chemical Laws Worksheet

Law of Conservation of Mass

- 1 When carbon burns it combines with oxygen to form carbon dioxide. The diagram shows some carbon atoms reacting with some oxygen molecules.



- a. Finish the diagram by drawing the correct number of carbon dioxide molecules. One has been done for you already.
b. Write "reactants" and "products" under the correct sides of the diagram.

- c. 12 grams of carbon reacted with 32 grams of oxygen. What mass of carbon dioxide was formed?

Circle the correct answer: 12 g 24 g 32 g 44 g 61 g

- 2 This diagram below shows the reaction between marble chips and acid.



- a. Is carbon dioxide a solid, a liquid, or a gas? _____

- b. What would you expect the balance to read when the reaction is finished?

Circle the correct answer. 179 g 180 g 181 g

- c. Explain your answer to part b.



- 3 Magnesium metal is placed in sulfuric acid inside a beaker. A chemical reaction occurs and the solution begins to bubble. The remaining liquid is a solution. The mass of the chemicals before the reaction was 10 grams, and the mass of the chemicals after the chemical reaction was 7 grams.

- a. Was this an open or closed system? _____

- b. After the chemical reaction the mass was less. What happened to the missing mass? Was the law of conservation of mass broken? Explain.

Law of Definite Proportions

- 4 Carbon dioxide has a ratio of 12 g C : 32 g O. Which of these experiments below produced carbon dioxide? Provide mathematical evidence to back up your answer.

Experiment #1: 30 g C and 88 g O Experiment #2: 36 g C and 90 g O Experiment #3: 36 g C and 96 g O

Law of Multiple Proportions

- 5 Circle all that demonstrate the law of multiple proportions. For the ones that are NOT demonstrating this law, explain why.

MgO H₂SO₄ Li₂O₅ C₂H₄O₂
MgS H₂SO₃ Li₂O C₂H₆O

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I can describe the three fundamental chemical laws that will be tied to what I learn this year

Three Fundamental Chemical Laws

- ① Law of Conservation of Mass
- ② Law of Definite Proportions
- ③ Law of Multiple Proportions

① mass can't be created or destroyed
↳ just converted (nuclear rxns)

Sample #1

$$\frac{1.119 \text{ g H}}{10.000 \text{ g H}_2\text{O}} = 11.19\% \text{ H} \quad \frac{8.881 \text{ g O}_2}{10.000 \text{ g H}_2\text{O}} = 88.81\% \text{ O}$$

Sample #2

$$\frac{2.021 \text{ g H}_2}{27.000 \text{ g H}_2\text{O}} = 11.19\% \text{ H} \quad \frac{23.979 \text{ g O}_2}{27.000 \text{ g H}_2\text{O}} = 88.81\% \text{ O}$$

* Same %: Both are water! *

③ elements can combine in different ratios, but always whole # ratios

✓ NO, NO₂, N₂O NOT NO_{1.5} ✗

✓ SO₂ & SO₃ ✓ CO & CO₂

NOT ✗ CH₄ & CO₂

K
Law Conserv. mass
Law Definite prop
Law multiple prop.

C
when you build with legos you can rearrange them but not magically make more appear

Q
① What is the Law of Definite Proportions?
② Explain how to calculate if two substances are the same w/ L.O.P.
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FLIPPY JON

Three Fundamental Chemical Laws Worksheet

Law of Conservation of Mass

1. When carbon burns it combines with oxygen to form carbon dioxide. The diagram shows some carbon atoms reacting with some oxygen molecules.



- Finish the diagram by drawing the correct number of carbon dioxide molecules. One has been done for you already.
- Write "reactants" and "products" under the correct sides of the diagram.
- 12 grams of carbon reacted with 32 grams of oxygen. What mass of carbon dioxide was formed?

Circle the correct answer: 12 g 24 g 32 g 44 g 61 g

2. This diagram below shows the reaction between marble chips and acid.
- Calcium carbonate + hydrochloric acid → calcium chloride + carbon dioxide + water



- Is carbon dioxide a solid, a liquid, or a gas? _____
- What would you expect the balance to read when the reaction is finished?

Circle the correct answer: 179 g 180 g 181 g

- Explain your answer to part b.

3. Magnesium metal is placed in sulfuric acid inside a beaker. A chemical reaction occurs and the solution begins to bubble. The remaining liquid is a solution. The mass of the chemicals before the reaction was 10 grams, and the mass of the chemicals after the chemical reaction was 7 grams.

- Was this an open or closed system? _____
- After the chemical reaction the mass was less. What happened to the missing mass? Was the law of conservation of mass broken? Explain.

Law of Definite Proportions

4. Carbon dioxide has a ratio of 12 g C : 32 g O. Which of these experiments below produced carbon dioxide? Provide mathematical evidence to back up your answer.
- Experiment #1: 30 g C and 88 g O Experiment #2: 36 g C and 90 g O Experiment #3: 36 g C and 36

Law of Multiple Proportions

5. Circle all that demonstrate the law of multiple proportions. For the ones that are NOT demonstrating this law, explain why.



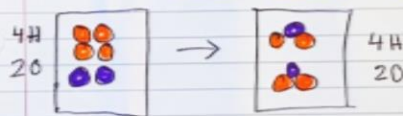
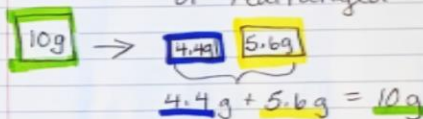
p. 22

I can describe the three fundamental chemical laws that will be tied to what I learn this year

Three Fundamental Chemical Laws

- Law of Conservation of Mass
- Law of Definite Proportions
- Law of Multiple Proportions

- 0 mass can't be created or destroyed
↳ just converted (Nuclear rxns)
or rearranged (Chemical rxns)



- 2 a molecule will have the same ratio of elements no matter how it's made

K
Law Conserv. mass
Law Definite prop
Law multiple prop.

C
when you build with legos you can rearrange them but not magically make more appear

Q
1) What is the Law of Definite proportions
2) Explain how to calculate if two substances are the same w/ L.O.P.P.

The Density of Pennies

The composition of pennies has changed over time. According to the U.S. Mint,

Pennies dated 1962-1982:

Composition: 95% copper, 5% zinc

Density of pre-1982 penny = 8.87 g/mL

Pennies dated 1982-present:

Composition: 97.5% zinc, 2.5% copper

Density of post-1982 penny = 7.39 g/mL



PURPOSE: The purpose of this lab is to determine the densities of pre-1982 and post-1982 pennies.

EQUIPMENT and MATERIALS: Electronic Balance, Pennies (10 pre-1982 and 10 post-1982), Graduated Cylinder (100mL), water

PROCEDURES:

- 1 Weigh 10 PRE-1982 pennies. Record this mass.
- 2 Fill a graduated cylinder with 50 mL of water.
- 3 Tilt the cylinder and gently slide all ten pennies into the water.
- 4 Read the volume of the water and the pennies together. Record this volume.
- 5 Calculate the volume of the pennies alone by subtracting 50 mL from the final reading of the water level. Record the volume of the pennies by themselves.
- 6 Use the recorded mass and volume of the pennies to calculate density.
- 7 Use the accepted values for density, provided by the U.S. Mint, to calculate your percent error for density.
- 8 Repeat steps 1-7 with ten POST-1982 pennies.

If lab not done in class, watch video and visit to do this sheet:

OBSERVATIONS/DATA:

PRE-1982 Pennies		POST-1982 Pennies	
Mass of 10 pre-1982 pennies		Mass of 10 pre-1982 pennies	
Volume of pennies + water		Volume of pennies + water	
Volume of JUST pennies = (Volume of pennies + water) - 50 mL of water		Volume of JUST pennies = (Volume of pennies + water) - 50 mL of water	

CALCULATIONS: (SHOW ALL WORK!!! BOX YOUR FINAL ANSWERS!!!)

Calculate the density of PRE-1982 pennies	Calculate the density of POST-1982 pennies
Calculate the % error for the density of PRE-1982 pennies	Calculate the % error for the density of POST-1982 pennies

POST-LAB QUESTIONS

#	Question - Answer in full detailed answers!
1	What are three possible sources of error in this lab?
2	How would each source of error affect your calculated density? Make it too big or too small? WHY? Think about the math.
3	How could the existing procedures be modified to yield a more accurate result?

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I can calculate the density of objects

Density

How much "stuff" crammed into how much space?

$$D = \frac{m}{V} = \frac{\text{mass}}{\text{volume}}$$

mass g/mL
per g/cm^3
volume kg/L
etc...

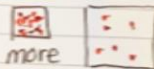
$$1 \text{ cm}^3 = 1 \text{ mL}$$

Density of H₂O

$$1 \text{ g/mL} \quad 1 \text{ g/cm}^3$$



more dense

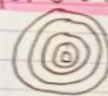


more dense

Air pressure



Layers of earth



memorize!

Volcanos

tectonic plates

D = ?

$$m = 45.8 \text{ g}$$

$$V = 12 \times 3 \times 6.5 = 234$$

$$D = 45.8 / 234 = 0.196 \text{ g/cm}^3$$

$$\textcircled{1} \quad D = 6.73 \text{ g/mL}$$

$$V = 8 \text{ cm}^3 = 8 \text{ mL}$$

$$m = ?$$

$$D = m/V$$

$$6.73 \text{ g} = \frac{m}{8 \text{ mL}}$$

$$m = 53.84 \text{ g}$$

$$\textcircled{2} \quad D = 1.45 \text{ g/mL}$$

$$m = 15.2 \text{ g}$$

$$V = ?$$

$$1.45 = \frac{15.2}{V}$$

$$V = 10.48 \text{ mL}$$

k
Density

c
lots of examples on earth like islands forming from volcanos when tectonic plates collide

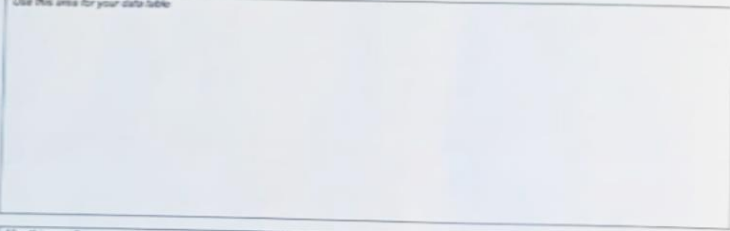
o
① equation for Density?
② what is mass if Density = 0.8 g/cm^3 and Volume = 25 mL?

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Spaghetti Graphing Activity

- In this lab activity you will determine the relationship between the mass and length of spaghetti noodles.
- You will do this by making a data table where you record the lengths and masses of small pieces of spaghetti.
- In order to make the best possible graph, use widely varying lengths of spaghetti. Record your data in a table.
- When you have measured the masses and lengths of 10 pieces of spaghetti, use your data table to make a line graph.
- You will be graded on how closely your data table and your graph conforms to the rules discussed in class.
- Collect your data in class, you can always finish the graph at home if you run out of time in class, you can't collect your data at home!
- Good luck!

Use this area for your data table

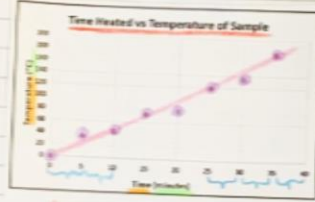


Use this area for your graph



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I can construct high quality charts & graphs in order to communicate data effectively



- 1 Descriptive title
- 2 Labels
- 3 Units
- 4 uniform scale
- 5 large visible data points
- 6 line of best fit
 - Don't play connect the dots
 - can be linear or a smooth curve

Mass and Temperature Data for Heat Transfer from Unknown Metal Block to Water

Sample	Mass of Metal Block (g)	Mass of Water (g)	Starting Temp of Water (°C)	Ending Temp of Water (°C)
1	15.25	100	22.0	45.3
2	25.01	100	21.8	50.1
3	22.88	100	22.1	29.6

- 1 Descriptive title
- 2 labels for every column or row
- 3 units for every column or row
- 4 Data written largely and clearly
- 5 include decimals if possible

K Labels vs units
uniform scale
line of best fit

c we do graphing in math class w/ uniform scales, but don't always have units, sometimes just labels

d 1 compare & contrast the graph & chart requirem.
2 Explain why we use line of best fit. p.27

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CONVERTING AND SCIENTIFIC NOTATION

Show work on notebook paper!

Convert:

- 1) 100kg → g
- 2) 1L → mL
- 3) 100cm → mm
- 4) 1.4 km → m
- 5) 80 cm → m
- 6) 75 mL → L
- 7) 5.6 m → cm
- 8) 65 g → mg

Compare using <, >, or =

- 9) 7g ? 600mg
- 10) 1,500 mL ? 1.5 L
- 11) 536 cm ? 53.6 dm
- 12) 3.6 m ? 36cm

Write the abbreviation for each metric unit and tell if it measures mass, length, or volume

- 13) decigram
- 14) milliliter
- 15) meter
- 16) decimeter

Write in scientific notation:

- 17) 12
- 18) 0.156000
- 19) 0.0000000015

Write in standard notation:

- 20) 1.98×10^3
- 21) 4.5×10^{-4}
- 22) 2.71×10^{-7}

What is wrong with the following #s?

- 23) 0.54×10^2
- 24) 57×10^{-4}

Why does this not make sense? Look at the number, exponent!

- 25) The diameter of a particular atom is 1.3×10^6 cm.

Solve the following word problems:

- 26) In Australia, the people use approximately 2,240,000,000 pounds of bread in a year. Put in scientific notation
- 27) 0.000005 is the wave length of yellow light. Put in scientific notation.
- 28) A proton weighs 1.673×10^{-27} kg, a neutron weighs 1.75×10^{-27} kg, and an electron weighs 9.11×10^{-31} kg. Write the heaviest particle's mass in standard notation. Make sure you don't forget to look at the exponent in addition to the number itself!

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I can perform metric conversions and use scientific notation

Metric & Sci Notation

- we all need the same math language
- Everyone else uses it
- Its easier

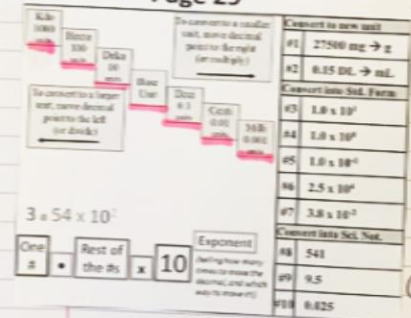
Base ten

Base units
meter Second
Liter Kelvin
gram Mole

Just move the decimal

King Henry Died by drinking chocolate milk

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- 1) K H D B d c m 27,500
3x ←
- 2) K H D B d c m 27,500 g
4x → 0.1500
1500 mL
- 3) $1.0 = 10$
- 4) $1.0 \times 10^0 = 1.0$
- 5) $1.0 = 0.10$
- 6) $2.5 = 25000$
- 7) $3.8 = 0.038$
- 8) $541 = 5.41 \times 10^2$
- 9) $9.5 = 9.5 \times 10^0$
- 10) $0.025 = 2.5 \times 10^{-2}$

K
Metric system scientific notation
Base units prefix

C
We use english system in cooking, lbs, oz, cups, tsp etc
But my baking scale can also do grams & kg

Q
1) Prefix for centi?
2) convert 0.00045 into scientific notation

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