

OAKLAND CUSD #5

# CHEMISTRY

APRIL 27-MAY 1, 2020

WILLIAM SEWELL

# Week: April 27-May 1, 2020

**Teacher:** William Sewell

**Communication:** email: [william.sewell@oakland5.org](mailto:william.sewell@oakland5.org) or Google Hangout-Meet

**Office hours:** Monday and Wednesday: 12:00 to 2:00 p.m., Tuesday and Thursday: 12:00 to 1:00 p.m.

**Due Date:** All assignments are due 5/4/2020 either by sending a picture of it and turning it into Google Classroom or turning it into the office.

**Assignments:** All assignments will be in "Google Classroom" and a paper copy will be provided from the Oakland main office. I will have office hours as listed above which we can review the assignments given and I will help you as much as needed. However, the expectation is the same as it was before. I expect you to have made a serious effort to complete the assignment, before asking for help. You will not learn anything with me just giving you the answers.

Class	Choice 1	Choice 2	Choice 3 (Enrichment)
Earth Science	Collect 15 different rock samples. Take pictures and describe them: shape, various colors, size, sharp sides/ smooth, etc.	Repeat this activity for this week and make a comparison to last week, if you did this activity or wait until next week and compare it then. Take pictures of the moon and record the cycle that it is in from Monday through Friday. Please use the given table to complete. Please refer to page 779 in your book.	Human Impact On Resources Please answer and respond to the following questions and statements. Make a list of five ways humans impact Earth by doing the following for each.  1. State the human impact. 2. Determine whether or not it is positive or negative. 3. State the things which determine the degree of this impact. 4. Is this impact permanent or temporary?
Physical Science	Do speed lab of races. Record your distance and time yourself. Please use the given table to complete.	Graph your data of distance versus time. With distance on the vertical axis and time on the horizontal axis, using the given graph paper.	Chapter 13: Review Worksheet, p.35-36, and the Chapter Test, p. 37-38

Class	Choice 1	Choice 2	Choice 3 (Enrichment)
Chemistry	WS#4 or Unit 4 Test	Do the Unit 5 WS#2. Use dimensional unit conversions to complete. or Unit 5: Relative Mass Lab video and write-up.	Unit 5: Quiz 1
Pre-calculus	Matrix WS #2	WS on Inverse Trig Functions	New problems: Watch videos on Inverse trigonometric functions. They will be assigned in Khan academy.

## Chemistry – Unit 4 Worksheet 4

Answer the following questions on your own piece of paper. Be sure to show all mathematical work and reasoning and use complete sentences in explanations.

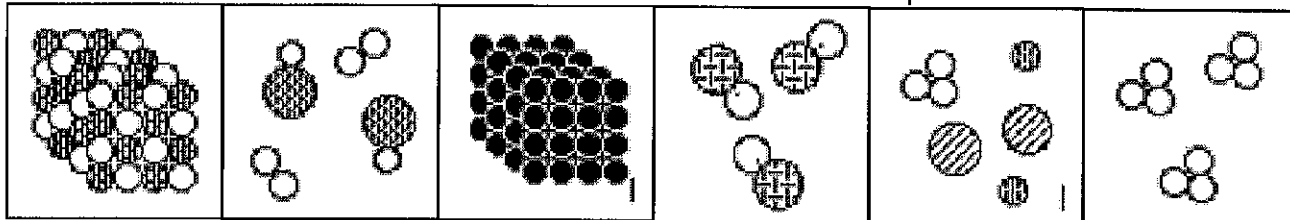
1. Table sugar is a compound known as sucrose. Sucrose is composed of the elements carbon, hydrogen, and oxygen. Analysis of a 20.0 g of sucrose from a bag of sugar finds that the sugar is composed of 8.44 g of carbon, 1.30 g of hydrogen, and 10.26 g of oxygen.
  - a. Express, as fractions, the ratio of the mass of each element to the total mass of the sample.
  - b. Using these ratios, calculate the percent composition by mass of each element in the compound.
2. A similar chemical analysis is performed on a 500.0 g sample of the sugar isolated from a sample of pure sugar cane. Analysis shows this sample contains 211.0 g of carbon, 32.5 g of hydrogen, and 256.5 g of oxygen.
  - a. Determine the percent composition by mass of each element in the sugar cane sample.
  - b. Could the sugar in this sample be sucrose? Justify your conclusion.
3. A similar chemical analysis is performed on a 200.0g sample of the sugar found in corn syrup. This sample contains 80.0g of carbon, 13.3 g of hydrogen and 106.7 g of oxygen.
  - a. Determine the percent composition by mass of each element in the sugar cane sample.
  - b. Could the sugar in corn syrup be sucrose? Justify your conclusion.
4. A 1.0 g sample of hydrogen reacts completely with 19.0 g of fluorine to form a compound of hydrogen and fluorine.
  - a. What is the percent by mass of each element in the compound?
  - b. What mass of hydrogen would be present in a 50 g sample of this compound?
  - c. Justify your answer to b.
5. Explain how the previous examples help to illustrate the Law of Definite Proportions.

## Chemistry – Unit 4 Test-a

Write the letter(s) of the word(s) or phrase(s) that match the definition.

- \_\_\_1. This substance consists of two or more elements in a fixed mass ratio.
- element
  - compound
  - mixture
  - pure substance
- \_\_\_2. This substance cannot be broken down by physical or chemical means.
- element
  - compound
  - mixture
  - pure substance
- \_\_\_3. The composition of this substance is variable; its physical properties depend on the composition.
- element
  - compound
  - mixture
  - pure substance
- \_\_\_4. Electrolysis can be used to separate this substance.
- element
  - compound
  - mixture
  - pure substance
- \_\_\_5. This substance can be either homogeneous or heterogeneous.
- element
  - compound
  - mixture
  - pure substance

Write the letter of the box whose contents best match the description.



a

b

c

d

e

f

\_\_\_6. a mixture of molecules

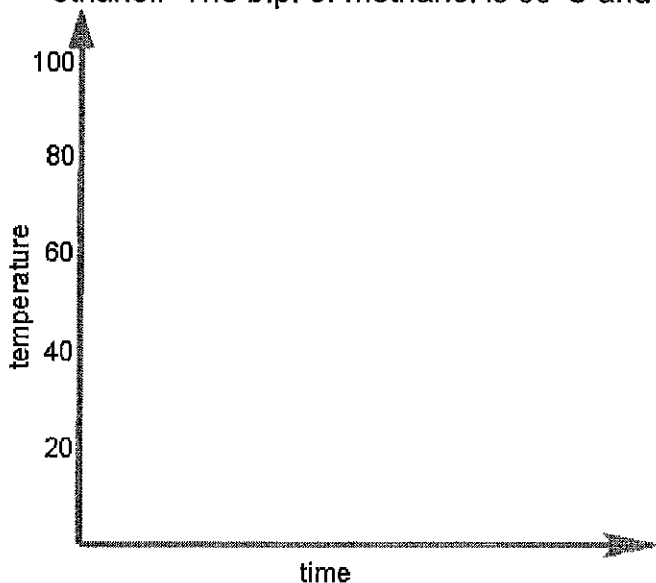
\_\_\_7. atoms of a pure metal

\_\_\_8. molecules of an element

\_\_\_9. a solid compound

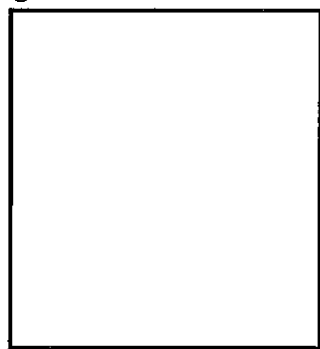
\_\_\_10. a mixture of elements

11. Sketch a graph of temperature vs. time for the heating of a mixture of methanol and ethanol. The b.p. of methanol is 65°C and that of ethanol is 78°C.

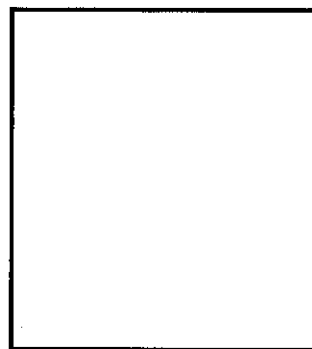


12. Describe how you could use the information in the graph you sketched for Q 11 to separate a mixture of methanol and ethanol.

13. Sketch a particle diagram representing a mixture of hydrogen and oxygen gases. Sketch a particle diagram for the compound formed when these gases react. Describe how these diagrams are different.

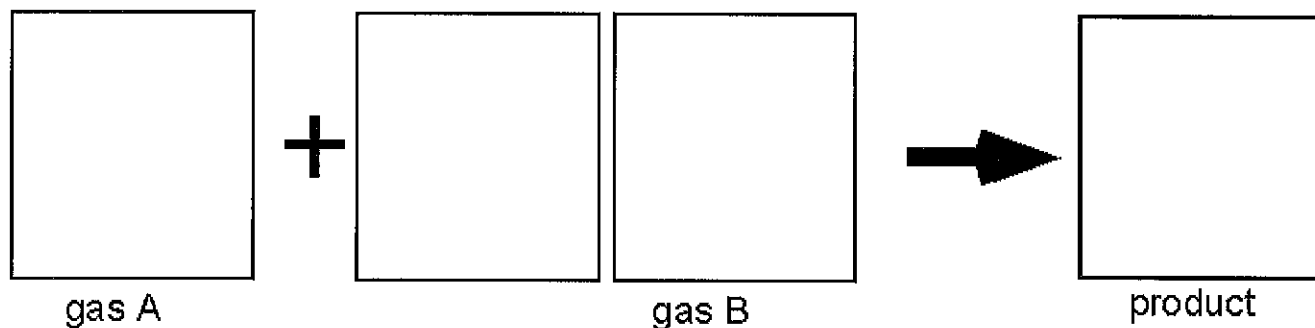


mixture



compound

14. Suppose that one volume of gas A combined with two volumes of gas B to form one volume of product when measured at the same pressure and temperature. Sketch particle diagrams for molecules of gas A, gas B and the product; assume gases A and B are monatomic.



15. If the gases in Q 14 were diatomic, how many volumes of the gaseous product would be formed? Explain.

16. Nitrogen and oxygen form several compounds. Two of these have the following mass composition.

Compound A: 63.6 g of N and 36.4 g of O

Compound B: 46.7 g of N and 53.3 g of O

- Determine the value of the ratio \_\_\_\_\_ in each compound. A \_\_\_\_\_ B \_\_\_\_\_
- How does the mass ratio for compound A compare to that in compound B?
- Sketch particle diagrams for the compounds of A and B that account for these mass ratios. Write the formula for the compound in each diagram.



## Chemistry—Unit 5 Relative Mass Lab

### Purpose

The purpose of this lab is to determine the relative mass of different items and to recognize the connection between such an activity and the information on the periodic table.

### Data

Object Measured	Mass (g)	Adjusted Mass (g)	Relative Mass (in units or <i>item mass units</i> )
Empty vial			
Vial + Item #1			
Vial + Item #2			
Vial + Item #3			
Vial + Item #4			
Vial + Item #5			
Vial + Item #6			

### Calculations and Discussion Questions

- Each vial contains the same number of pieces. From each mass, subtract the mass of the empty vial to determine the adjusted mass. (Do you think the empty vial will have an adjusted mass?) To find the relative mass, divide the mass of each item by the mass of the smallest item. (What will the relative mass of the smallest item be?) Don't forget units and significant figures. Show all work for **one item** below.

2. What does *relative* mean in the phrase relative mass?
3. When calculating relative mass, why is it important to be sure the same number of items are in each vial?
4. Which item is used to determine relative masses of the other items? Why?
5. Why do you think the units were changed from grams to mu's in the table above?

## Conclusion

6. Which element is used to determine relative masses of the other elements? Explain the connection between this activity and the work of Gay-Lussac and Avogadro.

**Chemistry – Unit 5 Worksheet 2**

1. An old (pre-1987) penny is nearly pure copper. If such a penny has a mass of 3.3 g, how many moles of copper atoms would be in one penny?
2. Four nails have a total mass of 4.42 grams. How many moles of iron atoms do they contain?
3. A raindrop has a mass of 0.050 g. How many moles of water does a raindrop contain?
4. What mass of water would you need to have 15.0 moles of H<sub>2</sub>O?
5. One box of Morton's Salt contains 737 grams. How many moles of sodium chloride (NaCl) is this?
6. A chocolate chip cookie recipe calls for 0.050 moles of baking soda (sodium bicarbonate, NaHCO<sub>3</sub>). How many grams should the chef mass out?
7. Rust is iron (III) oxide (Fe<sub>2</sub>O<sub>3</sub>). The owner of a 1959 Cadillac convertible wants to restore it by removing the rust with oxalic acid, but he needs to know how many moles of rust will be involved in the reaction. How many moles of iron (III) oxide are contained in 2.50 kg of rust?

8. First-century Roman doctors believed that urine whitened teeth and also kept them firmly in place. As gross as that sounds, it must have worked because it was used as an active ingredient in toothpaste and mouthwash well into the 18th century. Would you believe it's still used today? Thankfully, not in its original form! Modern dentists recognized that it was the ammonia that cleaned the teeth, and they still use that. The formula for ammonia is  $\text{NH}_3$ . How many moles are in 0.75 g of ammonia? How many molecules?



9. Lead (II) chromate,  $\text{PbCrO}_4$ , was used as a pigment in paints. How many moles of lead chromate are in 75.0 g of lead (II) chromate? How many atoms of oxygen are present?

10. The diameter of the tungsten wire in a light bulb filament is very small, less than two thousandths of an inch, or about  $1/20$  mm. The mass of the filament is so very small – 0.0176 grams – that it would take 1,600 filaments to weigh an ounce! How many tungsten atoms are in a typical light bulb filament?



11. Two popular antacids tablets are Tums and Maalox. The active ingredient in both of these antacids is calcium carbonate,  $\text{CaCO}_3$ . Tums Regular Strength tablets contain 0.747 g and Maalox tablets contain 0.600 g of calcium carbonate. Compare the number of formula units of calcium carbonate in both Tums and Maalox.

**Chemistry – Unit 5 Quiz 1a**

**Show work. Label set-ups and answers.**

1. Three nails have a mass of 3.05 g. How many moles of iron do they contain?
2. A student needs to use 0.575 moles of sodium chloride in an experiment. How many grams should he mass out?
3. There are 17 key nutrients essential for bone health in the human body. The ideal intake of calcium is approximately 1.25 g per day; however, most adults only consume about 0.5 g per day in their diets. How many atoms of calcium does the average adult need daily?
4. Suppose that you massed out 3.50 g of  $\text{Na}_2\text{CO}_3$ . How many moles would you have?