

MIXTURES AND COMPOUNDS SIMULATION LAB

INTRODUCTION:

There are some very important differences between mixtures and compounds. These differences are not necessarily easy to detect by looking at the substances. This lab will demonstrate some important characteristics of mixtures and compounds through the use of models.

PURPOSE:

To show some of the ways that compounds and mixtures are *not alike*.

MATERIALS:

1. Various samples of packaged foods: M & M's, Skittles, Pretzels, Chips, Twizzlers, Peanuts etc.
2. Large Bowl & stirrer
3. Paper cups (sample containers)
4. Paper Towels
5. Lego Pieces of different colors (at least 3 colors)
6. zip loc bags (sandwich size)

SAFETY:

Although this lab does not involve any safety hazards, proper lab procedures should be followed at all times.

PROCEDURE:

1. The Teacher will collect all donated packaged snacks and place the contents in the large bowl.

2. The “Mixture” will be stirred by the teacher and divided into equal portions (samples) in the paper cups. This could be done by weight.
3. Each person in the class needs to have a piece of paper towel measuring at least 30cm. X 30 cm.
4. Each group will receive one sample cup. The leader of the group will divide the sample evenly among the people in the group on paper towels.
5. Each person must count the items in their own sample and record the numbers on the team data table. When the numbers have been recorded you may eat your samples.
6. The team must add all their sample numbers and get the total number of each item, and record this number on the data table.
7. The team needs to calculate the percentage of the total for each item in the team sample and record these percentages on the data table also. And make a bar graph showing these percents.
8. The teacher will create a class data table using the totals and percents from each team. Everyone will record this information on the class data table. You will make a bar graph showing the percentages of each sample in the class data table.
9. Each team will then use their model kit bags to make models of water molecules(H_2O). The teacher will tell you what colors to use for each of the elements in the molecules of the compound you are making. Make as many molecules as you can of one compound at a time .
10. Once your models are made, divide them up amongst the team and count the numbers of each element and record them on your team data table. Also calculate and record on the table the percentages of each element in the compound.
11. Then make models of hydrogen peroxide (H_2O_2) and record and models of carbonic acid(H_2CO_3) and record on the team data table. You will then make bar graphs showing the percentages of each element in each compound. Make one bar graph for each compound.

12. Your teacher will make a class data table which will include your information from the team data tables – The class totals of each element will be tabulated and the percents of each element in each compound will be calculated and recorded. You will then make a bar graph for each compound on the class data table showing the percentages of the elements in each compound.

QUESTIONS:

1. After you have graphed all the data compare the graphs of the mixtures and state what you notice about the percentages of samples in the mixtures. Are the class results the same as the ones in your team? What about other teams?
2. How would you explain the results of the mixtures part of this lab?
3. Name some other mixtures.
4. What are some other ways that the parts of mixtures can be separated? Would it be very difficult to do?
5. Would you need a chemical reaction to occur in order to separate a mixture.
6. Is the formation of a mixture a chemical or physical change? Explain.
7. Now compare the graphs of the compounds. What do you notice?
8. Why do you think you found what you did with the compound graphs?
9. How could you separate the compounds?
10. What are your conclusions about mixtures and compounds based on your lab results (data)?

TEAM DATA TABLES

#1 MIXTURES DATA TABLE

SAMPLES						
NAMES						
						TOTAL OF TOTALS
TOTALS						
PERCENT OF TOTAL						100%

#2 COMPOUND DATA TABLE: WATER – H₂O

NAMES	HYDROGEN	OXYGEN	TOTALS	
				T O F T
TOTALS				
PERCENTAGE				100%

HYDROGEN PEROXIDE – H₂O₂

NAMES	HYDROGEN	OXYGEN	TOTALS	
				T OF T
TOTALS				
PERCENTAGE				100%

CARBONIC ACID – H₂CO₃

NAMES	HYDROGEN	OXYGEN	CARBON	TOTALS	T OF T
PERCENT				100%	

CLASS DATA TABLES

#1 MIXTURES DATA TABLE

SAMPLES

TEAMS						
#1						
#2						
#3						
#4						
#5						
#6						
#7						
#8						TOTAL OF TOTALS
TOTALS						
PERCENT OF TOTAL						100%

#2 COMPOUND DATA TABLE:

WATER – H₂O

TEAMS	HYDROGEN	OXYGEN	TOTALS	
#1				
#2				
#3				
#4				
#5				
#6				
#7				
#8				T OF T
TOTALS				
PERCENTAGE				100%

HYDROGEN PEROXIDE – H₂O₂

TEAMS	HYDROGEN	OXYGEN	TOTALS	
#1				
#2				
#3				
#4				
#5				
#6				
#7				
#8				T OF T
TOTALS				
PERCENTAGE				100%

CARBONIC ACID – H₂CO₃

TEAMS	HYDROGEN	OXYGEN	CARBON	TOTALS	
#1					
#2					
#3					
#4					
#5					
#6					
#7					T OF T
#8					
PERCENT					100%