Messing With Mixtures

Name _____

Part A: Hit The Trail!

(1) Look at the mixture in Bag A. What do you see?

(2) Would this mixture be classified as a heterogeneous or homogeneous mixture? Give a reason for your answer.

(3) What is the total mass of your mixture? Be sure to subtract the mass of the ziploc bag. Record this amount in the "Mass of Mixture" column of the chart.

(4) Separate the parts of the mixture and find the mass of each group. Use the formula provided to calculate the percentage for each part of the mixture. Record your data in the chart.

Name	Mass (g)	Mass of Mixture (g)	% of Mixture
FORMULA ➟ Mass of substance (g) ÷ Mass of mixture (g) x 100 Round final percentages to the nearest hundredth!			Total =

Part B: Tasty Solutions

(5) Read the steps below, then obtain 3 pieces of M&M candy from your teacher. You will need 3 pieces <u>for each group member</u>.

➥Step 1: Place one piece of candy in your mouth and allow it to dissolve <u>without using your tongue or teeth to help</u>! Record the time (in seconds) it takes for the <u>candy shell</u> to dissolve.

➥Step 2: Place another piece of candy in your mouth and allow it to dissolve using <u>only your tongue</u> to move it around. Record the time (in seconds) it takes for the <u>candy shell</u> to dissolve.

➥Step 3: Place another piece of candy in your mouth and allow it to dissolve <u>using your tongue and teeth</u>. Record the time (in seconds) it takes for the <u>candy shell</u> to dissolve.

Piece of Candy	Dissolving Time (s)
1st	
2nd	
3rd	

(6) In your solution, what was the solute and the solvent?

Solute =_____ Solvent = _____

(7) Explain the results of your experiment in terms of dissolving rate or the time it takes for a substance to dissolve.

(8) Identify the solute(s) and solvent in each solution. Underline the solute and circle the solvents. Remember that a SOLUTE dissolves in a SOLVENT!

Ocean water - Salt and water	Kool-Aid - Powder, sugar, and water
Antifreeze - Water and ethylene glycol	Lemonade - Water, lemon juice, and sugar
Soda Pop - Syrup, water, and CO_2 gas	Air - Nitrogen, oxygen, and other gases
Gold jewelry - Gold and copper	Sterling Silver - Silver and copper

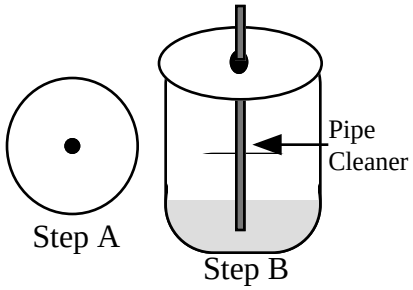
(9) What liquid is called the "universal solvent"?

(10) Which would have the most SOLUTE: a glass of very sweet Kool-Aid or a glass of barely sweet Kool-Aid? Give a reason for your answer.

Part C: Mystery Colors

(11) Follow the steps below to use chromatography to separate the pigments in black ink. You will need three black markers, three pieces of filter paper, a piece of pipe cleaner, and a small beaker of water.

(A) Use one of the markers to draw a circle (about the size of a dime) in the center of a piece filter paper.
(B) Insert one end of a pipe cleaner into the center of your ink dot. Place the other end into the water in the beaker.
(C) Allow time for the water to move up the pipe cleaner and separate the pigments in the ink.
(D) Repeat the first three steps to test the other markers.



(12) What happened to the black ink?

(13) What colors did you observe for each pen?

Pen 1 -

Pen 2 -

Pen 3 -

(14) Identify the solute and solvent for this experiment.

Solute = _____ Solvent = _____

(15) What do you think would happen if you used a permanent marker? Explain your answer.

Part D: See The Light

(16) Create 4 different mixtures by following the steps below.

Step 1: Mix 10 grams of salt with 100 mL of water in a ziploc bag. Label the bag as D-1.
Step 2: Mix 10 grams of flour with 100 mL of water in a ziploc bag. Label the bag as D-2.
Step 3: Mix 10 grams of Kool-Aid powder with 100 mL of water in a ziploc bag. Label the bag as D-3.
Step 4: Mix 10 grams of dirt with 100 mL of water in a ziploc bag. Label the bag as D-4.

(17) Shine a flashlight through each bag. What do you observe about each mixture?

D-1 = Salt & water ➟

D- 2 = Flour & water ➟

D-1 = Kool-Aid powder & water ➟

D-1 = Dirt & water ➟

(18) Read the following information from the Columbia Encyclopedia, then answer the questions.

One property of a colloid that distinguishes it from a true solution is that the particles in a colloid scatter light. If a beam of light passes through a colloid, the light is reflected or scattered by the particles in the colloid and the path of the light can be observed. When a beam of light passes through a true solution there is so little scattering of the light that the path of the light cannot be seen and the small amount of scattered light cannot be detected except by very sensitive instruments. The scattering of light by colloids, known as the Tyndall effect, was first explained by the British physicist John Tyndall.

(A) Which mixtures would be classified as colloids? _____ & _____

(B) Which mixtures would be classified as solutions? _____ & _____

(C) Name the solutes and solvents for the solutions.

Bag _____ → Solute = _____ Solvent = _____

Bag _____ → Solute = _____ Solvent = _____

(D) Describe a situation in which you would observe the Tyndall Effect.