

Lab: Messing With Mixtures

1 pt EC for printing

Part A: Tasty Solutions

1. Read the steps below, then obtain 3 M&Ms from your teacher. You need 3 pieces for each group member.

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

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

Step 3: Place another piece of candy in your mouth and allow it to dissolve using only your tongue to move it around. Record the time (in seconds) it takes for the candy shell to dissolve.

Piece of Candy	Dissolving Time (seconds)
#1	
#2	
#3	

2. In your solution, what was the solute and the solvent?

Solute: _____ Solvent: _____

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

4. In each solution, underline the solute and circle the solvent. Remember that a SOLUTE dissolves in the SOLVENT!

Ocean water: Salt and (water)

Kool-Aid: Powder, sugar, and water

Antifreeze: Water and ethylene glycol

Lemonade: Water, lemon juice, and sugar

Soda: Syrup, water, and CO₂ gas

Air: Nitrogen, oxygen, and other gases

5. What liquid is called the “universal solvent”? Why?
6. 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 B: Mystery Colors

1. Follow the steps below to use *chromatography* to separate the pigments in black ink.

Step 1: Cut a **3x15 cm strip of paper** from a **coffee filter**. Wrap one end around a **pencil** so that the other end will just touch the bottom of a **plastic beaker**. Secure the strip of paper to the pencil with a **piece of tape**.

Step 2: Using one **black marker**, make a dot in the center of the strip about 2 cm from the bottom end of the paper.

Step 3: Pour **water** in the beaker to a depth of 1 cm.

Step 4: Gently lower the paper into the beaker so the end is in the water, but the dot you made is **not** underwater.

Step 5: Watch the filter paper; you may need to wait 15 minutes, go onto part C while you are waiting. Remove the paper when the water is 1 cm from the top of the paper.

2. What happened to the black ink?

3. Identify the solute and solvent for this experiment.

Solute: _____ Solvent: _____

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

Part C: See The Light

1. **Read:** In this part, you will classify four mixtures as **solutions**, **colloids**, or **suspensions**. First, to determine if the mixtures are heterogeneous or homogeneous (solutions), you will be using a technique known as the **Tyndall effect**, which is the scattering of visible light in all directions. When a beam of light is shined through a heterogeneous mixture you can see the beam just like you can see a sunbeam in a dusty room. The beam is visible in the mixture because the particles are large enough for the light to reflect off of and scatter. Therefore, *suspensions and colloids would show the Tyndall effect*; however, *solutions would not* because the particles are too small. To differentiate between colloids and suspensions you will filter the mixtures to see if the component parts can be separated. Suspensions can be separated by filter paper and colloids cannot.

2. Create 4 different mixtures by following the steps below.

Step 1: Label a beaker #1. Mix 1 small scoop of **salt** with 100 mL of water.

Step 2: Label a beaker #2. Mix 1 small scoop of **flour** with 100 mL of water,

Step 3: Label a beaker #3. Mix 1 small scoop of **Kool-Aid powder** with 100 mL of water,

Step 4: Label a beaker #4. Mix 1 small scoop of **dirt** with 100 mL of water,

Step 5: Label a beaker #5. Mix a few squirts of **milk** with 100 mL of water,

3. Shine a flashlight through each beaker. What do you observe about each mixture? Copy your observations.

Beaker	Mixture	Observations	Can it be separated? How?	Colloid, Solution or Suspension???
1	Salty water			
2	Floury water			
3	Kool-Aid			
4	Dirty water			
5	Milky water			