

## SOLUTIONS, MIXTURES, AND EMULSIONS VOCABULARY

**chemist**—a person who studies solids, liquids, and gases to solve problems

**chemistry**—the branch of science that identifies the substances that compose matter; the study of the way materials interact, combine, and change

**density**—how much matter is in a certain volume—all matter has density

**diffuse**—to spread out within a solution or an area; to scatter

**dissolve**—to break up, as in a solid breaking into a liquid; when something dissolves, it seems to disappear

*Example:* stirring sugar into coffee

**emulsify**—to blend, shake, or mix together to make an emulsion

**emulsifier**—a material which is used to combine or blend two other materials in an emulsion

**emulsion**—a solution formed with substances that do not usually mix

**ingredient**—any food or substance that is combined to make something new or different

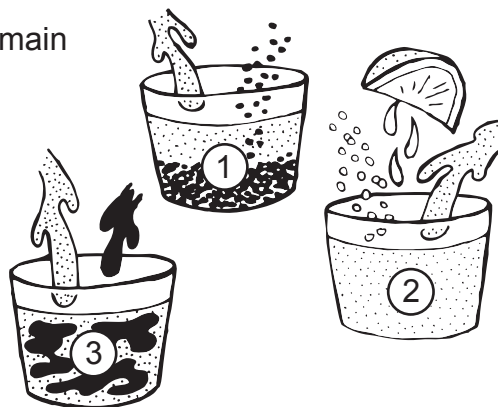
**mixture**—a combination of two or more substances that do not blend to create a new substance (example: sand and water)

**reaction**—a response; a chemical change

**solution**—a special type of mixture in which two or more items mixed together blend to form one substance (example: sugar and water)

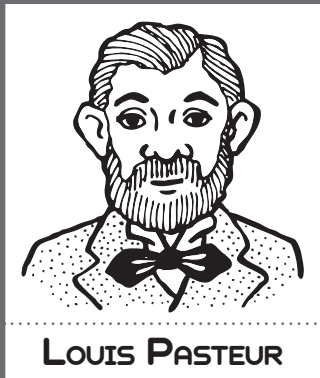
### SOLUTIONS, MIXTURES, AND EMULSIONS—WHAT IS THE DIFFERENCE?

1. **Mixture:** Sand and water do not blend—they remain sand and water when mixed.
2. **Solution:** Lemon juice, sugar, and water blend to make lemonade.
3. **Emulsion:** A salad dressing made of oil and vinegar will not stay blended, but adding mustard will blend the oil and vinegar for a while.



# SOLUTIONS, MIXTURES, AND EMULSIONS

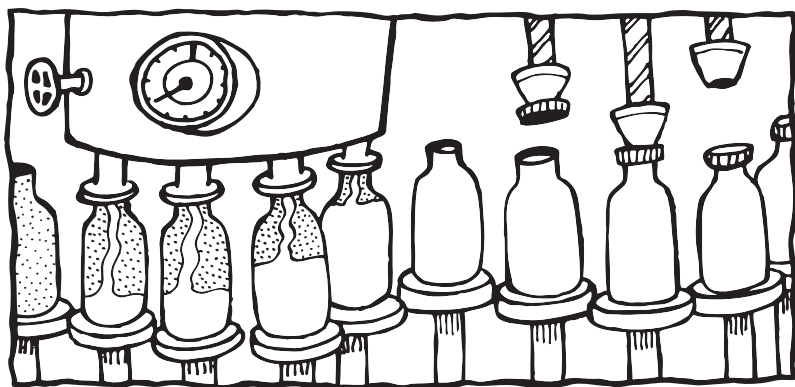
## WHO KNEW?



## LOUIS PASTEUR

Let's look at the work of one chemist, Louis Pasteur. He was a chemist a long time ago. He lived in France in the 1800s. Dr. Pasteur knew how important it was to wash our hands. He knew that if people washed their hands they would not spread as many germs. This means that people would not get as sick. Today, we know how important it is to wash our hands. We try to wash our hands often at home and at school.

He taught doctors to wash their hands. He told doctors to wash their tools in very hot water, too. This made hospitals much safer.



He is also famous for his work with foods. You may have heard the word *pasteurization*. It is named after Dr. Pasteur. It is a process of boiling liquids, like milk, and then cooling them. This process gets rid of germs. This process keeps milk and other foods from spoiling. His work improved people's lives all over the world.

In addition, Dr. Pasteur also studied the germs that made people sick. He made medicines to help people fight these germs. Chemists like Dr. Pasteur help us live healthy lives.

Chemists today continue to try to make life better. The work they do helps keep our foods safe. Some chemists design new medicines. Others work to make our air and water cleaner.



How has chemistry affected your life? \_\_\_\_\_

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# SOLUTIONS, MIXTURES, AND EMULSIONS

## LET'S BRAINSTORM!

Many occupations need chemists. Chemists study liquids, solids, and gasses to make new products and improve old ones.

Think of jobs that require ingredients to be mixed. How do you think the jobs below use chemistry?

1. **Chefs:** \_\_\_\_\_

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2. **Perfume makers:** \_\_\_\_\_

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3. **Pyrotechnics operator** (fireworks displays): \_\_\_\_\_

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4. **Road builders and pavers:** \_\_\_\_\_

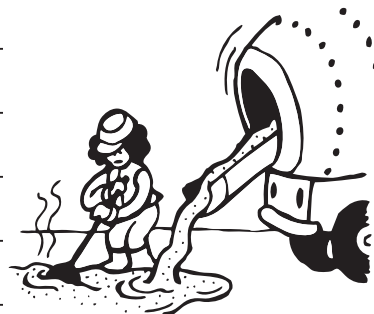
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## WORKING WITH SOLUTIONS AND MIXTURES

**TEACHER PREPARATION:** Have students work in pairs or small teams. Explain that they will be combining liquids and solids and determining if the combinations are *solutions* or *mixtures*. Working in teams will help with timing and observing different interactions.

Students will also be observing *density*—which is seen in the relationship of the heaviness of the different liquids they use. Remember, heaviness and density are not the same thing.

Review and discuss the vocabulary list together to gain a better understanding of the unit topic. Discuss the meaning of *solution* and *mixture* throughout this unit:

**SOLUTION**—a special type of mixture in which two or more items mixed together blend to form one item. For instance, when you mix lemon juice, sugar, and water, you get something new—lemonade!

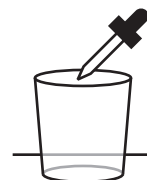
**MIXTURE**—a combination of two or more substances that do not chemically combine, such as sand and water. You can mix them together, but the sand will not blend into the water; the sand and water will still be two separate substances.

### TEAM MATERIALS

- 6" paper circles (for funnels)
- baking soda
- black pepper
- 12 oz. clear plastic bottles with caps
- colored pencils
- cooking oil
- eyedroppers
- food coloring (yellow, blue, red)
- funnels
- measuring cups
- permanent markers
- plastic teaspoons
- scissors
- sugar
- table salt
- tape
- timers or stopwatches
- water

### NOTES

**Eyedroppers:** If using large bottles of food coloring, you will need to provide students with eyedroppers to add coloring to the mixtures. Smaller squeeze bottles of food coloring are made to squeeze a drop at a time.



**Measuring Cups:** If measuring cups are unavailable, mark 6" clear plastic cups. Use a permanent marker to draw 5 short, evenly-spaced lines on the plastic cups. These will provide a fairly accurate estimate of 5 ounces. (See picture at right.)



**Plastic Bottles:** The flatter the sides (fewer ripples) of the bottles or jars, the better. The students will be observing reactions in the bottles. Lidded jars may be used as well.



**Funnels:** Allow each student time to create a funnel (see p.66) before beginning the activities in this unit. Encourage students to consider different types of funnels and funnel designs.



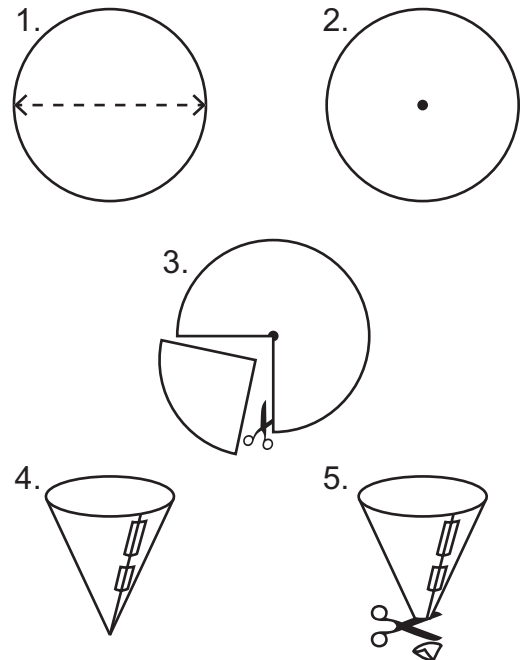
### CAUTIONS

- ☐ ALWAYS keep hands away from face and eyes when handling chemical compounds.
- ☐ ALWAYS wash your hands when done.
- ☐ NEVER drink or taste liquids used in science class.

# WORKING WITH SOLUTIONS AND MIXTURES

## MAKE A FUNNEL

1. Measure the diameter of the paper circle.  
**DIAMETER** = \_\_\_\_\_
2. Mark the middle of the circle. You can fold the paper in quarters to find this. The middle point is half the diameter, which is \_\_\_\_\_ inches.
3. Cut out a wedge, using the middle of the circle as the point.
4. Wrap the paper to form a cone, and tape it.
5. Snip a small opening that will fit inside the opening of the bottle. This opening may need to be adjusted during the activities.
6. Test the funnel.
7. If time allows, try making more funnels with other types of paper, or use thin plastic sheets which work better for funnels.



## GETTING STARTED—MIXING TWO LIQUIDS

1. Measure out 5 ounces of water. Use a funnel to pour the water into an empty plastic water bottle. The bottle should hold at least 12 oz.
2. Squeeze a single drop of food coloring into the water in the bottle. (*Note:* If you have a large bottle of food coloring, use an eyedropper to add the color drop.) Do *not* shake the bottle. Replace the cap.
3. Watch the food coloring **diffuse** (spread) through the water.
4. Describe how the food coloring moved. Use your best descriptive words.

\_\_\_\_\_

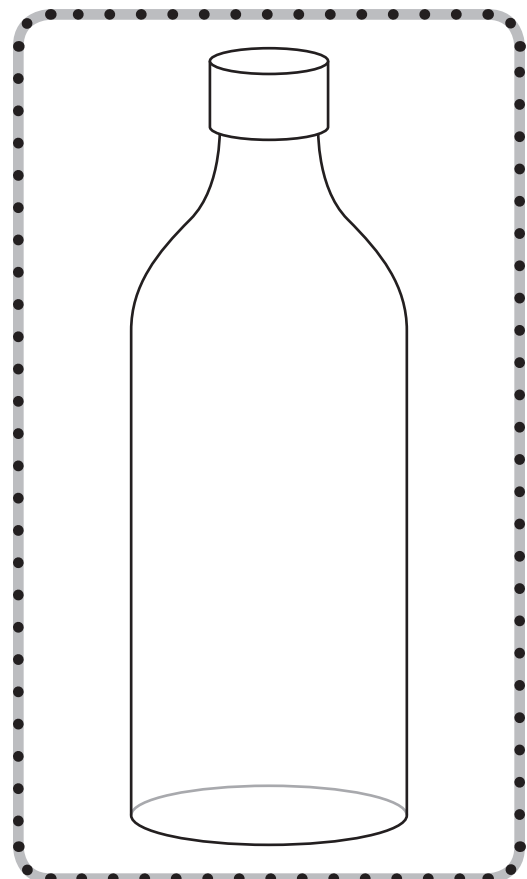
\_\_\_\_\_

5. What do water and food coloring form?

**MIXTURE**

**SOLUTION**

6. Use colored pencils to sketch the food coloring diffusing through the water in the bottle to the right.



# WORKING WITH SOLUTIONS AND MIXTURES

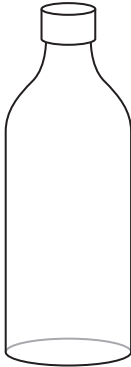
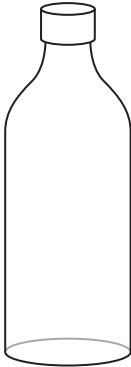
**Directions:** Read all the directions before beginning so you will know when you need to stop and start the timers.

## ADDING SALT

1. Start the timer when you add a teaspoon of salt to the water and food coloring. Use a funnel to get the salt into the bottle. Watch the salt for 15 seconds. What does it do?  
\_\_\_\_\_
2. Put the cap back on. Lift up the bottle and look up at the bottom. What do you see?  
\_\_\_\_\_
3. About how much salt dissolved on the way down? **SOME** **ALL**
4. Shake the bottle for 15 seconds and then let the contents settle for 60 seconds.
5. About how much of the teaspoon of salt seems to have dissolved? **SOME** **ALL**
6. Sketch the contents of the bottle that is in the bottle below, on the left. Circle whether the ingredients formed a *solution* or a *mixture*.

## ADDING SUGAR

1. Add a teaspoon of sugar to the mixture. Observe the sugar. What does it do?  
\_\_\_\_\_
2. Put the cap back on. Lift up the bottle and look up at the bottom. What do you see?  
\_\_\_\_\_
3. About how much sugar dissolved on the way down? **SOME** **ALL**
4. Shake the bottle for 15 seconds and then let the ingredients settle for 60 seconds.
5. About how much of the teaspoon of sugar seems to have dissolved? **SOME** **ALL**
6. Sketch the contents of the bottle in the bottle below that is on the right. Circle whether the ingredients formed a *solution* or a *mixture*.

SALT AND WATER		SUGAR, SALT, AND WATER	
			
<b>SOLUTION</b>	<b>MIXTURE</b>	<b>SOLUTION</b>	<b>MIXTURE</b>

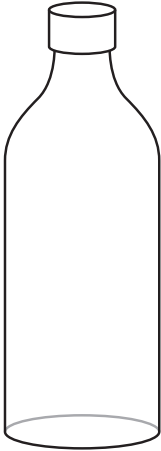
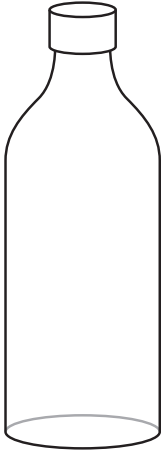
# WORKING WITH SOLUTIONS AND MIXTURES

## ADDING BAKING SODA

1. Add a teaspoon of baking soda to the bottle that has the salt and sugar. Observe the baking soda falling to the bottom of the bottle. Do you think it will all dissolve? **YES NO**
2. Put the cap back on the bottle and lift it up to look at the bottom. What do you see?  
\_\_\_\_\_
3. About how much baking soda dissolved on the way down? **SOME ALL**
4. Shake the bottle for 30 seconds and then let the ingredients settle for 60 seconds.
5. About how much of the baking soda dissolved? **SOME ALL**
6. Sketch the bottle and its contents in the bottle below that on the left. Circle whether the ingredients formed a *solution* or a *mixture*.

## ADDING BLACK PEPPER

1. Add a teaspoon of black pepper to the bottle. What does the black pepper do?  
\_\_\_\_\_
2. Put the cap back on the bottle and lift it up to look at the bottom. What do you see?  
\_\_\_\_\_
3. About how much black pepper dissolved on the way down? **SOME ALL NONE**
4. Shake the bottle for 30 seconds and then let the ingredients settle for 60 seconds.
5. About how much of the teaspoon of black pepper seems to have dissolved?  
**SOME ALL NONE**
6. Take turns shaking the bottle for 15 seconds each. Any change? **YES NO**
7. Sketch the contents of the bottle in the bottle below that is on the right. Circle whether the ingredients formed a *solution* or a *mixture*.

ADDING BAKING SODA		ADDING BLACK PEPPER	
			
<b>SOLUTION</b>	<b>MIXTURE</b>	<b>SOLUTION</b>	<b>MIXTURE</b>



# WORKING WITH SOLUTIONS AND MIXTURES

## JOURNAL ENTRY

1. What is a **solution** in chemistry? \_\_\_\_\_

\_\_\_\_\_

Give two examples. \_\_\_\_\_

\_\_\_\_\_

2. What is a **mixture** in chemistry? \_\_\_\_\_

\_\_\_\_\_

Give an example or two. \_\_\_\_\_

3. When the food coloring was **diffused** in the water, what did it do? \_\_\_\_\_

\_\_\_\_\_

4. Do you think funnels are useful when adding ingredients to a mixture? **YES** **NO**

Explain your answer. \_\_\_\_\_

\_\_\_\_\_

5. If you were a **chemist**, what type of projects would you like to work on? Why?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### SCIENTIFIC METHOD REVIEW—WORKING WITH SOLUTIONS AND MIXTURES

Share your journal entries, documents, and experiences making funnels and working with solutions and mixtures with your class in a discussion moderated by your teacher.



# MORE MIXTURES

**Directions:** Work in pairs. Read through the directions before beginning so you will know when you need to stop and start the timers.

## TEAM MATERIALS

- clear plastic bottles (at least 30 oz.) with caps
- colored pencils
- cooking oil
- eyedroppers
- food coloring (red, yellow, blue)
- funnels
- measuring cups
- permanent markers
- plastic teaspoons
- stopwatch or timer
- water

## GETTING STARTED—MIXING OIL AND WATER

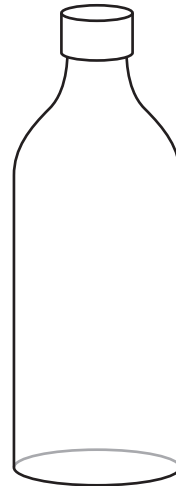
1. Fill a plastic bottle halfway with water.
2. Measure out 2 ounces of cooking oil and use a funnel to add it to the water in the bottle. **Do not shake the bottle!**
3. What does the oil do? \_\_\_\_\_

When combined, what do the two liquids make?

**A SOLUTION      A MIXTURE**

4. Where does the oil settle? \_\_\_\_\_
5. Which liquid do you think is denser? \_\_\_\_\_  
Why? \_\_\_\_\_
6. In the bottle on the right, sketch what the oil does.

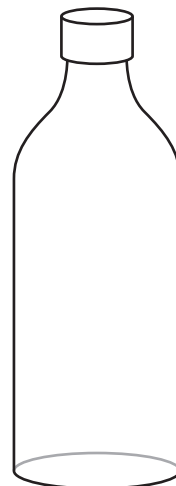
### OIL AND WATER



## ADDING A DROP OF COLOR

1. Carefully add one or two drops of yellow or red food coloring to the ingredients and start the timer. **Do not shake or disturb the bottle!**
2. What does the food coloring do at first? \_\_\_\_\_
3. Observe the color drops. You may have to wait 2–3 minutes to see a change. (Try doing some arm stretches while you wait, but don't take your eyes off the drops!) Stop the timer as soon as the reaction begins.
4. How long did it take? \_\_\_\_\_
5. Describe and sketch what happened to the food coloring.  
\_\_\_\_\_  
\_\_\_\_\_

### DROPS BEFORE REACTION



## MORE MIXTURES

### SHAKE IT UP!

1. Make sure the cap on the bottle is secure. Set the timer again and shake the ingredients for 30 seconds.
2. Use colored pencils to sketch the contents of the bottle.
3. Describe what happens to the oil, water, and food coloring after shaking. \_\_\_\_\_

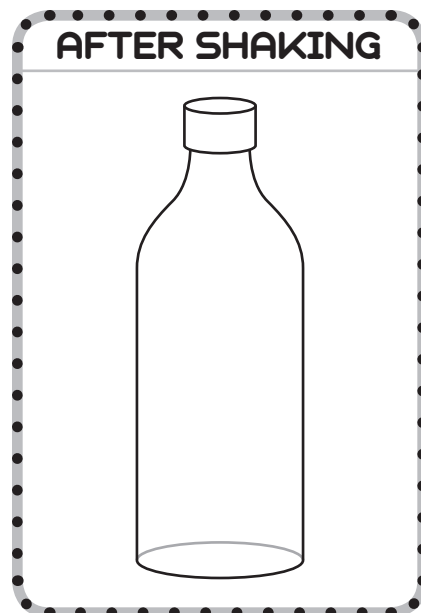
4. What type of mixture did you make?

**A SOLUTION**

**A MIXTURE**

How do you know? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



### ADDING A SECOND COLOR

1. Use the oil, water, and color mixture from the previous activity. Make sure it has settled.
2. Carefully add 2 drops of blue food coloring to the ingredients.
3. Set the timer to see how long it takes the color drops to travel through the oil. (Do some side-to-side neck stretches or neck rolls while you watch, but keep your eyes on the drops!)
4. Describe what happens. \_\_\_\_\_

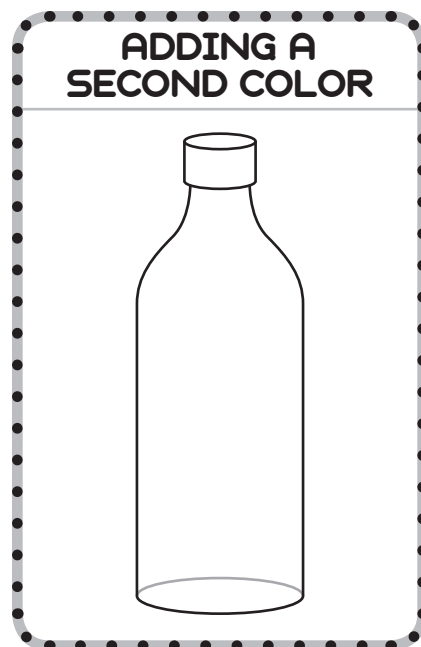
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5. Make sure the cover is on tightly. Set the timer again, and shake the bottle for 15 seconds.
6. Describe what happens to the oil, water, and colors after shaking. \_\_\_\_\_

\_\_\_\_\_

7. What color is the mixture now? \_\_\_\_\_

Use colored pencils to sketch the settled mixture with the second color. Use the bottle in the lower box on the right.



★ ★ ★ SAVE THIS MIXTURE ★ ★ ★

## MORE MIXTURES

### ADDING WARM WATER

1. Wait for the colored liquid to settle. While you wait, *carefully* measure out 3 ounces of warm water.
2. Use a funnel to add the warm water to the bottle, and put the cap on the bottle again. Describe the reaction.

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3. Use colored pencils to sketch the results in the box below on the left.

### ADDING A THIRD COLOR

1. Set the timer and add a drop of a third color food coloring. (Do some side stretches while you watch, but keep your eyes on the drop!) Stop the timer when a reaction occurs.
2. How long before the reaction of the color and the warm water began? \_\_\_\_\_
3. Describe the reaction of the color to the warm water. \_\_\_\_\_

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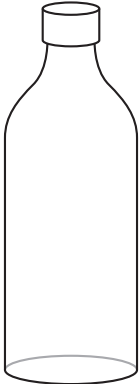
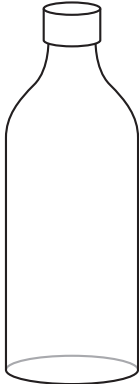
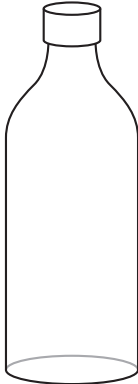
4. Use colored pencils to sketch the results in the middle box below.
5. Shake the bottle one more time. Let it settle. Describe the results this time. \_\_\_\_\_

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6. What did you make when you added warm water? **SOLUTION** **MIXTURE**  
How do you know? \_\_\_\_\_

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7. Use colored pencils to sketch the settled mixture with the third color in the box on the right.

ADDING WARM WATER	ADDING THIRD COLOR	AFTER SHAKING
		

★ LABEL YOUR BOTTLE "ACTIVITY 2" AND SAVE THE MIXTURE FOR ACTIVITY 3. ★

## MORE MIXTURES

### JOURNAL ENTRY

1. What was the most unexpected reaction that occurred in your mixture? \_\_\_\_\_

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2. Do oil and water naturally mix?      **YES**      **NO**

Explain your answer. \_\_\_\_\_

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3. Which material is denser?      **OIL**      **WATER**

How do you know? \_\_\_\_\_

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4. Did the food coloring mix with the oil?      **YES**      **NO**

**Why?** \_\_\_\_\_

**Think:** What do you think food coloring is mostly made of? \_\_\_\_\_

5. Name a mixture you have made at home. \_\_\_\_\_

What ingredients did you use? \_\_\_\_\_

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What did you do with the mixture you made? \_\_\_\_\_

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### SCIENTIFIC METHOD REVIEW—MORE MIXTURES

Share your journal entries, documents, and experiences working with mixtures with your class in a discussion moderated by your teacher.

## WORKING WITH EMULSIONS

**Directions:** Work in pairs to explore how to add an **emulsifier** to blend a mixture.

**Emulsion**—the combination of two liquids that do not mix, like oil and water or oil and vinegar

**Emulsifier**—an added ingredient that allows ingredients in a mixture to blend for a short time.

Add mustard to oil and vinegar and you will create salad dressing that stays blended for a while.

### TEAM MATERIALS

- |                             |                                |                         |
|-----------------------------|--------------------------------|-------------------------|
| • bottles from Activity 2   | • eyedroppers                  | • permanent markers     |
| • colored pencils           | • food coloring—various colors | • timers or stopwatches |
| • cooking oil               | • funnels                      | • warm or hot water     |
| • dish soap (Dawn® or Joy®) | • measuring cups               |                         |

### GETTING STARTED—BLENDING AN EMULSION

1. Carefully place your mixture from Activity 2 on the table. Try not to shake up the layers in the **emulsion** in the bottle.

2. Use colored pencils to sketch and label the settled emulsion in the box on the right. Describe what you see.

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3. Measure out 1 ounce of dish soap and use a funnel to pour it into the bottle.
4. Watch the soap and the oil interact. What happens when you add the dish soap?

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5. Measure out 1 ounce of warm or hot water into a cup. Use a funnel to *slowly* add the water to the mixture.
6. Sketch this interaction in the box on the right. Describe how the soap, oil, and warm or hot water interact.

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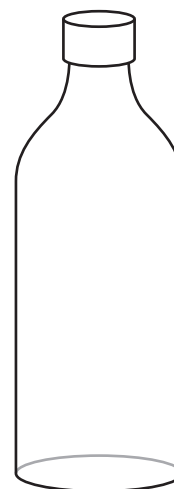


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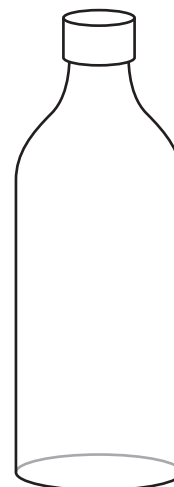


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#### SETTLED EMULSION



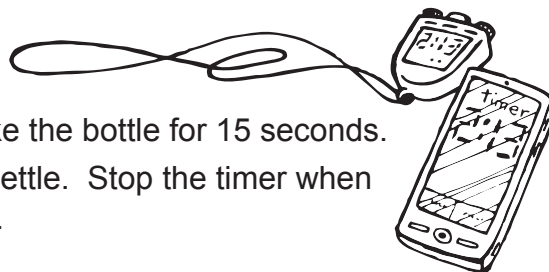
#### SOAP, OIL, HOT WATER



## WORKING WITH EMULSIONS

**Directions:** Work in pairs and continue working with your emulsions. Read all the directions before beginning each activity so you know when you need to stop and start the timers.

### SHAKE IT!



1. Make sure the cap is secure on your mixture. Shake the bottle for 15 seconds.
2. Set the timer to see how long the mixture takes to settle. Stop the timer when the emulsion has settled (approximately 3 minutes).

**TOTAL TIME:** \_\_\_\_\_

3. While you wait, describe the reaction when the bottle was shaken. How did the mixture look right after being shaken up? \_\_\_\_\_  
\_\_\_\_\_
4. Add two more color drops to the settled solution and set the timer. Time how long the food coloring takes to get through the oil. (Stretch while you wait, but keep your eyes on the drops!)

**TOTAL TIME:** \_\_\_\_\_

5. Describe the results. \_\_\_\_\_  
\_\_\_\_\_

### ADDING WARM WATER

1. Add 3 ounces of warm water to the settled emulsion. Describe what happens. \_\_\_\_\_  
\_\_\_\_\_
2. Add one more drop of food coloring, and put the cap back on tightly.
3. Wait 3 minutes. Stretch. Describe and sketch the results in the space below.
4. Save the emulsion to use again in Activity 4. Figure out a safe way to store the bottles.

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★ ★ ADD A NEW LABEL TO THE BOTTLE—"EMULSION ACTIVITIES 2 AND 3." ★ ★

# WORKING WITH EMULSIONS

## JOURNAL ENTRY

1. Name foods or drinks you have tried that are **solutions**. List the ingredients you know that are in each solution.

**Food:** \_\_\_\_\_

**INGREDIENTS:** \_\_\_\_\_

\_\_\_\_\_

**DRINK:** \_\_\_\_\_

**INGREDIENTS:** \_\_\_\_\_

\_\_\_\_\_

2. All of the following foods are **emulsions**. Check the ones you have eaten or drunk.

☐

butter

☐

margarine

☐

salad dressing

☐

ice cream

☐

milk

☐

whipped cream

3. Can you explain why salad dressing in bottles often has layers? Use words from this unit's vocabulary to help you explain.

\_\_\_\_\_

\_\_\_\_\_

4. If you added salt to a glass of water, what would you make?

**A SOLUTION**

**AN EMULSION**

Explain your reasoning. \_\_\_\_\_

\_\_\_\_\_

5. Explain how an **emulsifier** works. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## SCIENTIFIC METHOD REVIEW—WORKING WITH EMULSIONS

Share your journal entries, documents, and experiences with emulsions with your class in a discussion moderated by your teacher.



## ADDING TO EMULSIONS

**Directions:** Work in pairs with mixtures and emulsions. Read through the directions before beginning so you will know when you need to stop and start the timers.

### TEAM MATERIALS

- |                                |                     |                 |
|--------------------------------|---------------------|-----------------|
| • baby oil                     | • measuring cups    | • table salt    |
| • baking soda                  | • plastic spoons    | • timers        |
| • bottle from Activity 2 and 3 | • rock salt         | • trays or tubs |
| • colored pencils              | • rubbing alcohol   | • vinegar       |
| • funnels                      | • small, clear cups | • warm water    |

### GETTING STARTED—OBSERVE THE EMULSION

- Carefully study your emulsion bottle. It should be settled in a number of layers.
- Sketch the unshaken emulsion in the box on the right and label the layers.

### ADDING BABY OIL TO THE EMULSION

- The cooking oil should be settled at the top of your emulsion. Measure out 1 ounce of baby oil. Use a funnel to add the baby oil to the emulsion.
- Wait for it to settle. (Stretch or run in place.)
- Observe the reaction. Which oil settles on top?

**COOKING OIL      BABY OIL**

Why do you think that this oil settled on the top?

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Which oil appears to be denser?

**COOKING OIL      BABY OIL**

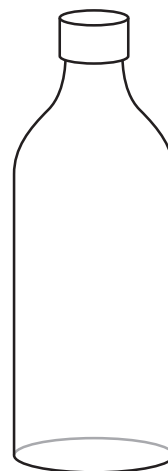
- Sketch the new emulsion in the bottle on the right and label the layers.
- Measure out 3 ounces of warm water. Use a funnel to pour this water into the bottle. Put the cap on the bottle, and shake it vigorously for 15 seconds.
- Describe the results of the reaction.

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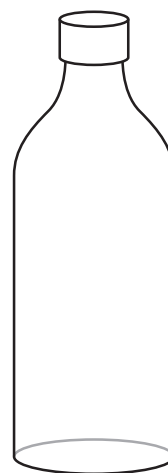


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### SETTLED EMULSION



### ADDING BABY OIL



## ADDING TO EMULSIONS

### ADDING TABLE SALT AND ROCK SALT

1. Carefully add a spoonful of table salt to the settled emulsion. Does the salt stay on top of the oil?

**YES NO**

2. Observe the movement of the table salt. Does it float through the oil to the water, or does it sink quickly?

**FLOAT SINK**

3. Sketch the traveling salt in the box on the right.
4. Carefully add  $\frac{1}{2}$  a teaspoon of rock salt to the emulsion. (Rock or flake salts have larger pieces.) Describe what the larger pieces of salt do.

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5. Shake the emulsion. Observe the large salt pieces in the emulsion. Sketch your observation on the right.

### ADDING RUBBING ALCOHOL

1. Measure out 1 ounce of rubbing alcohol. Use a funnel to slowly add the rubbing alcohol to the emulsion.
2. Describe the reaction of the other materials with the rubbing alcohol.

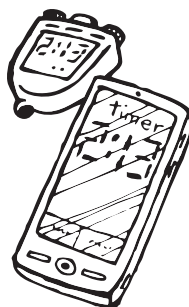
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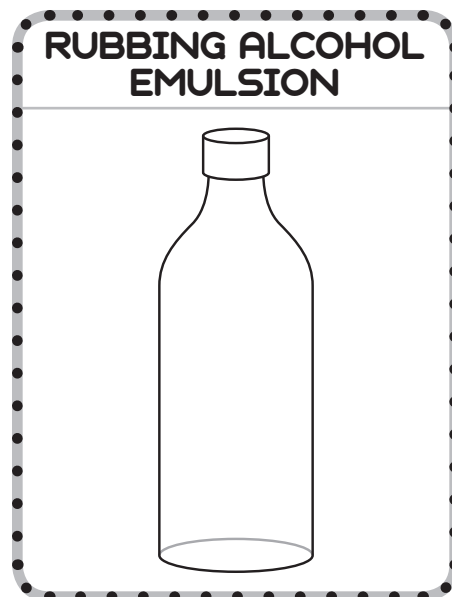
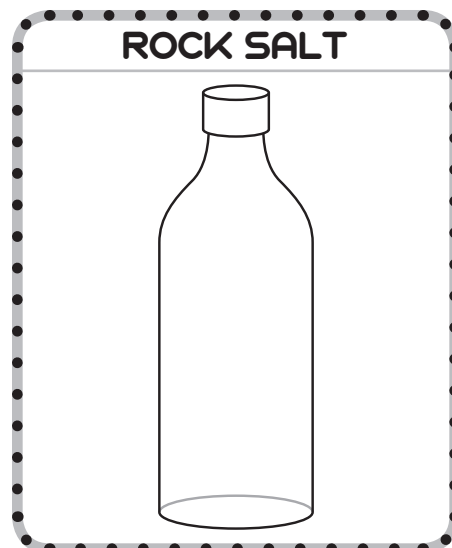
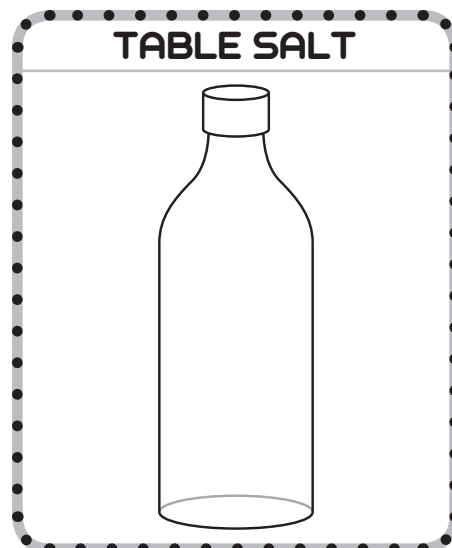
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3. Set the timer. Shake the emulsion several times until all of the ingredients are mixed again. How long did it take?

- ☐ **15 SECONDS**
- ☐ **30 SECONDS**
- ☐ **45 SECONDS**
- ☐ **LONGER**



4. Observe how the materials settle this time.
5. Use your colored pencils to sketch the settled rubbing alcohol emulsion. Label each layer.



## ADDING TO EMULSIONS

### BAKING SODA AND VINEGAR

**Note:** Follow these directions exactly. If weather permits, it is best to do this activity outside. Either way, place the bottle in a tub or tray.



1. Put one teaspoon of baking soda into a cup. In chemistry, baking soda is called a *base*.
2. Take the cap off your emulsion.
3. Pour 1-ounce of vinegar into the cup. Vinegar is an *acid*.
4. Use a funnel to pour the combination of vinegar and baking soda into your bottle and put the cap on securely. The material will start fizzing right away, so pour quickly and carefully.
5. Describe the reaction within your emulsion. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Use colored pencils to illustrate the reaction below.

#### VINEGAR & BAKING SODA EMULSION

# ADDING TO EMULSIONS

## JOURNAL ENTRY

1. List at least 3 scientific facts about chemistry, emulsions, or mixtures that you learned by doing today's activities.

**Fact 1:** \_\_\_\_\_

\_\_\_\_\_

**Fact 2:** \_\_\_\_\_

\_\_\_\_\_

**Fact 3:** \_\_\_\_\_

\_\_\_\_\_

2. Why is it useful to use colored pencils to sketch the results of chemistry experiments?

\_\_\_\_\_

3. Why did the oil not stay fully mixed with the water? \_\_\_\_\_

\_\_\_\_\_

4. Which of the following materials will not mix with the others? Circle your answers.

**FOOD COLORING      SALT      WATER      BABY OIL      SUGAR**

**Why?** \_\_\_\_\_

\_\_\_\_\_

5. Are you creating a solution, a mixture, or an emulsion when you mix oil, water, and dish soap together?

**A SOLUTION**

**A MIXTURE**

**AN EMULSION**

How can you tell? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## SCIENTIFIC METHOD REVIEW—ADDING TO EMULSIONS

Gather with your teacher and class. Take turns sharing your journal entries, questions, and experiences with emulsions.