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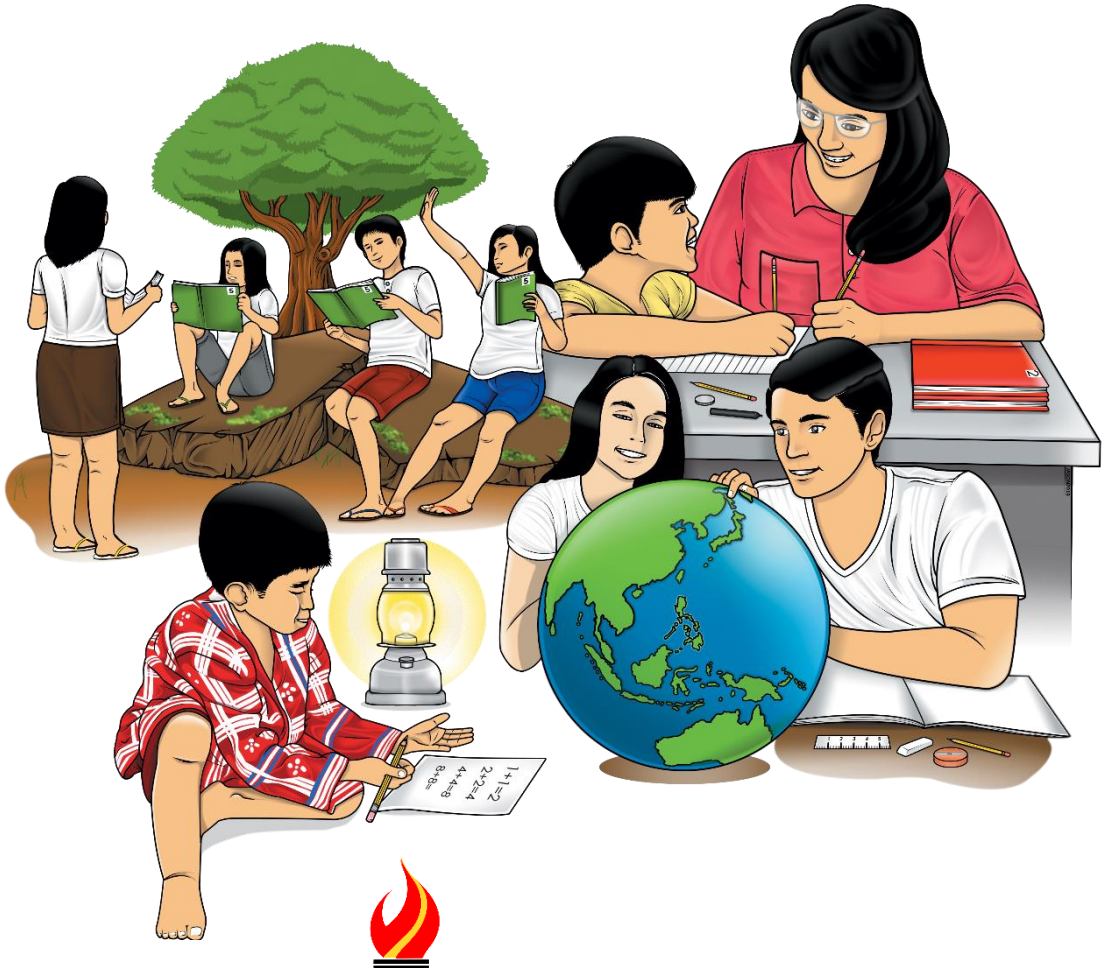
DepED
DEPARTMENT OF EDUCATION

Science

Quarter 1 – Module 1
Lesson 4: Solutions and Their Characteristics



ALTERNATIVE DELIVERY MODE
ADM

What I Need to Know

This module was designed and written with you in mind. It is here to help you master the matter. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the module you are now using.

The module is about:

- the appearance and uses of solutions.

After going through this module, you are expected to be able to:

- describe the appearance and uses of solutions.

What I Know

A. For numbers 1-5 choose the letter of the correct answer. Write your answer using your Science journal or notebook.

1. What is the universal solvent?
   a. water b. vinegar
   c. acetone d. soy sauce
2. What is a solution?
   a. It is a homogeneous mixture in which particles are evenly distributed.
   b. It is a heterogeneous mixture in which particles are evenly distributed
   c. It has a larger particle that is visible to the naked eyes.
   d. It has a particle that settle out when left undisturbed
3. What is being dissolved in a solution?
   a. solute b. solvent
   c. precipitate c. water
4. The _____ is the one doing the dissolving.
   a. solute b. solvent
   c. precipitate c. water
5. The amount of solute that can be dissolved by the solvent is defined as _____.
   a. solubility b. saturated
   c. unsaturated d. supersaturated

B. For numbers 6-10 write TRUE if the statement is correct and FALSE if not.

6. Particles in a solution are not visible to the naked eye?
7. A solution may exist in any phase.
8. Air is an example of gaseous solution.
9. A solution consists of a heterogeneous mixture.
10. A simple solution is basically two substances that are evenly mixed together.

Lesson 4 Solutions and Their Characteristics

Most of the household materials found at home like soda, vinegar and wine are examples of solution. A solution might exist in liquid, solid or gas depending on the state of its solvent. Air is an example of gaseous solution, and its solvent is nitrogen gas. Steel is a solid solution. Its solvent is iron and the solute is carbon. Vinegar is a solution that forms from acetic acid and water. These are a few examples of solutions we encounter every day.

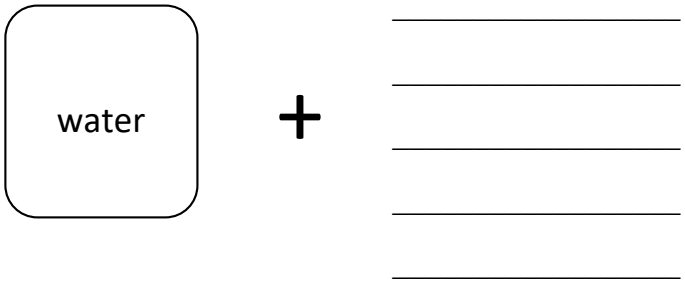
What's In

Identify the solvent and the solute in the following mixtures. Answer it using a separate sheet of paper.

1. cold ice tea _____ +_____
2. hot coffee _____ +_____
3. saltwater _____ +_____
4. carbonated beverages _____ +_____
5. lemonade _____ +_____
6. wine _____ +_____
7. steel _____ +_____
8. detergent solution _____ +_____
9. orange juice _____ +_____
10. vinegar _____ +_____

What's New

Write examples of common materials that can be added in the given solvent to form a solution and then answer the questions below. Do it in a separate sheet of paper.

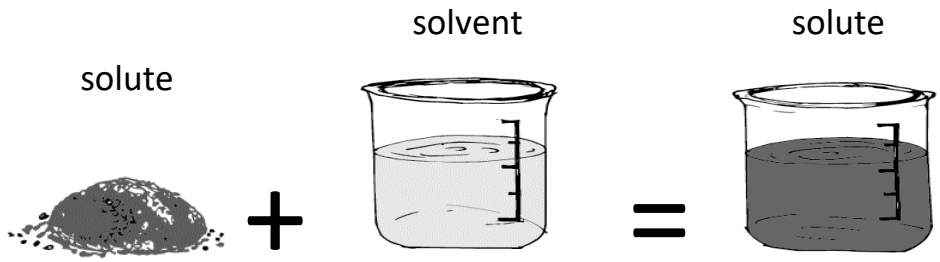


1. What kind of mixture is it?
2. How many phases can you see when you mix the given solute to the solvent?

What is It

A solution is a homogeneous mixture of one or more solutes dissolved in a solvent. There are many kinds of solutions. It exists in any phase. Note, that the solute is a substance that dissolved in the solvent. For example, in a saline solution, salt is the solute dissolved in water as the solvent. Any two substances which can be evenly mixed may form a solution. Even if it is made of different phases if the result exists of a single phase, it is a solution.

The solution particles cannot be seen by our naked eye. It does not allow beams of light to scatter. And the solute from a solution cannot be separated by filtration (or mechanically). The picture below shows the components of solution.



What's More

Activity 1. Look at the words in the box. Choose and combine two or more words to form a solution. Write your answer using your Science journal or notebook.

water	sugar	salt	carbon dioxide
gas	acetic acid	copper	Zinc
	silver	mercury	

1.
2.
3.
4.
5.

Activity 2. How do you describe a solution? List down your answers on your notebook.

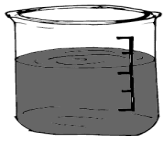
1.
2.
3.
4.
5.

What I Have Learned

Create a sort of infomercial featuring a solution you created or designed. Say a few statements about it.

What I Can Do

1. Based on the illustration below, describe what a solution is.
2. How does solution appear?



A mixture of blue lemonade powder and water

Assessment

Choose the letter of the correct answer. Do it in your Science journal or notebook.

1. What type of mixture is a solution?
   a. Heterogeneous
   b. Homogeneous
   c. Immiscible
   d. Miscible

2. Which of the following is not a characteristic of a solution?
   a. It is a uniform mixture
   b. It will scatter a beam of light
   c. It is stable over time
   d. The solute and solvent cannot be distinguished by the naked eye

3. What is the substance that is being dissolved in a solution?
   a. Solute
   b. Mixture
   c. Solvent
   d. Concentrator

4. What is the substance that dissolves the other substance in a solution?
   a. Solute
   b. Mixture
   c. Solvent
   d. Concentrator

5. In a salt water solution, what substance is considered the solvent?
   a. Salt
   b. Water
   c. Both are solvents
   d. Neither substance is a solvent

6. What is NOT an example of a solution?
   a. Acetic acid and water
   b. Sugar and water
   b. soil and water
   c. iron and carbon

7. Which of the following is an example of a solid solution?
   a. Carbonated water
   b. Steel
   c. Oil and water
   d. toothpaste

8. Which of the following is an example of a gas solution?
   a. Air
   b. Oxygen
   c. carbon dioxide
   d. brass

9. Which of the following will dissolve in water?
   a. Oil
   b. Salt
   c. gasoline
   d. sand

10. Which of these will not form a solution?
   a. preparing syrup
   b. preparing a cup of coffee
   c. ice and water
   d. stirring of sugar in water

Additional Activities

Do the following and list down your answer using your Science journal or notebook.

1. Prepare a beverage using powdered juice and observe its appearance.

2. List down what you observed in the mixture.

Answer Key

What I Know	**What's In**	**What's New**
1. a 2. a 3. a 4. b 5. a 6. True 7. True 8. True 9. False 10. True	1. cold water/water + tea powder 2. water + coffee 3. water + salt 4. carbon dioxide + water 5. water + lemon juice 6. alcohol + water 7. iron + carbon 8. detergent + water 9. water + orange juice 10. acetic acid + water	-Aüswers may vary: Water + powdered juice **+ salt** **+ sugar** **+ baking soda** **+ calamansi juice** **-Solution -One phase**
What's More Activity 1 1. Water & sugar 2. Water & salt 3. Copper & Zinke 4. Silver & mercury 5. Acetic acid & water Activity 2 1. A solution ie a homogeneous mixture. 2. It exdete in any phase. 3. The solution particlee cannot be seen by our naked eye. 4. It doee not allow beams of light to scatter. 5. And the solute from a solution cannot be separated by filtration [or mechanically].	**What I can do** A solution ie a homogeneous mixture of one or more solutes dissolved in a solvent.	**Assessment** 1. b 2. b 3. a 4. c 5. b 6. b 7. b 8. a 9. b 10. a