7

DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Science

Quarter 1
Lesson
7

Lesson Exemplar for Science 7
Quarter 1: Lesson 7 (Week 7)
S.Y. 2024-2025

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SCIENCE (CHEMISTRY) / QUARTER 1 / GRADE 7

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners shall learn the properties of solutions such as solubility and reaction to litmus determine their use.
B. Performance Standards	By the end of the Quarter, learners recognize that scientists use models to describe the particle model of matter. They use diagrams and illustrations to explain the motion and arrangement of particles during changes of state. They demonstrate an understanding of the role of solute and solvent in solutions and the factors that affect solubility. They demonstrate skills to plan and conduct a scientific investigation making accurate measurements and using standard units.
C. Learning Competencies and Objectives	***Learning Competency*** The learners shall be able to identify the role of the solute and solvent in a solution and to express quantitatively the amount of solute present in a given volume of solution. ***Learning Objectives*** At the end of the lesson, the learner shall be able to: 1. *identify the properties of a solution.* 2. *differentiate saturated from unsaturated solutions.* 3. *calculate the amount of solute in a given mass of solution (percent by mass)* 4. *calculate the amount of solute in a given volume of solution (percent by volume)*
D. Content	Properties of Solutions Saturated and Unsaturated Solutions Solutions, solubility, and concentration
E. Integration	Understanding the role of solutions is essential in the field of environmental science because it help mitigate many environmental issues and protect human health by improving environmental quality and reducing exposure to harmful pollutants. Moreover, in the field of pharmacy, solutions play a critical role in various aspects of pharmaceutical practice, research, and healthcare.

II. LEARNING RESOURCES

- Science 7 Q1 PIVOT Learning Materials pages 20-24
- Asuncion, Alvie et.al "Science Grade 7 Learners Material" First Edition 2017, 111-112
- Set-up of Filtration (3D diagram). Retrieved from https://quizlet.com/hk/241654822/set-up-of-filtration-3-d-diagram/
- Saturated vs. Unsaturated Solutions. Retrieved from https://chemistrynonmetals.wordpress.com/solubility/

III. TEACHING AND LEARNING PROCEDURE		NOTES TO TEACHERS
A. Activating Prior Knowledge	**DAY 1** Complete the statements below by choosing the correct answers from the given choices in the box. solvent solute soluble insoluble greater smaller A _____ is a substance used to dissolve a _____. It is of the _____ amount. While a _____ is a substance that is being dissolved. It is of the _____ amount. There are substances that can be dissolved in the given solvent, it is called _____. While the materials that can't be dissolved is called _____.	**ANSWER KEY:** A solvent is a substance used to dissolve a solute. It is of the greater amount. While a solute is a substance that is being dissolved. It is of the smaller amount. There are substances that can be dissolved in the given solvent, it is called soluble. While the materials that can't be dissolved is called insoluble.
B. Establishing Lesson Purpose	**1. Lesson Purpose** The learners shall be able to identify the properties of a solution. **2. Unlocking Content Vocabulary** Read out the following words and ask the learners to read them to themselves and then out loud as a class. **Mixture, solution, uniform, filtration** • Ask the learners to select one of the words above and write one sentence using that word in everyday language. • Ask the learners to select one of the words above and write one sentence using the scientific meaning of that word.	

C. Developing and Deepening Understanding	1. **Explicitation** The learners will read a Philippine folklore titled “Why the Sea is Salty” (10 minutes)  Why the Sea is Salty *Narrated by José M. Paredes of Bangued, Ilocos Sur.* He heard the story from a farmer. A few years after the creation of the world there lived a tall giant by the name of Ang-ngalo. Ang-ngalo was a wanderer, and a lover of work. He lived in the mountains, where he dug many caves. One bright morning, while Ang-ngalo was climbing to his loftiest cave, he spied across the ocean. The ocean at the time was pure, its water being the accumulated tears of a disappointed goddess - a beautiful maid. She beckoned to him, and waved her black handkerchief; so, Ang-ngalo waded across to her through the water. This beautiful maid was Signet, the goddess of the dark. She said to Ang-ngalo, "I am tired of my dark palace in heaven. You are a great builder. What I want you to do for me is to erect a great mansion on this spot. This mansion must be built of bricks as white as snow." Ang-ngalo could not find any bricks as white as snow; the only white thing there then was salt. So, he went for help to Asin, the ruler of the Kingdom of Salt. Asin gave him pure bricks of salt, as white as snow. Then, Ang-ngalo built hundreds of bamboo bridges across the ocean. Millions of men were employed day and night transporting the white bricks from one side of the ocean to the other. One day, while the men were busy carrying the salt bricks across the bridges, big waves destroyed them. The brick- carriers were buried in deep bosom. In time, the salt dissolved, and today the sea is salty. **1. Worked Example** **Guide Questions:** 1. Based on folklore, why do the fresh water from sea became salty? 2. What happens to the bricks of salt that made the water salty? 3. What is formed when a solute like salt dissolves in a solvent like water? *4.* How may phase of matter can be seen in a salt solution?	

3. Lesson Activity

Properties of Solutions

The learners will bring the following materials to perform a simple activity that highlights the properties of solution.

Materials:

sugar	transparent plastic cups of similar sizes
salt	6 cups of water
mongo seeds	6 pieces spoons
powdered juice	cheesecloth
cooking oil	

Procedure:

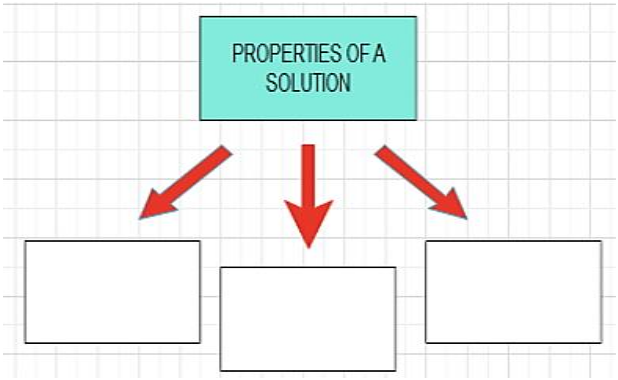
1. Predict which among the given samples will dissolve in water. Write your predictions in Column 2 of Table 1.
2. Put one cup of water in each of the cups.
3. Add ½ teaspoon of each of the six samples. Use the teaspoon to mix thoroughly as much of each sample as possible. Use a different teaspoon for each of the cups.

Table 1.

1	2	3	4	5	6
Sample (solid/liquid)	Will dissolve in 1 cup of water (Yes/No)	Appearance (Uniform/ Not uniform)	Number of Phases	Can be separated by filtration (Yes/No)	Solution or not
Sugar					
Salt					
Mongo seeds					
Powdered juice					
Cooking oil					
White vinegar					

The teacher will explain that if only one phase of matter is visible in a mixture, it exhibits a property of a solution. To dig deeper into the properties of solutions, the learners will carry out a simple investigation.

	4. Filter the mixture with filter paper using a setup like Figure 1. You may use cheesecloth or old, white T-shirt with the improvised funnel from the cut upper portion of the plastic bottle.  **Figure 1. Filtration Set-up** https://quizlet.com/hk/241654822/set-up-of-filtration-3-d-diagram/ **Guide Questions:** 1. Describe the mixture that resulted after mixing. Write your answer in Column 3 of Table 1. 2. How many phases have you observed? Write your answer and observations in Column 4. 3. Identify the solute in each of the mixtures. Write your answers on the space provided below. 4. What is the solvent in each of the mixtures? 5. In which mixture were you able to separate the components (solute and solvent) by filtration? Write your observations in column 5 of Table 1. 6. Which of the samples are solutions? Write your answers in Column 6. 7. Do you consider solutions as homogeneous mixtures? Why? Why not?	
D. Making Generalizations	**Learners' Takeaways** The learners will write down in the box the words or phrases which can be associated with the properties of solution.	

	 Has this lesson helped you better understand the properties of solutions? If so, how? _____	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		NOTES TO TEACHERS
A. Evaluating Learning	**1. Formative Assessment** Written Work. The learners will be given a set of questions which will serve as formative assessment to evaluate their learning outcomes for the day's lesson objectives and competencies. **Directions:** Read each question carefully and write only the letter of the correct answer in a separate sheet of paper. 1. All the following describes a solution EXCEPT: A. Clear B. Homogeneous C. Cannot pass through filter paper. D. Can be separated by physical means.	**ANSWER KEY:** 1. D 2. D 3. D 4. B 5. A

	2. Salt dissolved in water is a/an _____. A. Compound B. Element C. Heterogeneous mixture D. Solution 3. Which of the following is a homogeneous mixture? A. Oil and water B. Sand and water C. Halo-halo D. Air 4. Homogeneous and heterogeneous mixtures are different because _____. A. Heterogeneous has 2 substances while homogeneous has 3 or more substances. B. Homogeneous looks the same throughout, with heterogeneous you can see the different parts. C. Heterogeneous looks the same throughout, with homogeneous you can see the different parts. D. Both have an equal number of substances. 5. This type of mixture contains two or more substances that are visibly distinguishable. A. heterogeneous B. homogeneous C. solution D. suspension **2. Homework** The learners will be tasked to have an advanced reading on saturated and unsaturated solutions.	

<table>
<tr>
<td>A. Activating Prior Knowledge</td>
<td>DAY 2
The learners will identify if the given materials are homogeneous or heterogeneous mixtures. They also must give reasons for their answers.
1. Orange juice
2. Halo-halo
3. Milk
4. Sand mixed with water.
5. Milk and oat</td>
<td></td>
</tr>
<tr>
<td>B. Establishing Lesson Purpose</td>
<td>1. Lesson Purpose
The learners shall be able state the difference between saturated and unsaturated solutions.

2. Unlocking Content Vocabulary
The learners will arrange the numbers in descending order to reveal the correct word.

<table>
<tr><td rowspan="2">1.</td><td>2</td><td>4</td><td>5</td><td>3</td><td>6</td><td>8</td><td>7</td><td>9</td><td>1</td></tr>
<tr><td>E</td><td>A</td><td>R</td><td>T</td><td>U</td><td>A</td><td>T</td><td>S</td><td>D</td></tr>
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<tr><td rowspan="2">2.</td><td>16</td><td>3</td><td>20</td><td>10</td><td>12</td><td>25</td><td>6</td><td>22</td><td>8</td><td>2</td><td>1</td></tr>
<tr><td>A</td><td>T</td><td>S</td><td>U</td><td>T</td><td>U</td><td>A</td><td>N</td><td>R</td><td>E</td><td>D</td></tr>
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<tr><td rowspan="2">3.</td><td>16</td><td>3</td><td>20</td><td>10</td><td>5</td><td>14</td><td>6</td><td>22</td><td>9</td><td>2</td><td>4</td><td>1</td><td>7</td><td>8</td></tr>
<tr><td>P</td><td>T</td><td>U</td><td>R</td><td>R</td><td>E</td><td>U</td><td>S</td><td>S</td><td>E</td><td>A</td><td>D</td><td>T</td><td>A</td></tr>
</table>
</td>
<td>Answer Key:
1. SATURATED
2. UNSATURATED
3. SUPERSATURATED</td>
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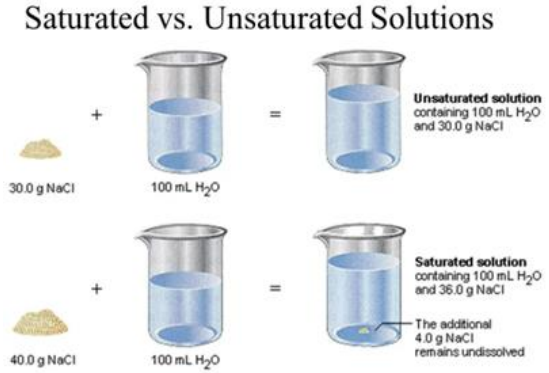
<tr>
<td>C. Developing and Deepening Understanding</td>
<td>1. Explicitation

The learners are tasked to analyze and explain the diagram that shows the differences between saturated and unsaturated solutions.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<td>Photo from:
https://chemistrynonmetals.wordpress.com/solubility/</td>
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</table>

2. Worked Example

1. In which type of solution does salt completely dissolve?
2. In which type of solution does salt did not dissolve completely?
3. What is saturated solution? /Unsaturated solution?

Directions: The learners will determine if the given solutions are saturated or unsaturated.

1. 500 grams of flour is completely dissolved in 1 liter of water.
2. When another 200 grams of flour was added in the solution, the additional flour was not dissolved completely.
3. The solutions cannot hold any more solute.
4. One pack of gelatin powder completely dissolved in 400 grams water.
5. The milk powder cannot be dissolved anymore in a cup of water.

3. Lesson Activity

Objective:

The learners will carry out an investigation to deepen their understanding on saturated and unsaturated solutions. They will identify if the solutions are saturated or unsaturated.

Materials:

2 teaspoons of sugar for solution A
1 teaspoon of sugar for Solution B
1 cup water for solution A
1 cup water for solution B
Teaspoon for stirring.
Beaker/measuring cup

Note: the cup and amount of water must be the same for Solution A and B

Procedure:

1. Label the two cups with Solution A and Solution B, appropriately.
2. Dissolve 1 teaspoon of sugar in 1 cup of water for Solution A.
3. Stir until all sugar is dissolved.
4. Dissolve 1 teaspoon of sugar in 1 cup of water for Solution B.

5. Stir until all sugar is dissolved.
6. Add another 1 teaspoon of sugar in the same cup of water for solution B.
7. Stir until all sugar particles are dissolved.
8. Copy and complete Table 2 below.

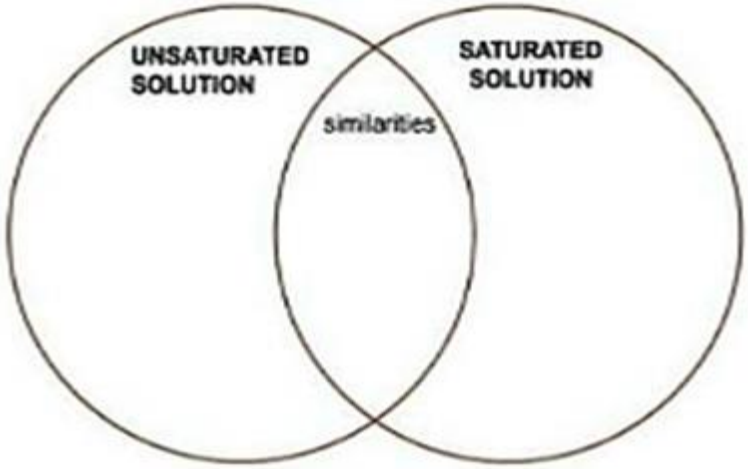
Table 2.

Type of Solution	Saturated/Unsaturated	Observation that will support your answer
Solution A		
Solution B		

D. Making Generalizations

Learners' Takeaways

Using the Venn Diagram, the learners will compare and contrast saturated and unsaturated solutions. Similarities will be written at the center and differences on both sides of the diagram.



IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		NOTES TO TEACHERS
A. Evaluating Learning	**1. Formative Assessment** **Written Work.** The learners will be given a set of questions which will serve as formative assessment to evaluate their learning outcomes for the day's lesson objectives and competencies. Directions: Read each question carefully and write only the letter of the correct answer on a separate sheet of paper. 1. What type of solution has small amount of solute and more solute would dissolve if added? A. Unsaturated B. Concentrated C. Saturated D. Supersaturated 2. When a solution cannot dissolve no more solute because it is at its maximum solute level, how can the solution be described? A. Concentrated B. Saturated C. Supersaturated D. Unsaturated 3. Which type of solution contains too much solute and will not dissolve but appears to be thick and crystallizes rapidly? A. Concentrated B. Dilute C. Saturated D. Supersaturated 4. You are given 40mL solution in a beaker. You add more solute and observed that some particles did not dissolve. What type of solution is it? A. Concentrated B. Saturated	**Answer Key:** 1. A 2. B 3. D 4. B 5. C

	C. Supersaturated D. Unsaturated 5. How will you prepare an unsaturated solution? A. Freeze the mixture. B. Stir the powder in the liquid. C. Add a smaller amount of powder to the liquid. D. Add more solute in a lower amount of solvent. **2. Homework** The learners will be tasked to have an advance reading on concentrations of solutions.	
A. Activating Prior Knowledge	**DAY 3** **Short Review** Based on the previous lesson, learners will read each sentence and categorize the underlined word based on how they are used in a situation. Choose the answer inside the box. solvent / saturated unsaturated / solution mass / solute 1. The salt mixed with water to make a brine solution. 2. Water is used to dissolve powdered juice to make lemonade. 3. You have 100 millimeters of water and 45.0 grams of sugar to make a sugar solution. In making the solution, add the sugar little by little while stirring it. You observed that there is still sugar which is dissolving after a series of adding and stirring processes. In this scenario, how will you describe the sugar solution? 4. In a brine solution, you used 35 grams of salt in 100 millimeters of water. Gradually, you put salt up to the last amount of it while stirring the water. You observe that no more salt is dissolving after completely adding 35 grams. Therefore, the brine solution is _____?	

<table>
<tr>
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<td>5. When you mix a solute in a solvent you form a homogeneous mixture called _____?
The teacher will check whether the answers are correct or not. In case the answer is incorrect, ask the student for a possible reason why they got it incorrect to make clarification and clear their minds on the specific item.</td>
<td></td>
</tr>
<tr>
<td>B. Establishing Lesson Purpose</td>
<td>1. Lesson Purpose
Explain to the learners that the lesson is all about calculation of the mass of solute in each mass of solution (percent by mass).

2. Unlocking Content Vocabulary
The teacher will assist the learners to analyze and arrange the phrases together to define each word below correctly.

Define:
1. Mass is _____.
<table><tr><td>amount of matter</td></tr><tr><td>measure of</td></tr><tr><td>in an object</td></tr></table>
2. Percent by mass is _____.
<table><tr><td>solute in a given mass</td></tr><tr><td>of solution expressed as grams of solute</td></tr><tr><td>per 100 grams of solution</td></tr><tr><td>the amount of</td></tr></table></td>
<td>ANSWER KEY:
1. Measure of amount of matter in an object
2. Percent by mass is the amount of solute in a given mass of solution, expressed as grams of solute per 100 grams of solution.</td>
</tr>
<tr>
<td>C. Developing and Deepening Understanding</td>
<td>1. Explicitation
The teacher will guide the learners in forming the correct equation to calculate the amount of solute in each mass of solvent.

The teacher will allow the learners to make an equation out of the information from the table:
<table><tr><td>Percent by mass</td><td>Mass of solution</td></tr><tr><td>Mass of solute</td><td>100%</td></tr></table></td>
<td></td>
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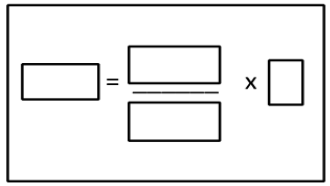


Correct answer.

$$\text{Percent by mass} = \frac{\text{mass of solute}}{\text{mass of solution}} \times 100$$

The teacher will also introduce to the students the steps to follow in this way, the learners will be guided in the problem-solving activity.

Procedure:

Step 1. Identify the given.
Given:
mass of solute =
mass of solution=

Step 2. What is asked?

Step 3. Write the formula to be used.

Step 4. Substitute the formula by the given data and perform the necessary operation.

2. **Worked Example**

There are some products that are sold in the market showing the concentrations of solutes expressed as percent by mass or percent by volume. The most common examples are the alcohols (isopropyl and ethyl) that are used as disinfectants. These alcohols are a solution of 70% isopropyl or ethyl alcohol. It means that there is 70 millimeters of alcohol in every 100 millimeters of rubbing alcohol.

Calculate the mass percent of salt in a brine solution that is made by dissolving 13 grams of salt in 100 grams of water.

Problem solving

Step 1. Identify the given.

Given:

mass of solute =13 grams of salt

mass of solution = 113 grams of water

Step 2. What is asked?

mass percent of salt

Step 3. Write the formula to be used.

$$\text{Percent by mass} = \frac{\text{mass of solute}}{\text{mass of solution}} \text{ X } 100$$

Step 4. Substitute the formula by the given data and perform the necessary operation.

$$\text{Percent by mass} = \frac{13 \text{ grams of salt}}{113 \text{ grams of water}} \text{X}100$$

= 11.50 %

Note: The teacher can provide more sample problems if needed.

3. Lesson Activity

Objective: The learners will solve the problem on their own using the steps learned from the discussion.

Problem Solving

Read each problem below and solve what is being asked in each number.

	Problem No. 1 A certain player won third place in his game, and he was given a bronze medal made from copper and zinc. What is the mass percent of zinc in a bronze medal made by adding 22.5 g of zinc to 427.5 g of copper? **Problem No. 2** You are walking along the path of the school, and suddenly found 1 peso coin. The coin is a nickel-plated steel solid solution made by dissolving 1.5 g of nickel in 4.5 g of copper. Solve for the mass percent of nickel. **Problem No. 3** A gold medal given to an honor student was a solid solution made by dissolving 11.0 g of gold in 554.0 g of silver. What is the percent mass of gold in a gold medal? N*ote: The teacher can provide more sample problems if needed.*	**ANSWER KEY:** **Problem No. 1** the mass percent of zinc in the bronze medal is 5%. **Problem No. 2** the mass percent of nickel in the 1 peso coin is 25%. **Problem No. 3** the percent mass of gold in the gold medal is approximately 1.95%.
D. Making Generalizations	**Learners' Takeaways** The learners will answer the question: *Has this lesson helped you to calculate the amount of solute in each volume of solution (percent by volume)? /If yes, how?*	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		**NOTES TO TEACHERS**
A. Evaluating Learning	**1. Formative Assessment** **Written Work.** The learners will be given a set of questions which will serve as formative assessment to evaluate their learning outcomes for the day's lesson, objectives and competencies. **Directions:** Read each question carefully and write only the letter of the correct answer on a separate sheet of paper.	

1. Which of the following refers to the amount of matter in an object?
   A. Mass
   B. Volume
   C. Percent by mass
   D. Percent by volume

2. Which of the following best describes percent by mass?
   A. The amount of space occupied by matter.
   B. The amount of matter in an object.
   C. It is the amount of solute in each volume of solution expressed as grams solute per 100 milliliters.
   D. It is the amount of solute in each mass of solvent expressed as grams solute per 100 milliliters.

3-5 Problem solving. (1 point each step). Be guided by the steps.

25 cents are a solid solution that is made by adding 1.26g of zinc to 2.34 g of copper. Find the percent of volume of zinc in a solution.

Problem solving

Step 1. Identify the given.
Step 2. What is asked?
Step 3. Write the formula to be used.

Step 4. Substitute the formula by the given data and perform the necessary operation.

2. Homework

Practice solving problems by calculating percent by mass of a substance in a solution.

ANSWER KEY:
1. A
2. D
3-5. Problem Solving

Given:
Mass of zinc (solute) = 1.26 g
Mass of copper = 2.34 g
Total mass of solution (coin) = mass of zinc + mass of copper = 1.26 g + 2.34 g = 3.60 g

Formula:

$$\text{Percent by mass} = \left(\frac{\text{mass of solute}}{\text{mass of solution}}\right) \times 100$$

Solution:

$$\text{Percent by mass of zinc} = \left(\frac{1.26\,\text{g}}{3.60\,\text{g}}\right) \times 100$$

$$\text{Percent by mass of zinc} = \left(\frac{1.26}{3.60}\right) \times 100$$

$$\text{Percent by mass of zinc} = 0.35 \times 100$$

$$\text{Percent by mass of zinc} = 35\%$$

Answer: the percent by mass of zinc in the 25 cents coin is 35%.

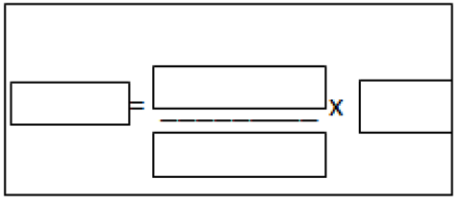
A. Activating Prior Knowledge

DAY 4

Short Review

Based on the previous discussion, calculating the amount of solute in each mass of solution (percent by mass) answers the following activity.

a. Write the formula to be used in calculating amount of solute in each mass of solution (percent by mass).



b. The following are the steps used to be guided in calculating the amount of solute in each mass of solution (percent by mass). Arranged the steps accordingly. Write steps 1, 2, 3 and 4.

_____ What is asked?
_____ Substitute the formula by the given data and perform the necessary operation.
_____ Write the formula to be used.
_____ Identify the given.

B. Establishing Lesson Purpose

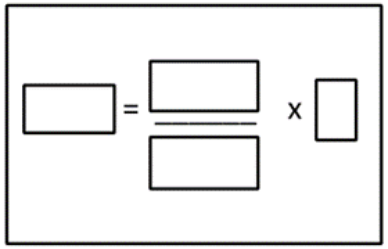
1. Lesson Purpose

Explain to the learners that the lesson is all about calculation of the volume of solute in each volume of solution (percent by mass).

2. Unlocking Content Vocabulary

The teacher will let the learners match Column A with Column B. Let the learners read the definition/description in Column A to match correctly in the terms in Column B.

Column A	Column B
1. It is the volume of solute in each volume of solution x 100	a. volume
2. These are used to express measured volume of liquid (small or large amount)	b. Percent by volume
3. The amount of space occupied by matter	c. milliliters (mL), liters (L)

C. Developing and Deepening Understanding	**1. Explicitation** The teacher will guide the learners in forming the correct equation to calculate the volume of solute in each volume of solution. The teacher will allow the learners to make an equation out of the information from the table. | Volume of solute	Volume of solution
---	---
Percent by volume	100% |  Correct answer. Percent by volume = (volume of solute)/(volume of solution) X 100 The teacher will again introduce the students the steps to follow in solving the problem. In this way, the learners will be guided in the problem-solving activity. Step 1. Identify the given. Given: mass of solute = mass of solution= Step 2. What is asked? Step 3. Write the formula to be used. Step 4. Substitute the formula by the given data and perform the necessary operation.	

	2. Worked Example **Sample problem** A hydrochloric acid solution is made from diluting 7.5 millimeters of hydrochloric acid in 100 millimeters of water. Calculate the percent volume of hydrochloric acid in a solution. **Problem solving** Step 1. Identify the given. Given: volume of solute = 7.5 millimeters hydrochloric acid volume of solution = 100 millimeters of water Step 2. What is asked? percent volume of hydrochloric acid in a solution Step 3. Write the formula to be used. Percent by volume = (volume of solute)/(volume of solution) X 100 Step 4. Substitute the formula by the given data and perform the necessary operation. Percent by volume = (7.5 mL of hydrochloric acid)/(100 mL of water) X 100 = 7.5% *Note: The teacher can provide more sample problem if needed.* **3. Lesson Activity** The learners will solve the problem on their own using the steps learned from the discussion. **Problem Solving** Read each problem below and solve for what is being asked in each number. **Problem No. 1** What is the percent volume of ethyl alcohol in a 100 mL of rubbing alcohol which contains 30 mL of ethyl alcohol?	**ANSWER KEY:** 1. The percent volume of ethyl alcohol in the rubbing alcohol is 30%.

	Problem No. 2 Calculate the percent volume of benzene in a solution made by dissolving 15 mL of benzene to 70 mL of toluene. **Problem No. 3** What is the percent volume of acetone in a solution made from adding 10 liters of acetone to 25 liters of water? Note: The teacher can provide more sample problems if needed.	2. The percent volume of benzene in the solution is approximately 17.65%. 3. The percent volume of acetone in the solution is 28.57%.
D. Making Generalizations	**Learners' Takeaways** The learners will answer the Question: Has this lesson helped you to calculate the amount of solute in each volume of solution (percent by volume)? /If yes, how? _____	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		**NOTES TO TEACHERS**
A. Evaluating Learning	**1. Formative Assessment** **Written Work.** The learners will be given a set of questions which will serve as an assessment to evaluate their learning outcomes for the day's lesson objectives and competencies. **Directions:** Read the questions carefully and choose the letter of the correct answer from the given choices. Write your answer in a separate sheet of paper. 1. Which of the following best describes percent by volume? A. The amount of space occupied by matter. B. The amount of matter in an object C. It is the volume of solute in a given volume of solution expressed in milliliters solute per 100 milliliters of solution D. It is the amount of solute in each mass of solution expressed in grams solute per 100 grams solution	**ANSWER KEY:** 1. C 2. A

	2. Which of the following refers to the amount of space occupied by matter? A. Volume B. Mass C. Percent by mass D. Percent by volume 3-6 Problem solving. (1 pt each step). **Problem1:** What is the percent composition by mass of 70 grams of salt solution that contains 30 grams of salt? **Problem solving** Step 1. Identify the given. Step 2. What is asked? Step 3. Write the formula to be used. Step 4. Substitute the formula by the given data and perform the necessary operation. 7-10 Problem solving. (1 pt each step). **Problem 2:** A gold medal was a solid solution made from dissolving 9.0 g of gold in 250.0 g of silver. What is the percent mass of gold in a gold medal of the student? **Problem solving** Step 1. Identify the given. Step 2. What is asked? Step 3. Write the formula to be used. Step 4. Substitute the formula by the given data and perform the necessary operation. **2. Homework** Practice solving problems by calculating percent by volume of a substance in a solution.	3-6. Problem 1: **Formula:** $\text{Percent Composition by Mass} = \left(\frac{\text{Mass of Solute}}{\text{Total Mass of Solution}}\right) \times 100$ **Given:** Mass of Solute (Salt) = 30 grams Total Mass of Solution = 70 grams **Solution:** $\text{Percent Composition by Mass} = \left(\frac{30 \text{ grams}}{70 \text{ grams}}\right) \times 100$ $\text{Percent Composition by Mass} = \left(\frac{30}{70}\right) \times 100$ $\text{Percent Composition by Mass} = 0.4286 \times 100$ $\text{Percent Composition by Mass} = 42.86\%$ **Answer:** the percent composition by mass of the salt in the salt solution is 42.86%. 7-10. Problem 2: **Formula:** $\text{Percent Composition by Mass} = \left(\frac{\text{Mass of Solute}}{\text{Total Mass of Solution}}\right) \times 100$ **Given:** Mass of Gold (Solute) = 9.0 grams Mass of Silver (Solvent) = 250.0 grams **Solution:** $\text{Total Mass of Solution} = \text{Mass of Gold} + \text{Mass of Silver}$ $\text{Total Mass of Solution} = 9.0 \text{ g} + 250.0 \text{ g} = 259.0 \text{ g}$

<table>
<tr><td></td><td colspan="3"></td><td>Percent Composition by Mass $= \left(\frac{9.0\text{ g}}{259.0\text{ g}}\right) \times 100$
Percent Composition by Mass $= \left(\frac{9.0}{259.0}\right) \times 100$
Percent Composition by Mass $\approx 0.0347 \times 100$
Percent Composition by Mass $\approx 3.47\%$

Answer: the percent mass of gold in the gold medal is approximately 3.47%</td></tr>
<tr><td rowspan="5">B. Teacher’s Remarks</td><td>Note observations on any of the following areas:</td><td>Effective Practices</td><td>Problems Encountered</td><td rowspan="5"></td></tr>
<tr><td>strategies explored</td><td></td><td></td></tr>
<tr><td>materials used</td><td></td><td></td></tr>
<tr><td>learner engagement/ interaction</td><td></td><td></td></tr>
<tr><td>Others</td><td></td><td></td></tr>
<tr><td>C. Teacher’s Reflection</td><td colspan="3">Reflection guide or prompt can be on:
▪ <u>principles behind the teaching</u>
What principles and beliefs informed my lesson?
Why did I teach the lesson the way I did?

▪ <u>students</u>
What roles did my students play in my lesson?
What did my students learn? How did they learn?

▪ <u>ways forward</u>
What could I have done differently?
What can I explore in the next lesson?</td><td></td></tr>
</table>