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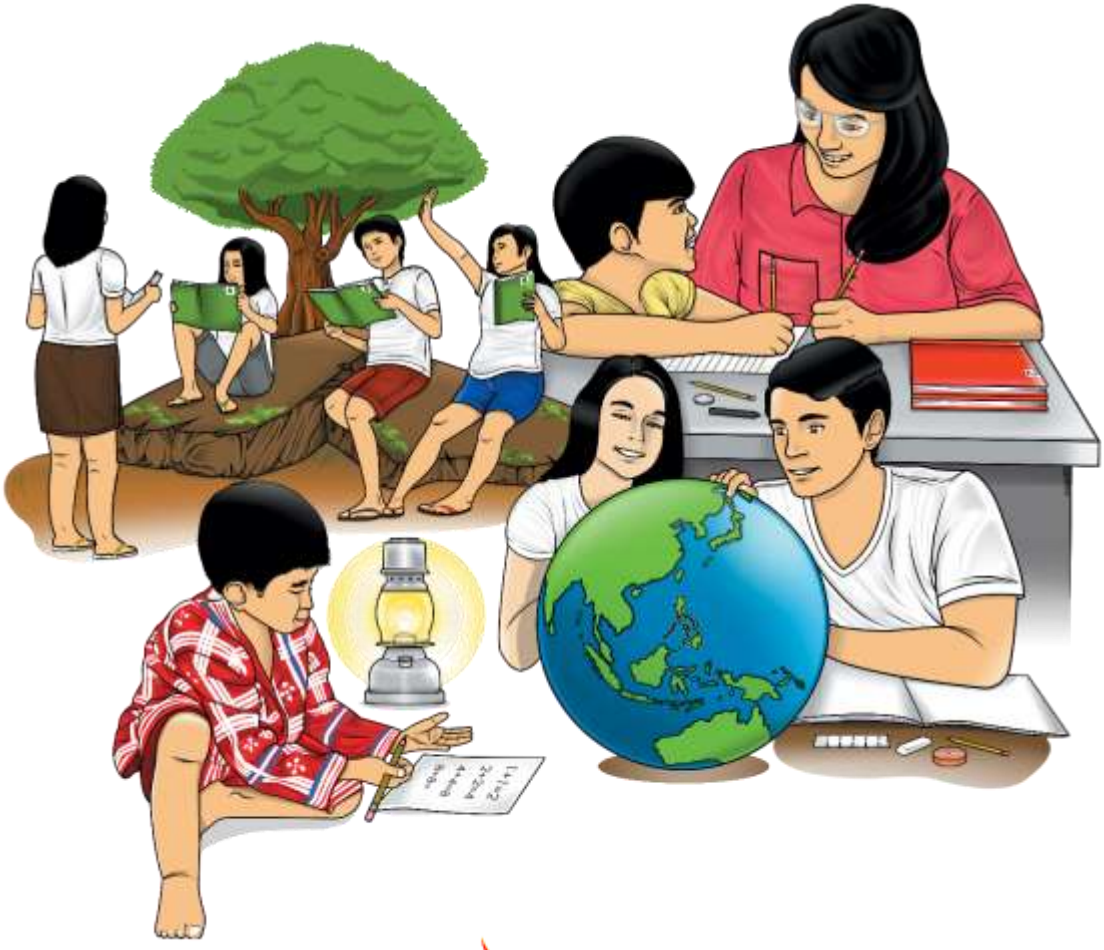
DepED
DEPARTMENT OF EDUCATION

Science

Quarter 1- Module 3
Two Worlds Apart:
Pure Substances vs Mixtures



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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners can continue your studies and learn while at home. Activities, questions, directions, exercise, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on the lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text. Note to the teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put necessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

Hello? How are you today? Are you ready for another round of learning? In this module, before you will distinguish mixtures from substances based on a set of properties, you will explore the pure substances first.

For example, look around you. Can you tell whether these matter found in your environment or even at your home are pure substances such as the air you smell and breathe, the food you eat, the water you drink and the other things you see, hear and feel? It is for you to find out with the help of this module.

After going through this module, you are expected to:

1. Define pure substance;
2. Describe pure substance based on a set of properties; and
3. Relate the importance of pure substance in real – life situations

What I Know

Directions: Read each item carefully. Write only the letter of the correct answer for each question. Use a separate sheet for your answers.

1. What are the two (2) classes of matter?
   a. atom and molecule
   b. element and compound
   c. pant and animal cells
   d. substance and mixture

2. Which is true regarding water?
   a. compound of element
   b. element of gases
   c. mixture of gases
   d. substances of gases

3. What is the difference between a substance and a mixture?
   a. Substance can be separated while mixture cannot be separated.
   b. Substance has many components while mixture has one only.
   c. Substance is heterogeneous while mixture is homogeneous.
   d. Substance is pure while mixture is impure.

4. To separate salt from water in a seawater mixture, what process is used?
    a. condensation
    b. distillation
    c. evaporation
    d. filtration

5. Which of the following is a property of mixture?
    a. It has a definite composition.
    b. It consists of a single phase.
    c. It has a heterogeneous composition.
    d. It can be chemically separated into its components.

6. Which of the following is a physical appearance of a substance?
    a. complicated
    b. homogeneous
    c. heterogeneous
    d. non-uniform

7. Which one is the best way to determine whether an unknown sample is a substance or a mixture?
    a. Knowing its density
    b. Tasting the given sample
    c. Observing its physical appearance
    d. Testing its melting and boiling point

8. Which is **NOT** a technique to separate components of mixture?
    a. condensation
    b. distillation
    c. evaporation
    d. filtration

9. Which of the following is a heterogeneous mixture?
    a. air
    b. oil in water
    c. stainless steel
    d. soft drink

10. What is/are true for substance and mixture?

I. Pure substance melts completely. II. Pure substance has a varying boiling point. III. Mixture does not melt completely. IV. Mixture has a fixed boiling point.

    a. I and II only
    b. I and III only
    c. II and IV only
    d. I and IV only

11. What does it indicate when a sugar is heated in a test tube until it is completely changed into a black mass and droplets of water?
    a. compound
    b. element
    c. mixture
    d. solution

12. What substance is made by mixing two elements without being chemically combined?
    a. compound
    b. element
    c. mixture
    d. solution

13. What is the best way to use in separating iron parts from a mixture?
    a. filter paper
    b. magnet
    c. water
    d. spoon

14. Which of the following uses evaporation as a means of separating the components of the given mixture?
    a. iron fillings and sand
    b. pebbles and water
    c. sand and gravel
    d. sugar and water

15. Which of the following statements distinguishes pure substances from mixtures?
    a. It can be separated by physical means.
    b. It consists of two or more kinds of matter.
    c. It has no specific solubility and densities.
    d. It has constant boiling temperature and melting temperature.

Lesson 1 Pure Substance

What's In

In your previous lesson, you learned that a solution is a homogeneous mixture. It means that it has a uniform composition which makes the appearance uniform all throughout.

This time you will describe the appearance and other properties of pure substances. Is it homogeneous or heterogeneous? What are other properties of pure substances?

What's New

Activity No. 1

Let us proceed with the new lesson to be presented through a poem. You've got what it takes to be a conqueror if you read carefully this poem and discover the differences between substances and mixtures. The poem is entitled, "I am Substance, I am Mixture." (Note: This poem was composed exclusively for ADM module)

I am Substance, I am Mixture
By Wilfredo D. Bartolo, Jr.

Matter has two broad classes
Mixtures and substances
Each one with differences
Let us start with their appearances.

Homogeneous or heterogeneous
Telling a substance from a mixture can be used
When substances are all homogeneous
Mixtures can be homo or heterogeneous.

Next way to distinguish is through separating technique
Mixtures can be separated easy and quick
Through evaporation, distillation and filtration

But not substances due to chemical combination.

Substances and mixtures behave differently,
During boiling and melting most especially
Boiling point of substance is fixed while mixture is not
Substance melts completely but mixture does not

I am substance, I am mixture
Two worlds apart
Just always remember the differences they've got
To distinguish a substance or mixture from what is and what is not.

How are you feeling so far? Did you find the poem interesting and effective learning resource? If your answer is a big yes, let us find out!

To find out if the poem really helped you to discover and understand some of the important concepts of the lesson; you will be asked to answer the following questions below.

Guide Questions:

1. What is a pure substance?
2. What are the properties of pure substances?
3. Tabulate your answers about pure substances.

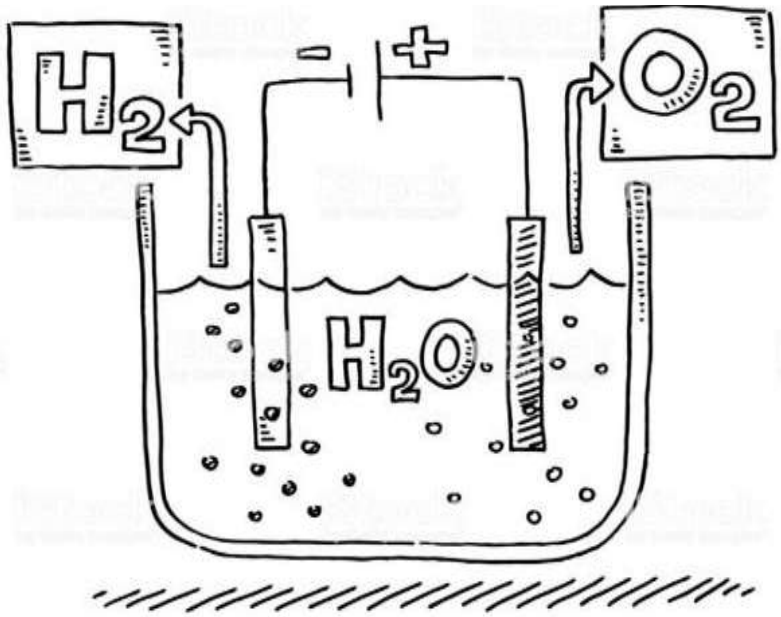
Set of Properties	**Pure Substances**
Appearance	
Melting point	
Boiling point	

What is It

Pure Substances are one of the classes of matter. Substances are homogeneous or with uniform composition and appearance are the same all throughout. The temperature of a substance is fixed and sharp. During melting, a substance melts completely/smoothly within a short time.

Activity No. 1.1

The figure below shows separating technique for the components of pure substances. Another set of properties that distinguishes substances from mixtures.



Electrolysis of Water

Guide Questions:

A. What is the name of the pure substance H_2O?

B. What are the components of water?

C. In the picture, can we separate Hydrogen (H) from Oxygen (O)?

D. What is the process that separates components H and O of water?

In pure substances, the components are chemically combined. The component parts are difficult to separate except for water. During the process called electrolysis or by-passing electric current the components Hydrogen (H) and Oxygen (O) of water are separated.

Activity No. 1.2

Consider activity guides no. 1 and 2. Study first the given table and scenario.

Table 1: Boiling point of two liquid samples

SAMPLES	**Temperature in ˚C**						
	Before heating	After 5 minutes	After 8 minutes	After 10 minutes	After 12 minutes	After 14 minutes	After 16 minutes
Liquid A	28	40	65	90	100	100	100
Liquid B	30	45	65	97	105	108	113

Scenario 1: Melting point of two solid samples

Chef Matt and his assistant observed two solid samples: Solid A and Solid B. Both substances are white crystalline powder. They cannot determine which is a substance and mixture just by looking at it. So, to distinguish which is which, they heated the two samples using an improvised melting dish. Both the two samples were heated at the same time and received an equal amount of heat. After a few minutes, they had observed that Solid A melts completely within a short period of time; while Solid B has portions that seem to be not melting.

To find out if you have understood the important concepts of the lesson, answer the following questions below.

1. Which liquid sample is a pure substance?

Table 1: Boiling point of two liquid samples

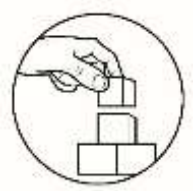
Samples	Temperature	Observation while heating
Liquid A		
Liquid B		

2. Which solid sample is a pure substance?

Scenario 1: Melting point of two solid samples

Samples	Appearance	Observation while melting
Solid A		
Solid B		

During boiling, the temperature of a substance changes at the start then it becomes the same and constant. During melting, a substance melts completely/ smoothly within a short time.



What's More

Decide how to separate these pure substances? If it is not possible, please write "cannot be separated" on the space provided.

Substance 1	**Oxygen**	_____
Substance 2	**Water**	_____
Substance 3	**Gold**	_____
Substance 4	**Carbon Dioxide**	_____
Substance 5	**Carbon**	_____

Here is another Enrichment Activity for you. Read the paragraph below and answer the questions that follow.

A

Joseph wants to compare the chemical properties of two substances. In doing it, he prepared two flasks containing the substances and labeled them Liquid A and Liquid B. He monitored the boiling points of the liquids and found that the boiling points were 100˚C for substance A and 110˚C - 112˚C for liquid B. How would you classify the two liquids?

Answer: Which liquid sample is a pure substance? _____

B

A student tests the melting point of a certain sample of potassium alum/tawas. It starts melting at 91˚C and melts completely until the temperature is 92.5˚C. According to a data book, the melting point of potassium alum is 92.5˚C. What can you say about the sample?

Answer: The sample is a_____.

What I Have Learned

Directions: Read the paragraph and identify the correct words that fit in the given sentences in the box below.

constant	Boiling point	melting	liquid
completely	different	pure substance	mixture
solid	distilled water	Melting point	
heterogeneous	homogeneous		

Pure substances are (1)_____ in appearance. During boiling, the temperature of a (2)_____changes at the start then it becomes (3)_____. During melting, a substance melts (4)_____ within a short time.

To determine a (5)_____ sample if it is a pure substance , you should test it using its boiling point; while if it is a (6)_____ sample, its melting point is the best way to test.

In Enrichment A, the liquid A is (7)_____ since it has a fixed boiling point while the water with salt is a mixture because it has a varying melting point.

What I Can Do

Identify at least five (5) pure substances found in nature, in the supermarket, grocery store and even at your home. Use the table below to explain your answer based on appearance, separating techniques, boiling and melting point.

Pure Substances	Appearance (Homogeneous or Heterogeneous)	Separating Techniques (Components can be separated or inseparable)	Boiling point (Fixed temperature or temperature different in different times)	Melting point (Melts completely and smoothly or a portion does not melt)
1.				
2.				
3.				
4.				
5.				

Assessment

Directions: Read each item carefully. Write only the letter of the correct answer for each question. Use a separate sheet for your answers.

1. A gaseous material has a strong smell, evaporates quickly, particularly boils at -33.34˚C and melts at -77.73˚C. This matter can be classified as _____.
   a. metal
   b. mixture
   c. solution
   d. substance

2. Ella is experimenting on how two liquid samples. The data he gathered is shown in the table below.

SAMPLES	**Temperature in ˚C**						
	Before heating	After 5 minutes	After 8 minutes	After 10 minutes	After 12 minutes	After 14 minutes	After 16 minutes
Liquid A	29	45	60	90	100	100	100
Liquid B	30	47	65	97	100	105	108

   What can be inferred from the table?

   a. Liquid A is pure substance while Liquid B is a mixture.
   b. Liquid A is a mixture while Liquid B is a pure substance.
   c. Liquid A is an element while Liquid B is a substance.
   d. Both Liquids A and B are pure substance.

3. A pinch of bread was placed inside a test tube and heated until it became blackish in color and released some gas. Which of the following statement/s is/are true according to the given information?

   I. Bread is solution.
   II. Bread is composed of only one substance.
   III. Bread is made up of solid and gaseous substances.
   IV. Bread is made up of mixtures of different substances.

   a. I only
   b. II & III
   c. II only
   d. III & IV

4. Water boils at 100˚C and pure ethanol at 78˚C. Which of the statements are TRUE about water and ethanol?

I. Water and ethanol are pure substances. II. Water and ethanol can be boiled at either 100˚C or 78˚C. III. Water and ethanol have specific temperatures at which they would start to boil. IV. Water and ethanol can be identified according to temperature at which they boil.

   a. I only
   b. I, II and IV
   c. III only
   d. I, III, and IV

5. Sodium chloride dissolves in water very well. Which is **NOT TRUE** in the following statements?
   a. Water is a pure substance.
   b. Sodium chloride is a pure substance.
   c. Dissolving sodium chloride with water produces a mixture.
   d. Dissolving sodium chloride with water produces a new substance.

6. Ana wants to compare the chemical properties of two substances. In doing it, he prepared two flasks containing the substances and labeled them Liquid A and Liquid B. He monitored the boiling points of the liquids and found that the boiling points were 100˚C for substance A and 110˚C - 112˚C for liquid B. How would you classify the two liquids?
   a. Liquid A is pure substance while Liquid B is a mixture.
   b. Liquids A and B contain two or more atoms that are chemically bonded.
   c. Liquid A has varying boiling points while liquid B has a fix boiling point.
   d. Liquid A maybe homogenous or heterogeneous but substance B is not.

7. A white powder was tested and heated. After some time, it melts completely. What does it imply?
   a. It is a mixture.
   b. It is a pure substance.
   c. It is a homogeneous mixture.
   d. It is a combination of pure substance and mixture.

For items 8 and 9, two liquids were observed and heated. The data gathered is shown in the table below.

Temperature (˚C)	Liquid A	Liquid B
At start of boiling	100	80

After 30 sec	100	85
After 60 sec	100	84
After 90 sec	100	86

8. Based on the table above, which of the following is TRUE about Liquid A?
    a. It has a fixed boiling point.
    b. It is heterogeneous.
    c. It is a mixture.
    d. It is an element.

9. Which of the following could be Liquid A?
    a. fruit juice
    b. soft drinks
    c. water
    d. water – salt solution

10. Ethan wants to separate the marbles in a jar full of water. Which of the following is the best way to separate the mixture?
    a. decantation
    b. dissolving
    c. evaporation
    d. using a magnet

11. Which of the following will Jeofrey do to segregate the rubber bands of different colors?
    a. water Decantation
    b. evaporation
    c. filtration
    d. physical manipulation

12. What is the best way to use in separating iron fillings from a mixture?
    a. filter paper
    b. magnet
    c. water
    d. spoon

13. Which of the following uses evaporation as a means of separating the components of the given mixture?
    a. oil and water
    b. pebbles and sand
    c. sand and gravel
    d. salt and water

14. Which of the following materials will be used to separate a mixture of iron nails and sand?
    a. alcohol Lamp
    b. filter paper
    c. magnet
    d. spoon

15. Glen wants to separate salt and water mixture. Which of the following will help him to successfully separate the components of the mixture?

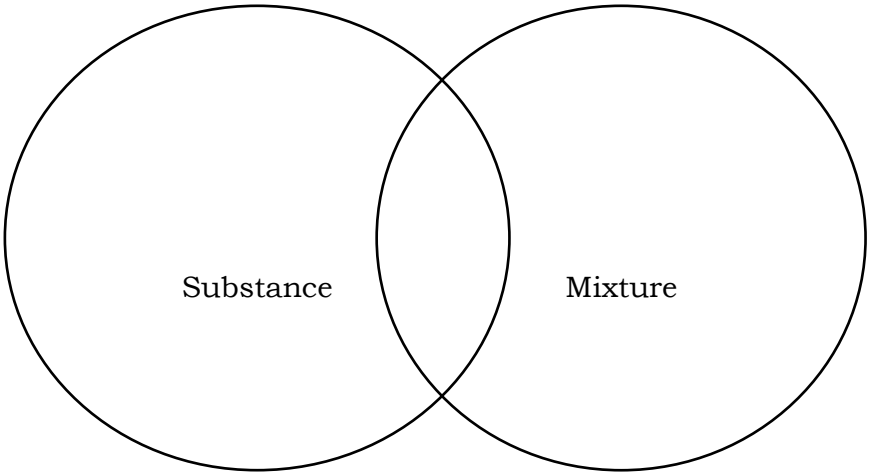
I. Using a magnet	III. Decantation
II. Dissolving	IV. Evaporation

a. I, II, III, IV
b. I, II only
c. III, IV only
d. I and IV only

Additional Activities

Fill in the Venn Diagram below with similarities and differences between pure substances and mixtures.

Homogeneous
Homogeneous/Heterogeneous
It has fixed boiling point
It has varying boiling point
It melts completely
Some portion seems to be not melting



Lesson 2 Properties of Pure Substance

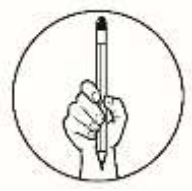
What I Need to Know

Hello? How are you today? Are you ready for another round of learning? In this module, before you will distinguish mixtures from substances based on a set of properties, you will also explore the mixtures.

For example, look around you. Can you tell whether if these matter found in your environment or even at your home are mixtures such as the air you smell and breathe, the food you eat, the water you drink and the other things you see, hear and feel? It is for you to find out with the help of this module.

After going through this module, you are expected to:

1. Define mixtures
2. Describe mixtures based on a set of properties
3. Relate the importance of mixtures in real – life situations



What I Know

Directions: Read each item carefully. Write only the letter of the correct answer for each question. Use a separate sheet for your answers.

1. What are the two (2) classes of matter?
   a. atom and molecule
   b. plant and animal cells
   c. element and compound
   d. substance and mixture

2. Which is true regarding air?
   a. compound of gases
   b. element of gases
   c. mixture of gases
   d. substances of gases

3. What is the difference between a substance and a mixture?
    a. Substance can be separated while mixture cannot be separated.
    b. Substance has many components while mixture has one only.
    c. Substance is heterogeneous while mixture is homogeneous.
    d. Substance is pure while mixture is impure.

4. To separate salt from water in a seawater mixture, what process is used?
    a. condensation
    b. distillation
    c. evaporation
    d. filtration

5. Which of the following is a property of mixture?
    a. It has a definite composition.
    b. It consists of a single phase.
    c. It has a heterogeneous composition.
    d. It can be chemically separated into its components.

6. Which of the following is a physical appearance of a substance?
    a. complicated
    b. homogeneous
    c. heterogeneous
    d. non-uniform

7. Which one is the best way to determine whether an unknown sample is a substance or a mixture?
    a. knowing its density.
    b. tasting the given sample
    c. observing its physical appearance.
    d. testing its melting and boiling point.

8. All are techniques which help to separate components of mixtures. Which of these is **NOT**?
    a. condensation
    b. distillation
    c. evaporation
    d. filtration

9. Which of the following is a heterogeneous mixture?
    a. air
    b. soft drink
    c. oil in water
    d. stainless steel

10. What is/are true for substance and mixture?

I. Pure substance melts completely. II. Pure substance has a varying boiling point. III. Mixture does not melt completely. IV. Mixture has a fixed boiling point.

a. I and II only
b. I and III only
c. II and IV only
d. I and IV only

11. What does it indicate when a sugar is heated in a test tube until it is completely changed into a black mass and droplets of water? The sugar is _____ a/an
a. compound
b. element
c. mixture
d. solution

12. What substance is made by mixing two elements without being chemically combined?
a. compound
b. element
c. mixture
d. solution

13. What is the best way to use in separating iron parts from a mixture?
a. filter paper
b. magnet
c. water
d. spoon

14. Which of the following uses evaporation as a means of separating the components of the given mixture?
a. iron fillings and sand
b. pebbles and water
c. sand and gravel
d. sugar and water

15. Which of the following statements distinguishes pure substances from mixtures?
a. It can be separated by physical means.
b. It consists of two or more kinds of matter.
c. It has no specific solubility and densities.
d. It has constant boiling temperature and melting temperature.

What's In

In your previous lesson, you learned solution which is a homogeneous mixture. Homogeneous means uniform in composition which makes the appearance uniform all throughout.

This time you will describe the appearance and other properties of mixtures. Is it homogeneous or heterogeneous? What are other properties of pure substances?

What's New

Activity No. 1

Let us proceed with the new lesson to be presented though a poem. You've got what it takes to be a conqueror if you read carefully this poem and discover the differences between substances and mixtures. The poem is entitled, "I am substance, I am mixture." (Note: This poem was composed exclusively for SILM)

I AM SUBSTANCE, I AM MIXTURE

By Wilfredo D. Bartolo, Jr

Matter has two broad classes
Mixtures and substances
Each one with differences
Let us start with their appearances.

Homogeneous or heterogeneous
Telling a substance from a mixture can be used
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Mixtures can be homo or heterogeneous.

Next way to distinguish is through separating technique
Mixtures can be separated easy and quick
Through evaporation, distillation and filtration
But not substances due to chemical combination.

Substances and mixtures behave differently,
During boiling and melting most especially
Boiling point of substance is fixed while mixture is not
Substance melts completely but mixture does not

I am substance, I am mixture

Two worlds apart

Activity 1.1

Find out if the poem really helped you to discover and understand some of the important concepts of the lesson. Answer the following questions below.

Guide Questions:

1. What is a mixture?
2. What are the sets of properties of mixtures?
3. Tabulate your answer about the properties of matter.

Set of Properties	Mixtures
Appearance	
Melting point	
Boiling point	

Substances and mixtures are classes of matter. Mixtures are heterogeneous or without uniform composition and appearance are not the same all throughout. The temperature of a mixture is different at different times. During melting, a mixture has portions that seem to be not melting.

Activity No. 1.2

Figures below show separating techniques for the components of mixtures. Another set of properties that distinguishes substances from mixtures.

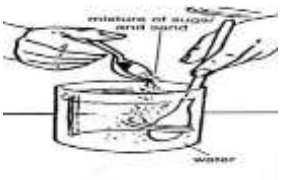


Figure A

Figure B

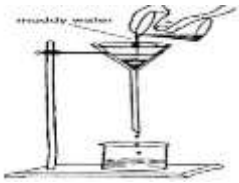


Figure C

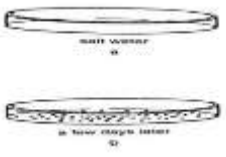


Figure D

Figure E

Figure F

What is It

Find out if you have discovered and understood the important concepts of the lesson, you will be asked to answer the following questions below.

A. Which pictures show filtration or straining?

B. Which picture shows filter paper being used?

C. Which picture shows pieces of iron being separated?

D. Which picture shows decantation?

E. Which picture shows dissolving?

F. Which picture shows evaporation?

There are a lot of ways to separate mixtures. Physical manipulation separates using a spoon or any scooping material or by picking. The use of magnet can be done to separate the metallic materials from nonmetallic materials. Filtration is the separation of an insoluble solid from a liquid mixture using filter paper. In decantation, the large particles of insoluble solid are separated from the liquid mixture. Evaporation separates the soluble solid from the liquid component of the solution by evaporating the liquid substance.

Activity No. 1.3

Consider activity guides no. 1 and 2. If you are ready, start! Study fist table 1 and scenario 1.

Table 1: Boiling point of two liquid samples

SAMPLES	Temperature in ˚C						
	Before heating	After 5 minutes	After 8 minutes	After 10 minutes	After 12 minutes	After 14 minutes	After 16 minutes
Liquid A	28	40	65	90	100	100	100
Liquid B	30	45	65	97	105	108	113

Scenario 1: Melting point of two solid samples

Chef Matt and his assistant observed two solid samples: Solid A and Solid B. Both substances are white crystalline powder. They cannot determine which is a substance and mixture just by looking at it. So, to distinguish which is which, they heated the two samples using an improvised melting dish. Both the two samples were heated at the same time and received an equal amount of heat. After a few minutes, they had observed that Solid A melts completely within a short period of time; while Solid B has portions that seem to be not

Guide Questions:

1. Which liquid sample is a substance?

Table 1: Boiling point of two liquid samples

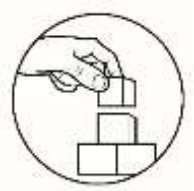
Samples	Temperature	Observation while heating
Liquid A		
Liquid B		

2. Which solid sample is a substance?

Scenario 1: Melting point of two solid samples

Samples	Appearance	Observation while melting
Solid A		
Solid B		

During boiling, the temperature of a mixture is different at different times. During melting, a mixture has portions that seem to be not melting.



What's More

Decide how to separate these mixture? If it is not possible, please write "cannot be separated" on the space provided.

Mixture 1	salt and iron filings	_____
Mixture 2	water and pebbles	_____
Mixture 3	salty water	_____
Mixture 4	salt, iron filings and water	_____
Mixture 5	gravel, sand and sugar	_____
Mixture 6	gravel, sand, sugar and iron filings	_____

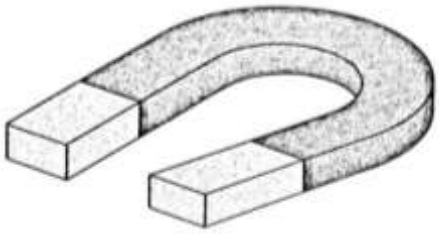


Figure A *A magnet is used to separate iron*

Figure B *Water is used to dissolve a solid*

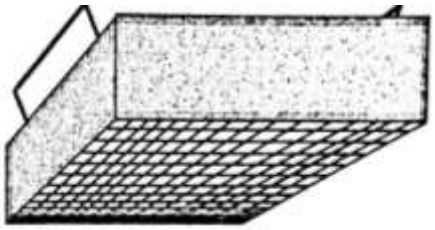


Figure C *A strainer is used to separate large solids*

Figure D *Decanting water with insoluble materials into the other container*

Figure E *Evaporation is used to separate already dissolve solids.*

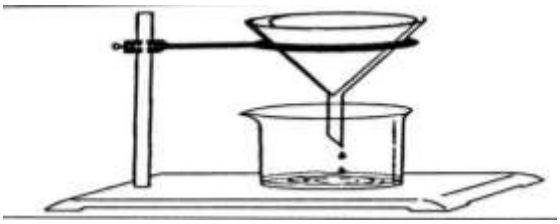


Figure F *Filtration is used to separate very small solids.*

Read the paragraph below and answer the questions that follow.

A

Joseph wants to compare the chemical properties of two substances. In doing it, he prepared two flasks containing the substances and labeled them Liquid A and Liquid B. He monitored the boiling points of the liquids and found that the boiling points were 100˚C for substance A and 110˚C - 112˚C for liquid B. How would you classify the two liquids?

Answer: Liquid A is_____.
Liquid B is _____.

B

A student tests the melting point of a certain sample of potassium alum/tawas. It starts melting at 87-89˚C but does not melt completely until the temperature is 91˚C. According to a data book, the melting point of potassium alum is 92.5˚C. What can you say about the sample?

Answer: The sample is a_____.

C

Teacher Joy placed two white solid substances in two different beakers. She labeled the beakers as Solid A and Solid B. She said that Solid A is a substance and Solid B is a mixture. If you are going to test the melting point of the two samples what would you expect to the melting point of Solid A and Solid B?

Answer: _____.

What I Have Learned

Read the paragraph carefully and fill in the correct words that fit in the given sentences found in the box below.

magnet	mixtures	filtration	different
manipulation	evaporation	liquid	

(1) _____ are separated without any chemical reactions. There are many different kinds of mixtures. Different mixtures are separated in (2)_____ ways.

Physical (3)_____ separates the components of varying sizes using a spoon or any scooping material or by picking. The use of (4)_____ can be done to separate the metallic materials from nonmetallic materials. (5)_____ is the separation of an insoluble solid from a liquid mixture using a semipermeable membrane like filter paper.

In decantation, the large particles of insoluble solid are separated from the (6)_____ mixture. (7)_____ separates the soluble solid from the liquid

What I Can Do

Identify at least five (5) examples of mixtures found in nature, in the supermarket, grocery store and even at your home. Distinguish these matters as either substances or mixtures. Use the table below to explain your answer based on appearance, separating techniques, boiling and melting point.

Mixtures	Appearance (Homogeneous or Heterogeneous)	Separating Techniques(Components can be separated or inseparable)	Boiling point (Fixed temperature or temperature different in different times	Melting point (Melts completely and smoothly or a portion does not melt)
1.				
2.				
3.				
4.				
5.				

Assessment

Directions: Read each item carefully. Write only the letter of the correct answer for each question. Use a separate sheet for your answers.

1. A gaseous material has a strong smell, evaporates quickly, particularly boils at -33.34˚C and melts at -77.73˚C. This matter can be classified as _____.
   a. metal
   b. mixture
   c. solution

d. substance

2. Ella is experimenting on how two liquid samples. The data he gathered is shown in the table below.

SAMPLES	Temperature in ˚C						
	Before heating	After 5 minutes	After 8 minutes	After 10 minutes	After 12 minutes	After 14 minutes	After 16 minutes
Liquid A	29	45	60	90	100	100	100
Liquid B	30	47	65	97	100	105	108

What can be inferred from the table?

a. Liquid A is pure substance while Liquid B is a mixture.
b. Liquid A is a mixture while Liquid B is a pure substance
c. Liquid A is an element while Liquid B is a substance
d. Both Liquids A and B are pure substance.

3. A pinch of bread was placed inside a test tube and heated until it became blackish in color and released some gas. Which of the following statement/s is/are TRUE according to the given information?

I. Bread is solution.
II. Bread is composed of only one substance.
III. Bread is made up of solid and gaseous substances.
IV. Bread is made up of mixtures of different substances.

a. I only
b. II & III
c. II only
d. III & IV

4. Water boils at 100˚C and pure ethanol at 78˚C. Which of the statements are TRUE about water and ethanol?

I. Water and ethanol are pure substances.
II. Water and ethanol can be boiled at either 100˚C or 78˚C.
III. Water and ethanol have specific temperatures at which they would start to boil.
IV. Water and ethanol can be identified according to temperature at which they boil.

a. I only
b. I, II and IV
c. III only
d. I, III, and IV

5. Sodium chloride dissolves in water very well. Which is **NOT TRUE** in the following statements?

a. Water is a pure substance.
b. Sodium chloride is a pure substance.
c. Dissolving sodium chloride with water produces a mixture.
d. Dissolving sodium chloride with water produces a new substance.

6. Ana wants to compare the chemical properties of two substances. In doing it, he prepared two flasks containing the substances and labeled them Liquid A and

Liquid B. He monitored the boiling points of the liquids and found that the boiling points were 100˚C for substance A and 110˚C - 112˚C for liquid B. How would you classify the two liquids?

a. Liquid A is pure substance while Liquid B is a mixture.
b. Liquids A and B contain two or more atoms that are chemically bonded.
c. Liquid A has varying boiling points while liquid B has a fix boiling point.
d. Liquid A may be homogenous or heterogeneous but substance B is not.

7. A white powder was tested and heated. After some time, it melts completely. What does it imply?
    a. It is a mixture.
    b. It is a pure substance.
    c. It is a homogeneous mixture.
    d. It is a combination of pure substance and mixture.

Two liquids were observed and heated. The data gathered is shown in the table below.

Temperature (˚C)	Liquid A	Liquid B
At start of boiling	100	80
After 30 sec	100	85
After 60 sec	100	84
After 90 sec	100	86

8. Based on the table above, which of the following is TRUE about Liquid A?
    a. It has a fixed boiling point.
    b. It is heterogeneous.
    c. It is a mixture.
    d. It is an element.

9. Which of the following could be Liquid A?
    a. fruit juice
    b. soft drinks
    c. water
    d. water – salt solution

10. Ethan wants to separate the marbles in a jar full of water. Which of the following is the BEST way to separate the mixture?
    a. decantation
    b. dissolving
    c. evaporation
    d. using a magnet

11. Which of the following will Jeofrey do to segregate the rubber bands of different colors?
    a. decantation
    b. evaporation
    c. filtration
    d. physical manipulation

12. What is the BEST way to use in separating iron fillings from a mixture?
    a. filter paper
    b. magnet
    c. water
    d. spoon

13. Which of the following uses evaporation as a means of separating the components of the given mixture?
    a. oil and water
    b. pebbles and sand
    c. sand and gravel
    d. salt and water

14. Which of the following materials will be used to separate a mixture of iron nails and sand?
    a. alcohol Lamp
    b. filter paper
    c. magnet
    d. spoon

15. Glenn wants to separate salt and water mixture. Which of the following will help him to successfully separate the components of the mixture?

I. Using a magnet	III. Decantation
II. Dissolving	IV. Evaporation

    a. I, II, III, IV
    b. I, II
    c. III, IV
    d. IV only

Additional Activities

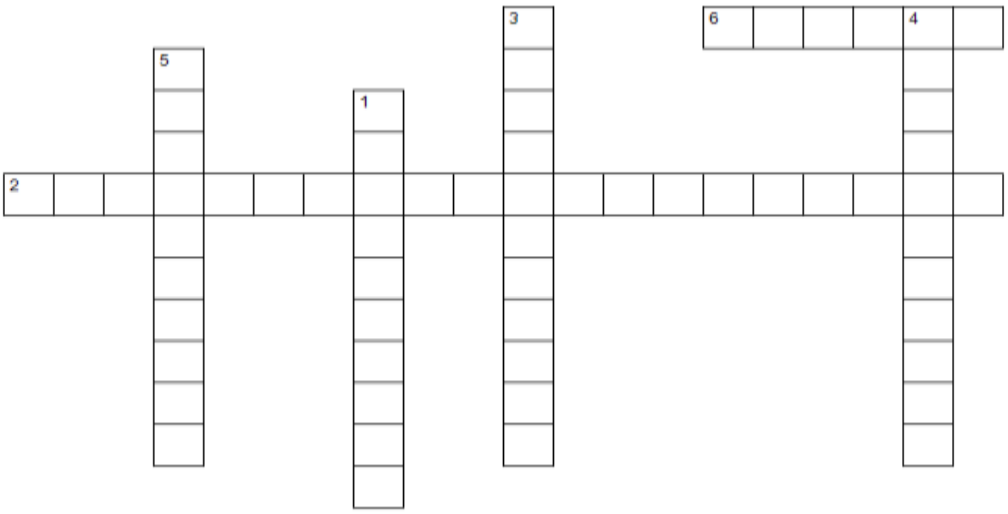
Ending with Crosswords

Across:

2. It separates the components of varying sizes using a spoon or any scooping material or by picking.
6. This is used when separating the iron nails from a jar full of sand.

Down:

1. It is the separation of an insoluble solid from a liquid mixture using a semi-permeable membrane like filter paper.
3. The large particles of insoluble solid are separated from the liquid mixture.
4. The liquid component is separated from the solid component by heating the mixture leaving the solid component.
5. This is the best way to separate sugar and sand mixture.



Answer Key

Lesson 1

What I know!

1. D
2. C
3. D
4. C
5. B
6. A
7. D
8. A
9. B
10. B
11. A
12. C
13. B
14. D
15. D

Assessment

1. D
2. A
3. D
4. D
5. D
6. A
7. B
8. A
9. C
10. A
11. D
12. B
13. D
14. C
15. D

Lesson 2

What I know!

1. D
2. C
3. D
4. C
5. B
6. A
7. D
8. A
9. B
10. B
11. A
12. C
13. B
14. D
15. D

Assessment

1. D
2. A
3. D
4. D
5. D
6. A
7. B
8. A
9. C
10. A
11. D
12. B
13. D
14. C
15. D

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