

# **General Chemistry 1**

**Quarter 1 - Module 1:  
Properties of Matter**

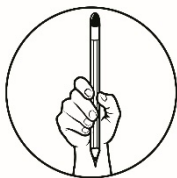


## ***What I Need to Know?***

This module was written to guide you in determining the properties of matter. Different samples of matter exist around us with varied properties but have similarities also in some aspects. That is why familiarization on properties of matter would help us to make better choices and to make right decision especially on the things we are using every day from cooking dishes to solving crimes using pieces of evidence. The scope of this module covers many different learning situations where students could relate their personal experiences on properties of matter and their uses. 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 textbook you are now using.

After going through this module, you are expected to:

1. Use properties of matter to identify substances and to separate them, **(STEM\_GC11MP1a-b-5).**



## ***What I Know?*** ***(Critical Thinking)***

To check your prior knowledge about the topic, and to solicit the questions that you want to know about it, fill in the Know and Want to know components of the Know-Want to know- Learned (KWL) chart properly and correctly. For the Know component, you may write word/s or sentence. For the want to know component, state your responses in interrogative or question form. You may list as many responses as you want for each component. Write your responses on a separate sheet of paper.

**KWL Chart**

<b>Topic</b>	<b>Know</b>	<b>Want to know</b>	<b>Learned</b>
Properties of Matter			

### Guide Questions

1. Based from what you have written on the Know component of the chart, what do you know about properties of matter?
2. If you were to think of a question that you want to ask about properties of matter, what question would that be?



### **HOLD ON AMIGO!!!**

**DIRECTION:** After you have filled-in the K and W components of the chart and answered the guide questions, answer now the diagnostic assessment below within 10 minutes.

### **PRE-TEST**

Read and answer each statement carefully then write the letter of the best answer on a separate sheet of paper.

1. Which physical property of matter is shown when a piece of material is turned into a thin sheet?  
A. Stiffness                      B. Flexibility                      C. Elasticity                      D. Malleability
2. Copper wires are usually used for electrical wire installations because it is \_\_\_\_  
A. ductile                      B. malleable                      C. brittle                      D. cheap
3. Materials that easily break when a force is applied like glass are said to be \_\_\_\_  
A. malleable                      B. brittle                      C. ductile                      D. elastic
4. Which of the materials below is a poor conductor of heat?  
A. Iron                      B. Wood                      C. Gold                      D. Copper
5. \_\_\_\_ is the characteristic or trait that can be observed when a matter reacts to another substance.  
A. Intensive Physical Property                      C. Chemical Property  
B. Extensive Physical Property                      D. Physical Property
6. \_\_\_\_ property is the characteristic or trait of matter that does not depend on the amount.  
A. Intensive Physical Property                      C. Chemical Property  
B. Extensive Physical Property                      D. Physical Property
7. \_\_\_\_ is the characteristic or trait of matter that can be observed or perceived with our senses easily without changing its chemical composition.  
A. Intensive Physical Property                      C. Chemical Property  
B. Extensive Physical Property                      D. Physical Property
8. \_\_\_\_ is the characteristic or trait of matter which is dependent on the amount or quantity.  
A. Intensive Physical Property                      C. Chemical Property  
B. Extensive Physical Property                      D. Physical Property
9. Color and taste are examples of \_\_\_\_  
A. Intensive Physical Property                      C. Chemical Property  
B. Extensive Physical Property                      D. Physical Property

10. The rusting of iron nail is an example of \_\_\_\_
- A. Intensive Physical Property      C. Chemical Property  
B. Extensive Physical Property      D. Physical Property



**HOLD ON AMIGO!!!**

**DIRECTION:** Rest for 1 minute then you may start reading the lesson 1 below about Properties of Matter.

## Lesson 1

# Properties of Matter

Do not judge the book by its cover. A saying or quote that is applicable not only to the persons we encounter every day but also to the things we use. The said saying reminds us to avoid making unnecessary or offending comment to someone or something which we know little about them. That is why, it is important for us to understand the process of knowing the properties of matter that will lead us to discern on what makes an object different from other objects. Our understanding on the different properties of matter could help us to avoid accident in selecting the right material. Furthermore, those properties of matter could help us to make new inventions or device that could make our work easier.

This module will discuss the different properties of matter and how the knowledge on properties of matter has influenced the behaviour and actions of people when it comes to their every changing surroundings.



## What's In?

**LET US HAVE SOME FUN!**

**WORD HUNT-** Find the terms listed in the term bank from the jumbled letters.

### TERM BANK

Intensive

Color

Chemical

Size

Extensive

Property

Hot

Shape

Mass

E	M	A	S	S	W	T	O	H	B
X	F	H	I	U	T	N	J	F	H
T	X	C	Z	J	K	S	D	G	L
E	C	H	E	M	I	C	A	L	V
N	O	Q	E	P	A	H	S	B	M
S	L	W	T	Y	U	I	O	P	A
I	O	P	R	P	P	E	R	T	Y
V	R	S	D	F	G	H	J	K	L
E	V	I	S	N	E	T	N	I	V

## JUMBLED LETTERS



**HOLD ON AMIGO!!!**

**DIRECTION:** After you have identified the important terms from the jumbled letters, let us proceed to what's new. Read the direction carefully.



## What's New? (Communication)

### IMPORTANT VOCABULARY WORDS

Read the description of important terms that you will encounter in this module.

#### VOCABULARY WORD

1. Property
2. Mass

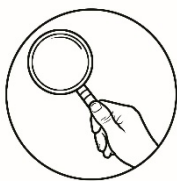
#### MEANING

- It means characteristics, traits or qualities.
- The amount of matter possessed by an object.



**HOLD ON AMIGO!!!**

**DIRECTION:** After finding out the meaning of important terms that you will encounter as you read the next part, make time to read the properties of matter below thoroughly.



# ***What are the Properties of Matter?***

## **Properties of Matter**

If we are to find the meaning of the word property, it means characteristics, traits or qualities. This only means that properties of matter are about the observable characteristics, traits or qualities of matter.

## **What are the Properties of Matter?**

There are two major classifications of the properties of matter. These are; ( 1 ) physical property of matter and ( 2 ) chemical property of matter. Furthermore, the physical properties of matter can still be classified into 2 groups. These are; ( 1 ) intensive physical property and ( 2 ) extensive physical property.

### **1. Physical property**

This refers to the characteristic or trait of matter that can be observed or perceived with our senses easily without changing its chemical composition. To understand this concept, take a look of the picture of the chalk. Could you determine some of the characteristics of the chalk as shown in the picture below?



Based from our observation, we could say that the chalk is white in color and cylindrical in shape. We have identified these characteristics of chalk using our sense. Which sense did we use in determining its color and shape? Very good, we used the sense of sight. This means physical properties of matter can easily determine using our senses without changing or altering the composition of matter.

If color and shape can be determined using our sense of sight, what properties can be determined if we will use the sense of touch and smell. You are right, if we will use the sense of touch, the properties of matter that could determine are the texture and temperature. And if we will use the sense of smell, the property of matter that could determine is the scent.

Now, those physical properties of matter which we have mentioned awhile ago can be classified into two. These are; ( 1 ) intensive physical property and ( 2 ) extensive physical property. How is intensive physical property different from the extensive physical property? To find out, let us read the difference of Intensive Physical Property and Extensive Physical Property.

### **A. Intensive Physical Property**

This is the characteristic or trait of matter that does not depend on the amount. Earlier, we have identified the color and shape of the chalk. Those properties of chalk will fall under intensive physical property because if you increase the amount of chalk, the color and its shape will remain the same which is white and cylindrical in shape. In addition, temperature, malleability, diffusion and ductility are also under intensive physical property of matter.

*Ductility* is the ability of substance to be stretched into wire. A very good example of this property is found in the strings of the guitar or wires inside the electrical connections. Do you see sample of this inside your house?



**Ductility of the copper metal**

*Malleability* is the ability of substance to be hammered or transformed into thin sheet. This can be seen among metals like bracelet, tin cans and metallic roofs of our houses. Do you see sample of this inside your house?



**Malleability of the copper metal**

*Diffusion* is the ability of matter to be scattered or spread out. This can be observed when you add ink into the water. The ink will mix to the water even without stirring it. Can you cite other example of this?





**Diffusion of ink**

### **B. Extensive Physical Property**

It is the characteristic or trait of matter which is dependent on the amount or quantity. Examples of extensive physical properties of matter are size, mass, volume, density, length and width. This means that if the amount of matter or particles is increased, it may cause change in the size, mass, volume, density, length and width of an object.



**Measuring tape**



**Graduated cylinder**

Which intensive physical properties of matter are being measured by the tape measure and graduated cylinder?



## 2. Chemical Property

This is the characteristic or trait that can be observed when a matter reacts to another substance. Combustibility/flammability and oxidation like rusting are examples of chemical properties of matter.



**Flammability of Paper**

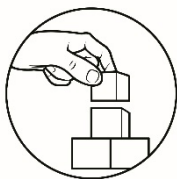


**Rusting of Iron Roof**



### ***HOLD ON AMIGO!!!***

Did you understand what you have read about the properties of matter? If yes, let us proceed to the mini-performance task. You are about to perform the procedure as instructed in the Mini-performance task. Read and follow the procedure carefully. Good luck!



### ***Mini-Performance Task*** ***(Collaboration)***

## **Activity 1- Testing the Properties of Matter**

### **Procedure**

1. Prepare a spoon of sugar, salt, water, cooking oil and tissue paper using measuring spoon then place each in separate containers.
2. Observe the five substances then complete the table below by determining their physical and chemical properties.

### Data and Result

<b>Substance</b>	<b>Mass (g)</b>	<b>Color</b>	<b>Taste</b>	<b>Flammability</b>
1. Salt				
2. Sugar				
3. Water				
4. Cooking oil				
5. Tissue paper				

### Questions

1. Which substances have similar physical property? Explain your answer.
2. Which substances have the same mass? How about color, taste and flammability?
3. Which substance is said to be flammable? What precautionary measure could you cite about flammable materials?
4. Which property is extensive physical property? How about the intensive physical property and chemical property of matter?



#### ***HOLD ON AMIGO!!!***

*Congratulations Mi Amigo! You have just finished the lesson 1. Let us continue our journey as we about to tackle the next lesson.*

## **Lesson 2**

### **Uses of the Properties of Matter**

Many products which we are using at home have similarities to one another. Good examples of these are the sugar and salt which are both white in color. Because of this similarity in color, some people may get confuse on which of the salt and sugar will they use specially in times of urgency. Because of this, people should be familiar with the different properties of matter to various reasons. First is to avoid accident because of the wrong choice of substance, and secondly is get the best result by using the right material.

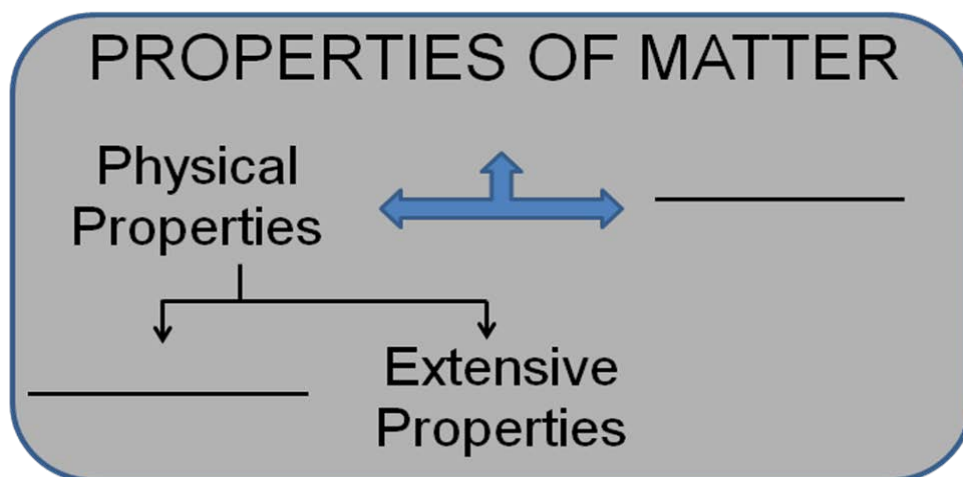
This module will cite some uses of the properties of matter in our practical life.



## ***What's In?*** *(Critical Thinking)*

### **CONCEPT MAPPING**

Analyze and complete the concept map below about the properties of matter.



### ***HOLD ON AMIGO!!!***

Are those words you have listed inside the blank of the concept map about the properties of matter correct? Could you explain why?



## ***What's New?*** *(Communication)*

### **IMPORTANT VOCABULARY WORDS**

Read the description of important terms that you will encounter in this module.

#### **VOCABULARY WORD**

1. Physical Property

#### **MEANING**

The characteristic or trait of matter that can be observed or perceived with our senses easily without changing its chemical composition.

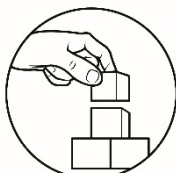
## 2. Chemical Property

The characteristic or trait that can be observed when a matter reacts to another substance.



### ***HOLD ON AMIGO!!!***

Did you find the meaning of the important concepts? If yes, let us proceed to the mini-performance task. You are about to simulate a crime scene. Read and follow the procedure carefully. Good luck!



## **Mini-Performance Task** *(Creativity and Collaboration)*

### **Activity 2- Detective Conan**

#### **Procedure**

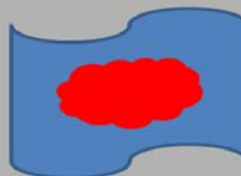
1. A crime situation is presented to you. You need to solve the crime by using your senses and given information.
2. Fill in the investigation report correctly.

#### **CRIME SCENE**

A man is found dead in a vacant lot near his work place. In the crime scene, the SOCO collected different pieces of evidence including two pieces of cloth tainted with unknown stains. The police are hoping that through these pieces of evidence they could find the culprit or criminal.



**Cloth A**



**Cloth B**

**Pieces of evidence**

## Data and Result

Crime: \_\_\_\_\_ Date: \_\_\_\_\_  
Piece of collected evidence: \_\_\_\_\_

OBSERVATIONS:  
Cloth A \_\_\_\_\_  
\_\_\_\_\_  
Cloth B \_\_\_\_\_  
\_\_\_\_\_  
Final Findings: \_\_\_\_\_

## Questions

1. Which of the cloth A and cloth B can be used as possible source of evidence in the crime? Why?
2. Which property of matter did you use in making your observation?



## ***What I Have Learned?*** *(Critical Thinking)*

You have to fill in the L component of the KWL chart to generalize the things they have learned about the topic.

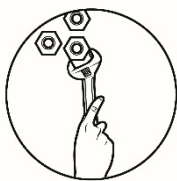
**KWL Chart**

<b>Topic</b>	<b>Know</b>	<b>Want to know</b>	<b>Learned</b>
Properties of Matter			I have learned that ....



### ***HOLD ON AMIGO!!!***

After you have filled-in the L component of the chart, proceed now to the what I can do.



## **What I Can Do?** *(Character and Creativity)*

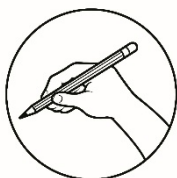
### **WORK IN PROGRESS**

You are tasked to make an alternative disinfectant for corona virus. Which materials are you going to use and why? Explain how this product could promote nationalism and compassion to others.



### **HOLD ON AMIGO!!!**

*Congratulations Mi Amigo! You are almost done in lesson 2. Let us do the last part which is the assessment.*



## **Assessment** *(Critical Thinking)*

### **FORMATIVE ASSESSMENT**

**A. Classification.** Categorize the following properties of matter as intensive physical property, extensive physical property or chemical property.

1. Coal is used to produce electricity by burning them to power the generator.
2. Water freezes at 0°C.
3. Salt and refined sugar are both white in color.
4. 5 kg. rice is as heavy as 5 kg. newly harvested cotton.
5. Silver is usually tarnished when exposed to air forming silver oxide.
6. Color of the paper
7. Combustibility of plastic
8. Length of paper
9. Mass of the paper
10. Boiling point of water.

**B. Essay- Read and answer the question below properly and correctly.**

Which intensive physical property is observed when the droppings of a person seated inside a closed room has able to reach a person who is 1 meter away from him after sneezing? If you were that person, what would you do to avoid this?



### **HOLD ON AMIGO!!!**

*Congratulations Mi Amigo!!! We are done in this module. You may now proceed to the next module. See you next time.*

## REFERENCES

Mendoza E. and Religioso T. (2008). *Chemistry Laboratory Manual*. Phoenix Publication

Mendoza E. (2003). *Chemistry Textbook*. Phoenix Publication

### Acknowledgements

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**ANSWER SHEET**  
**Module 1 - Properties of Matter**

Name: \_\_\_\_\_ Grade/ Sec. \_\_\_\_\_ Score: \_\_\_\_  
Teacher: \_\_\_\_\_ School: \_\_\_\_\_ Date: \_\_\_\_

**General Direction:** Write your answers here from Pre-Test to Post-Test including the answers in the activities. Detach and submit this part to your teacher upon his/her direction which usually given after you have completed this module.

**KWL CHART**

Topic	Know	Want to know	Learned
Properties of Matter			

**PRE-TEST**

- |    |    |    |    |     |
|----|----|----|----|-----|
| 1. | 3. | 5. | 7. | 9.  |
| 2. | 4. | 6. | 8. | 10. |

**POST-TEST**

- |    |    |    |    |     |
|----|----|----|----|-----|
| 1. | 3. | 5. | 7. | 9.  |
| 2. | 4. | 6. | 8. | 10. |

**Essay: Use the back part of the paper or this part.**

**WORD HUNT**

E	M	A	S	S	W	T	O	H	B
X	F	H	I	U	T	N	J	F	H
T	X	C	Z	J	K	S	D	G	L
E	C	H	E	M	I	C	A	L	V
N	O	Q	E	P	A	H	S	B	M
S	L	W	T	Y	U	I	O	P	A
I	O	P	R	P	P	E	R	T	Y
V	R	S	D	F	G	H	J	K	L
E	V	I	S	N	E	T	N	I	V

## Activity 1- Testing the Properties of Matter

### Data and Result

<b>Substance</b>	<b>Mass (g)</b>	<b>Color</b>	<b>Taste</b>	<b>Flammability</b>
1. Salt				
2. Sugar				
3. Water				
4. Cooking oil				
5. Tissue paper				

### Answer to Questions

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

### CONCEPT MAPPING



## Activity 2- Detective Conan

### Data and Result

Crime: \_\_\_\_\_ Date: \_\_\_\_\_

Piece of collected evidence: \_\_\_\_\_

OBSERVATIONS:

Cloth A \_\_\_\_\_

Cloth B \_\_\_\_\_

Final Findings: \_\_\_\_\_

### Answer to the Questions

1. \_\_\_\_\_
2. \_\_\_\_\_