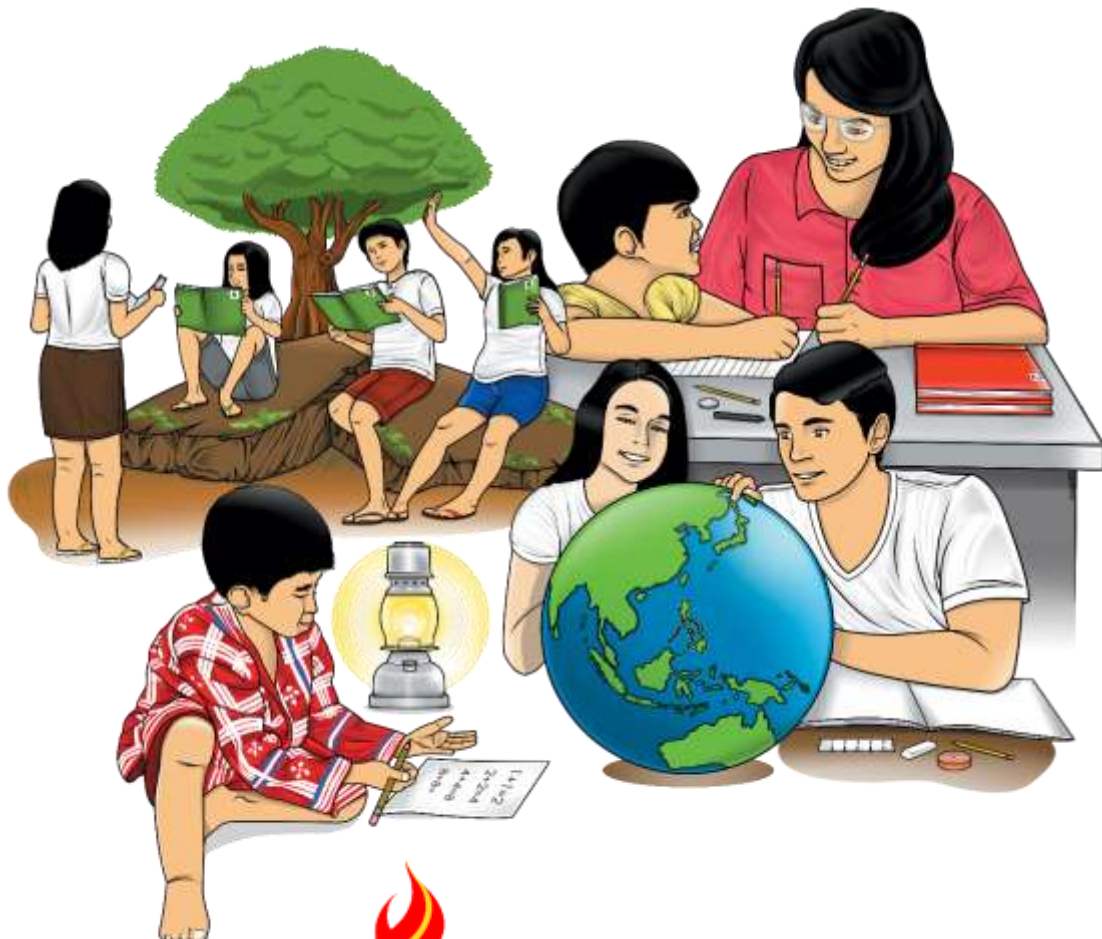


Science

Quarter 3 – Module 1: The Particle Nature of Matter



Science – Grade 8
Alternative Delivery Mode
Quarter 3 – Module 1: The Particle Nature of Matter
First Edition, 2020

Republic Act 8293, section 176 states that: No copyright shall subsist in any work of the Government of the Philippines. However, prior approval of the government agency or office wherein the work is created shall be necessary for exploitation of such work for profit. Such agency or office may, among other things, impose as a condition the payment of royalties.

Borrowed materials (i.e., songs, stories, poems, pictures, photos, brand names, trademarks, etc.) included in this module are owned by their respective copyright holders. Every effort has been exerted to locate and seek permission to use these materials from their respective copyright owners. The publisher and authors do not represent nor claim ownership over them.

Published by the Department of Education
Secretary: Leonor Magtolis Briones
Undersecretary: Diosdado M. San Antonio

Development Team of the Module

Writers: Lynnette C. Dua, Eva A. Bentes

Editor: Rowena A. Ga

Reviewers: Bernabe L. Linog, Edna Esplana Trinidad, Jane C. Basul,
Kevin Hope Z. Salvaña, Romeo A. Villarín, Alfonz Lexie John C. Basul,
Myra Joy B. Montero, Pamela Lou C. Suazo

Illustrator: Rosa Mia L. Pontillo

Layout Evaluators: Celeste Faith R. Almanon, Jay S. Ayap, Ana Lorma A. Dahiroc

Management Team: Francis Cesar B. Bringas
Isidro M. Biol, Jr.
Maripaz F. Magno
Josephine Chonie M. Obseñares
Gregoria T. Su
Marvilyn C. Francia
Jay S. Ayap
Nonita C. Patalinghug

Printed in the Philippines by _____

Department of Education – Caraga Region

Office Address: Teacher Development Center
J.P. Rosales Avenue, Butuan City, Philippines 8600

Telefax: (085) 342 – 8207 / (085) 342 - 5969

E-mail Address: caraga@deped.gov.ph

Science

Quarter 3 – Module 1: The Particle Nature of Matter

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, exercises, 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 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, Notes 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 unnecessary 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

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

This module contains:

- **Lesson 1** - The Particle Nature of Matter

After going through this module, you are expected to:

1. Describe the particle nature of matter; and
2. Explain the properties of solids, liquids, and gases based on the particle nature of matter. (**MELC Week 1-2 S8MT-IIIa-b-8**)



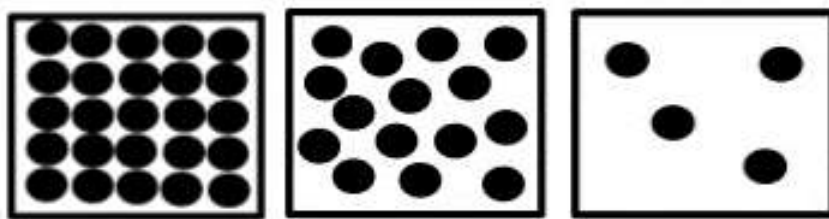
What I Know

Directions: Choose the letter of the correct answer. Write your answers on a separate sheet of paper.

1. Which of the following statements BEST describes matter?
 - A. It has weight.
 - B. It is a form of energy.
 - C. It has a definite shape.
 - D. It occupies space and has mass.
2. Which is NOT an example of matter?
 - A. air
 - B. chalk
 - C. sound
 - D. water
3. Which of the following sets of samples below is NOT matter?
 - A. air, water, love
 - B. idea, chair, chalk
 - C. crayon, light, heat
 - D. light, shadow, feeling

4. Which of the following statements is TRUE regarding the particle nature of matter?
- Matter is not made of tiny particles.
 - Particles of matter are moving all the time.
 - Particles of matter do not attract each other.
 - Spaces between the particles are filled with air.
5. Which of the following has the weakest force of attraction between the particles?
- gas
 - liquid
 - solid
 - vacuum
6. What happens to the attractive forces of liquid particles when they are cooled?
- start to weaken
 - start to decrease
 - remain the same
 - start to strengthen
7. The attractive force of the particles of a gas is described as _____ attractive force.
- weak
 - strong
 - very strong
 - intermediate

For numbers 8 – 10. Refer to the illustrations given.



A

B

C

Which of the above illustrations represents the particles of solid? liquid? gas?

8. Solid _____
9. Liquid _____
10. Gas _____

11. Which of the following statements BEST describes the particles of a gas?
- All the particles are attached from each other.
 - The particles are not attached and moving slowly.
 - The particles are arranged in sequence and moving rapidly.
 - The particles are not attached and are moving rapidly in any direction.

12. Which statement describes the particles of solid?
- A. Its particles are closely packed and held together by strong attractive force.
 - B. Its particles have enough space, definite volume but have indefinite shape.
 - C. Its particles are far from each other and have an indefinite volume and shape.
 - D. Its particles are free to move slowly but it takes the shape of their container.
13. Which of the following states of matter cannot be held by your hand?
- A. Gas
 - B. Liquid
 - C. Solid
 - D. Both A and B
14. Why do liquids have definite volume but have indefinite shape?
- A. Because its particles are closely packed and have strong attractive forces.
 - B. Because its particles are far from each other and they occupy the entire space available.
 - C. Because its particles are free to move easily and are held together by less attractive force.
 - D. Because its particles have weak attractive forces and are moving from one place to another.
15. Which pair of states of matter has definite volume?
- A. Solid and gas
 - B. Gas and liquid
 - C. Liquid and solid
 - D. None of the above

Lesson

1

The Particle Nature of Matter

What properties are common on the pictures below?



Photo Credits: Lynnette C. Dua

There are three words that are important to recall as you begin this lesson: mass, volume, matter.

Mass is _____.

Volume is _____.

Matter is _____.

Write a statement that connects the three words (mass, volume, matter) together.

The pictures above can be categorized as _____.

Can we say that all the things surround us are examples of matter?

This module on the Particle Nature of Matter shifts students' macroscopic view of materials being emphasized from Grade 3 to 7 to the sub-microscopic of matter.



What's In

Activity 1. Which is matter? Which is not?

Objectives:

1. Identify examples of matter; and
2. Distinguish properties of matter from non-matter.

A. **Directions:** Draw ♥ if the sample has mass and ♦ if not. Write your answers on a separate sheet of paper.

Sample	Does each sample have mass?
a. Air inside the ball	
b. Flour	
c. Human Heart	
d. Light	
e. Leaves	
f. Smoke	
g. Sound	
h. Toy	

Which of the given samples have measurable mass?

B. **Directions:** Draw 😊 if the sample occupies space and ○ if not. Write your answers on a separate sheet of paper.

Sample	Does each sample occupy space?
a. Air inside the ball	
b. Flour	
c. Human Heart	
d. Light	
e. Leaves	
f. Smoke	
g. Sound	
h. Toy	

Which of the given samples occupy space?

C. **Directions:** Write \checkmark if the sample is matter and X if not. Write your answers on a separate sheet of paper.

Sample	Does each sample an example of matter?
a. Air inside the ball	
b. Flour	
c. Human Heart	
d. Light	
e. Leaves	
f. Smoke	
g. Sound	
h. Toy	

- Is smoke an example of matter? _____
Does it have mass? _____
Does it occupy space? _____
- Are toys and leaves examples of matter? _____
Do they occupy space? _____
Do they have mass? _____
- In the activity given, how do you identify the sample as matter?

- What is your basis in identifying such samples?

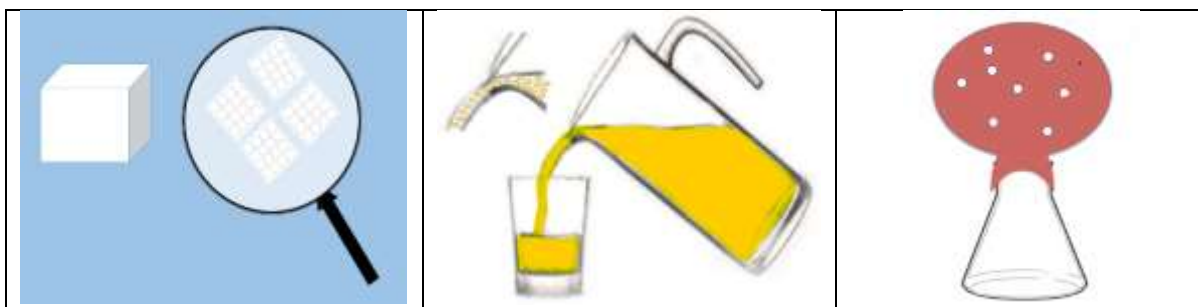


What's New

Matter

Everything we see or even not seen in the universe is matter. Matter is anything that occupies space and has mass. Leaves, human hearts, toys, flour, smoke, and air are examples of matter because they occupy space and have mass. Light and sound are not examples of matter since they do not occupy space nor have mass.

Matter is made of tiny particles. These particles are arranged depending on their states. The arrangement of particles of each state gives matter its own unique properties. In the pictures below, a solid material, a liquid material, and a gas inside a balloon can be viewed sub-microscopically as substances composed of tiny particles.



Illustrated by: Lynnette C. Dua

Ice cube

Juice

Air insi

Activity 2. Are the particles of matter moving?

Objective:

1. Infer from the observation that particles of matter move.

Procedure:

1. Study Figures 1–3 which show the arrangement of particles of matter.
2. Word check: Write the meaning of the following words on your answer sheet.
 - A. Closed-pack _____
 - B. Near _____
 - C. Far _____
 - D. Vibrating _____
 - E. Flow _____
3. Answer the questions that follow. Choose the correct answers inside the parenthesis and write them on your answer sheet.

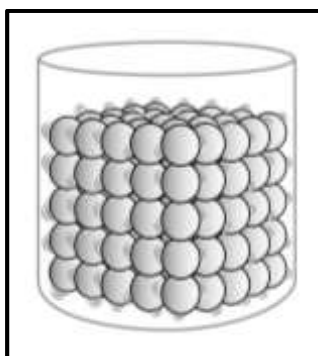


Figure 1. Solid

A. The particles of solid (Figure 1).

1. What can you say about the arrangement of particles in solid? (closely packed, near, far)
2. Can you infer that solid particles move? (yes, no)
3. How? (by vibrating, by flowing)

Source: DedEd Science 8
Learner's Module, 2013

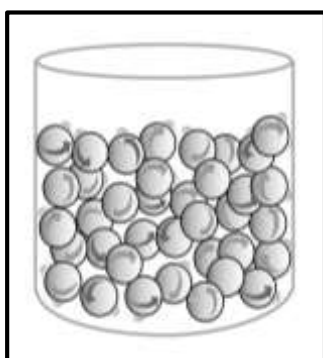


Figure 2. Liquid

B. The particles of liquid (Figure 2).

4. What can you say about the arrangement of particles in liquid? (closely packed, near, far)
5. Can you infer that liquid particles move? (yes, no)
6. How? (by vibrating, by flowing)

Source: DedEd Science 8
Learner's Module, 2013

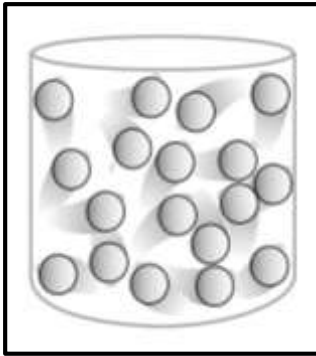


Figure 3. Gas

Source: DedEd Science 8
Learner's Module, 2013

C. The particles of gas (Figure 3).

7. What can you say about the arrangement of particles in gas? (closely packed, near, far)
8. Can you infer that gas particles move? (yes, no)
9. How? (by vibrating, by flowing, moving from one place to another in any direction faster compared to liquid)



What is It

Matter has three states namely: solid, liquid and gas. Each state has different arrangement of particles.

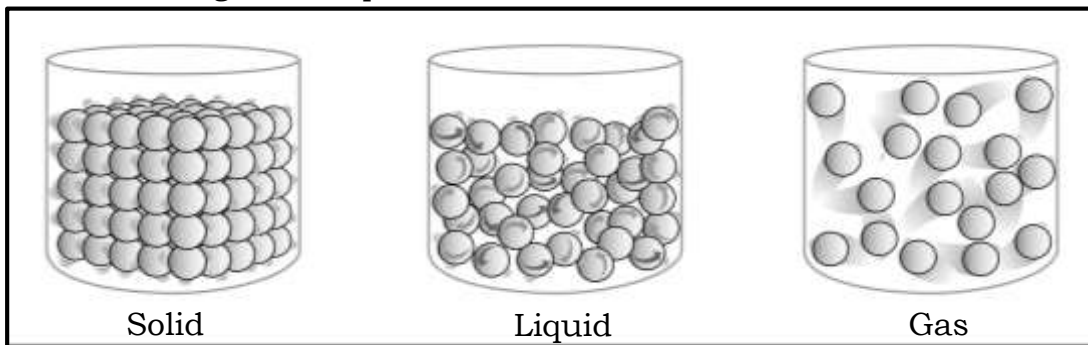


Figure 4. Arrangement of particles in solid, liquid and gas

Source: DedEd Science 8 Learner's Module, 2013

Solid

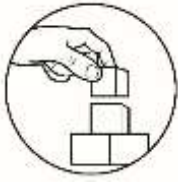
It has definite shape and volume because its particles are closely packed together in a fixed position. These particles vibrate and are held together by strong attractive forces. It is difficult to compress the particles.

Liquid

It has a definite volume and takes the shape of the container. Liquid flows easily because its particles have enough space and have less attractive force. The spaces in the particles allows particles to be compressed a little bit.

Gas

It takes the volume and shape of the container. Gas particles are far from each other that is why they have the weak attractive force and can flow easily. They occupy the entire space available. The large spaces in between particles allows particles to be compressed easily.



What's More

Activity 3. Select My Box!

Directions: Inside the box are descriptions of the particle nature of matter. Choose the letter of the correct description that characterizes the 5 given samples. Write your answers on a separate sheet of paper.

- A. The particles are closely packed and are held together by strong attractive force.
- B. The particles are free to move easily and are held together by less attractive force.
- C. The particles are far from each other and they occupy the entire space available.

- 1. Book
- 2. Raindrops
- 3. Perfume in air
- 4. Steam produced in cooking rice
- 5. Chocolate drink

Activity 4. Pinpoint!

Directions: Analyze the given situations then answer the questions below. Write your answers on a separate sheet of paper.

Situation 1: Hundreds of Grade 8 students were seated in rows during a science lecture.

Situation 2: The same Grade 8 students were permitted to stay in a room to have a 10-minute break.

Situation 3: After the lecture, the students hurried out for their next class.

Which situation above represents:

- 1. Solid state _____
- 2. Liquid state _____
- 3. Gaseous state _____

Activity 5. Match Me!

Directions: Match the state of matter to its property by writing the letter of the correct answers on a separate sheet of paper.

States of Matter

- A. Gas
 - B. Liquid
 - C. Solid
- Properties

- ___ 1. Has a definite shape.
- ___ 2. Particles are closely packed.
- ___ 3. Particles are held by weak attractive forces.
- ___ 4. Easy flowing in any direction faster compared to liquid.
- ___ 5. Has a definite volume and takes the shape of the container.



What I Have Learned

Directions: Fill in the blanks with the correct answer. Write your answers on a separate sheet of paper.

Matter is made of tiny (1) _____. It has three states; (2) _____, (3) _____, and (4) _____.

Solid particles have (5) _____ shape and volume. These particles vibrate and held together by (6) _____ attractive forces.

Liquid particles have (7) _____ volume and take the shape of the container. These particles have less attractive forces and they easily flow.

Gas particles take the volume and shape of the container. Gas particles are far from each other and have (8) _____ attractive force. They easily flow in any direction faster than liquid particles and occupy the entire space available.



What I Can Do

Water exists in three states such as ice as solid state, water as liquid state, and water vapor as gas state. In what activity do these three states of water can be applied in your daily lives? Cite examples. Write your answers on a separate sheet of paper.

Scoring Rubrics

- 3 – Discussions did not have misconceptions; with complete scientific evidence.
- 2 – Discussions did not completely show scientific evidence.
- 1 – Discussions did not show complete scientific evidence; with misconceptions.
- 0 – There is no discussion shown.



Assessment

Directions: Choose the letter of the correct answer. Write your answers on a separate sheet of paper.

1. When you are observing a sample of matter you are focusing a particular characteristic. What term refers to the characteristics that describe a sample of matter?
 - A. color
 - B. mass
 - C. property
 - D. volume
2. Which of the following given sets of samples are solids?
 - A. stone, nail, pen
 - B. ice, water, crayon
 - C. radio, car, gasoline
 - D. oxygen, stone, ice cream
3. Which of the following is NOT true about the particles of solids, liquids, and gases?
 - A. Liquids have definite volume.
 - B. Gas particles are far from each other.
 - C. Solids have indefinite shape and volume.
 - D. Liquids take the shape of their containers.

4. Which of the following statements is FALSE regarding the particle model of matter?
 - A. The particles of matter in solid attract each other.
 - B. The particles of matter in solid are vibrating in a fixed position.
 - C. The space in between the particles of matter in solid is filled with air.
 - D. The particles of matter in a gas are randomly moving in any direction.

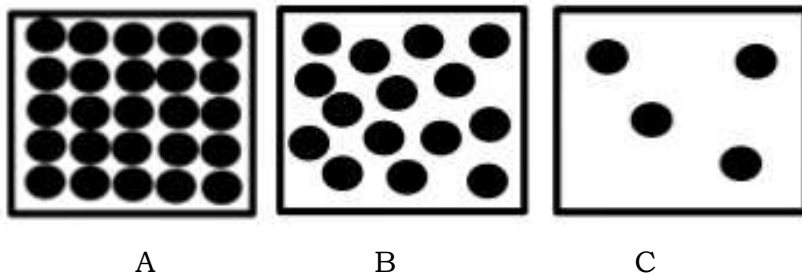
5. Which of the following states of matter allow an easy flow of particles?
 - A. Gas and liquid
 - B. Liquid and solid
 - C. Solid and gas
 - D. Solid, liquid and gas

6. Which of the following has the strongest force of attraction between the particles?
 - A. gas
 - B. liquid
 - C. solid
 - D. vacuum

7. Which BEST describes the particles of a solid?
 - A. completely unmoving
 - B. vibrating at a fixed position
 - C. have weak attractive force
 - D. have large spaces in between

8. Which of the following states of matter has an indefinite shape and definite volume?
 - A. gas
 - B. liquid
 - C. solid
 - D. both a and b

For numbers 9-11. Refer to the illustrations given.



- Which of the above illustrations represents the particles of solid? liquid? gas?
9. Gas _____
 10. Solid _____
 11. Liquid _____

12. When you inflate a balloon with air, it takes the shape and volume of the container. Why do gases like air do NOT have definite shape and volume?
- A. Because gases are free to move slowly.
 - B. Because gases have weak attractive forces.
 - C. Because gases do not have attractive forces.
 - D. Because gases have strong attractive forces.
13. Which pair of states of matter has indefinite shape?
- A. gas and solid
 - B. liquid and gas
 - C. solid and liquid
 - D. none of the above
14. Which of the following statements BEST describes the particles of a liquid?
- A. Particles are closely packed.
 - B. Particles are free to move slowly.
 - C. Particles are far from each other.
 - D. Particles are held by strong attractive forces.
15. Which of the following samples of matter is held together by strong attractive forces?
- A. water
 - B. ice cubes
 - C. water vapor
 - D. orange juice



Additional Activities

Directions: Group the listed materials below according to their given states. Write your answers on a separate sheet of paper.

1. Vinegar
2. Urine
3. Powdered Juice
4. Copper wire
5. Salt
6. Rice grains
7. Buko juice
8. Plastic bottle
9. Hydrogen gas
10. Water vapor



Answer Key

<p>Additional Activities</p> <p>Solid Powdered Juice Cooper Wire Salt Rice grains Plastic bottle</p> <p>Liquid Vinegar Urine Buko juice</p> <p>Gas Hydrogen gas Water vapor</p>	<p>Assessment</p> <p>1. C 2. A 3. C 4. C 5. A 6. C 7. B 8. B 9. C 10. A 11. B 12. B 13. B 14. B 15. B</p>	<p>What I Can Do</p> <p>Example</p> <p>Boiling of water, making of ice cream/ice candy, drying of wet clothes and etc.</p>
<p>What's New</p> <p>Act1: 2. Expected answers A. closed-pack D. Vibrating - shaking B. Near- close/nearby E. Flow - move C. Far - Great distance A. Solid 1. closely packed 2. yes, 3. by vibrating B. Liquid 4. near 5. yes 6. by flowing C. Gas 7. far 8. yes, 9. by moving from one place to another in any direction faster compared to liquid.</p>	<p>What's More</p> <p>Activity 5: 1. C 2. C 3. A 4. A 5. B</p> <p>What I Have Learned</p> <p>1. Particles 2. Solid 3. Liquid 4. Gas 5. Definite 6. Strong 7. Definite 8. Weak</p>	<p>What's More</p> <p>Activity 3: 1. A 2. B 3. C 4. C 5. B</p> <p>Activity 4: 1. Situation 1 2. Situation 2 3. Situation 3</p>
<p>What's In</p> <p>B. a. ☺ b. ☺ c. ☺ d. ○ e. ☺ f. ☺ g. ○ h. ☺ 2. Air, flour, human heart, leaves, smoke and toy</p>	<p>What's In</p> <p>A. a. ▲ b. ▲ c. ▲ d. ◇ e. ▲ f. ▲ g. ◇ h. ▲ 1. Air, flour, human heart, leaves, smoke and toy</p>	<p>What I know</p> <p>1. D 2. C 3. D 4. B 5. A 6. D 7. A 8. A 9. B 10. C 11. D 12. A 13. A 14. C 15. C</p>

References

- Campo, Pia et al. 2013. *Science 8 Learner's Module*. Pasig City: Department of Education.
- Education, Department of. n.d. "Project EASE (Effective Alternative Secondary Education) CHEMISTRY." In *Moduel 15: Changes That Matter Undergoes*, 4-6. Pasig City: Bureau of Secondary Education.
- . 2004. *Science and Technology III CHEMISTRY Textbook*. Quezon City: Department of Education.

For inquiries or feedback, please write or call:

Department of Education - Bureau of Learning Resources (DepEd-BLR)

Ground Floor, Bonifacio Bldg., DepEd Complex
Meralco Avenue, Pasig City, Philippines 1600

Telefax: (632) 8634-1072; 8634-1054; 8631-4985

Email Address: blr.lrqad@deped.gov.ph * blr.lrpd@deped.gov.ph