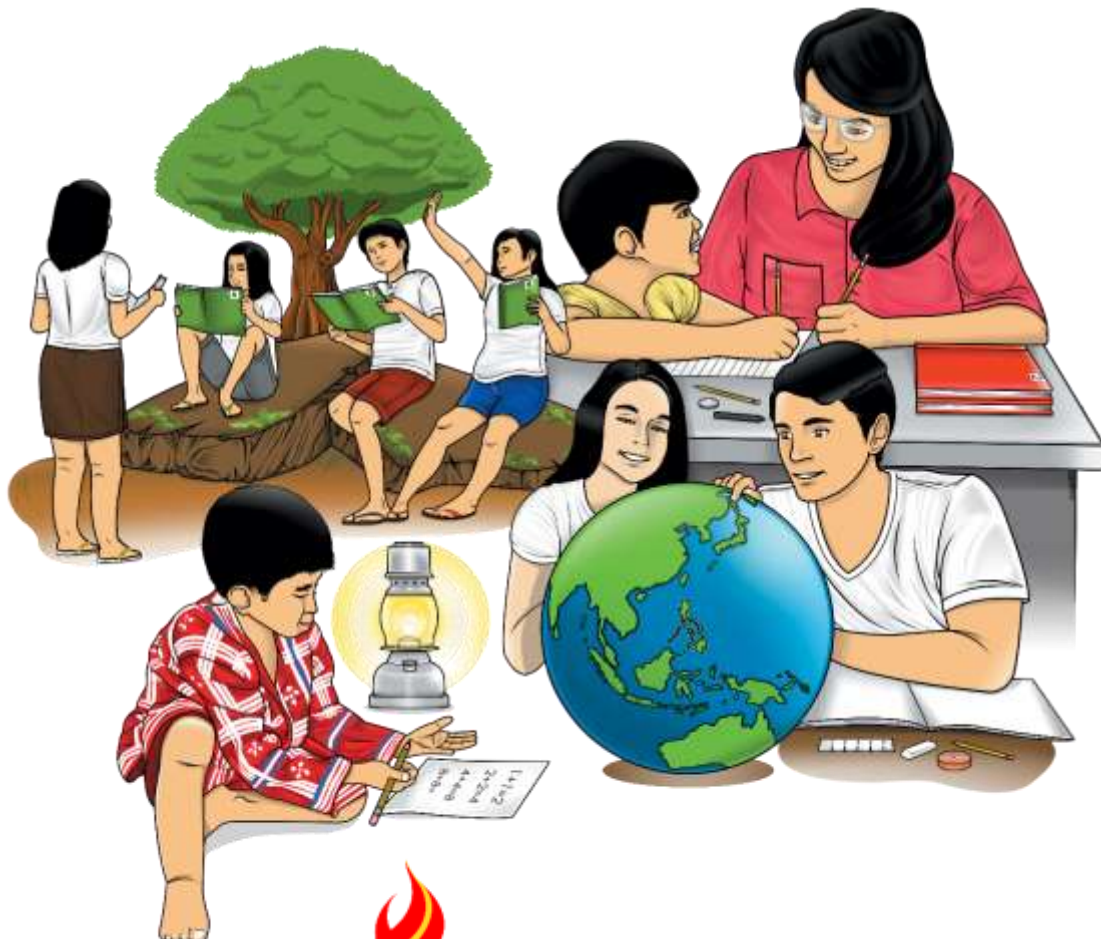


# Science

## Quarter 4 – Module 7: Construct a Model of the Solar System



**Science– Grade 6**  
**Alternative Delivery Mode**  
**Quarter 4 – Module 7: Construct a Model of the Solar System**  
**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**

**Writer:** Eva D. Granada

**Editor:** Sheila V. Quirino

**Reviewers:** Emilie P. Nono, Ma. Irene M. Estrera

**Illustrators:** Orencio D. Estrera, Luke D. Granada

**Layout Artists:** Orencio D. Estrera, Antionette D. Sacyang

**Management Team:** Ma. Gemma M. Ledesma and Josilyn S. Solana

Gladys Amylaine D. Sales and Mitchell L. Acoyong

Elena P. Gonzaga

Donald T. Genine

Janalyn V. Navarro

Ellen G. Dela Cruz

Edna Rose P. Gueco

Printed in the Philippines by \_\_\_\_\_

**Department of Education – Region VI**

Office Address: Duran St., Iloilo City  
Telefax: (033) 336-2816, (033) 509-7653  
E-mail Address: bacolod.city@deped.gov.ph

# Science

## Quarter 4 – Module 7: Construct a Model of the Solar System

## **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 construct a model of the solar system showing the relative sizes of the planets and their relative distances from the Sun (S6ES-IVi-j-7). The scope of this module allows you to use it 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.

After going through this module you are expected to:

1. identify the position of each planet in the solar system; and
2. make a model of the solar system showing relative sizes of the planets and their relative distances from the Sun.



## What I Know

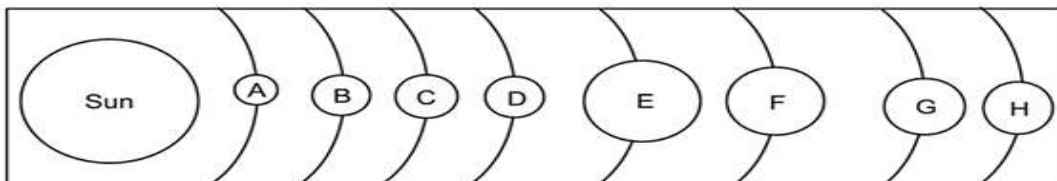
Read each item carefully. Write the letter of the correct answer.

1. Nathan is making a model of the solar system. Which planets in the diagram are not in its proper order?

**Mercury-Earth-Venus-Mars-Jupiter-Saturn-Uranus-Neptune**

- A. Earth and Venus
  - B. Mercury and Earth
  - C. Saturn and Jupiter
  - D. Uranus and Neptune
2. How does a solar system model help us?
    - A. They show which planet are rocky.
    - B. They show how to go to other planets.
    - C. They show which planets are colorful.
    - D. They show the relative size and distance of the planets.
  3. Which of the following are the inner planets of the solar system?
    - A. Mercury, Venus, Earth, Mars
    - B. Sun, Mercury, Jupiter, Saturn
    - C. Neptune, Uranus, Earth, Mars
    - D. Jupiter, Saturn, Uranus, Neptune

For questions No. 4 and 5 refer to Figure 1.



**Figure 1.** Diagram of the Solar System  
*Illustrate by Orencio D. Estrera*

4. Which planet in Figure 1 represents the Earth?
  - A. B
  - B. C
  - C. D
  - D. E

5. In Figure 1, which planet represents Neptune?
  - A. E
  - B. F
  - C. G
  - D. H
  
6. Which of the following is the center of the solar system?
  - A. Sun
  - B. Jupiter
  - C. Asteroid
  - D. Mercury
  
7. Which of the following is the largest planet in the solar system?
  - A. Earth
  - B. Saturn
  - C. Jupiter
  - D. Neptune
  
8. Which of the following is the fourth planet from the Sun?
  - A. Mars
  - B. Earth
  - C. Venus
  - D. Jupiter
  
9. Which of the following is the seventh planet in the solar system?
  - A. Earth
  - B. Jupiter
  - C. Uranus
  - D. Neptune
  
10. Which of the following is the fourth largest planet in diameter?
  - A. Earth
  - B. Jupiter
  - C. Uranus
  - D. Neptune

## Lesson

# 1

## Construct a Model of the Solar System Showing the Relative Sizes of the Planets and their Relative Distances from the Sun

The eight planets travel around the Sun and comprise the solar system. The planets are held in orbit by the Sun's gravity.

There are four inner or terrestrial planets. They are called terrestrial planets because they have a compact, rocky surface like Earth's solid surface and relatively small but massive. The four outer planets are Jovian planets. They are called Jovian planets because have relatively small, dense cores surrounded by massive layers of gas.



### *What's In*

In the past lesson, you have learned that the solar system is composed of the eight planets that revolve around the Sun.

Answer the questions below about the solar system. Select the correct answer inside the parenthesis and write your answer in your answer sheet.

1. Which planet in the solar system is closest to the Sun?  
(Mercury, Neptune, Earth, Saturn)
2. Which of the following is located in the outermost part of the solar system?  
(Venus, Earth, Mars, Saturn)
3. What is the third planet from the Sun?  
(Mercury, Venus, Earth, Mars)
4. Which of the four planets has the hottest temperature?  
(Venus, Earth, Mars, Jupiter)
5. Which is the largest planet in the Solar System?  
(Mars, Jupiter, Uranus, Neptune)





## What's New

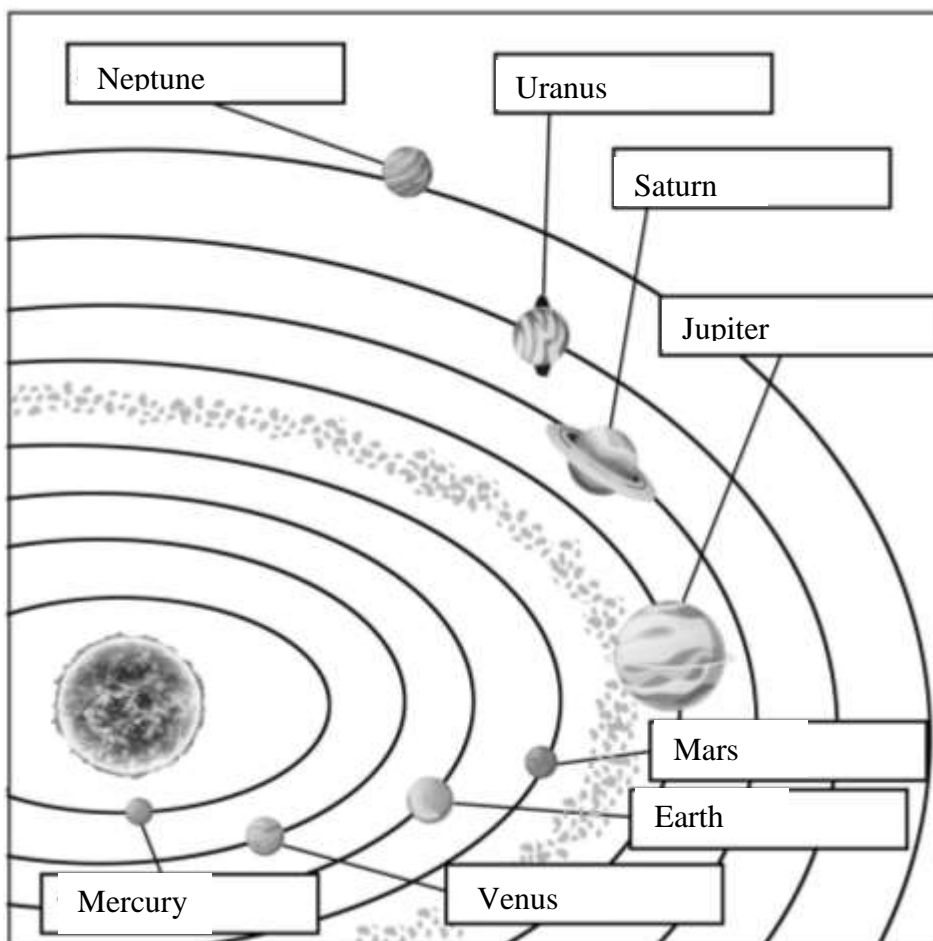
The eight planets in the solar system are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. The planets are classified into inner and outer planets.

The inner or terrestrial planets are Mercury, Venus, Earth, and Mars. They are solid and are mostly made up of rocks and metal; they do not have rings. These are the planets closer to the Sun.

The outer or Jovian planets are Jupiter, Saturn, Uranus, and Neptune. They are called gas giants. These gas giants are so-called because they are much larger than the terrestrial planets and are mostly made up of gas. All of these gas giants have rings.

### Activity 1: Space in Between

Study closely the model of the solar system below then answer the questions that follow.



**Figure 2.** Model of the Solar System  
*Illustrated by Orencio D. Estrera*

Analysis questions:

1. Which heavenly body do all the planets in the solar system revolve?
  - A. Sun
  - B. Pluto
  - C. Earth
  - D. Asteroid
2. Which of the following planets has prominent rings?
  - A. Mars
  - B. Earth
  - C. Saturn
  - D. Mercury
3. Which planet is between Venus and Mars?
  - A. Venus
  - B. Earth
  - C. Jupiter
  - D. Uranus
4. Which planets are large and have rings?
  - A. Planetarium
  - B. Solar System
  - C. Inner planets
  - D. Outer planets
5. Which of the four planets below is an outer planet?
  - A. Mars
  - B. Earth
  - C. Jupiter
  - D. Mercury
6. Which is the closest planet to the Sun?
  - A. Mars
  - B. Earth
  - C. Jupiter
  - D. Mercury
7. Which of the eight planets is farthest from the Sun?
  - A. Mars
  - B. Earth
  - C. Neptune
  - D. Mercury



## What is It

The planets in the solar system, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune, are divided into two groups – the inner planets and the outer planets.

The inner planets are closer to the Sun, smaller in size, rock-like structure and dense. The four inner planets, Mercury, Venus, Earth, and Mars, are called terrestrial planets because their surfaces are solid, and mostly made up of silicate rocks while the core is made of iron and nickel.

The outer planets are farther away, larger in size, and made up mostly of gas. These planets - Jupiter, Saturn, Uranus, and Neptune are sometimes called Jovian planets or gas giants because they are very large and are mostly made up of gas. They are huge planets with dense core wrapped by thick gaseous materials.

A simplified number is used to describe a planet's distance from the Sun. It is called an **astronomical unit** or **AU**. It is a unit of length equal to the average distance of Earth from the Sun which is approximately 149,600,000 kilometers or  $14.96 \times 10^7$  Km. Earth is assigned 1 AU. The planets closer to the Sun has less than 1 AU while the planets farther away would have a distance greater than 1 AU. Using AU can help scientists keep the numbers manageable or smaller because distances in the solar system are very large. **Table 1** shows these numbers in kilometers, AU, and scaled distances in centimeters.

**Table 1:** Scale Model of Distances from the Sun

<b>Name of Planets</b> (In order from the Sun)	<b>Average Distance from Sun</b> ( $\times 10^7$ km.)	<b>Distance AU</b>	<b>Model Distance from the sun</b>
Mercury	5.79	0.38	38 millimeters
Venus	10.82	0.72	72 millimeters
Earth	14.96	1.0	1.0 centimeters
Mars	22.28	1.5	1.5 centimeters
Jupiter	77.84	5.2	5.2 centimeters
Saturn	142.70	9.5	9.5 centimeters
Uranus	287.07	19.2	19.2 centimeters
Neptune	449.70	30.1	30.1 centimeters

Planet sizes can be determined from its diameter. A diameter is the distance from one end of a circle or sphere to another side passing through the middle. **Table 2** shows these numbers in kilometers, relative diameter, and scaled sizes in centimeters.

**Table 2:** Scale Model of Relative Diameters of Planets

<b>Name of Planets</b>	<b>Diameter in Kilometers</b>	<b>Relative Diameter Compared to Earth</b>	<b>Size in cm</b>
Mercury	4800	0.376	0.4 cm
Venus	12100	0.949	0.9 cm
Earth	12750	1.00	1 cm
Mars	6800	0.533	0.5 cm
Jupiter	142800	11.2	11 cm
Saturn	120660	9.46	9 cm
Uranus	51800	4.06	4 cm
Neptune	49500	3.88	3 cm



## What's More

### Activity 2: Space Neighbors

In this activity, you will need the following materials:

1. 1/2 of Manila paper or old newspaper
2. Ruler (cm)
3. String or thread
4. Glue
5. Any coloring material available to you

Direction: Construct a model of the solar system showing the relative distances of the planets from the Sun and their relative sizes. Follow the procedure below.

Procedure:

1. Prepare all materials needed.
2. Draw the Sun in the Manila paper.
3. Measure the distances of the planets from the Sun and put a mark labeling it with the name of the planet. Make sure you follow the scaled distances. Refer to Table 1 for the scaled planet distances.
4. Measure the sizes of the planets and draw a circle according to the scaled size where you put the label. Make sure you followed the scaled sizes. Color your work. Refer to Table 2 for the scaled planet sizes.
5. Attach the string from the Sun to each planet using the glue.
6. Label each planet.
7. Your work will be rated following the rubric.

### Rubrics for Constructing a Solar System

Name \_\_\_\_\_

Grade and Section: \_\_\_\_\_

Criteria	Possible Points	Points Received
Title, Name, Planet Label	10	
Planets are in correct order following the scaled distances in Table 1	25	
Planets show relative sizes following the scaled sizes in Table 2.	25	
Creativity, use of color	20	
Neatness	20	
Total	100	



## ***What I Have Learned***

Fill in the blanks below to complete the first three statements. Underline the correct answer inside the parenthesis to complete the last three statements.

large	small
rocky	without rings
inner planet	gaseous
outer planets	with rings

1. I have learned that the two groups of planets in the solar system are \_\_\_\_\_ and \_\_\_\_\_.
2. I have learned that the inner planets are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
3. I have learned that the outer planets are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
4. I have learned that the inner planets are **(smaller, bigger)** than the outer planets.
5. I have learned that the inner planets are **(nearer, farther)** from the Sun.
6. I have learned that the outer planets are **(nearer, farther)** from the Sun.



## ***What I Can Do***

Supply **column B** with the planet's corresponding distance from the Sun in AU units and arrange the planets in order in **column C** by providing their position from the sun (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>...).

**Table 3.** Order of Planets in the Solar System

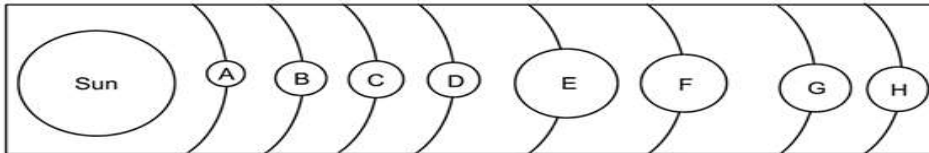
<b>A</b> <b>The Eight Planets of the Solar System</b>	<b>B</b> <b>Distance from the Sun AU</b>	<b>C</b> <b>Correct Order of the Eight Planets based on Distance from the Sun</b>
<b>Saturn</b>		
<b>Earth</b>		
<b>Mercury</b>		
<b>Mars</b>		
<b>Venus</b>		
<b>Neptune</b>		
<b>Jupiter</b>		
<b>Uranus</b>		



## Assessment

Read each item carefully.

The diagram below represents the Sun and planets of our solar system.



**Figure 3: Diagram of the Solar System**

*Illustrated by Orencio D. Estrera*

1. Which planet on Figure 3 represents Jupiter and Saturn?
  - A. B and C
  - B. C and D
  - C. D and E
  - D. E and F
2. In Figure 3, which planet represents Neptune?
  - A. E
  - B. F
  - C. G
  - D. H
3. Which is the largest planet in the solar system?
  - A. Sun
  - B. Jupiter
  - C. Mercury
  - D. Asteroid
4. Kevin is making a model of the solar system. Which two planets in the model below are missing?

**Mercury-\_\_\_\_\_ -Earth-Mars-Jupiter-Saturn-\_\_\_\_\_ -Neptune**

  - A. Earth and Venus
  - B. Venus and Uranus
  - C. Mercury and Earth
  - D. Uranus and Neptune
5. Which planet is the third planet from the Sun?
  - A. Earth
  - B. Venus
  - C. Saturn
  - D. Jupiter
6. How does a solar system model help us?
  - A. They show which planet are rocky.
  - B. They show how to go to other planets.
  - C. They show which planets are colorful.
  - D. They show the relative size and distance of the planets.



7. Which of the following are the outer planets of the solar system?
  - A. Mercury, Venus, Earth, Mars
  - B. Neptune, Uranus, Earth, Mars
  - C. Venus, Mercury, Jupiter, Mars
  - D. Jupiter, Saturn, Uranus, Neptune
8. Which of the following planets is the fifth planet from the Sun?
  - A. Mars
  - B. Jupiter
  - C. Uranus
  - D. Neptune
9. Which of the following is the last planet in the solar system from the Sun?
  - A. Earth
  - B. Uranus
  - C. Jupiter
  - D. Neptune
10. Which of the following is the smallest planet in the solar system?
  - A. Earth
  - B. Jupiter
  - C. Neptune
  - D. Mercury



## ***Additional Activities***

Identify objects at home that can represent the scaled planet sizes. Write the names of the objects in the third column.

<b>Planets</b>	<b>Scaled Planet Sizes</b>	<b>Items at home that may represent scaled planet sizes</b>
<b>Mercury</b>	.4 cm	
<b>Venus</b>	.9 cm	
<b>Earth</b>	1 cm	
<b>Mars</b>	.5 cm	
<b>Jupiter</b>	11 cm	
<b>Saturn</b>	9 cm	
<b>Uranus</b>	4 cm	
<b>Neptune</b>	3 cm	



# Answer Key

## Lesson 1: Construct a Model of the Solar System

<p>Column C: 1. 6th 2. 3rd 3. 1st 4. 4th 5. 2nd 6. 8th 7. 5th 8. 7th</p> <p><b>Assessment</b></p> <p>1. D 2. D 3. B 4. B 5. A 6. D 7. D 8. B 9. D 10. D</p> <p><b>Additional Activity</b> Answers may vary.</p>	<p><b>What's More</b> <b>Activity 2- Space Neighbors</b> (Rating for scale model will be based on rubric)</p> <p><b>What I Have Learned</b> 1. inner and outer planets 2. small, rocky, without rings 3. large, gaseous, with rings 4. smaller 5. nearer 6. farther</p> <p><b>What I Can Do</b> <b>Column B:</b> 1. 9.5 AU 2. 1.0 AU 3. 0.38 AU 4. 1.5 AU 5. 0.72 AU 6. 30.1 AU 7. 5.2 AU 8. 19.2 AU</p>	<p><b>What I Know</b> 1. A 2. D 3. A 4. B 5. D 6. A 7. C 8. A 9. C 10. D</p> <p><b>What's In</b> 1. Mercury 2. Saturn 3. Earth 4. Venus 5. Jupiter</p> <p><b>What's New</b> <b>Activity 1-Space in Between</b> 1. A 2. C 3. B 4. D 5. C 6. D 7. C</p>
---	--	---

## **References**

DepEd Learning Portal. Planets in the solar system. *EASE Module 15*, 2014.

DepEd Learning Portal. Inner Planets. *MIMOSA 5 Module 25*, 2014.

DepEd Learning Portal. Outer Planets. *MIMOSA 5 Module 26*, 2014.

Manna, R. Making Models of the Solar System. *Scholastic*. Retrieved from <https://www.scholastic.com/teachers/lesson-plans/teaching-content/making-models-solar-system/>

[NASA](https://solarsystem.nasa.gov/planets/overview/) Science Solar System Exploration. (n.d) Planets. Retrieved from <https://solarsystem.nasa.gov/planets/overview/>

Tan, C. T. Science for Daily Use 5. Marikina City: JICA Enterprises, 2012.

**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](mailto:blr.lrqad@deped.gov.ph) \* [blr.lrpd@deped.gov.ph](mailto:blr.lrpd@deped.gov.ph)