7

DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Science

Quarter 4
Lesson
7

Lesson Exemplar for Science Grade 7
Quarter 4: Lesson 7 (Week 7)
SY 2024-2025

Development Team

Writers: Jaquilyn A. Floriano (Malabon National High School)

Validators: Shila Rose Sia - Pastor (Philippine Normal University)

Management Team

Philippine Normal University
Research Institute for Teacher Quality
SiMMER National Research Centre

SCIENCE (EARTH AND SPACE SCIENCE) /QUARTER 4/ GRADE 7

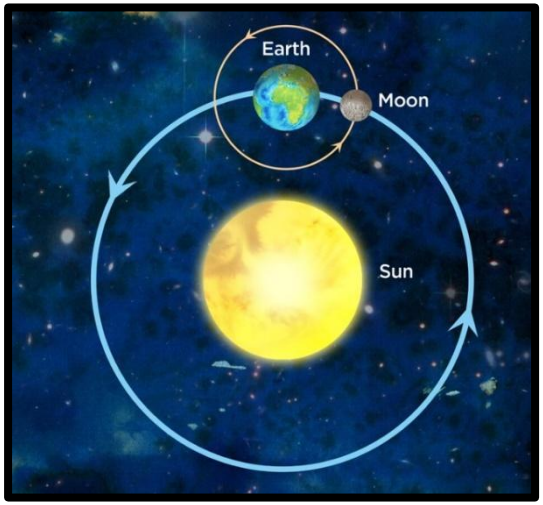
I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners learn that: 1. The Earth's revolution, rotation, and tilt explain the patterns of day and night and the seasons.
B. Performance Standards	By the end of the quarter, learners will use reliable scientific information to identify and explain how solar energy influences the atmosphere and weather systems of the Earth. They will also use such information to appreciate and describe the dominant processes that affect the climate of the Philippines.
C. Learning Competencies and Objectives	**Make a physical model or use drawings to demonstrate how the tilt of the Earth relative to its orbit around the Sun affects the intensity of sunlight absorbed by different areas of Earth over a year.** **Explain, using models, how the tilt of the Earth affects the changes in the length of daytime at different times of the year.** Lesson Objectives: 1. Illustrate the position and movement of the Earth around the Sun. 2. Relate the tilt of the Earth to the length of daytime, nighttime, and seasons. 3. Illustrate the position of the Sun and Earth at different seasons of the year. 4. Relate the length of daytime to the amount of energy received. 5. Relate the position of the Earth in its orbit to the height (altitude) of the Sun in the sky. 6. Relate the height (altitude) of the Sun in the sky to the amount of energy received. 7. Relate the latitude of an area to the amount of energy it receives.
● **Content**	**Topic: The Tilt of the Earth and Its Effect on Earth's Season** ● Sub-Topic 1. Motion of Earth a. Revolution and Rotation b. Tilt of the Earth and Latitude (distribution of heat) ● Sub-Topic 2. Tilt of the Earth and Seasons
● **Integration**	SDG#7 - Affordable and Clean Energy SDG#11 - Sustainable Cities and Communities SDG#13 - Climate Action

	IKSP - Indigenous Knowledge Systems and Practices

II. LEARNING RESOURCES

- Pavico, Josefna et.al (2013). Exploring Life Through Science. Phoenix Publishing Inc.
- Pepito, Leah Joy Desamparado-Walan, (2020). Science – Grade 7 Learner's Module First Edition. DepEd – Instructional Materials Council Secretariat (DepEd-IMCS. Pasig City
- Education, S. (n.d.). Earth, Moon, and Sun system. Flickr. https://www.flickr.com/photos/121935927@N06/13598100735/in/photostream/
- დედამიწა მზის გარშემო.gif - Wikimedia Commons. (2016, September 30). https://commons.wikimedia.org/wiki/File:%E1%83%93%E1%83%94%E1%83%93%E1%83%90%E1%83%9B%E1%83%98%E1%83%AC%E1%83%90_%E1%83%9B%E1%83%96%E1%83%98%E1%83%A1_%E1%83%92%E1%83%90%E1%83%A0%E1%83%A8%E1%83%94%E1%83%9B%E1%83%9D.gif
- Rotation. (n.d.). https://education.nationalgeographic.org/resource/rotation/
- P. K. (2020, September 1). EARTH'S ROTATION & REVOLUTION | Why Do We Have Seasons? | The Dr Binocs Show | Peekaboo Kidz. YouTube. https://www.youtube.com/watch?v=6SzjlsuyTdk
- Earth-lighting-winter-solstice HU cropped.png - Wikimedia Commons. (2012, September 16). https://commons.wikimedia.org/wiki/File:Earth-lighting-winter-solstice_HU_cropped.png#/media/File:Earth-lighting-summer-solstice_EN_-_corrected.png
- Seasons illustration.jpg - Wikimedia Commons. (2008, July 15). https://commons.wikimedia.org/wiki/File:Seasons_illustration.jpg
- Why Do We Have Seasons? (n.d.). https://d3tt741pwxqwm0.cloudfront.net/WGBH/npls13/npls13_int_seasons/index.html
- Season simulator | Earth's rotation and tilt | Earth geological and climatic history | Cosmology and astronomy | Science | Khan Academy. (n.d.). Khan Academy. https://www.khanacademy.org/science/cosmology-and-astronomy/earth-history-topic/earth-title-topic/pi/season-simulator
- Werrell, B. (2023, August 15). The Reasons for the Seasons: Questions, Answers and Activities for Kids. https://www.connectionsacademy.com/support/resources/article/reasons-seasons-questions-answers-activities-kids/
- Orbital relations of the Solstice, Equinox & Intervening Seasons.svg - Wikimedia Commons. (2011, November 3). https://commons.wikimedia.org/wiki/File:Orbital_relations_of_the_Solstice,_Equinox_%26_Intervening_Seasons.svg

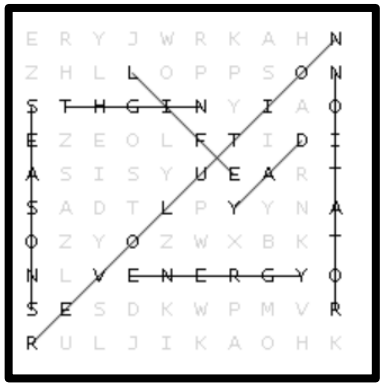
III. TEACHING AND LEARNING PROCEDURE		NOTES TO TEACHERS
A. Activating Prior Knowledge	**1. Short Review** Instruct the learners to find seven words related to the illustration of the Sun, Earth, and Moon System.	Note: ▪ The teacher may provide positive feedback to the learners' answers. ▪ The word hunt puzzle is created using a puzzle maker.

<table>
<tr>
<td></td>
<td>


Education, S. (n.d.). Earth, Moon and Sun system. Flickr. https://www.flickr.com/photos/121935927@N06/13598100735/in/photostream/

Sun, Earth, and Moon

E R Y J W R K A H N
Z H L L O P P S O N
S T H G I N Y I A O
E Z E O L F T I D I
A S I S Y U E A R T
S A D T L P Y Y N A
O Z Y O Z W X B K T
N L V E N E R G Y O
S E S D K W P M V R
R U L J I K A O H K
</td>
<td>
▪ https://puzzlemaker.discoveryeducation.com/word-search/result

Answers:

</td>
</tr>
<tr>
<td>B. Establishing Lesson Purpose</td>
<td>
2. Lesson Purpose
Self-Assessment
Instruct the learners to read the statement and assess their skills and knowledge using the emoticons. Ask them to draw the appropriate number of emoticons that describe their skills and understanding of the concepts before the lesson.
<table>
<tr><td>☺</td><td>No, I cannot do it.</td></tr>
<tr><td>☺☺</td><td>Yes, I can do it alone.</td></tr>
<tr><td>☺☺☺</td><td>Yes, I can do it and apply what I have learned.</td></tr>
</table>
</td>
<td>
The teacher may use other symbols or strategies.

This activity will assess learners' level of understanding and confidence about the lessons.
</td>
</tr>
</table>

Before the lesson	Statements	After the lesson
	1. I can illustrate the position and movement of the Earth around the Sun.	
	2. I can relate the tilt of the Earth to the length of daytime and nighttime and seasons.	
	3. I can illustrate the position of the Sun and Earth at different seasons of the year.	
	4. I can relate the length of daytime to the amount of energy received.	
	5. I can relate the position of the Earth in its orbit to the height (altitude) of the Sun in the sky.	
	6. I can relate the height (altitude) of the Sun in the sky to the amount of energy received.	
	7. I can relate the latitude of an area to the amount of energy it receives.	

2. Unlocking Content Vocabulary

Ask the learners to complete the missing information by choosing the correct answer from the three words below.

SEASON **REVOLUTION**

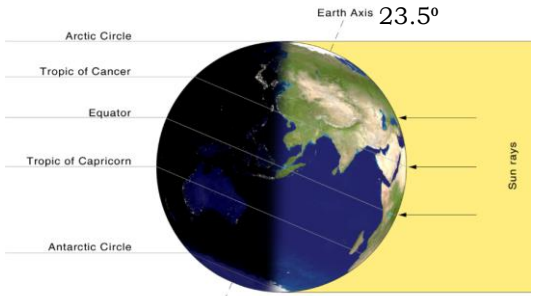
The Earth's _____ causes day and night, while its _____ around the Sun brings about the changing _____ throughout the year.

Answers:
Rotation
Revolution
Season

8. **Developing and Deepening Understanding**	**SUB-TOPIC 1: MOTION OF EARTH: REVOLUTION, ROTATION, AND TILT OF THE EARTH AND LATITUDE (DISTRIBUTION OF HEAT)** **1. Explicitation** **Activity 1.** Instruct the learners to answer worksheet 7.1 then ask them to check (/) whether the statement refers to Earth's Rotation or Revolution. **Motion of the Earth** **Rotation** | **Statements** | **Revolution** | The Earth is turning on its axis. | | Approximately 365.25 days. | | Approximately 23 hours, 56 minutes, and 4 seconds or 24 hours. | | Creates the diurnal cycle of lightness and darkness | | The movement of the Earth around the Sun. |	**Answers for worksheet 7.1:** a. Orbit b. North Pole c. Equator - 0º Latitude d. Earth e. South Pole f. Axis g. Earth's revolution h. Moon i. Sun The teacher may use reading resources or short video clips. ▪ Rotation. (n.d.). https://education.nationalgeographic.org/resource/rotation/ ▪ P. K. (2020, September 1). EARTH'S ROTATION & REVOLUTION | Why Do We Have Seasons? | The Dr Binocs Show | Peekaboo Kidz. YouTube. https://www.youtube.com/watch?v=6SzjlsuyTdk The teacher must emphasize the difference between rotation and revolution. Answers: Rotation ▪ The Earth is turning on its axis. ▪ Approximately 23 hours, 56 minutes, and 4 seconds or 24 hours.

2. Worked Example

Activity 2. Ask the learners to analyze the illustration and answer the questions that follow. (Worksheet 7.2)



Earth-lighting-winter-solstice HU cropped.png - Wikimedia Commons. (2012, September 16). https://commons.wikimedia.org/wiki/File:Earth-lighting-winter-solstice_HU_cropped.png#/media/File:Earth-lighting-summer-solstice_EN_-_corrected.png

Guide Questions:

a. What is the angle of Earth's axial tilt?
b. Which part of the Earth receives the greatest intensity of the Sun's rays?
c. Why does the energy received by places farther from the equator decrease?
d. Why are the coldest regions on Earth typically located near the poles?
e. Why are regions with high temperatures typically located at the equator?

- Creates the diurnal cycle of lightness and darkness.

Revolution

- The movement of the Earth around the Sun.
- Approximately 365.25 days.

The teacher may use a diagram showing the amount of sunlight received by the Earth or a globe and flashlight to demonstrate the concept.

Answers:

a. The angle of Earth's axial tilt is 23.5º.
b. in the diagram, the Tropic of Cancer and the equatorial region receive the greatest intensity of the Sun's rays. Sunlight strikes the equator more directly compared to other latitudes. This direct angle of sunlight results in greater heating and higher temperatures
c. As you move from the equator towards the poles, sunlight strikes the Earth's surface at an increasingly oblique angle. This means the same amount of sunlight is spread over a larger area, resulting in less intense heating.
d. Near the poles, sunlight strikes the Earth's surface at a very oblique angle, especially during winter months. This results in

3. Lesson Activity

Ask the learners to complete the Earth's Tilt Cloze by choosing the correct answer from the word bank.

Earth's Tilt Cloze

The tilt of the Earth's axis relative to its orbit around the Sun contributes to the changing seasons. Regions near the **1)** _____experience higher temperatures because sunlight strikes the Earth's surface more **2)** _____ resulting in greater heating. Near the equator, sunlight strikes the Earth's surface more **3)** _____ leading to higher intensity of solar radiation and heat. The tilt of the Earth's axis causes different parts of the Earth to receive varying amounts of **4)** _____ throughout the year, leading to the changing seasons. The angle at which sunlight strikes the Earth's surface near the equator and near the poles affects the **5)** _____ of solar radiation and heat received.

Temperatures vary by latitude, with locations closer

Word Bank

sunlight	less	cooler	directly
intensity	warmer	equator	perpendicularly

less solar energy being absorbed, leading to colder temperatures. These regions also have reduced duration of sunlight leading to less heat being received.

e. Near the equator, sunlight strikes the Earth's surface almost perpendicularly throughout the year. This direct angle of sunlight leads to maximum heating and results in higher temperatures.

Answers:

1. Equator
2. Directly
3. Perpendicularly
4. Sunlight
5. Intensity
6. Warmer
7. Cooler
8. Less

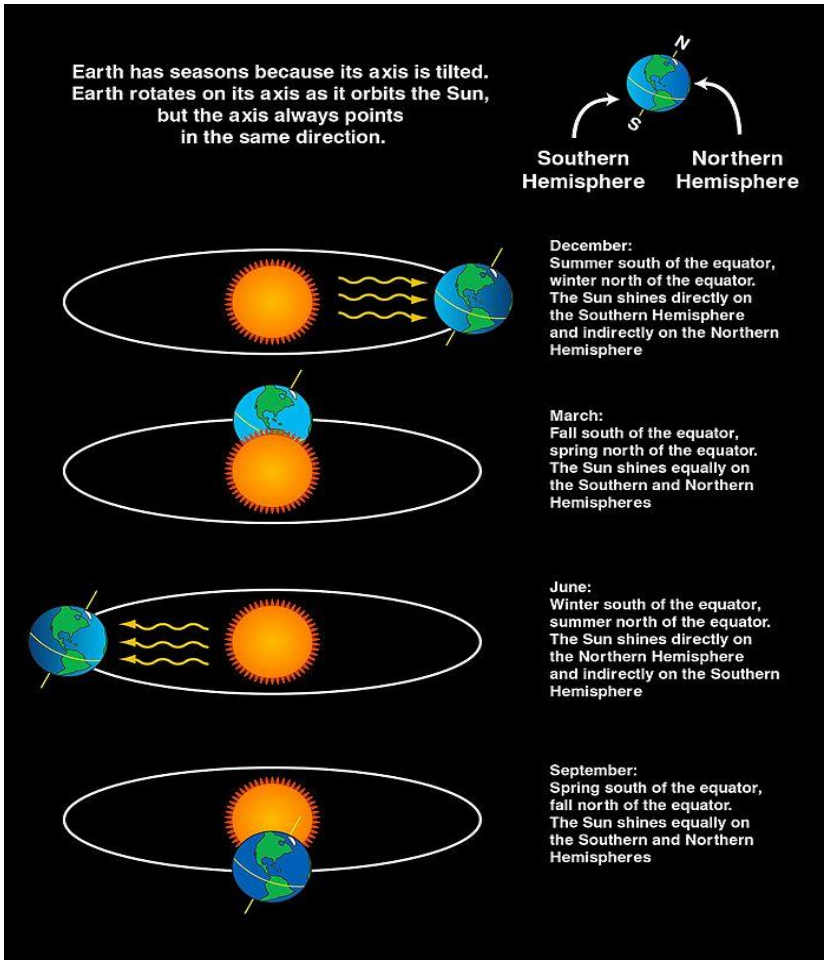
The teacher must emphasize that:

- ✓ Earth's 23.5-degree tilt and the resulting angles of sunlight striking Earth's surface at different latitudes cause temperature variations around the globe.
- ✓ Temperatures are warmer closer to the equator and cooler farther from the equator partly because the intensity of sunlight varies along Earth's curved surface.

SUB-TOPIC 2: Tilt of the Earth and Seasons

1. Explicitation

Instruct the learners to analyze the illustration and complete the table below.



Worksheet 7.3

The teacher may use the given illustration or the interactive concept notes.

- Why Do We Have Seasons? (n.d.). https://d3tt741pwxqwm0.cloudfront.net/WGBH/npls13/npls13_int_seasons/index.html
- Season simulator | Earth's rotation and tilt | Earth geological and climatic history | Cosmology and astronomy | Science | Khan Academy. (n.d.). Khan Academy. https://www.khanacademy.org/science/cosmology-and-astronomy/earth-history-topic/earth-title-topic/pi/season-simulator
- Werrell, B. (2023, August 15). The Reasons for the Seasons: Questions, Answers and Activities for Kids. https://www.connectionsacademy.com/support/resources/article/reasons-seasons-questions-answers-activities-kids/

Seasons illustration.jpg - Wikimedia Commons. (2008, July 15).
https://commons.wikimedia.org/wiki/File:Seasons_illustration.jpg

Earth's Tilt and Season

Months	Seasons	Length of Daylight and Night	Sun's Path in the Sky	Sun's Angle at Noon
March	*March Equinox, the Sun shines equally on the Southern (fall) and Northern(spring) Hemispheres.*	*equal*	*During the vernal equinox in March, the sun rises due east reaches its highest point in the sky at noon, and sets due west.*	*Directly overhead at noon on the Equator.*
June	*On the June Solstice, Earth's North Pole (summer) is pointed toward the Sun, and the South Pole (winter) is pointed away from the Sun.*	*The Northern Hemisphere has the most hours of daylight.*	*During the summer solstice in June, the Sun's path rises northeast, reaches its highest point in the sky at noon, and sets northwest.*	*At noon, the Sun is directly overhead at 23.5° north of the Equator, the Tropic of Cancer.*
September	*September Equinox, the Sun shines equally on the Southern (spring) and Northern (fall) Hemispheres*	*equal*	*During the autumnal equinox in September, the Sun's path generally rises due east, reaches its highest point in the sky at noon, and sets due west.*	*Directly overhead at noon on the Equator.*
December	*December Solstice, Earth's North Pole (winter) is pointed away from the Sun, and the South Pole (summer) is pointed toward the Sun.*	*The Northern Hemisphere has the fewest hours of daylight.*	*During the winter solstice in December, the Sun's path generally rises southeast, reaches its lowest point in the sky at noon, and sets southwest.*	*At noon, the Sun is directly overhead at 23.5° south of the Equator, the Tropic of Capricorn.*

The teacher should remove the answers before presenting the activity.

The teacher may ask a few learners or a group of learners to discuss the answers.

The teacher may also consider demonstrating how seasons happen with the use of a globe and a lamp.

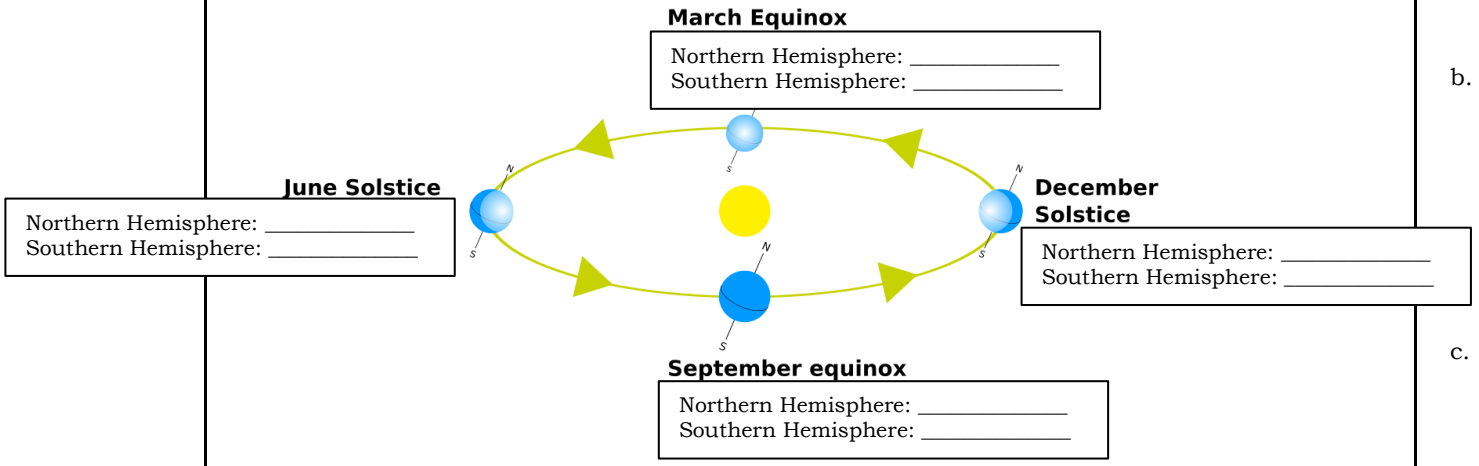
2. Worked Example

Instruct the learners to watch the video https://www.youtube.com/watch?v=WhxPVb7I7Cs and answer the following questions.

a. What causes day and night?
b. Why are there seasons?
c. Why do the seasons change?
d. What is the difference between an equinox and a solstice?

3. Lesson Activity

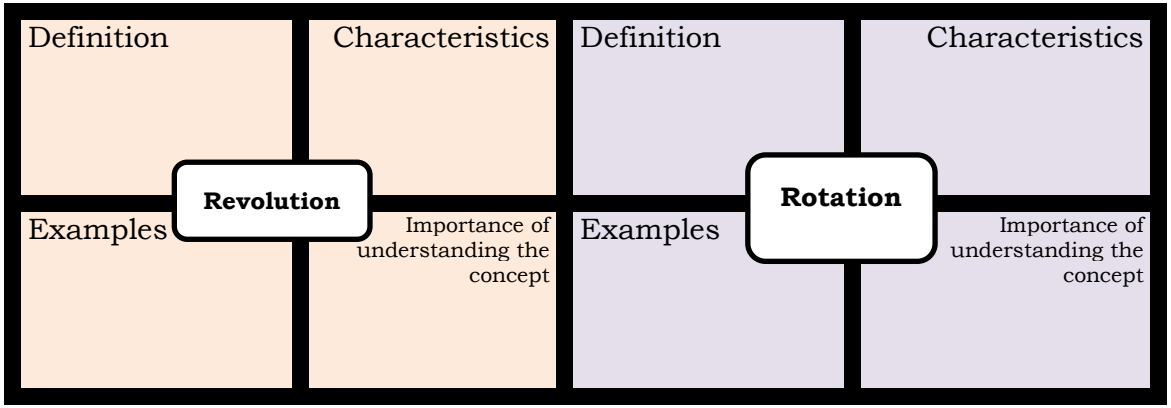
Ask the learners to analyze the illustration and identify the season in each hemisphere of the earth.

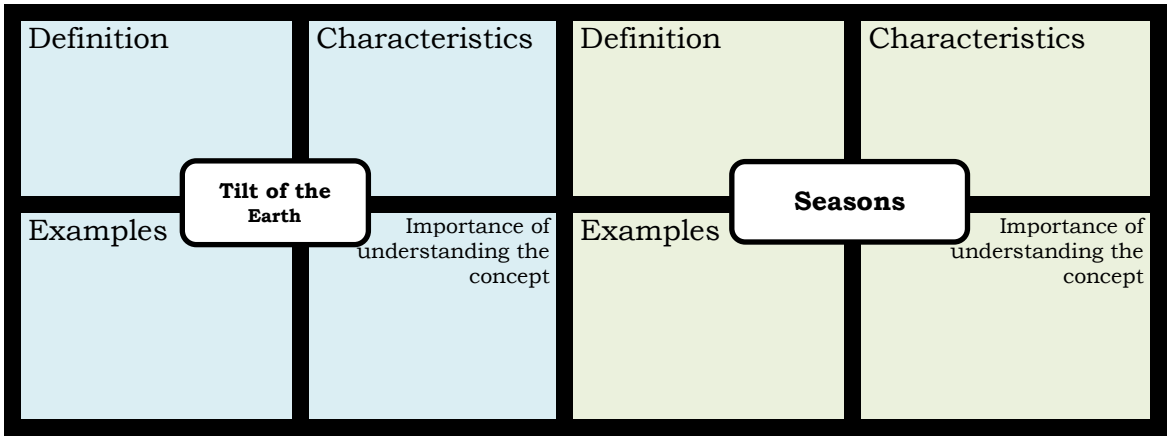


The teacher must remind the learners to use the concept map and other resources provided to answer the questions.

Answers:

a. The earth makes one complete rotation approximately once every 24 hours. As one side of the earth rotates toward the sun, that side experiences daylight. The side facing away from the sun experiences darkness or night.
b. Earth's axis is tilted 23.5º in the same direction, so the parts of Earth that receive more direct sunlight and have more daylight hours change throughout the year. This causes seasons or times of the year with patterns of weather and daylight, which vary depending on where you live.
c. The seasons change due to the tilt of the Earth's axis as it orbits around the Sun. Throughout the year, different parts of the Earth receive varying amounts of

	Orbital relations of the Solstice, Equinox & Intervening Seasons.svg - Wikimedia Commons. (2011, November 3). https://commons.wikimedia.org/wiki/File:Orbital_relations_of_the_Solstice,_Equinox_%26_Intervening_Seasons	sunlight because of this tilt. When a particular hemisphere is tilted towards the Sun, it receives more direct sunlight, leading to warmer temperatures and summer. When that hemisphere is tilted away from the Sun, it receives less direct sunlight, resulting in cooler temperatures and winter. The changing angle of sunlight and the varying duration of daylight hours throughout the year contribute to the cycle of seasons. d. Equinoxes are characterized by equal lengths of day and night, while solstices are characterized by the longest or shortest days of the year.
9. **Making Generalizations**	**1. Learners' Takeaways** Ask the learners to complete the fryer model by applying the given variables, such as the definition of the word, characteristics, examples, and importance of the concept.  	The teacher may use online tools or applications to facilitate this activity. The teacher may ask the learners to share their answers.



2. Reflection on Learning

Instruct the learners to read the statement and assess their skills and knowledge using the emoticons. After the lesson, ask them to draw the appropriate number of emoticons that describe their skills and understanding of the concepts.

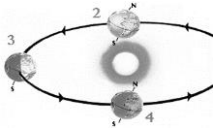
☺	**No, I cannot do it.**
☺☺	**Yes, I can do it alone.**
☺☺☺	**Yes, I can do it and apply what I have learned.**

Before the lesson	Statements	After the lesson
	1. I can illustrate the position and movement of the Earth around the Sun.	
	2. I can relate the tilt of the Earth to the length of daytime and nighttime and seasons.	

		3. I can illustrate the position of the Sun and Earth at different seasons of the year.	
		4. I can relate the length of daytime to the amount of energy received.	
		5. I can relate the position of the Earth in its orbit to the height (altitude) of the Sun in the sky.	
		6. I can relate the height (altitude) of the Sun in the sky to the amount of energy received.	
		7. I can relate the latitude of an area to the amount of energy it receives.	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		**NOTES TO TEACHERS**
A. Evaluating Learning	**1. Formative Assessment** Multiple-Choice Questions: Encircle the letter of the best answer. 1. What causes the sun to appear as it rises in the east and sets in the west? A. revolution B. rotation C. tilt of the earth D. earth's gravitation 2. Which day in the northern hemisphere has the fewest hours of daylight? A. winter solstice B. vernal equinox C. summer solstice D. autumnal equinox 3. Which statement is TRUE if you are living near the equator? A. A nighttime all year long. B. A longer daylight all year long. C. A shorter daylight all year long. D. An equal hour of daylight all year long.	**Answer Key:** 1. B 2. A 3. D 4. B 5. D 6. D 7. B 8. D 9. B 10. C 11. D 12. C 13. D 14. C 15. D

4. What causes the Sun's apparent path across the sky during the day?
   A. Earth's tilt
   B. Earth's rotation
   C. Earth's revolution
   D. Earth's magnetic field
5. Which best explains why winter is colder than summer?
   A. Earth is closer to the sun during winter.
   B. Earth rotates on its axis slower during winter.
   C. Earth's rotation causes more wind to blow during winter.
   D. Earth's tilt allows less energy to be received during winter.
6. Why is it summer in the southern hemisphere if the northern hemisphere is experiencing winter?
   A. The southern hemisphere is nearest to the sun.
   B. The southern hemisphere is balancing the temperature of the earth.
   C. The southern hemisphere is on a path of warm winds from the north.
   D. The southern hemisphere is receiving the most direct rays from the sun.
7. In January, what would be the season in the southern hemisphere and northern hemisphere respectively?
   A. winter and summer
   B. summer and winter
   C. both experiences summer
   D. both experiences winter
8. What season occurs in the northern hemisphere if the axis is pointed away from the sun?
   A. fall
   B. spring
   C. summer
   D. winter
9. What season is experienced in the northern hemisphere at position 2?
   A. fall
   B. spring
   C. summer
   D. winter



10. What is the season north of the equator if the north pole is tilted towards the sun?
    A. fall
    B. spring
    C. summer
    D. winter

11. What is the cause of the earth's season?
    A. variation in the amount of energy given off by the sun
    B. earth's elliptical orbit and varying speed of revolution
    C. earth's greatest distance from the sun during winter
    D. inclination of the earth's axis and revolution around the sun
12. How does the tilt of the Earth's axis affect the length of daylight hours at different latitudes?
    A. It has no effect on daylight hours.
    B. It results in longer daylight hours near the poles.
    C. It causes daylight hours to vary with the seasons.
    D. It causes daylight hours to remain constant throughout the year.
13. How does the tilt of the Earth's axis contribute to the changing seasons?
    A. By changing the Earth's distance from the Sun
    B. By causing variations in the Earth's orbital speed
    C. By creating differences in the intensity of solar radiation
    D. By altering the angle of sunlight reaching different latitudes
14. Which of the following statements about the summer solstice is true?
    A. It marks the beginning of autumn.
    B. It marks the shortest day of the year.
    C. It occurs when the Earth's axis is tilted towards the Sun.
    D. It occurs when the Earth's axis is tilted away from the Sun.
15. Which factor primarily determines the length of daylight hours during a particular season?
    A. Earth's rotation speed
    B. Earth's distance from the Sun
    C. Earth's atmospheric composition
    D. Earth's tilt relative to its orbit around the Sun

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

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

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