Republic of the Philippines
Department of Education
NATIONAL CAPITAL REGION
Misamis Street, Bago-Bantay, Quezon City

UNIFIED SUPPLEMENTARY LEARNING MATERIALS
(USLeM)

SCIENCE 6 WEEK 5

Development & Editorial Team

Writers:	Mr. Jaison C. Dayacus Ms. Bianca Camille A. San Pedro
Illustrators:	Mr. Jaison C. Dayacus Ms. Bianca Camille A. San Pedro
Layout Artists:	Mr. Jaison C. Dayacus Dr. Normina B. Hadji Yunnos
Content Editors:	Dr. Maripaz T. Mendoza Dr. Efren E. Canzana Ms. Gerla L. Mateo Mrs. Rubby Ann C. Camu Mr. Roni P. Sapad
Language Editors:	Ms. Ma. France T. Nuñez Ms. Ivy Joy C. Oxiño
Management Team:	Dr. Malcom S. Garma, Regional Director - NCR Dr. Loreta B. Torrecampo, CESO V, SDS - SDO-Pasay City Dr. Arturo A. Tolentino, OIC ASDS- SDO, Pasay City Dr. Genia V. Santos, CLMD Chief - NCR Mr. Librado F. Torres, CID Chief - SDO,Pasay City Ms. Micah G. Pacheco, EPS Science NCR Mr. Dennis M. Mendoza, LR EPS - NCR Ms. Nancy C. Mabunga, Librarian - NCR Dr. Maripaz T. Mendoza, EPS Science –SDO, Pasay City Dr. Efren E. Canzana, PSDS - SDO, Pasay City Dr. Normina B. Hadji Yunnos, LR EPS – SDO, Pasay City

THE EFFECTS OF THE EARTH'S MOTION

Expectations

This Unified Supplementary Learning Material will help you to:

- describe the phenomenon that occurs during Earth's rotation and revolution; and
- describe the effects of the Earth's motion.

Pre-Test

DIRECTIONS: Encircle the letter of the **best** answer.

1. Which occurs due to the Earth's rotation?

   A. daytime only
   B. nighttime only
   C. day and night
   D. four seasons

2. Which tells about the effect of the Earth's counterclockwise rotation on its axis? The Sun seems to rise in the _____ and set in the _____.

   A. east - west
   B. west - east
   C. north - south
   D. south - north

3. Why do temperate countries in the Northern Hemisphere experience spring while those in the Southern Hemisphere experience autumn during March 21? The Northern and Southern Hemispheres experience _____.

   A. longer daytime than nighttime
   B. equal lengths of daytime and nighttime
   C. longer length of nighttime than daytime
   D. unequal lengths of daytime and nighttime

4. Why do temperate countries like Japan experience four seasons? It is because the Earth _____.

   A. has two hemispheres
   B. has North Pole that is facing toward the Sun
   C. spins on its axis every 23 hours and 56 minutes
   D. tilts at 23.5^0 on its axis and revolves around the Sun

5. Which statement **completely** describes the effects of the Earth's motions?

   A. The occurrence of day and night.
   B. The varying seasons at the equatorial region.
   C. The changing seasons in the temperate regions.
   D. The occurrence of daytime, nighttime and four seasons.

Looking Back

DIRECTIONS: Identify if the statement refers to the Earth's *ROTATION or REVOLUTION*. Write the answer on the space provided.

_____1. The Earth travels around the Sun in an elliptical path.
_____2. The Earth spins on its axis every 23 hours and 56 minutes.
_____3. The Earth moves on its axis in a counterclockwise direction.
_____4. The Earth completes its trip around the Sun within 365 ¼ days.
_____5. The Earth spins on its axis at an angle of 23.5^0 tilted towards the North.

Brief Introduction

You have learned that the Earth rotates on its axis as it revolves on its orbit around the Sun. These movements cause certain periodic changes that affect our lives. What are the effects of these movements?

Effects of the Earth's Rotation: Day and Night

The Sun always seems to rise in the east and sets in the west. This apparent movement of the Sun is due to the direction of the Earth's rotation. As it spins, not all places on the Earth's surface receive light from the Sun at the same time. It is **daytime** on the part of the Earth that receives sunlight while it is **nighttime** on the part that is not lighted. This spinning motion of the Earth on its axis causes daytime and nighttime.

Effects of the Earth's Revolution: Seasons

The movement of the Earth around the Sun with its axis tilted at 23.5^0 with respect to its orbital plane, causes the occurrence of seasons namely summer, autumn/fall, winter and spring in temperate regions.

Seasons occur at different positions of the Earth as it travels in its elliptical orbit around the Sun as shown in Figure 1. As the Earth orbits the Sun everyday, different regions of the Earth receive varying amounts of sunlight throughout the year. Some areas receive vertical rays while others receive slanting rays of the Sun. Every three months, the seasons in temperate regions change.

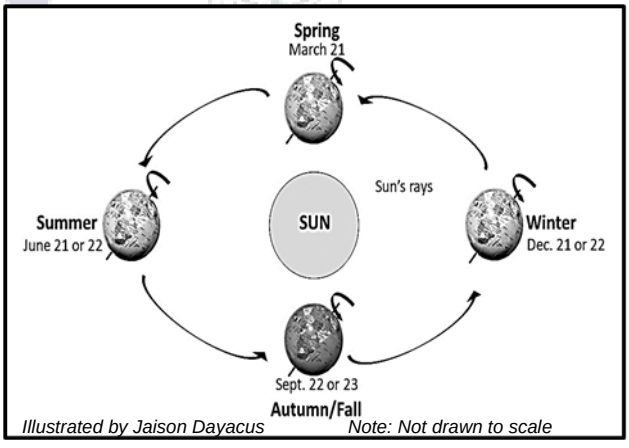


Figure 1. *Earth's Revolution*

Summer starts in the Northern Hemisphere on June 21 or 22. During this time, the North Pole tilts towards the Sun hence, the Northern Hemisphere receives direct rays of the Sun. At about this time, the Southern Hemisphere experiences the coldest season of the year which is winter. This region receives the least amount of light rays from the Sun because the South Pole is inclined away from the Sun. Summer is the warmest season of the year. Plants proudly display their thick green foliage, bear fruits, and unveil full bloomed flowers.

Autumn or **fall** begins on September 22 or 23. The sunlight is distributed uniformly all over the Earth that causes equal length of daytime and nighttime. This is the time when the leaves of the trees in the temperate regions begin to change their color and to shed their leaves off.

Winter begins on December 21 or 22. This time the North Pole receives the least amount of sunlight. This results in low temperature. The shortest daylight period occurs in the Northern Hemisphere while the longest daylight period occurs in the Southern Hemisphere. This is the coldest season of the year that is characterized by snowfall, cold temperature and shorter daytime and longer nighttime.

Spring starts on March 21. The length of day and night is equal during this season. The trees start to grow new leaves, plants start to bloom and some animals like bunnies and birds mate during this season.

Activities

Activity 1: Figure it Out!
DIRECTIONS: Study Figure 2 and answer the questions below.

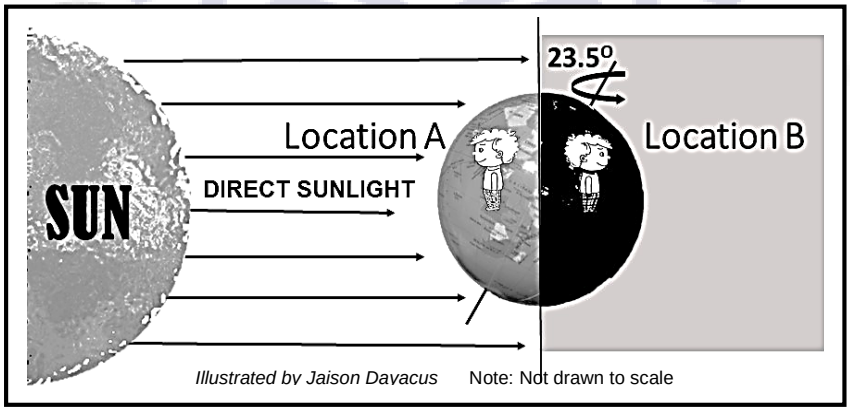


Figure 2. *Occurrence of Day and Night*

1. What location on Earth receives sunlight?

2. Why the Sun cannot be seen in location B?

3. What time of the day is being experienced in location A? location B?

4. What happens when the Earth rotates and the two locations switch positions? Explain your answer.

5. How do daytime and nighttime occur?

Activity 2: Seasons Change

DIRECTIONS: Study *Figure 3* and answer the questions that follow.

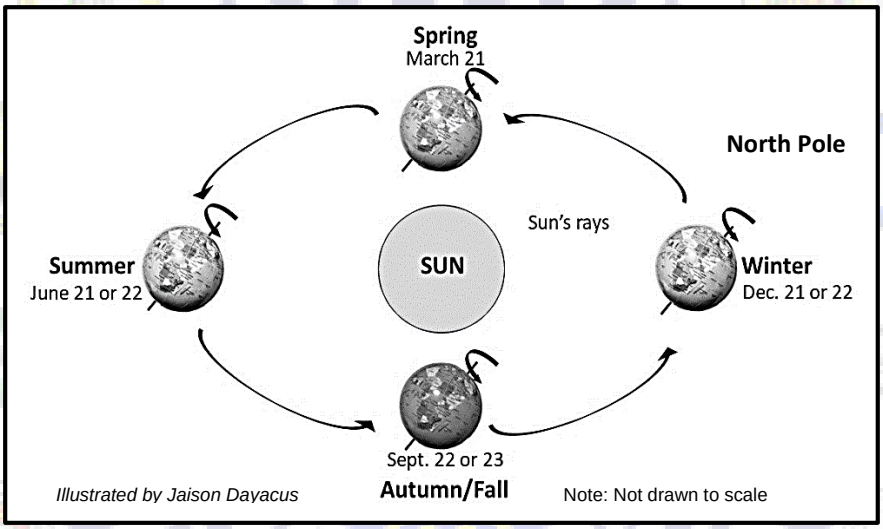


Figure 3. *Changes in Season*

1. In which month is the North Pole tilted towards the Sun?

2. In which month is the North Pole tilted away from the Sun?

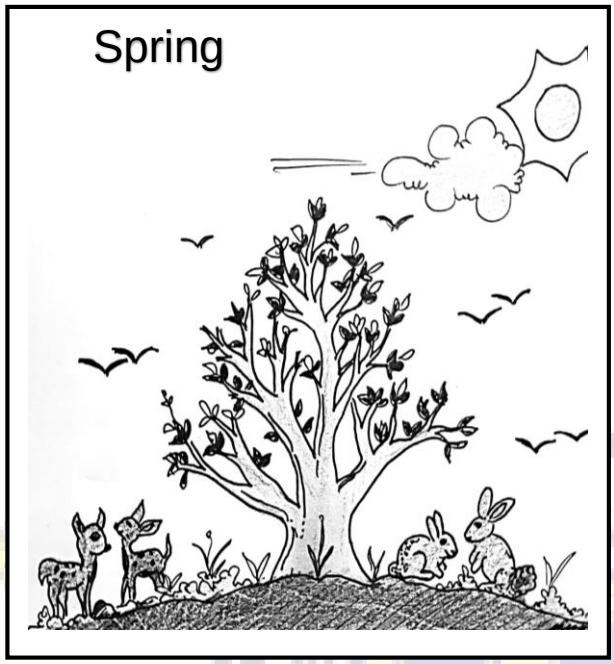
3. What is the season in the Northern Hemisphere on September 22 or 23?

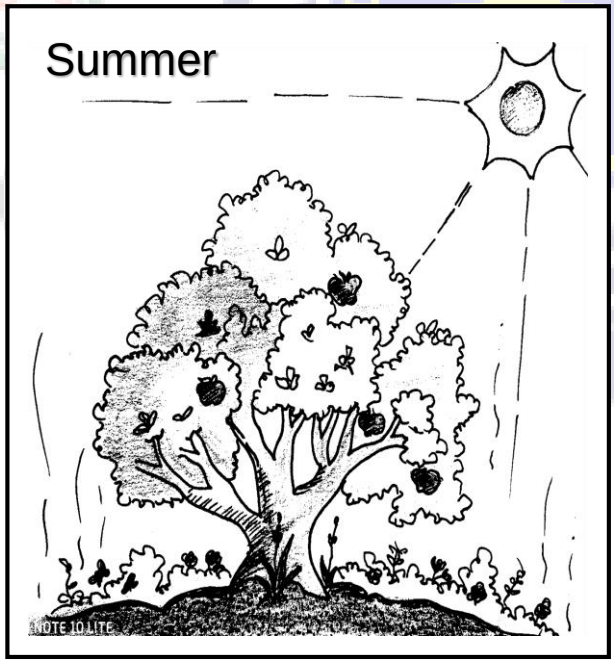
4. What season does the Northern Hemisphere experience on March 21?

5. Why do seasons change?

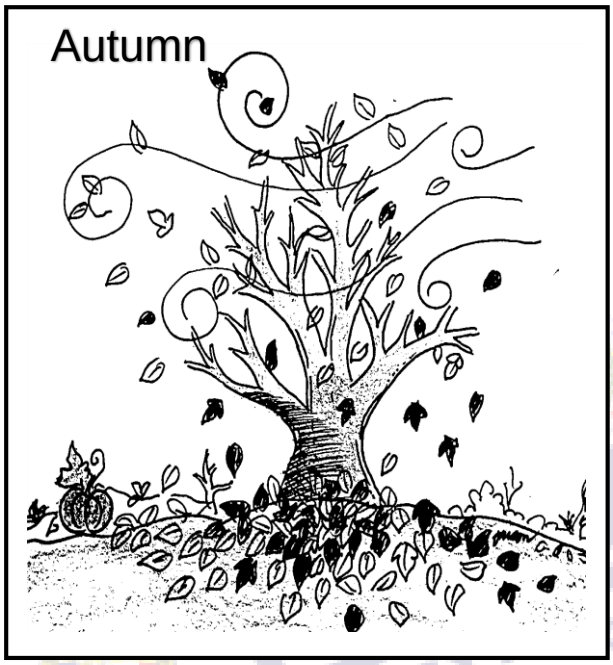
Activity 3: The Magic of Seasons

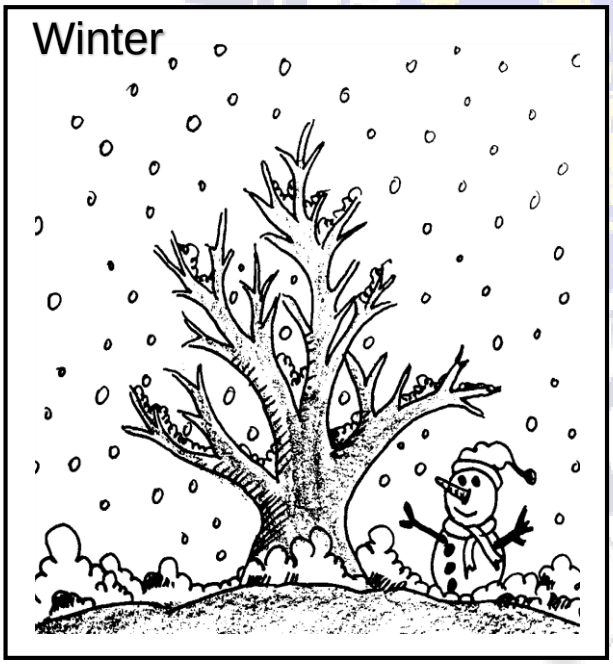
DIRECTIONS: Characterize each season based on the given illustrations. Write the answers in the box.





Spring, Summer, Autumn and Winter Illustrated by Jaison Dayacus





Spring, Summer, Autumn and Winter Illustrated by Jaison Dayacus

Remember

- The rotation of the Earth on its axis causes day and night.
- The revolution of the Earth and the inclination of its axis cause the occurrence of seasons, namely: summer, autumn or fall, winter and spring.

Checking Your Understanding

DIRECTIONS: Fill each blank with the **correct** word to complete the paragraph below.

The Earth spins in a counterclockwise motion or from west to east direction. This explains why the Sun seems to rise in the _____ and set in the _____. As the Earth rotates on its axis, _____ and _____ happen.

As the Earth revolves around the Sun, changes in the seasons occur in the _____ countries every _____ months. These seasons are _____, _____, _____ and _____.

To sum it up, the occurrence of day and night is due to the Earth's _____ while the Earth's revolution causes _____.

Post-Test

DIRECTIONS: Encircle the letter of the **best** answer.

.

1. Why do the temperate countries in the Northern Hemisphere experience summer while those in the Southern Hemisphere experience winter during June 21? The Northern and Southern Hemispheres experience_____.

   A. longer daytime than nighttime
   B. equal lengths of daytime and nighttime
   C. longer length of nighttime than daytime
   D. unequal lengths of daytime and nighttime

2. Which shows the effect of the Earth's rotation?

   I. daytime
   II. nighttime
   III. four seasons
   IV. rising of the Sun in the east

   A. I and II
   B. II and III
   C. I, II and III
   D. I, II and IV

3. What are the effects of the Earth's counterclockwise direction relative to the Sun's apparent position?
   I. Sun rises in the east
   II. Sun rises in the west
   III. Sun sets in the east
   IV. Sun sets in the west

   A. I and II B. III and IV C. II and III D. I and IV

4. Why do temperate countries experience the four seasons? It is because the Earth _____.
   I. tilts at axis 23.5^0
   II. inclines toward the Sun.
   III. revolves around the Sun within 365 1/4 days.
   IV. spins on its axis every 23 hours and 56 minutes.

   A. I and II B. I and III C. II and IV D. III and IV

5. Which describe the effects of the Earth's motions?
   I. Occurrence of day and night.
   II Changing seasons in the temperate regions.
   III The varying seasons at the equatorial region.

   A. I and II
   B. I and III
   C. II and III
   D. I, II, and III

References

Buena A. Lozada et al. (2011) Science for Daily Use 4 Textbook. JICA Enterprises and Buena A. Lozada & Augusto T. Mendoza 16 Horizon St. Rim View Park, SSS Village, Marikina City pp. 234-235 and 238.

Carmelita C. Coronel et al. (1999) Science and Health 6 Textbook. SD Publication Inc. Araneta Ave. cor. Maria Clara St. Sta Mesa Heights, Quezon City p. 229.

Sarte, Evelyn T. et al. (2016) Science Beyond Borders 6. Vibal Group Inc. 1253 G Araneta Ave. Quezon City. pp. 208-213.

n.d. Science Learner's Materials 7 **Government Property DepEd-IMCS** 2nd floor Dorm G, PSC Complex, Meralco Ave., Pasig City p. 128

Answer Key

Pre-Test:	**Looking Back:**	**Post-Test**
1. C	1. Revolution	1. D
2. A	2. Rotation	2. D
3. B	3. Rotation	3. D
4. D	4. Revolution	4. B
5. D	5. Rotation	5. A

Activities:

1.Figure It Out!

1. Location A
2. It is because location B is not facing the Sun or it is because location B is facing away from the Sun.
3. Daytime – Nighttime
4. No. Because time changes as the Earth rotates on its axis. Location A will experience nighttime while location B will then experience daytime.
5. Daytime and nighttime occur when the Earth rotates on its axis.

2. Seasons Change

1. June
2. December
3. Autumn/fall
4. Spring
5. The revolution of the Earth around the Sun.
6. Seasons change due to the Earth's revolution around the Sun and inclination of its axis.

3. The Magic of Seasons

Possible answers:

Spring- trees begin to grow new leaves, plants start to flower, weather turns warmer, birds fly around and animals like bunnies and birds mate

Summer- plants display thick green foliage/leaves, plants unveil full bloomed flowers, plants bear fruits and days become warmer to hot.

Autumn/Fall- trees shed their leaves and start to fall

Winter- snowfall, cold weather, trees do not have leaves and become dormant or inactive.

Checking your Understanding

The Earth rotates in a counterclockwise direction or from west to east. This explains why the Sun seems to rise in the **east** and set in the **west**. As the Earth rotates on its axis, **day** and **night** happens.

As the Earth revolves around the Sun, changes in seasons occur in the **Temperate** countries every **three** months. These seasons are **summer**, **autumn or fall**, **winter** and **spring.**

To sum it up, the occurrence of day and night is due to Earth's **rotation** while the Earth's revolution causes **seasons**.