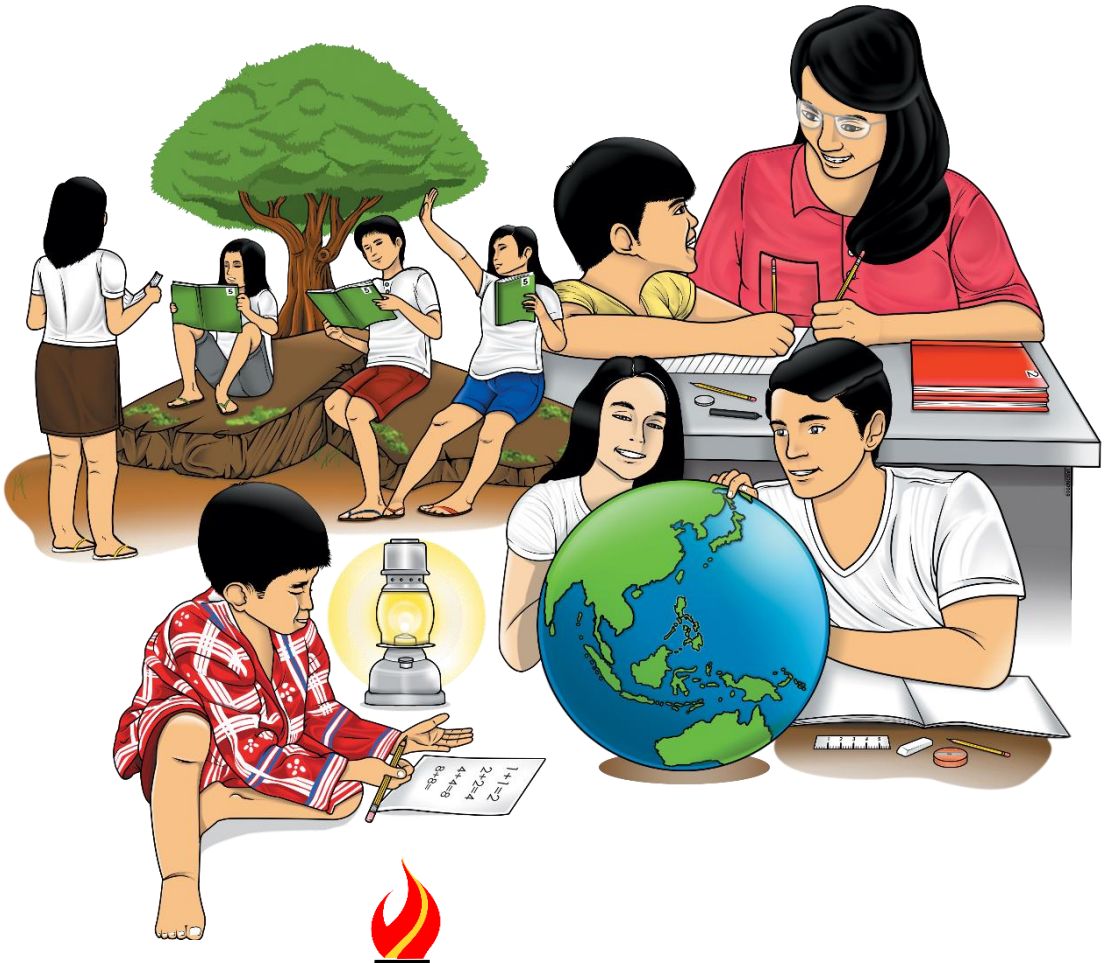
8

DepED
DEPARTMENT OF EDUCATION

Science

Quarter 4 – Module 9: Cycling of Materials in the Ecosystem



ALTERNATIVE DELIVERY MODE
ADM

Science– Grade 8
Alternative Delivery Mode
Quarter 4 – Module 9: Cycling of Materials in the Ecosystem
First Edition, 2020

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

Development Team of the Module

Writers: Honey R. Bolo, John Rey L. Baradero, Jenile Y. Orias, Adelita I. Escudero, Jocelle B. Bañares

Editor: Ana Rubi L. Sereño

Reviewers: Bernabe L. Linog, Corazon P. Roa, Juvy B. Luna, Arlene L. Abala, Kathyleen S. Torculas

Illustrator: Rose Mia L. Pontillo, Jenile Y. Orias

Layout Artists: Celeste Faith R. Almanon, Jay S. Ayap, Eldiardo E. de la Peña

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

8

Science

Quarter 4 – Module 9:
Cycling of Materials
In the Ecosystem

DepED
DEPARTMENT OF EDUCATION

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

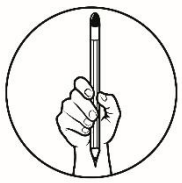
This module was designed and written with you in mind. It is here to help you master the cycling of materials in the ecosystem. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are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

The module contains:

- **Lesson 1** – Cycling of Materials in the Ecosystem

After going through this module, you are expected to:

1. Identify the processes involved in the cycling of materials in the ecosystem such as water cycle, oxygen-carbon dioxide cycle, and nitrogen cycle; and
2. Explain how materials cycle in an ecosystem. *(MELC Week 9 S8LT-IVi-23)*



What I Know

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

1. Which stage of the water cycle changes water vapor into droplets in the air, forming clouds?
   A. Condensation
   B. Evaporation
   C. Groundwater
   D. Precipitation

2. Where Earth's water is mostly stored?
   A. creeks
   B. lakes
   C. oceans
   D. rivers

3. How does water vapor in the atmosphere return to the earth's surface?
   A. It condenses and evaporates.
   B. It evaporates and condenses.
   C. It condenses and precipitates.
   D. It precipitates and evaporates.

4. Which of the following statements BEST describes evaporation?
   A. Water is absorbed and stored into plants.
   B. Water has reached its freezing point and becomes ice.
   C. Water vapor meets hot air and changes back to liquid.
   D. Water gets warm and changes from liquid to water vapor.

5. The following explains the importance of sunlight to water cycle EXCEPT:
   A. It gives energy to drive the water cycle.
   B. It changes the state of water from liquid to gas.
   C. It affects the temperature of water in the atmosphere.
   D. It breaks the bonds between hydrogen and oxygen of water vapor in the atmosphere.

6. Which is the result of photosynthesis?
   A. It changes sugar into energy.
   B. It converts carbon dioxide into sugar.
   C. It releases nitrogen into the atmosphere.
   D. It gives off carbon dioxide into the atmosphere.

7. What are the two main processes involved in Oxygen-Carbon dioxide cycle?
   A. Respiration and Transpiration
   B. Respiration and Photosynthesis
   C. Photosynthesis and Transpiration
   D. Photosynthesis and Condensation

8. Why is carbon dioxide important to living things?
    A. It is used in respiration.
    B. It is used by animals to produce oxygen.
    C. It is used by plants to produce sugar and starch.
    D. It is given off by plants when they break down food.

9. Which statement is TRUE about the process of respiration?
    A. It uses Oxygen and releases Carbon dioxide.
    B. It utilizes Carbon dioxide and produces energy.
    C. It utilizes Carbon dioxide and produces Oxygen.
    D. It consumes energy and produces Carbon dioxide.

10. Which of the following best explains the process of photosynthesis and respiration in Oxygen-Carbon Dioxide cycle in the ecosystem?
    A. Plants use oxygen for both photosynthesis and respiration.
    B. Animals breathe in carbon dioxide during both respiration and photosynthesis.
    C. Plants use carbon dioxide to produce oxygen during photosynthesis, while animals take in oxygen and give off carbon dioxide during respiration.
    D. Animals use carbon dioxide to produce oxygen during photosynthesis, while plants take in oxygen and give off carbon dioxide during respiration.

11. In which process is nitrogen circulated and recycled?
    A. Carbon cycle
    B. Nitrogen cycle
    C. Nitrogen fixation
    D. Water cycle

12. What do bacteria convert during the process of nitrification?
    A. ammonium into nitrates
    B. ammonium into nitrogen
    C. nitrogen into nitrous oxide
    D. nitrous oxide into nitrogen

13. Which of the nitrogen compound is taken up by plants?
    A. Ammonia
    B. Ammonium
    C. Nitrate
    D. Nitrite

14. Which stage in the nitrogen cycle is nitrogen converted into ammonium?
    A. Ammonification
    B. Denitrification
    C. Nitrogen fixation
    D. Nitrification

15. Nitrogen is considered a limiting element because _____.
    A. it easily escapes out of the soil into the ground water
    B. plants are generally made of nitrogen and they need much of it
    C. it stays suspended in the atmosphere and cannot get to the roots
    D. abundant forms of nitrogen that are available cannot be used by plants

Lesson 1 Cycling of Materials in the Ecosystem

In the ecosystem, essential elements or substances of living matter are circulated. These elements flow in different forms from non-living (abiotic) to a living (biotic) component of the environment and back. For the biotic components of the ecosystem to survive, all the important elements must be recycled continuously.

What's In

In Module 8, you have learned about the flow of energy in an ecosystem. Let us have a quick review of your understanding in the previous module!

Activity 1. Arrange Me!

Directions: Arrange the jumbled letters inside the parenthesis to reveal the term referred by the given statement. Write your answers on a separate sheet of paper.

1. It traps energy from the sun and converts it in the form of chemical energy for food. (**SNPLAT**)
2. The total dry mass of organisms in a food chain and food web. (**SSMAIOB**)
3. Organisms that eat plants. (**HREVOBIRE**)
4. It is the source of energy used by plants for photosynthesis. (**SNU**)
5. The trend in the amount of the biomass as it is transferred from one trophic level to another. (**ECRSINGEAD**)

What's New

Activity 2. Where Do I Belong?

In this activity you will gain understanding on the different processes involved in water, oxygen-carbon dioxide and nitrogen cycle.

Directions: Complete the table below by indicating the processes involved in the different cycles. Write your answers on a separate sheet of paper.

Ammonification	Fixation	Precipitation
Condensation	Nitrification	Respiration
Evaporation	Photosynthesis	

Water Cycle	Oxygen-Carbon dioxide Cycle	Nitrogen Cycle

What is It

Many elements including carbon, oxygen, and nitrogen cycle through ecosystems between biotic (e.g. plants and animals) and abiotic (e.g. soil, water, and air) components. These are used in essential processes, such as metabolism, the formation of amino acids, respiration and building of tissues. The Ecosystem depends on the recycling of these elements, such as water cycle, oxygen-carbon dioxide cycle and nitrogen cycle, to sustain life.

Water Cycle

Most part of the Earth is covered with water. It supports life, drains harmful substances and arbitrates day to day activities. The continuous movement of water through the atmosphere, land, and bodies of water is called Water Cycle, which is also called the hydrological cycle. The water cycle is composed of different processes namely: evaporation, condensation, precipitation, transpiration, surface runoff and infiltration. See Figure 1. Solar energy drives the water cycle through evaporation and transpiration, moving water from the earth's surface, and even plant parts, to the atmosphere.

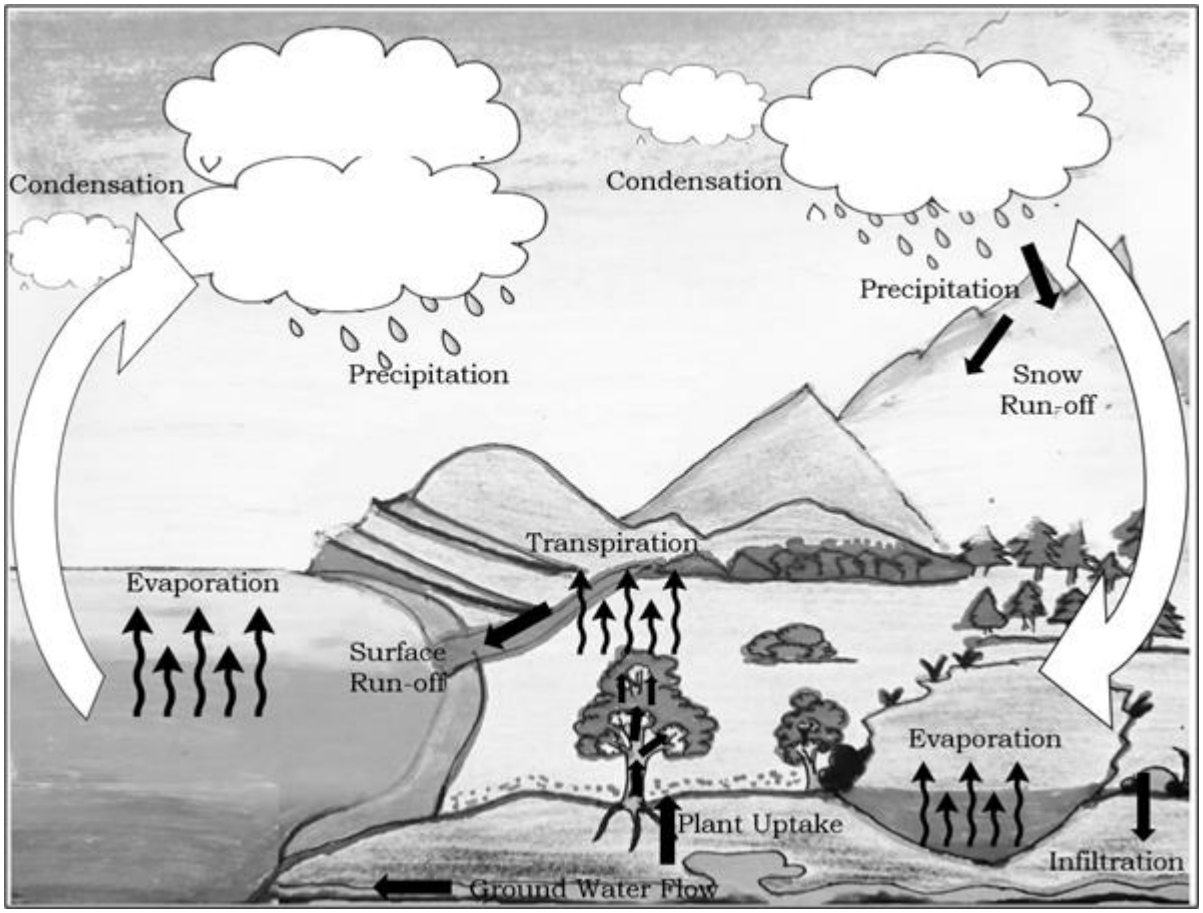


Figure 1. Water Cycle Illustrated by: Jenile Y. Orias

Evaporation

It takes place in oceans, lakes, streams, icebergs and even in soil and rocks. It is the physical change of water from liquid phase into gaseous phase known as water vapor that rises into the atmosphere. This process is driven by the warmth and energy from the sun.

Transpiration

Water moves into the different parts of the plants and evaporates through the process called **transpiration.** The water absorbed by the roots is pulled towards the leaves for photosynthesis. The excess water escape through the stomata (tiny openings of the leaves) into the environment as water vapor. This pulling mechanism in plants is driven by the energy from the sun.

Condensation

Water vapor rises into the atmosphere where it condenses to form clouds. The cooler temperature in the troposphere causes the water vapor to lose its heat and turn back to liquid water, which is known as **condensate,** in the process called **condensation**. In much colder temperatures, the condensate turns into ice.

Water vapor condenses with the help of some particles such as dust, smoke, sea salts and other matter that assist in cloud formation. The tiny particles of water

vapor condense into liquid on the surfaces of dust particles in the air. A cloud forms as more water vapor condenses into water droplets. Clouds form massive condensate in the sky. This happens when smaller water droplets combine to make bigger ones due to wind or temperature change.

Precipitation

Precipitation is water or liquid that forms in the atmosphere that falls back to earth as precipitates because of gravity, either in a rain, snow, hail, fog or sleet. In the Philippines, most precipitation occurs as rain.

Infiltration

Some of the water that precipitates seep through the pores of the soil and forms the groundwater in the aquifers. The flow of water from the surface into the soil is called **infiltration**. **Aquifers** are underground layers of rocks that hold groundwater. When water seeps down, it will increase the level of groundwater table. Groundwater can be accessed by drilling or digging through the ground into an aquifer as in the case of artesian wells.

Surface Runoff

Surface runoff is the manner by which water moves across the ground or land. It occurs when water can no longer infiltrate the ground because of water-impermeable rocks or when the ground is already saturated with water. Water flows through the surfaces and become part of a lake, river or ocean. Most of the Earth's water is stored in the ocean.

Oxygen-Carbon Dioxide Cycle

In the ecosystem, organisms consume and produce oxygen and carbon dioxide during the process of photosynthesis and respiration. These important gases flows through the organisms and the environment through a cyclic process called **oxygen-carbon dioxide cycle**.

Plants produce oxygen through the process called **photosynthesis** to manufacture their own food. In this process, plants use the energy of the sun to combine water and carbon dioxide to sugar molecules that give them the energy to live and grow. Oxygen is given off by plants through the stomata where carbon dioxide enters.

All animals need oxygen to survive. They take in oxygen and give off carbon dioxide through the process called **respiration**. Animals get energy from the food they eat. During respiration, cells use oxygen to break down sugar to obtain energy. Animals use this energy to grow, reproduce, and to perform other functions. They give off carbon dioxide into the atmosphere which in turn is used by the plants during photosynthesis.

Plants need the carbon dioxide released by animals when they manufacture their own food, while animals need oxygen for respiration. The release of oxygen by

the plants and carbon dioxide by the animals into the atmosphere constitute **oxygen-carbon dioxide cycle.** (See Figure 2 below).

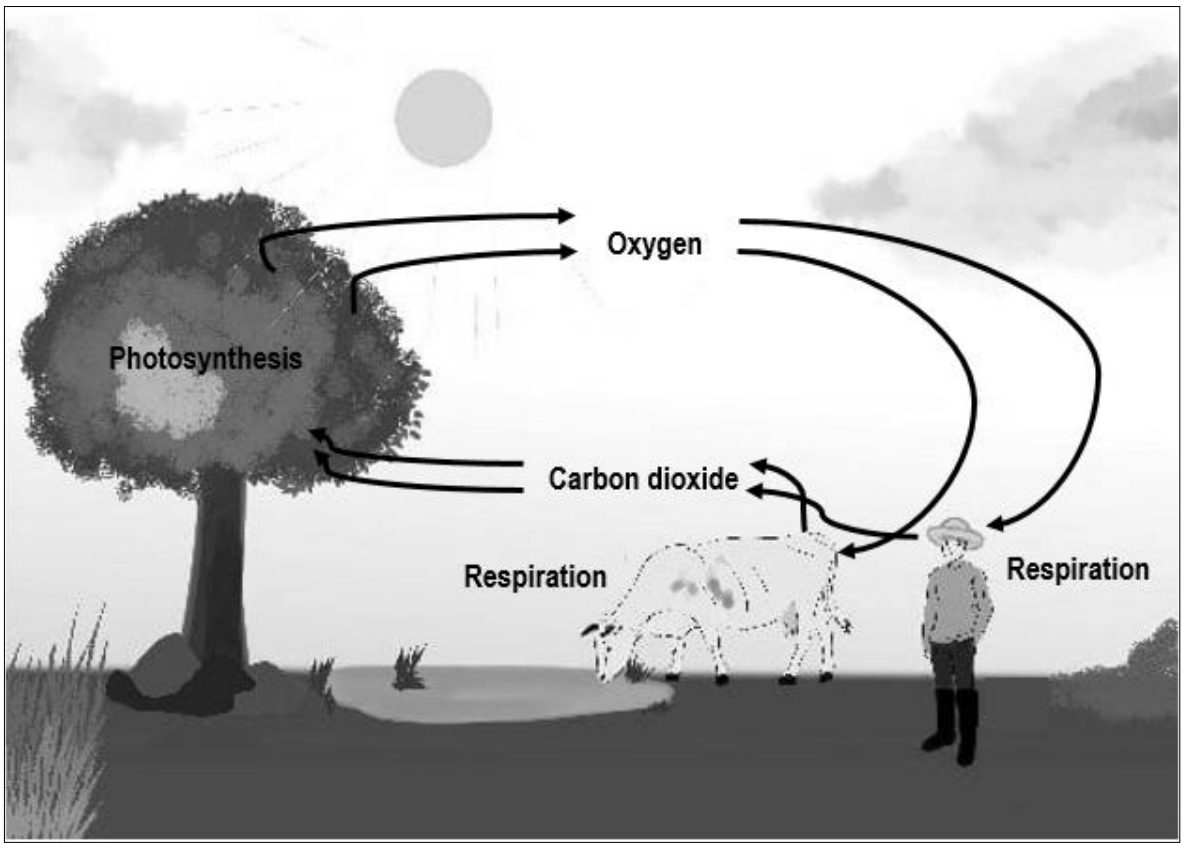


Figure 2. The Oxygen-Carbon dioxide Cycle

Illustrated by: Rose Mia L. Pontillo

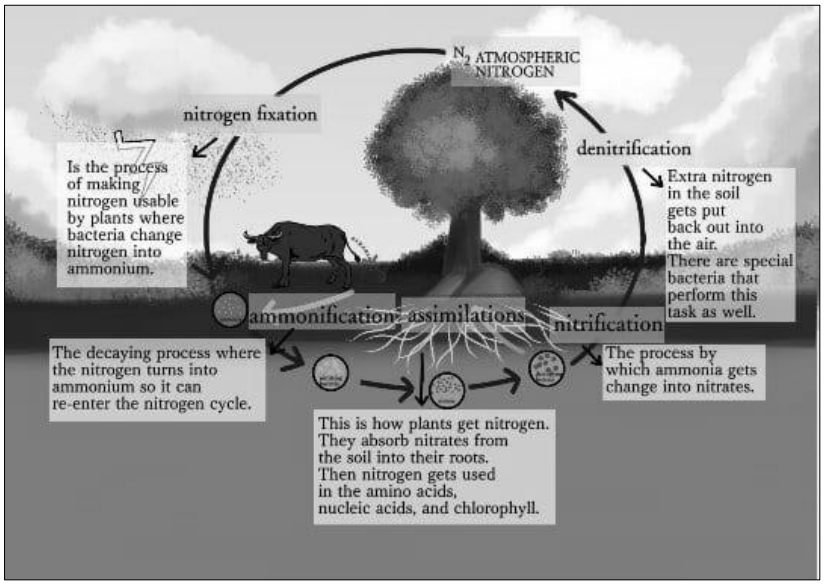
The exchange of oxygen and carbon dioxide through photosynthesis and respiration helps cycle these gases. Human activities such as deforestation and burning of fossils contribute to carbon dioxide emissions in the atmosphere resulting to global warming. **Global warming** is an increase in the earth's air temperature.

Trees play significant role in mitigating global warming by absorbing carbon dioxide, that is why planting of trees and other plants are necessary to reduce carbon dioxide in the atmosphere.

Nitrogen Cycle

Many processes in the ecosystem, such as plant and animal growth, are limited by the available supply of nitrogen. The earth's atmosphere contains nearly 78% of nitrogen gas. However, for it to be available to organisms, it must be changed first into usable forms. One of the many importance of nitrogen is for plant growth. Through a series of nitrogen-transformations, nitrogen is made available to plants. Nitrates ($N0_3$), Nitrites (NO_2), and Ammonium (NH_4) are forms of nitrogen that results of the nitrogen cycle.

There are five processes of Nitrogen cycle that happen in the environment. The steps which are not necessarily sequential include nitrogen fixation, nitrogen assimilation, ammonification, nitrification, and denitrification (Figure 3).



Illustrated by: Rose Mia L. Pontillo

Nitrogen fixation is the process in which nitrogen gas is converted into nitrates or ammonia. Lightning fixation is one type of nitrogen fixation wherein nitric oxide (NO) is formed in the air from nitrogen gas (N_2) and oxygen (0_2) during thunderstorms by lightning. Nitric oxide (NO) oxidizes further to nitrogen dioxide (NO_2) and later reacts with water forming nitric acids. Acids fall to the ground during rain and form nitrates (NO_3) and nitrites (NO_2^-) in the soil.

Another way of nitrogen fixation is the bacterial fixation which is estimated to harness 90% of nitrogen gas into its usable forms. Some genera of bacteria have the ability to fix atmospheric nitrogen. Most are free-living, but some form symbiotic relationships with the roots of legumes such as the mongo plant. Only the symbiotic bacteria fix enough nitrogen to be of a major role in nitrogen production. Nitrogen fixing bacteria act as a link between the nitrogen in the atmosphere and the nitrogen in land.

Nitrogen assimilation is the process by which nitrates and ammonia formed from nitrogen fixation are combined into the specific tissue compounds of algae and higher plants. Plants absorb nitrates from the soil through the roots and integrate them into plant protein and nucleic acids. The nitrates become one of the many components of the nutrient-rich water absorbed by the plants which will be utilized by it for growth and development.

Ammonification is the process of making ammonia or ammonium ions (NH4+) by living things. Ammonium ions are produced as a waste material of animals and some bacteria and during the decomposition of organic nitrogenous materials by bacteria. For example, some bacteria can convert nitrate into ammonia in soils. When an organism dies or eliminate waste, the nitrogen in its tissues is in the form of organic nitrogen. Many fungi and other unicellular organisms then decompose the tissue and release inorganic nitrogen back into the environment as ammonia in the process of ammonification. The majority of ammonium ions are rapidly used up in soil and water by microorganisms and plants. At different points in the food web, ammonium ions are released back to the environment.

Nitrification is a process by which soil ammonia are converted to nitrites then to nitrates, compounds usable by plants. This process is mediated by two distinct groups of microorganisms that live particularly in areas where ammonia is present in large amounts, such as areas of ammonification and in sewage. The ammonia-oxidizing bacteria (nitrosifyers) mediate the first step by oxidizing ammonia into nitrites. The second group, the nitrite-oxidizing bacteria (or nitrifying bacteria) such as Rhizobium in the roots of legumes, catalyze the second step, by oxidizing nitrites into nitrates, to complete the nitrification process.

Denitrification is the process wherein nitrate is converted into nitrogen gas (N_2) or other gaseous nitrogen compounds such as N_2O and NO by different bacteria in soils during anaerobic respiration. Denitrification reduces nitrate to nitrogen gas, thus, replenishing the atmospheric nitrogen that was once used, returning it to the atmosphere, the reservoir.

What's More

Activity 3. Match Me!

This activity will enable you to identify the different processes involved in the water cycle.

Directions: Match column A with column B. Write your answers on a separate sheet of paper.

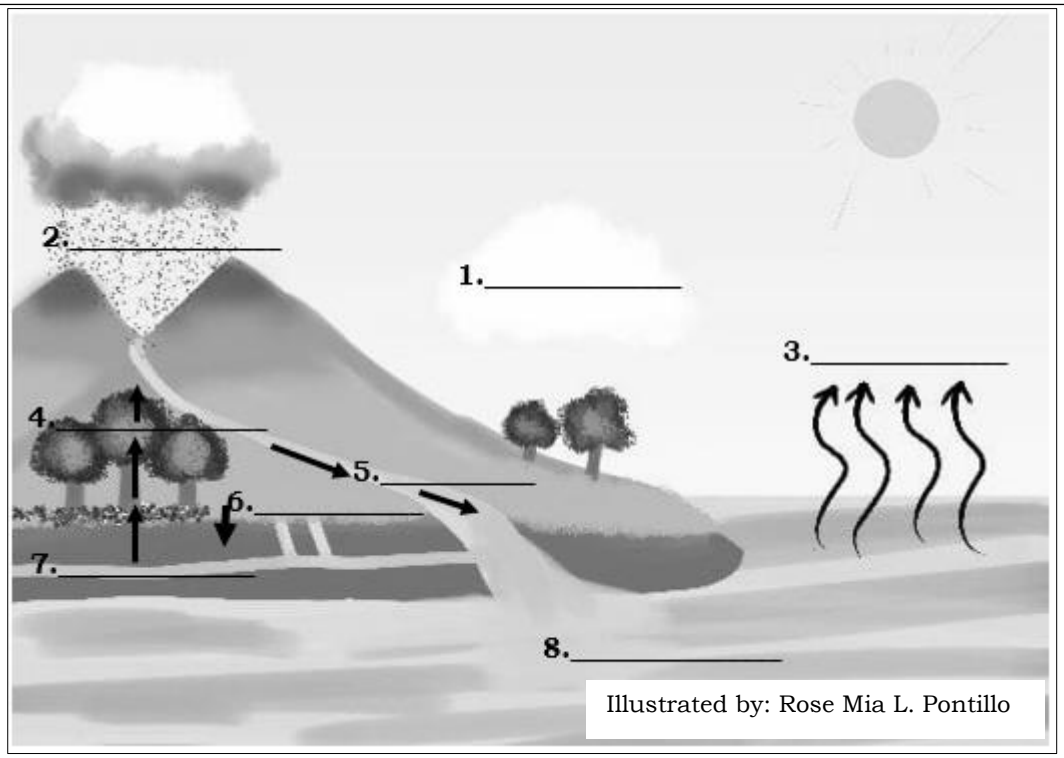
Column A	Column B
1. Condensation	A. Water droplets fall on the earth's surface because of gravity, either in the form of rain, snow, hail, fog or sleet.
2. Evaporation	B. The water seeps into the ground part of the soil where it becomes groundwater.
3. Infiltration	C. Water from the ocean rises in the atmosphere and turns into water vapor.
4. Precipitation	D. Water is absorbed by the roots and is given off in a form of water vapor through the stomata of the plant.
5. Surface Runoff	E. Water vapor changes to liquid phase and form into clouds.
6. Transpiration	F. The water that falls to the earth reaches the ground, moves along the surface and becomes part of a lake, river or ocean

Activity 4. Where Am I?

This activity will help you recognize and explain the essential elements of the water cycle.

Directions: Complete the water cycle using the words from the box and briefly answer the question below. Write your answers on a separate sheet of paper.

Condensation	Infiltration	Surface runoff
Evaporation	Ocean	Transpiration
Groundwater	Precipitation	



Question:

Explain how water cycle happens in the ecosystem?

_____

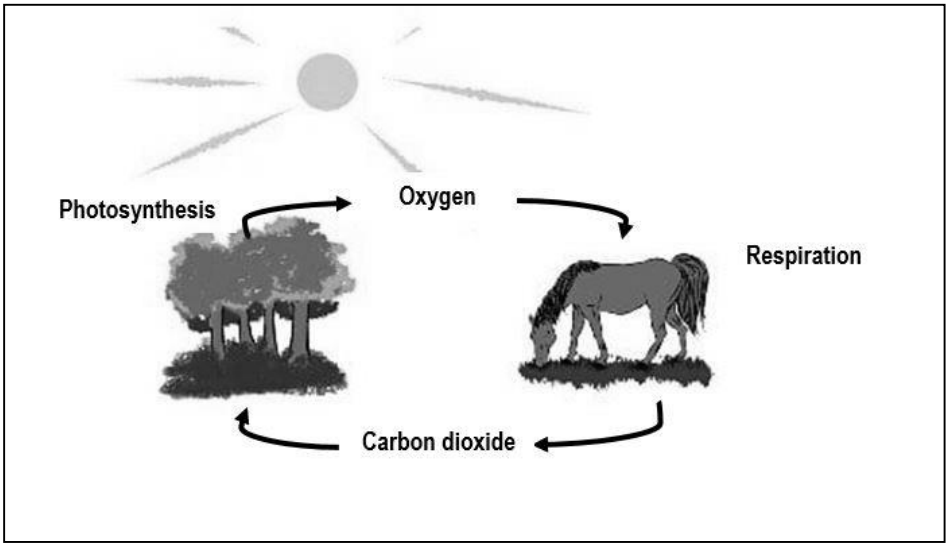
_____

Scoring Rubric
3 - Discussion has no misconceptions with complete scientific evidence.
2 - Discussion has no misconceptions with incomplete scientific evidence.
1 - Discussion has misconceptions and without scientific evidence.
0 - No discussion.

Activity 5. Understanding Oxygen-Carbon Dioxide Cycle

This activity is designed to allow you to dig deeper understanding on how oxygen and carbon dioxide flow through the ecosystem

Directions: Study the diagram of Oxygen-Carbon dioxide cycle. Answer the questions that follow. Write your answers on a separate sheet of paper.



Illustrated by: Rose Mia L. Pontillo

Questions:

1. What gas is needed by plants for photosynthesis? What gas is given off?

_____

_____

2. During respiration, what do animals absorb? What gas do they give off?

_____

_____

3. Explain how oxygen-carbon dioxide cycle occurs in the ecosystem?

_____

_____

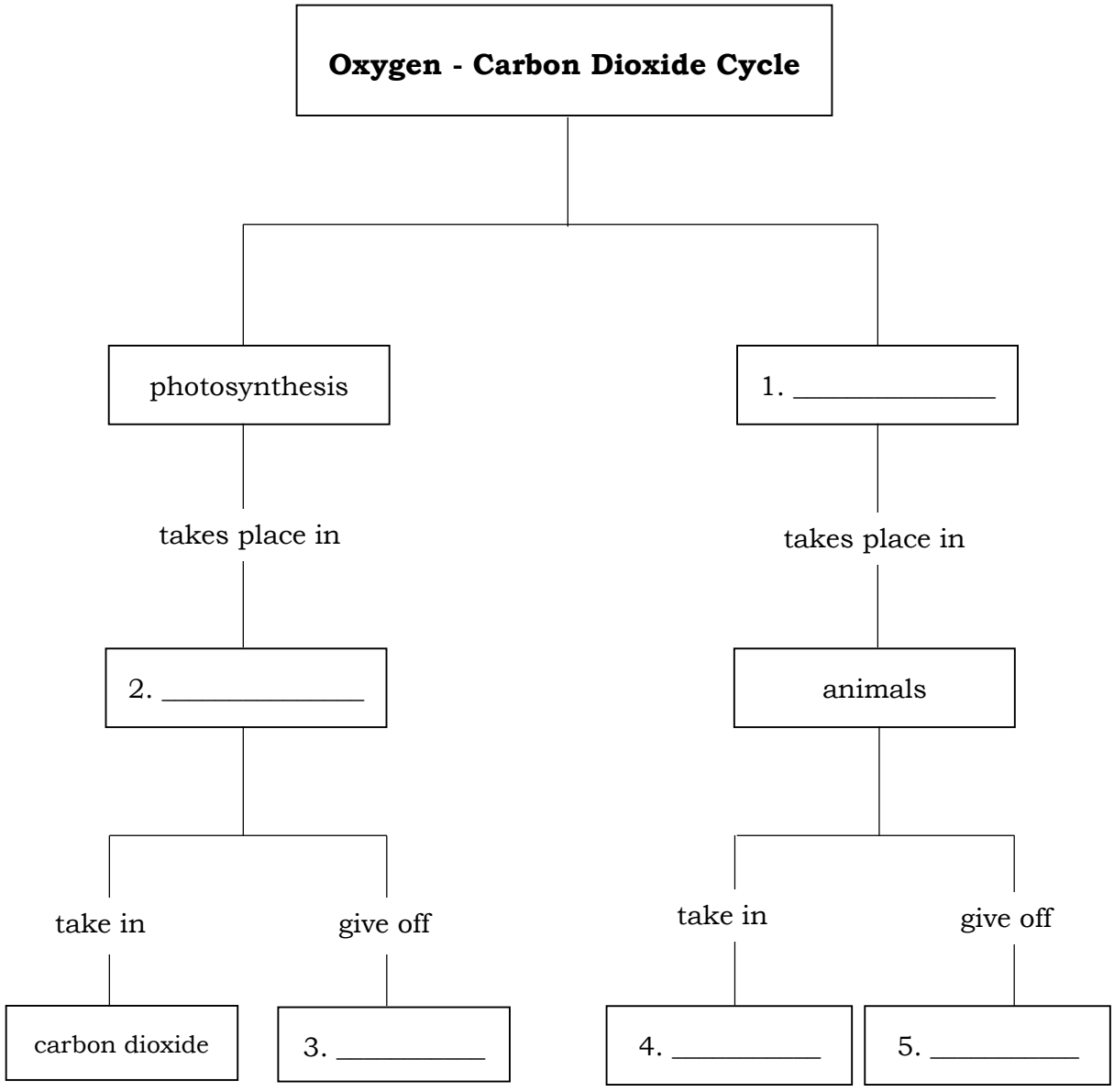
Scoring Rubric for number 3
3 - Discussion has no misconceptions with complete scientific evidence.
2 - Discussion has no misconceptions with incomplete scientific evidence.
1 - Discussion has misconceptions and without scientific evidence.
0 - No discussion.

Activity 6. Complete Me!

This activity will help you analyze the components of oxygen-carbon dioxide cycle.

A. Directions: Complete the Oxygen-Carbon dioxide cycle concept map using the terms inside the box. Write your answers on a separate sheet of paper.

Animals	Oxygen	Plants
Carbon dioxide	Photosynthesis	Respiration

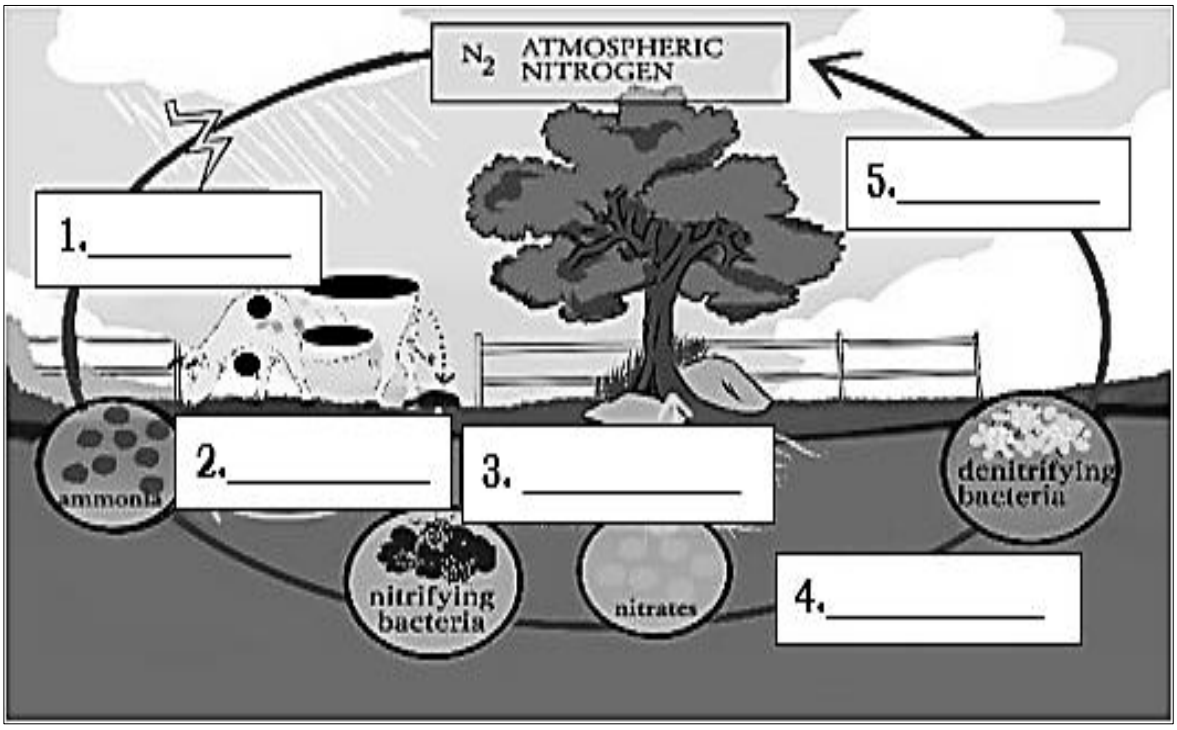


Activity 7. Fill Me Up!

You are challenged here to explore and explain the chemical processes that occur within the nitrogen cycle.

Directions: Complete the Nitrogen cycle using the words from the box and answer the question that follows. Write your answers on a separate sheet of paper.

Assimilation	Denitrification	Nitrogen-fixation
Ammonification	Nitrification	



Illustrated by: Rose Mia L. Pontillo

Question:

Explain the different processes of nitrogen cycle.

A. Nitrogen Fixation

_____

_____

B. Assimilation

_____

_____

C. Ammonification

_____

_____

D. Nitrification

_____

_____

E. Denitrification

_____

_____

Scoring Rubric
3 - Discussion has no misconceptions with complete scientific evidence.
2 - Discussion has no misconceptions with incomplete scientific evidence.
1 - Discussion has misconceptions and without scientific evidence
0 - No discussion.

What I Have Learned

Directions: Complete the statement by writing the appropriate word or phrase on the blank. Write your answers on a separate sheet of paper.

1. Water moves through the atmosphere to the earth's surface and back through the process called _____.

2. Evaporation happens when liquid phase of water is transformed into _____ which rises into the atmosphere.

3. The precipitate falls to the surface as _____.

4. _____is water that flows to across the ground or land surface.

5. The production of oxygen and carbon dioxide flows through the organisms and in the environment through a cyclic process called _____.

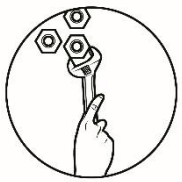
6. The process of manufacturing food by plants is called _____.

7. Animals give off _____ to the atmosphere during respiration, which in turn will be absorbed and used by plants in manufacturing food.

8. The gas that consists nearly 78% in the Earth's atmosphere is _____.

9. Nitrogen fixation is the process in which nitrogen gas is converted into _____ and ammonia.

10. In the _____ process, nitrate is converted into nitrogen gas (N_2) or other gaseous nitrogen compounds such as N_2O and NO by different bacteria in soils during anaerobic respiration.



What I Can Do

Activity 8. Let's combine!

In the ecosystem, water cycle, oxygen-carbon dioxide cycle and nitrogen cycle play vital role in maintaining the cycle of essential nutrients needed by all plants and animals. Regardless of the type of environment, these cycles occur.

Directions: Draw small ecosystem that you can see in your environment and incorporate the diagram of the three cycles.

Draw it here:

Scoring Rubrics:	
3 points	The illustration shows complete scientific concepts on the three cycle.
2 points	The illustration shows limited scientific concepts on the three cycle.
1 point	The illustration fails to show scientific concepts on the three cycle.
0 point	No illustration.

Assessment

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

1. Which stage of water cycle changes water into water vapor?
   A. condensation
   B. evaporation
   C. precipitation
   D. transpiration

2. Which is the source of energy that drives water cycle?
   A. clouds
   B. rain
   C. sun
   D. wind

3. A girl on her way home noticed a puddle of water on the road. As she passed by the next day, the water was gone. What has happened to the water? It has _____.
   A. condensed
   B. evaporated
   C. precipitated
   D. transpired

4. Which process involves water to move across the ground or land and becomes part of the oceans, lakes and other bodies of water?
   A. condensation
   B. evaporation
   C. surface runoff
   D. transpiration

5. Which of the following is true about water vapor?
   A. It can be counted.
   B. It is solid and visible.
   C. It is liquid and visible.
   D. It is gaseous and invisible.

6. Which process of water cycle is exhibited when water is absorbed by the roots and is given off as water vapor through the stomata of the plant?
   A. condensation
   B. evaporation
   C. precipitation
   D. transpiration

7. Which gas is given off by animals that is needed by plants?
   A. Carbon dioxide
   B. Carbon monoxide
   C. Nitrogen
   D. Oxygen

8. Which gas is needed by plants to manufacture food?
   A. Carbon dioxide
   B. Carbon monoxide
   C. Nitrogen
   D. Oxygen

9. Which of the following provides available natural oxygen?
   A. animal
   B. decomposers
   C. plant
   D. water

10. What happens during the process of respiration?
   A. Carbon dioxide is changed into oxygen.
   B. Oxygen and sunlight are converted to sugar.
   C. Oxygen is used up and carbon dioxide is released.
   D. Carbon dioxide and water form energy and oxygen.

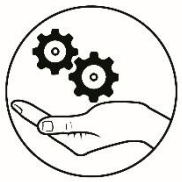
11. Which of the following is the effect of carbon dioxide build-up in the atmosphere?
   A. The amount of available oxygen decreases.
   B. There is less amount of solar energy reaching the earth.
   C. Global temperature increases that affect the weather patterns.
   D. Global air pressure increases making more difficult for plants and animals to breathe.

12. Which of the following processes of nitrogen cycle releases nitrogen gas (N_2) back to the atmosphere?
   A. Ammonification
   B. Denitrification
   C. Fixation
   D. Nitrification

13. Which of the processes of nitrogen cycle changes dead plants and animals into ammonium?
   A. Ammonification
   B. Denitrification
   C. Fixation
   D. Nitrification

14. Where do plants obtain nitrogen they need?
    A. atmosphere
    B. ecosystem
    C. soil
    D. water

15. Can the Earth's nitrogen be utilized directly by plants? Why?
    A. No, because nitrogen gas cannot be converted to other forms.
    B. Yes, because majority of the Earth's nitrogen is stored in land and water.
    C. No, most of it exists as inorganic nitrogen gas and is not usable by plants.
    D. Yes, because there is sufficient available nitrogen gas in the atmosphere and is usable to most organisms.



Additional Activities

Activity 9. Share Us

This activity will help you relate and apply the different cycle in a real life scenario.

Directions: Answer the questions below. Write your answers on a separate sheet of paper.

1. What is the importance of planting trees in relation to the Oxygen-Carbon dioxide cycle?

   _____
   _____

2. With your knowledge about the Nitrogen cycle, what suggestions can you give to farmers in your community to enhance their farming practices without destroying the environment?

   _____
   _____

Scoring Rubric
3 - Discussion has no misconceptions with complete scientific evidence.
2 - Discussion has no misconceptions with incomplete scientific evidence.
1 - Discussion has misconceptions and without scientific evidence
0 - No discussion.

Answer Key

What's New

Activity 2: Where I Belong?

Water Cycle
*Condensation
*Evaporation
*Precipitation
Oxygen- Carbon dioxide Cycle
*Photosynthesis
*Respiration
Nitrogen Cycle
*Ammonification
*Fixation
*Nitrification

What's In

Activity 1

1. Plants
2. Biomass
3. Herbivore
4. Sun
5. Decreasing

What I Know

1. A
2. C
3. C
4. D
5. D
6. B
7. B
8. C
9. A
10. C
11. B
12. A
13. C
14. C
15. D

Activity 5. Understanding Oxygen-Carbon dioxide Cycle

1. Carbon dioxide, Oxygen
2. Oxygen, Carbon dioxide
3. *Plants use Oxygen through the process called Photosynthesis. They use the energy from the sun to combine Carbon dioxide and water into sugar molecules that's give them energy to live and grow and provide food for other organisms. Oxygen is given off as a waste product of photosynthesis. Animals breathe in the oxygen released by plants and released Carbon dioxide in the process called respiration. During this process animals cells combine oxygen with food molecules to obtain energy. They release CO_2 into the air as a waste product which in turn is used by plants for photosynthesis.

What's More

Activity 4. Where Am I?

Explanation:
Water from soil and bodies of water (such as ocean, river, lake, etc.) evaporates as water vapor, condenses to form clouds and falls back to the earth surface as rain or snow. The liquid water flows across land (runoff) and becomes part of the oceans, lakes, rivers and other bodies of water. Some water that precipitates seep into the soil, becomes groundwater where it taken up by plants (plant uptake) and evaporates from plants into the atmosphere through transpiration and photosynthesis.

What's More

Activity 3: Match Me!

1. E
2. C
3. B
4. A
5. F
6. D

Activity 4. Where Am I?

1. Condensation
2. Precipitation
3. Evaporation
4. Transpiration
5. Surface runoff
6. Infiltration
7. Groundwater
8. Ocean

What I have Learned

1. Water Cycle
2. Gaseous phase/water vapor
3. rain, snow, hail, or sleet
4. Surface runoff
5. Oxygen-Carbon dioxide cycle
6. Photosynthesis
7. Carbon dioxide
8. Nitrogen
9. Nitrates
10. Denitrification

What's More

Activity7. Fill Me Up!

There are five processes of Nitrogen cycle that happen in the environment. which are not necessarily sequential are the following:

1. **Nitrogen Fixation** is the process in which nitrogen gas is converted into nitrates and ammonia.
2. **Ammonification** is the process of making ammonia or ammonium ions ($NH4+$) by living things.
3. **Assimilation** is the process by which plants are able to absorb nitrates as a water soluble substance from the soil through the roots.
4. **Nitrification** is a process by which soil ammonia and nitrites are converted to nitrates, compounds usable by plants.
5. **Denitrification** is the process wherein nitrate is converted back into nitrogen gas (N_2) or into other gaseous nitrogen compounds.

What's More

Activity 6. Complete Me!

1. Respiration
2. Plants
3. Oxygen
4. Oxygen
5. Carbon dioxide

Activity7. Fill Me Up!

Additional Activities

Activity 9.Share Us!

1.*Learn to reuse and recycle water.
*Turn off faucet when not in use.
*Observe proper waste disposal.
*Join/organize tree planting activities.
*Advocate reforestation and conduct campaign against illegal logging.
2. *Help balance oxygen-carbon Dioxide in the ecosystem.
* Help absorb CO_2, thus prevent global warming.
3. *Advise the farmers to use organic fertilizers.
*Planting legumínous plants.
*Avoid burning hay after harvest.
*Avoid using inorganic herbicide.

Assessment

1. B
2. C
3. B
4. C
5. D
6. D
7. A
8. A
9. C
10. C
11. C
12. B
13. A
14. C
15. C

What I Can Do

Activity 8.Let's combine!

Sample illustration

Illustrated by: Honey R. Bolo

References

Development Team of the Learner's Module, *Grade 8 Science Learner's Module*, DepEd, Pasig City Philippines: Vibal Publishing House, Inc, 2013.

Lourdes R. Carale, Aida Dasallas, Zenaida Lopez Dee, Elvira R. Galvez, Gerardo Luna, Ma. Dulcelina O. Sebastian, Esther Sebua, Merle C. Tan, Guadalupe Yap, Mabel Ypil and Risa L. Reyes, *Science and Technology II* Revised Edition Quezon City, Philippines: ISMED, 2004.

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