



Science 4 **Microlearning Module**

QUARTER 4 – Module 3 Effect of Different Types of Soil on the Growth of Plants





REGION XII - DIVISION OF SULTAN KUDARAT

Science 4 Microlearning Module (MLM) Quarter 4 Module 3: Effect of Different Types of Soil on the Growth of Plant First Edition, 2024

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MICROLEARNING MODULE

Name:	Grade & Sec:	Score:
Subject: <u>Science 4</u>	Quarter: <u>4</u>	MLM No. 3
Teacher:		
Learning Competency: 1	The learners participate	in a guided investigation
to identify the effect o	f different types of soil (on the growth of plants.

Effect of Different Types of Soil on the Growth of Plants

A. Look Back!

Directions: Determine the importance of water in our daily activities.

Write **True** if the statement is correct and **False** if it is wrong. Write your answers on a separate sheet of paper.

- 1. Only about 0.5% of earth's water is safe to drink.
- 2. Drinking contaminated water is safe for human body.
- 3. Water is considered as one of our basic survival needs.
- 4. People living near rivers and seas use water for transportation.
- 5. Freshwater is not drinkable and cannot be treated for drinking.
- 6. Water is used in industrial processes but it does have not minimal impact on daily life.
- 7. We don't need to save water because there is always enough for everyone.
- 8. All living creatures such as animals and humans can survive without water.
- 9. Learning about water and how to use it wisely can help us take care of our planet.
- 10. Water is used for swimming and playing in the pool but is not necessary for other activities.

B. What's New?

Activity B.1: Let's see

Directions: Analyze the pictures below. Answer the following questions that follow. Write your answers on a separate sheet of paper.



Guide Questions:

1. What are the plants that you see in the pictures A, B, and C?

- 2. In what type of soil do the corn, gabi (taro root), and cactus grow?
- 3. Why should you consider the types of soil before planting?

C. What Is It?

Soil types which are sand, clay, and loam have great effect on root growth of plant. They influence the ability of the root system to extract adequate water, and nutrients from the soil. In order to increase the nutrient availability and increase of growth of plant, biofertilizers (composts) are being added.

Sandy soil primarily comprises bigger particles of sand, rather than clay. This type of soil does not hold much water and lacks most essential nutrients that many plants require for maximum growth. The high absorbency of sandy soils leads to their fast infiltration by water, but the loose texture does not allow them to retain moisture for a long time. Soils with a sandy texture have good air movement and hinder any possibility of plants' root breakdown induced by excess moisture. Some full-sun plants can be cultivated in this kind of soil and still grow normally even with little or no water supply because they reach the maturity stage. When that happens, mix some compost in with the sand so it will hold water longer. Increasing sand content makes more nutrients flow out in the soil, thus leaving less for plants as well as increasing drainage rate whereby more water passes through the soil. Accordingly, when there is increased amount of sand, also the plants will become smaller ones, with little root development and lighter coloration; they will be small sized plants without proper roots' growth who are relatively light coloration on them.

Clay soil has smaller concentrations of sand. Therefore, it is a much more effective type of soil in retaining moisture. In dry regions, clay soils become hardened to a solid mass that may be difficult to penetrate. Clay soil becomes slippery and sticky when it gets wet. It is free of air pockets, which supports water retention but limits drainage. Roots of plants growing in clay soils will be stunned and held back from reaching maturity due to insufficient air supply. The presence of clay affects the growth of plants. The more clay there is in the soil composition, the more moisture and nutrients retained by the soil thereby increasing plant growth. However, with pure clay soil, it will become dense and waterlogged, and the growth of the any plant will be stunted.

An ideal soil is a **loam**, which has balanced proportions of sand, clay and organic matter. A rich loamy soil with all its soil components in balance including organic materials is a gardener's goal. There is just enough clay and organic matter to hold a good amount of water in the soil for plants' roots. Also, it has got right mixture of sand that allows drainage as well as some drying so as not to be waterlogged. Loams are grainy, moist, and retain water easily. Loam would be the more desirable medium for growing plants. It is the perfect soil for the cultivation of plants.

D. Let's try!

Activity D.1: Effect of the different kinds of soil on the growth of plant

Objective: Investigate the effects of different soil on the growth of a seed.

What you need:

9 monggo seeds

3 plastic cups the same size with holes at the bottom

3 types of soil (sandy, clay, and loam)

2 cups of water

Marker

Ruler

What to do:

- 1. Prepare 3 cups of the same size.
- 2. Label each cup with A (sandy), b (clay), and C (loam).
- 3. Place an equal amount of sandy, clay and loam soils in each cup.
- 4. Plant each cup with 3 seeds and water them after planting.
- 5. Place the plastic cup in a safe place.
- 6. Observe the growth of seeds every day for 5 days.
- 7. Record the observation in the table below.
- 8. Report observations in the class.

Typ CUP of Soi	Type	OBSERVATION					
		DAY 1		DAY 2		DAY 3	
	of	(Date)		(Date)		(Date)	
	5011	Height	Other	Height	Other	Height	Other
		(cm)	Observation	(cm)	Observation	(cm)	Observation
А							
В							
С							

	Type of Soil	OBSERVATION				
]	DAY 4	DAY 5		
CUP		(Date)		(Date)		
		Height	Other Observation	Height	Other Observation	
		(cm)	-	(cm)		
A						
В						
С						
С						

What did you find out?

- 1. In which type of soil did you first see some sprout? _____
- 2. In which type of soil did you not see any sprout? _____
- 3. In which type of soil did you see more leaves in day 5?_____
- 4. Based on your observations, which type of soil was best for growing the monggo ? Why do you think so?_____
- 5. Which type of soil was not appropriate for growing the monggo?

Why?_____

E. Let's Evaluate

Directions. Read and understand each item carefully. Write the letter of the correct answer on a separate sheet of paper.

- 1. Aside from water and sunlight plants also need nutrients, which of the nutrients do the plants in for growing?
 - A. nutrients from air C. nutrients from sun
 - B. nutrients from soil D. nutrients from water

Use this paragraph to answer question numbers 2 and 3.

Soil has different types, namely sandy, clay and loam. Sandy soil does not hold much water and lacks most essential nutrients that many plants require for maximum growth. Clay soil is sticky and does not allow water to drain easily. Roots of plants growing in clay soils will be stunned and held back from reaching maturity due to insufficient air supply. Loam soil is usually dark and can retain moisture and nutrients. It is an agricultural soil suited for farming.

- 2. Which type of soil does not hold much water and lacks most essential nutrients that many plants require for maximum growth?
 - A. clay B. loam C. sandy D. silt
- 3. Which type of soil is usually dark and can retain moisture and nutrients?
 - A. clay B. loam C. sandy D. silt
- 4. Fallen leaves and animal wastes after a while, will decay and turn into soil. In which of the following types of soil do they belong?A. lay B. loam C. sandy D. Silt
- 5. Which of the following statements best describes the soil?
 - A. The soil helps improve water infiltration.
 - B. The soil is rich in nutrients which is important to plants.
 - C. All types of soil are good for gardening because of the presence of nutrients.
 - D. Soil is made up of minerals, organic matter, water, air, and living organisms in a complex combination.
- 6. Which of the following is **NOT** true about clay?
 - A. It is the heaviest type of soil here on earth.
 - B. It has the smallest particle of all types of soil.
 - C. It has a good resistance to moisture and air penetrations.
 - D. It retains moisture and nutrients which is good in farming.

- 7. Renan is a vegetable gardener. He always chooses loam soil as his preferred soil. Why does Renan choose this soil?
 - A. because humus can retain moisture
 - B. because this soil is an organic waste that forms in soil from decaying plant and animal waste
 - C. because humus contains a lot of nutrients a lot of nutrients that are good for vegetable plants
 - D. All of the above
- 8. Yesterday there was heavy rain and Ana stepped on this soil that is very sticky. What type of soil did Ana step on?
 - A. clay B. humus C. loam D. sandy
- 9. If you are a gardener, you should avoid using this soil because this is the poorest type of soil for growing plants.
 A. clay
 B. humus
 C. loam
 D. sandy
- 10. Which of the following does **NOT** tell about loam soil?
 - I. Loam is a blend of sand, silt, and clay, with the beneficial elements of each present.
 - II. Loam soil is the densest and heaviest soil and does not drain properly or allow plant roots to grow.
 - III. Loam soil is known as agricultural soil because it has an equal amount of each of the three types of soil materials.

IV. Loam soil contains little nutrients and has a limited water-holding capacity, making it difficult for the plant's roots to absorb water.

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

F. References

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Answer Key

Grade 4 Science:a

Quarter: 4 LC: 3

Look Back!

- A. What's New?
 - 1. True
 - 2. True
 - 3. True
 - 4. True
 - 5. True
 - 6. False
 - 7. False
 - 8. False
 - 9. True
 - 10. False

What's Ne

Activity B.1

Answers may vary

D. Let's Try

Activity D.I

Answer May vary

E. Let's Evaluate

1. c	9. a
2. b	10. d
3. b	
4. b	
5. a	
6. d	

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