4

DepED
DEPARTMENT OF EDUCATION

Learning Activity Sheet for Science

Quarter 4
Lesson
1

Worksheet for Science Grade 4
Quarter 4: Lesson 1 (Week 1)
SY 2024-2025

Development Team

Writers: Dr. Berhana I. Flores (Western Mindanao State University)
Validators: Dr. Randel D. Estacio (Quezon City University)

Management Team
Philippine Normal University
Research Institute for Teacher Quality
SiMERR National Research Centre

LEARNING ACTIVITY SHEET 1

Learning Area:	Science	**Quarter:**	4th Quarter
Lesson No.:	1	**Date:**	
Lesson Title/ Topic:	**What is Soil (Importance of Soil for Plant Growth)**		
Name:		**Grade & Section:**	

I. Activity No. 1: Characteristics of Soil (20 minutes)

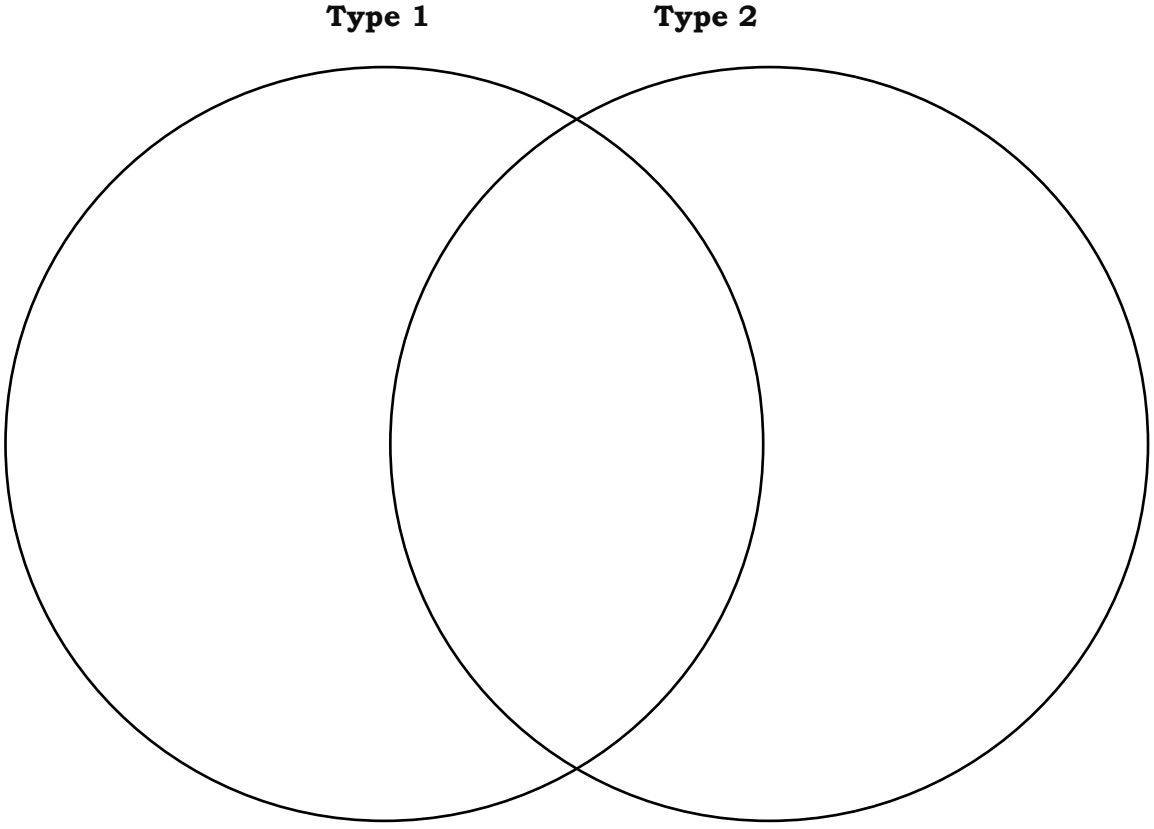
II. Objective(s): *At the end of the activity, the learners are expected to identify the different characteristics of soil.*

III. Materials Needed:

- School garden
- Magnifying glass (optional)

IV. Instructions:

1. Work in pairs.
2. Visit your school garden.
3. Observe the soil around.
4. Using the Venn diagram, describe two types of soil available in your garden.



Rubric or Scoring Guide:

Use the rubric guide below in assessing the student's Venn Diagram.

Criteria	4 Points	3 Points	2 Points	1 Point
Identification of Elements	Accurately identifies and labels common soil components (e.g., minerals, organic matter, water).	Identifies and labels most common soil components with minor inaccuracies.	Partially identifies common soil components with notable inaccuracies.	Struggles to identify and label common soil components accurately.
Comparison	Provides a clear and accurate comparison of similarities and differences between soil components.	Presents a comparison of similarities and differences between soil components but with minor inaccuracies.	Attempts to compare similarities and differences, but the understanding is limited, leading to notable inaccuracies.	Struggles to compare similarities and differences accurately.
Use of Descriptive Language	Uses precise and scientific language to describe soil components and their characteristics.	Uses appropriate language to describe soil components, with minor inaccuracies or less precise terminology.	Attempts to use descriptive language, but the expressions are simplistic or contain notable inaccuracies.	Struggles to use descriptive language appropriately.
Understanding of Concepts	Demonstrates a deep understanding of soil components and their roles in the environment.	Shows a solid understanding of soil components and their functions but may have some gaps in knowledge.	Demonstrates a basic understanding of soil components but lacks depth in knowledge.	Struggles to demonstrate a clear understanding of soil components.
Neatness and Organization	The Venn diagram is exceptionally neat, well-organized, and visually appealing.	The Venn diagram is neat and well-organized with minor deviations from perfection.	The Venn diagram is somewhat organized, with noticeable inconsistencies or untidiness.	The Venn diagram is disorganized, making it challenging to follow the information.

Scoring Guide:

- **16-20 points:** *Exemplary performance.* The student demonstrates a thorough understanding of soil components and presents the information exceptionally well.
- **11-15 points:** *Proficient performance.* The student has a solid understanding of soil components, with some minor areas for improvement in accuracy or organization.
- **6-10 points:** *Basic performance.* The student has a basic understanding of soil components but may struggle with accuracy, organization, or depth of knowledge.
- **1-5 points:** *Below basic performance*. The student has difficulty demonstrating a clear understanding of soil components, accuracy, and organization.

V. Synthesis/Extended Practice/Differentiation (if needed):

Synthesis

Soil is a dynamic mixture of minerals, organic matter, water, and air, with varying compositions leading to different soil types. It plays a critical role in supporting life, providing essential nutrients for plant growth, and fostering biodiversity. Soil erosion poses environmental challenges, but conservation practices help prevent soil loss. In agriculture, soil health is crucial, influencing crop selection and farming practices. Soil also acts as a filter, affecting water quality and playing a role in climate regulation through carbon sequestration. Understanding soil's complex interplay is essential for sustainable land management and environmental preservation.

Extended Practice

Design your ideal soil garden by applying your understanding of soil components and characteristics in a creative and practical way. *Use another sheet for your drawing.*

Suggested Modification:

Group project: "Soil Explorers."
Objectives: Investigate a specific type of soil and present their findings to the class.
Instructions:

1. Form a small group.
2. Research, investigate the composition and characteristics of the soil type assigned in your group.
3. Create a Venn Diagram comparing your group's assigned soil type with another discussed in class.
4. Present your Venn Diagrams in class.
5. Share your insights, questions, and identification of commonalities or differences between the various soil types.

LEARNING ACTIVITY SHEET 2

Learning Area:	Science	**Quarter:**	4th Quarter
Lesson No.:	1	**Date:**	
Lesson Title/ Topic:	**Different Types and Characteristics of Soil**		
Name:		**Grade & Section:**	

I. Activity No. 2: Identifying Types of Soil (30 mins)

II. Objective(s): *At the end of the activity, the learners are expected to:*

a. identify different types of soil; and

b. describe the characteristics of each kind of soil.

III. Materials Needed:

- Soil samples from different places (garden, riverbank, seashore, construction site)
- Bond papers
- Magnifying glass
- Ruler

IV. Instructions:

1. Work in group.
2. Together with your teammates perform the activity.
3. Place the soil sample on a sheet of bond paper. Mark the garden soil as sample A, the soil from the riverbank as sample B, the soil from the seashore as sample C, and the soil from the construction site as sample D.
4. Study each soil sample using a magnifying glass. Look at its color and particle size.
5. Using a ruler, measure the size of particles of each soil sample in millimeters (mm). If the soil particles are smaller than 1mm, indicate that the measurement is below 1mm in the table.
6. Write your findings in the table below. Identify the kind of soil that each soil sample represented.

Soil Sample	Color	Particle Size (mm)	Kind of Soil
A			
B			
C			
D			

7. Answer the following questions:
   a. Do all soil samples have the same color?

   _____

   _____

   b. How does the color of soil samples vary, and what factors contribute to the differences in soil color across various samples?

   _____

   _____

   _____

   _____

   _____

   c. Do all soil samples have the same particle size?

   _____

   _____

d. How does the particle size of soil samples vary, and what factors contribute to differences in particle size across various soil samples?

_____
_____
_____
_____
_____

e. What is the range of particle sizes among different soil samples, and can you identify which sample has the largest and smallest particle sizes, respectively?

_____
_____
_____
_____
_____

8. Present your findings to the class.

V. Synthesis/Extended Practice/Differentiation (if needed):

Synthesis

Different types of soil contribute to a diverse range of ecosystems, each characterized by specific compositions and properties. Sandy soil offers good drainage but struggles with water retention, while clayey soil retains water well but can be prone to compaction. Loamy soil strikes a balance, combining benefits from sand, silt, and clay. Silty soil is smooth and fertile, found in river valleys. Peat soil, rich in organic matter, is prevalent in marshy areas. Chalky or limestone soil is alkaline and rocky. Volcanic ash soil is nutrient-rich, originating from volcanic eruptions. Lateritic soil in tropical regions contains high levels of iron and aluminum. Understanding these soil types is crucial for effective land management and sustainable agriculture.

Extended Practice

Soil Profile Investigation. This extended practice involves a hands-on approach, allowing students to dig deeper, quite literally, into the layers of soil.

Suggested Modification:

Group Activity: Soil Explorers
Objectives: Use online resources and virtual tools to explore diverse soil types
Instructions:

1. Access links to soil science websites, educational simulations, or virtual field trips to engage with interactive platforms simulating soil profiles.
2. Analyze characteristics, vegetation, and crops associated with each soil type.
3. Create a digital presentation summarizing their virtual exploration, incorporating visuals and data.
4. Share to the class your experiences, discuss observed similarities and differences in soil profiles, and consider the potential impacts on ecosystems and human activities.

LEARNING ACTIVITY SHEET 3

Learning Area:	Science	**Quarter:**	4th Quarter
Lesson No.:	1	**Date:**	
Lesson Title/ Topic:	**Soil absorption Capacity**		
Name:		**Grade & Section:**	

I. Activity No.3: Comparing How Different Kinds of Soil Absorb Water (30 mins)

II. Objective(s): *At the end of the activity, the learners are expected to compare how different kinds of soil absorb water.*

III. Materials Needed:

- Different kinds of soil (clay, gravel, loam & sand)
- Water
- 4 identical beakers
- Stopwatch

IV. Instructions:

1. Work in group.
2. Together with your teammates perform the activity.
3. Put a cup of each kind of soil into a beaker.
4. Pour 50 mL of water into each beaker simultaneously.
5. Observe how the soil absorbs water.
6. Use a stopwatch to record the time in seconds (s) that it takes for the soil to absorb water completely
7. Complete the table below:

Kind of Soil	Time it Takes to Absorb the Water (s)
clay	
sand	
gravel	
loam	

8. Answer the following questions:
   a. How many seconds did it take for each type of soil to absorb water?
      _____ clay _____ gravel
      _____ sand _____ loam
   b. Which kind of soil absorbs water very fast?
      _____
      _____
   c. Which kind of soil absorbs water very slowly?
      _____
      _____
   d. Which kind of soil is best for growing plants? Why?
      _____
      _____
      _____
      _____
9. Present your findings to the class.

V. Synthesis/Extended Practice/Differentiation (if needed):

Synthesis

Comparing how different soils absorb water highlights distinct characteristics influencing water retention and drainage. Sandy soil, with larger particles, drains quickly but retains water poorly. Clayey soil, composed of fine particles, retains water well but has limited drainage. Loamy soil, a balanced mix, offers optimal water absorption for diverse plant life. Silty soil strikes a middle ground, supporting various crops. Peat soil, rich in organic matter, excels in water retention but can lead to waterlogging. Chalky or limestone soil provides good drainage, influenced by its alkaline nature. Volcanic ash soil efficiently absorbs water, promoting fertility. Recognizing these dynamics is crucial for effective land management, agriculture, and environmental preservation.

Extended Practice

Soil Water Absorption Garden Project: This activity will determine how much you understand how different soil types absorb water

Suggested Modification:

Create simple illustrations or diagrams showcasing the water cycle's connection to soil absorption.

LEARNING ACTIVITY SHEET 4

Learning Area:	Science	**Quarter:**	4th Quarter
Lesson No.:	1	**Date:**	
Lesson Title/ Topic:	**What is Soil (Importance of Soil for Plant Growth)**		
Name:		**Grade & Section:**	

I. Activity No. 4: Identifying the Effects of Different Types of Soil on the Growth of Plants (30 mins)

II. Objective(s): *At the end of the activity, the learners are expected to identify the effects of different types of soil on the growth of plants.*

III. Materials Needed:

- Different kinds of soil (clay, loam & sand)
- Mungo seeds
- 3 pots
- Marker

IV. Instructions:

1. Work in group.
2. Together with your teammates perform the activity.
3. Fill one pot with clay. Label it as pot A.
4. Fill another pot with loam soil or garden soil. Label it as pot B.
5. Fill the third pot with sandy soil. Label it as pot C.
6. Scatter mungo seeds on the soil of each pot. Make sure that the mungo seeds are distributed evenly on the soil.
7. Sprinkle the pots for 1 to 2 weeks. Draw what you observed in the table below.

Pot A (Clay)	Pot B (Loam)	Pot C (Sandy)

8. Answer the following questions:
   a. In which pot did the mungo seeds grow well?
      _____
      _____
   b. In which pot did the mungo seeds not grow well?
      _____
      _____
   c. Which kind of soil is best for growing plants? Why?
      _____
      _____
      _____
9. Present your findings to the class.

V. Synthesis/Extended Practice/Differentiation (if needed):

Synthesis

Identifying the effects of different soil types on plant growth reveals a multifaceted relationship between soil characteristics and various aspects of the plant life cycle. The synthesis emphasizes nutrient availability, water retention, root development, soil pH, microbial activity, and the broader impact on ecosystems. It underscores the importance of considering these factors for sustainable agriculture, informed land management, and environmental conservation. Recognizing the intricate interplay between soil and plants is crucial for making informed decisions that optimize plant health, foster biodiversity, and contribute to ecosystem resilience.

Extended Practice

Title: Soil Exploration and Plant Journal
Instructions:

1. Plant identical seeds in pots filled with different soil types, making daily observations on seed germination, seedling growth, and leaf development.
2. Conduct measurements on the plant, such as plant height and leaf count. Note all these observations. Make these observations in constant interval.
3. Draw or take pictures of the plant.
4. Share your observations, measurements and drawings, through a class presentation.
5. Compare your journal with your other classmates.

Suggested Modification:

Title: Soil Scientists
Instructions:

1. Form a small group.
2. Conduct research on your assigned soil type. Identify its characteristics and its effects on plant growth.
3. Design experiments to determine its effects on plants. Take not of the challenges and unexpected observations.
4. Present your findings to the class. Make sure to emphasize how your experiment helped in determining the impact of different soils to plant growth.

TEAM JOBS

Manager *(red)*

- Responsible for collecting and returning the team's equipment.
- Also tell the teacher if any equipment is broken or damaged.
- All members are responsible for cleaning up after an activity and getting ready to return.

Speaker *(blue)*

- Responsible for asking the teacher or another team's speaker for help.
- If the team cannot decide how to follow a procedure, the speaker is the **ONLY** person who may seek help.
- The speaker shares any information obtained with all the team members.
- The teacher may speak with all the team members.
- Each team member should be able to report on the team's result, not just the speaker.

Director *(green)*

- Responsible for making sure that the team understands the activity and helps team members to focus on each step to be completed.
- Helps team members to check that they have completed all aspects of the activity successfully.
- Provided guidance but is not the team leader.

Reports Coordinator *(yellow)*

- Responsible for ensuring that team members have completed all the necessary reports, data collection and relevant worksheet.
- Does not necessarily report on behalf of the team.
- Ensures that each member of the team has the necessary information so that they can report to the class if required to do so.

Rubric for assessing Performance Task 1: Collection of Soil

1 point	3 points	5 points
The students were able to collect one to two types of soil only.	The students were able to collect three to four types of soil.	The students were able to collect all the five types of soil.
The students were able to name or identify one to two types of soil correctly.	The students were able to name or identify three to four types of soil correctly.	The students were able to name or identify all the five types of soil correctly.
The students were able to discuss one to two characteristics of each type of soil.	The students were able to discuss three to four characteristics of each type of soil.	The students were able to discuss all the characteristics of each type of soil.
The students were able to discuss one to two uses of each type of soil.	The students were able to discuss three to four uses of each type of soil.	The students were able to discuss all the uses of each type of soil.

Rubric for assessing Performance Task 2: Slogan Making

CRITERIA	1 point	3 points	5 points
Clarity of Message	The message of the slogan cannot be understood.	The message of the slogan was a bit confusing.	The message of the slogan was very clear.
Appropriateness	The group did not use the appropriate materials (illustration board, coloring materials, and others) for the slogan.	The group use few appropriate materials for the slogan.	The group use all the appropriate materials for the slogan.
Visual Impact	The work of the group was not attractive.	The work of the group was fairly attractive.	The work of the group was very attractive.
Relevance	The message of the slogan was not related or relevant to the theme.	The message of the slogan was a little or relevant to the theme.	The message of the slogan was very much related or relevant to the theme.
Cooperation	The students did not help one another.	Only three to four students worked for the activity.	All students helped to do their work.