

Sangam SKM College – Nadi
Lesson Notes – Week 1
Year 9
Agriculture Science

Strand: Agronomy

Sub-strand: Soils

Content Learning Outcome:

At the end of the week students should be able to

- describe soil.
- identify the 3 main types of rocks
- explain how each type of rock is formed

Vocabs:

- **Soil** –it is a mixture of materials including pieces of rock, minerals, organic matter, gases, liquids and countless organisms that together supports life on Earth.

Notes:

- The surface of the earth, which is the crust, is covered in a soft layer of material called soil.
- 71% of the crust is covered in water.
- 29% of the crust as land in the form of islands and continents.
- The **two main types** are **sand** and **clay**.
- When sand and clay are combined in equal proportions, **loam** is formed.
- However, if individual sand grains are coated in clay, then **silt** is formed.

Refer to diagrams of page 72 of your textbook

ROCKS

Vocabs:

- Precipitation - rain, snow, sleet or hail that falls to the ground
- Weathering/Weathered – Rocks breaking down to form soil

Notes:

- Rocks result when tiny grains of different minerals react and are compressed together.
- Rocks are a valuable which are continuously being made and weathered.

Types of rocks:

There are three types of rocks.

1. **Igneous rocks**

- Formed when magma cools so do not contain fossils and organic matter.
-

2. **Sedimentary rocks**

- Formed when eroded particles of rock, wash down to the sea and settle out in layers, called strata, in a process called sedimentation.
- As more layers form, the weight causes compaction.
- Salt particles glue the layers together in a process called cementation.

3. **Metamorphic rocks**

- Formed when chemical changes occur in igneous and sedimentary rocks which are under extreme heat and pressure.

(Refer to diagrams of pages 73 – 74 of the textbook)

Rocks are always changing and moving from one place to another in a process called the rock cycle, which usually takes millions of years.

Student Activity:

1. List the three main types of rocks.
2. Discuss how metamorphic rocks are formed.
3. Discuss the relationship among sand, silt and clay.

Reference: Agriculture Science for Year 9 Text Book. pp 72 - 74

Sangam Skm College-Nadi

Lesson Notes- Week 2

Subject: Agricultural Science

Year: 9

Strand	Agronomy
Sub strand	Soils
Content Learning Outcome	<ul style="list-style-type: none">• Identify 5 factors responsible for the formation of soil.• Explain how each factor assists in the formation formed.

Vocabs:

- Aerate - introduce air into a material
- Burrow - make a hole or tunnel into a material
- Deposit - set down in a place
- Erode - gradually wear away
- Glacier - slowly moving mass or river of ice
- Weathered - worn away from long exposure to the elements

Notes:

- Soil is a valuable resource which is continuously being made, used and lost from an area. There are five factors which work together to form soil.
- The five factors responsible for soil formation are; parent material, climate, time, topography, biological activity and time.

1.Parent material

- Organic material, partially weathered rock, volcanic ash, deposited sediment and rock moved by glaciers are all part of the parent material of soil.
- Igneous, sedimentary and metamorphic rocks are broken into very small pieces during weathering. These pieces form the bulk of soil.

2. Climate

These include precipitation, wind and changing temperature which all cause rocks to weather.

- Water – moving water pulverizes rocks as they crash into each other.
- Wind – strong wind causes wind blasting as particles of soil hit rocks.
- Temperature – extreme heating and cooling causes exfoliation as rock surfaces peel off.

3. Topography

- Soil is removed from steep slopes so the rocks which are exposed can be weathered.
- The eroded soil is deposited on the level land at the bottom of steep slopes resulting in deeper soil.

4. Biological activity

- Plants and animals burrow into soil and soft rocks, so mix and aerate soil.
- Tree and plant roots can grow deep causing changes in the lower horizons (layer) of the soil.
- More organisms cause new soils to have greater amount of organic material as these same organisms die and decompose and so return minerals to the soil.
- Human activity can aid or deter new soil production.

5. Time

- It takes two hundred years to form 1cm³ of soil.
- New soil is always being formed as weathering is a very slow process.
- The more time each factor is given, the greater the influence on the soil.

Refer to diagrams of pages 75,76 of your textbook.

Student Activity

1. List the five factors responsible for soil formation.
2. Differentiate between pulverisation and sandblasting in relation to soil formation.
3. In a paragraph, discuss the effect which each of the five factors listed above have on soil formation.

Reference:

Agriculture Science for Year 9, pp. 74 – 76.

Sangam Skm College-Nadi

Lesson Notes- Week 3

Subject: Agricultural Science

Year: 9

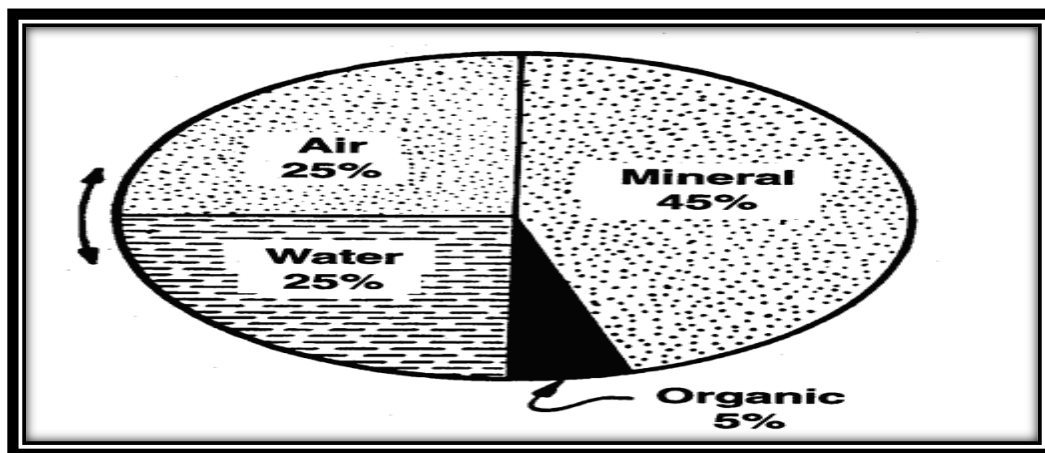
Strand	Agronomy
Sub strand	Soils
Content Learning Outcome	Identify the four components of soil.

Vocabs:

- Components - parts that make up a whole.
- Pores - area between solid particles in soil in which air and water are stored.

Notes:

- Soil is composed of equal proportions of solids and the spaces between them. The solids are divided into inorganic material and organic material.
- The spaces between the solids are called pores.
- Pores are filled with air and water.
- In an ideal soil, the volume of:
 - inorganic material is 45%.
 - organic material is 5%.
 - pore space is 50% - in which 25% is filled with air and 25% is filled with water.



Note: Inorganic material are also referred to as minerals.

Source: <http://passel-test.unl.edu/>.

- However, water displaces air so when more water is added to soil, air is pushed out of the pore spaces.
- This results in more water and less air in soil.
- When there is too much drainage and evaporation, there will be more air than water in pores.
- Therefore, the solid parts which make up 50% of the volume of soil are inorganic material [45%] and organic matter [5%].
- The other 50% of soil are pores between the solid parts. These pores are filled with air [25%] and water [25%]

Student Activity

1. Draw and label a pie chart showing the components of the soil.
2. Explain how soil air is pushed out of the soil?
3. Explain what happens when there is too much drainage and evaporation in the soil.

Reference

Agriculture Science for Year 9, page 77.