Science

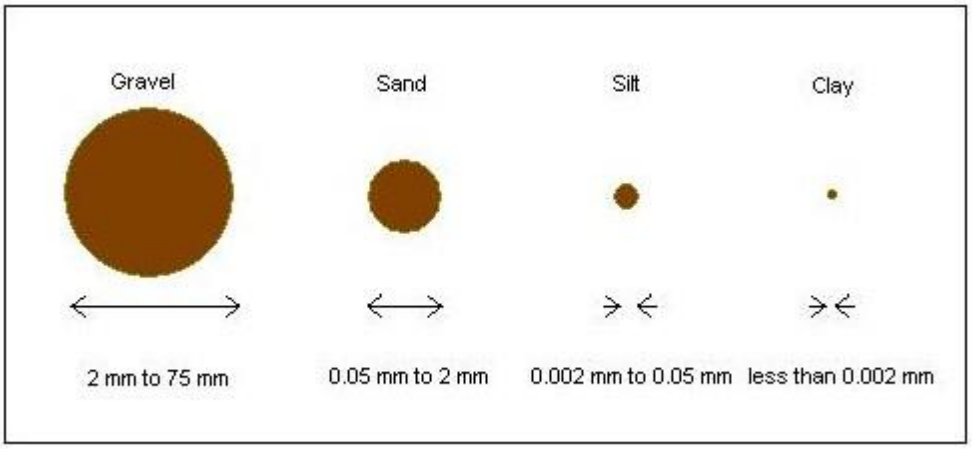
Level: Standard 2

Strand: Form and function

Topic: Movement of Water Through Soils

Key Points:

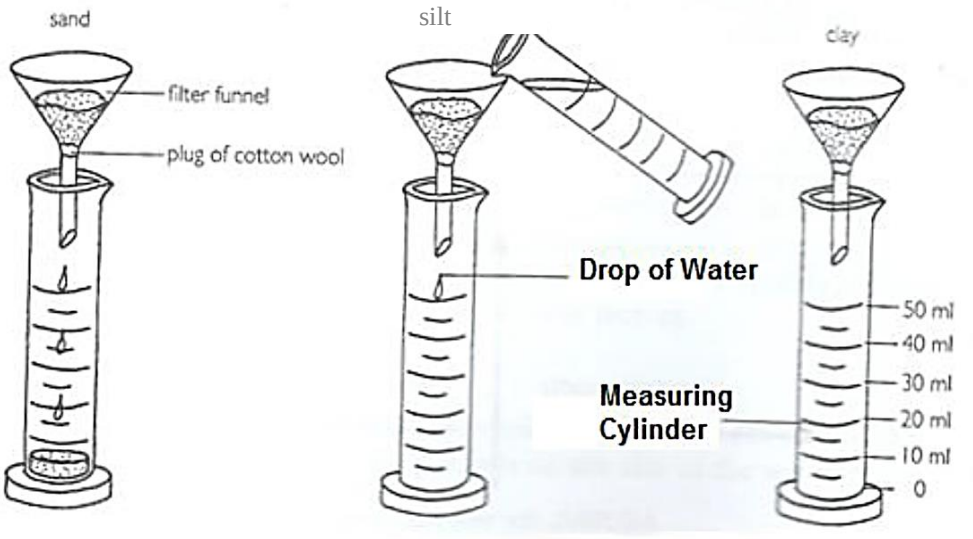
- Soil acts as a sponge to take up and store water.
- Tiny spaces in the soil allows the movement of water through soil.
- Three (3) types of soil are — **Sand, Silt, and Clay**.
- Clay has the smallest particles, while sand has the largest particles of the three.
- If you were to compare size of particles of each soil type, this is what they would look like:



Activity 1: **<u>Calculate</u>** how much water been retained by each soil sample and fill in the blank spaces of the last column in the **Table (i)** below

Fauci wants to investigate how much water can be retained in sandy, silt and clay soils. He sets up the apparatus as shown in the diagram below. He places equal amounts of soil in each funnel and then adds **50 ml** of water to each soil sample. When each funnel has stopped dripping, he recorded the amount of water **collected** in each measuring cylinder in the table below.

SAND **SILT** **CLAY**



Amount of water added to **each funnel: 50 ml**

Soil Type	Volume of water in cylinder (ml)	Volume of water in soil (ml)
Sand	**45**	
Silt	**30**	**(50 – 30) 20**
Clay	**15**	

Table (i): Amount of water in soil and cylinder

Complete the following below and write your answer in the blank spaces

i. Through which type of soil does water flow the fastest?

_____

ii. Give a reason for your answer to part i?

_____

_____

iii. In which soil type do you think a plant will grow best?

_____

Give a reason for your answer.

_____

_____

Assessment:

1. Which of the following is NOT one of the three types of soil?

(A) Clay (B) Mud

(C) Silt (D) Sand

2. Which of the following soil type has the largest particles?

(A) Sand (B) Silt

(C) Clay (D) Mud

3. You dig a small hole in the soil and the next day it rains.

The hole fills with water but does not empty even after several days of dry weather.

What is the soil mostly made of?

(A) Gravel (B) Sand

(C) Silt (D) Clay

4. Which type of soil can hold the least amount of water?

(A) Sand (B) Silt

(C) Clay (D) Mud

Answer key:

Activity 1:

Table (i)

Soil Type	Volume of water in cylinder (ml)	Volume of water in soil (ml)
Sand	**45**	**5**
Loam	**30**	**20**
Clay	**15**	**35**

i. Through which type of soil does water flow the fastest?

Sand

Give a reason for your answer?

Sand drains well and does not hold water well

ii. In which soil type do you think a plant will grow best?

Silt

Give a reason for your answer.

Silt is a blend of sand and clay soil. Therefore more water can pass through it than clay soil. Also, it holds more water than sandy soil. Thus, silt soil is neither too wet nor too dry. Hence, it will not cause plants to rot as if planted in clay or wilt as if planted in sand.

Assessment:

1. (B)
2. (A)
3. (D)
4. (A)

References

1. **Particle size:** http://techalive.mtu.edu/meec/module06/SoilClassification.htm

2. **Water retention experiment:**

   https://learn.mindset.africa/sites/default/files/resourcelib/emshare-show-note-asset/1659_fdoc.pdf