Practical Ecology

Soil PH

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Ecology BIO

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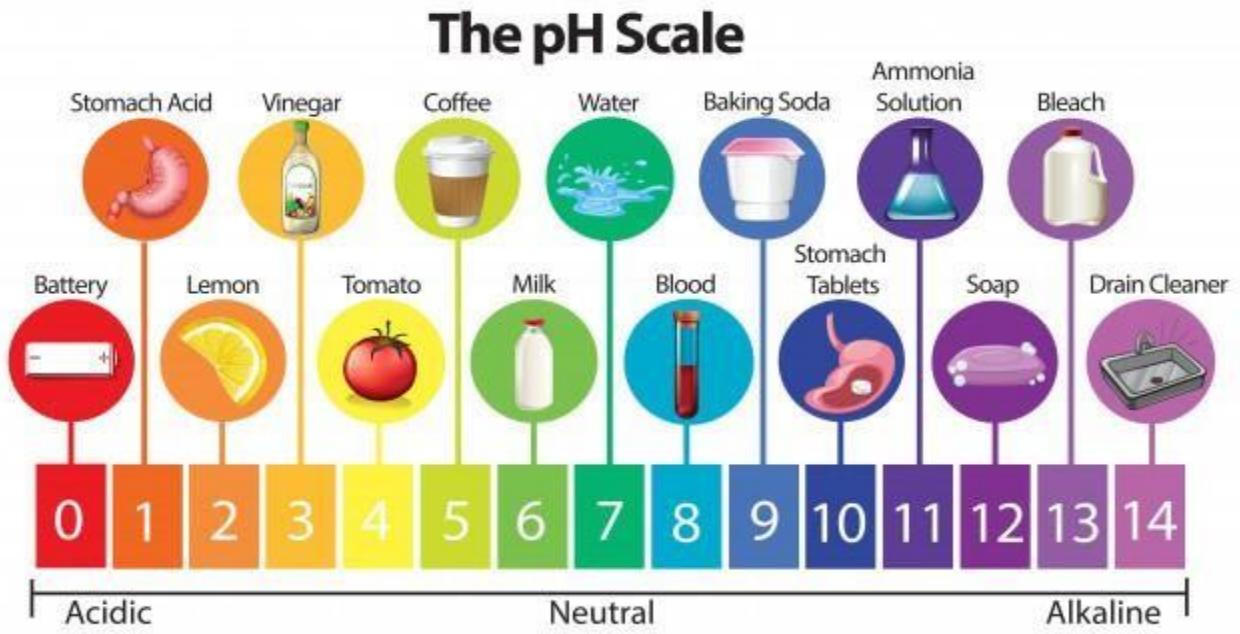
Objective

At the end of this laboratory students will be able to know what is Ph? And soil ph then will do some test for the soil that present at university.

What is pH ?

PH, quantitative measure of the acidity or basicity of aqueous or other liquid solutions. The term, widely used in chemistry, biology, and agronomy, translates the values of the concentration of the hydrogen ion—which ordinarily ranges between about 1 and 10^{-14} gram-equivalents per liter—into numbers between 0 and 14

https://www.youtube.com/watch?v=UX1sXf2dw_0&ab_channel=Studynlearn



Soil

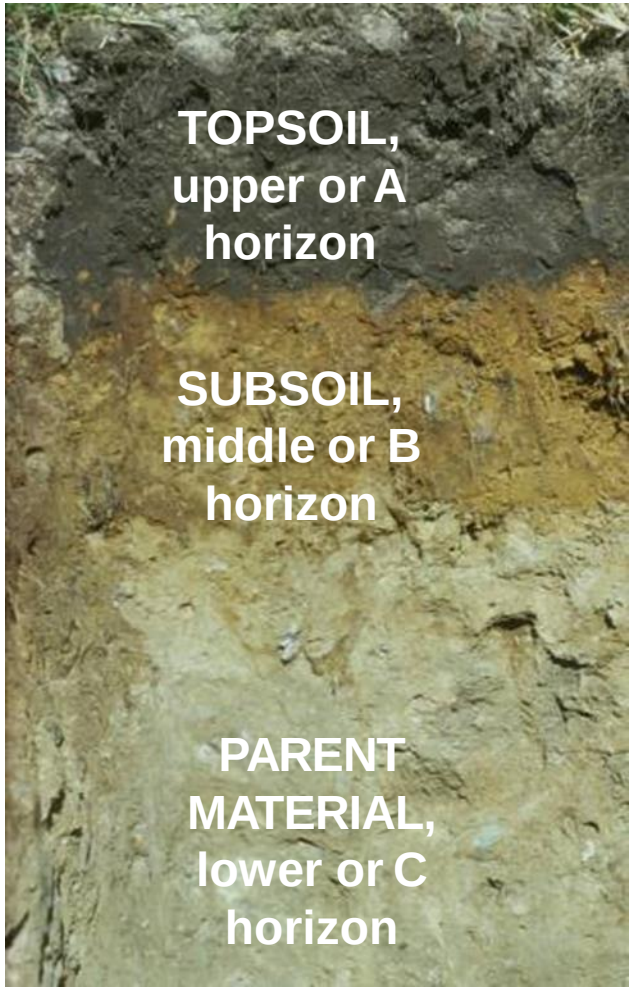
The study of soils as naturally occurring phenomena is called pedology
(from the Greek word *pedon*, meaning soil or earth).

Pedology takes into account:

- factors and processes of soil formation
- soil characteristics
- distribution of soil types

Soil Profile

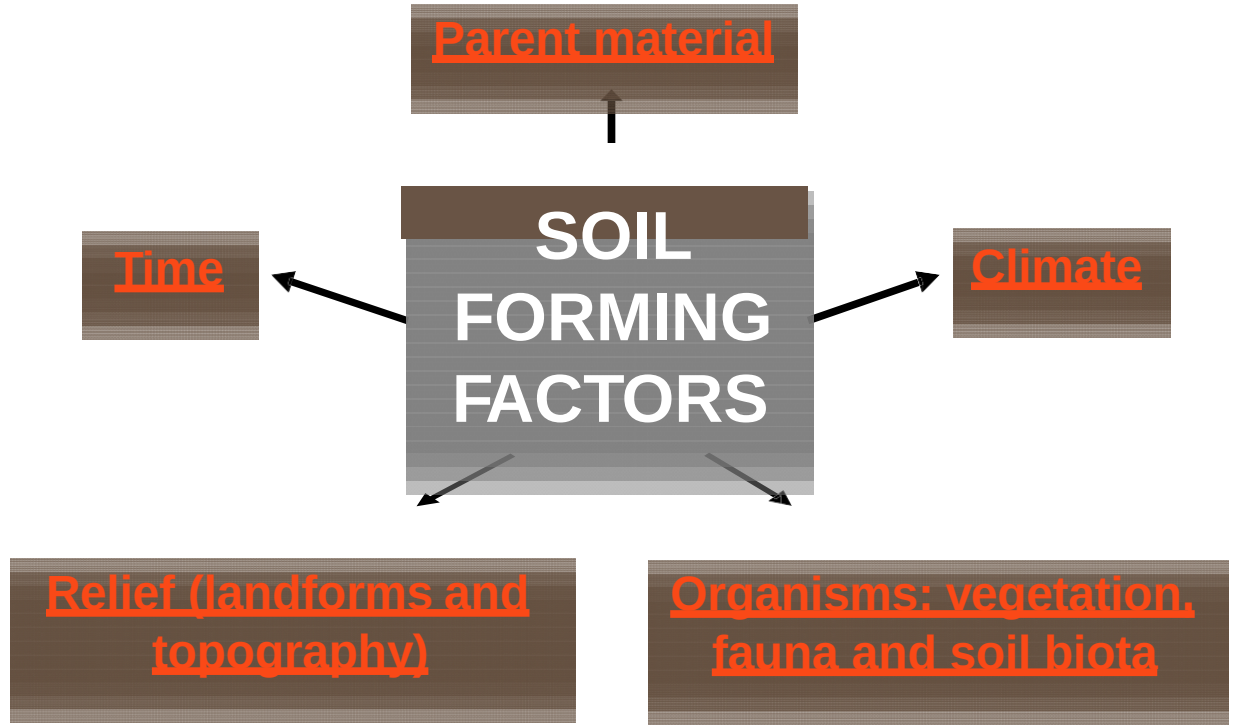
- A soil profile is a vertical cross- section of a soil. It is divided into a number of distinct layers, referred to as horizons.
- The horizons are normally designated by symbols and letters.
- The presence or absence of particular horizons allows pedologists (soil scientists) to classify the soil.



This diagram shows simplified soil horizons

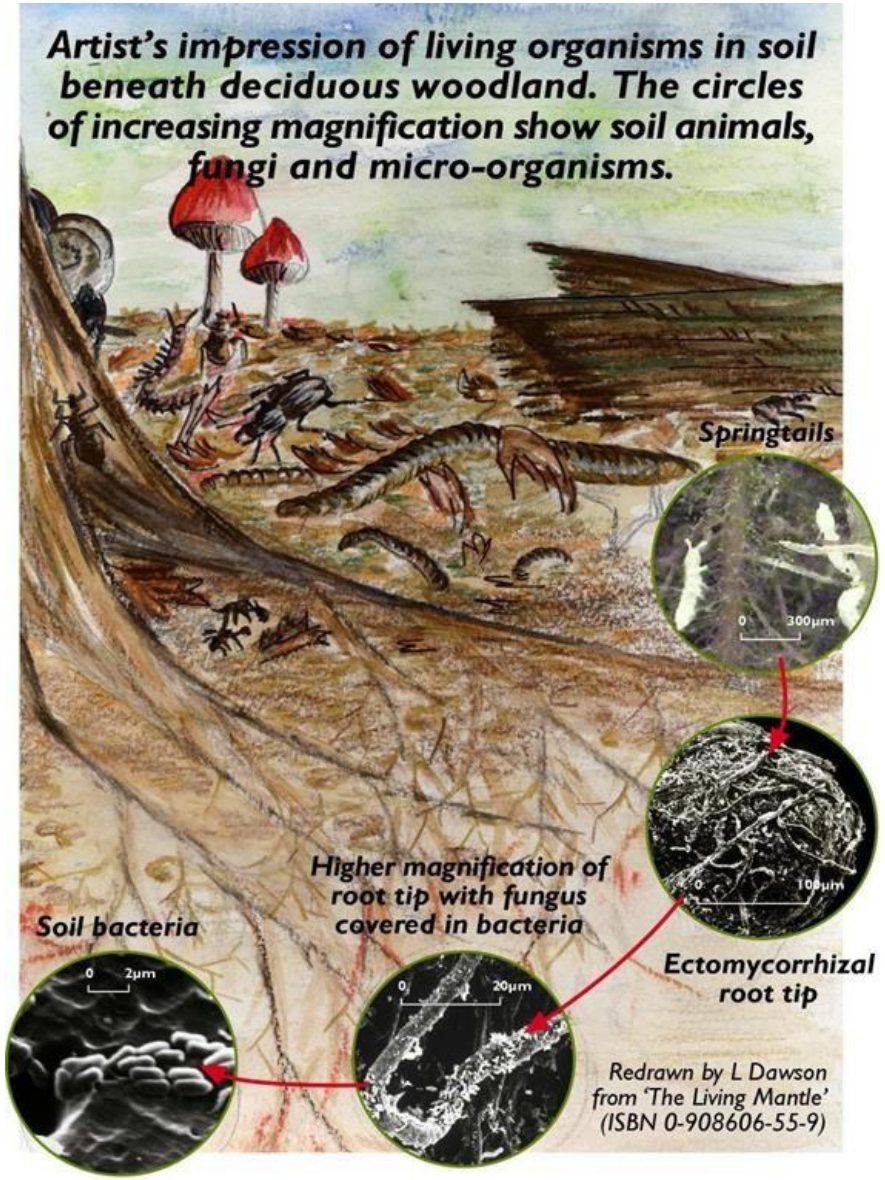
Soil Forming Factors

Soils develop as a result of the interplay of 5 factors; Parent material, climate, organisms, relief and time.



Click over factors for further explanation. Use back button to return to this slide

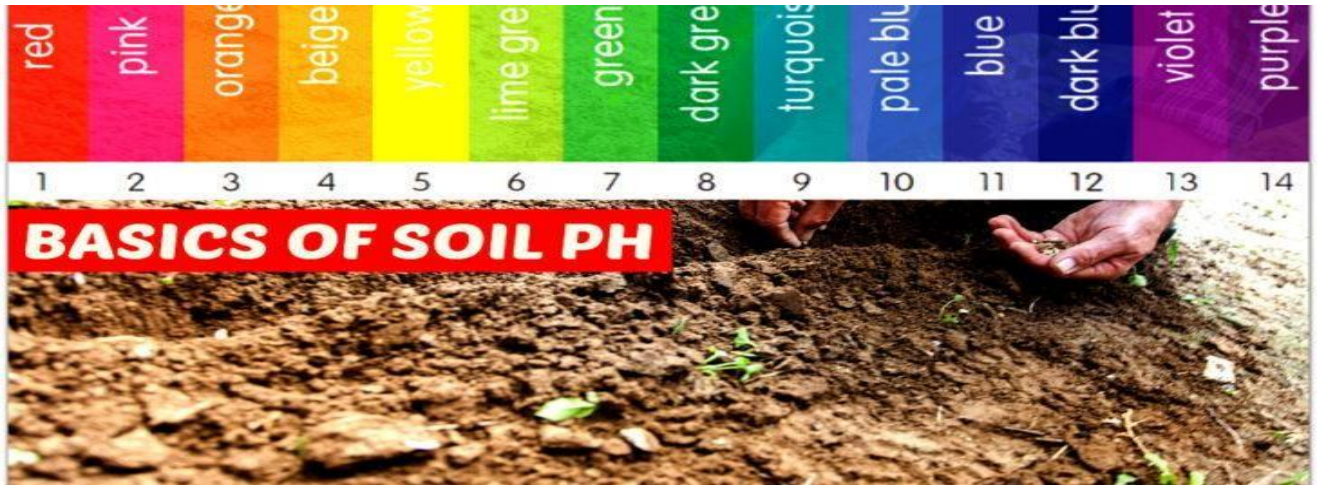
- Organisms influencing soil development range form microscopic bacteria to large animals including man. Micro organisms such as bacteria and fungi assist in the decomposition of plant litter. This litter is mixed into the soil by macro organisms (soil animals) such as worms and beetles.
- Soil horizons are less distinct when there is much soil organism activity



Soil pH ?

- Soil pH is a measure of hydrogen ions (H+) in the soil. In other words, a soil pH value is a measurement of the concentration of ions held to soil particles and organic matter

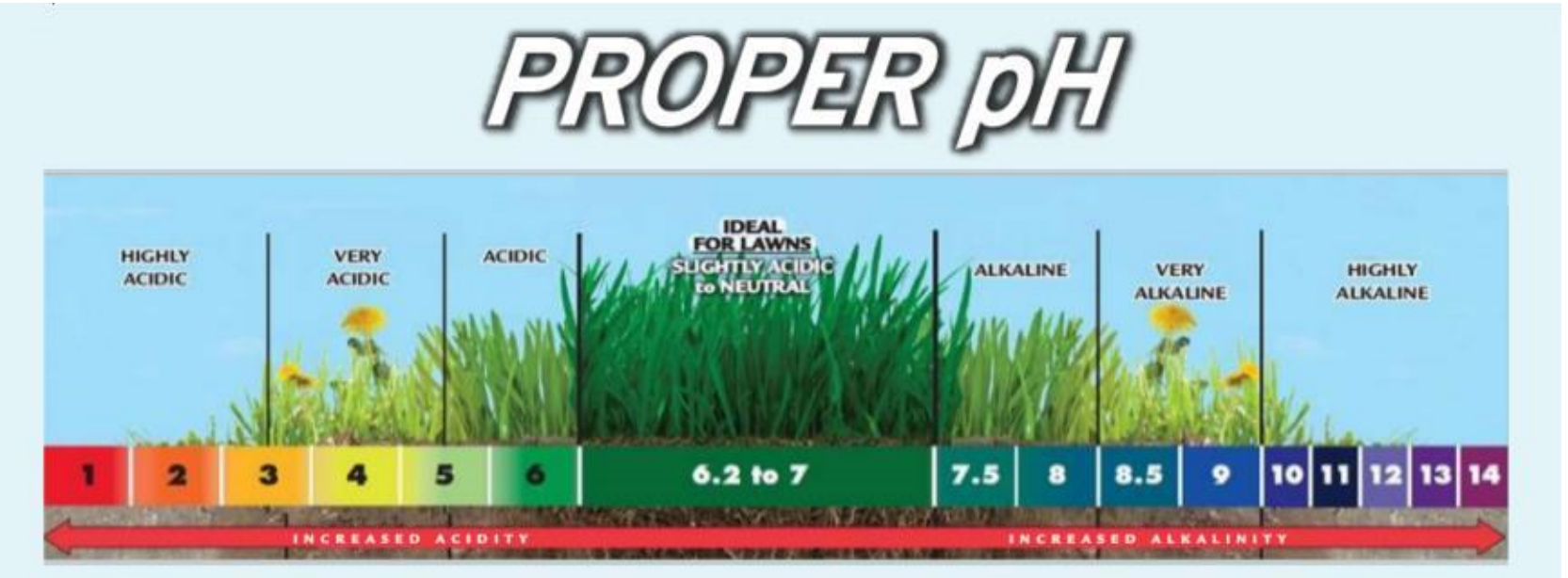
- The pH is important because it influences the availability of essential nutrients. Most horticultural crops will grow satisfactorily in soils having a pH between 6 (slightly acid) and **7.5** (slightly alkaline).



pH Affects Nutrients, Minerals and Growth

- The effect of soil pH is great on the solubility of minerals or nutrients. Fourteen of the seventeen essential plant nutrients are obtained from the soil. Before a nutrient can be used by plants it must be dissolved in the soil solution. Most minerals and nutrients are more soluble or available in acid soils than in neutral or slightly alkaline soils.

- The soil pH can also influence plant growth by its effect on activity of beneficial microorganisms Bacteria that decompose soil organic matter are blocked in strong acid soils. This prevents organic matter from breaking down, resulting in an accumulation of organic matter and the tie up of nutrients, particularly nitrogen, that are held in the organic matter.



Soils tend to become acidic as a result of:

- 1-rainwater leaching away basic ions (calcium, magnesium, potassium and sodium)
- 2-carbon dioxide from decomposing organic matter and root respiration dissolving in soil water to form a weak organic acid
- 3-formation of strong organic and inorganic acids, such as nitric and sulfuric acid, from decaying organic matter and oxidation of ammonium and sulfur fertilizers.


SAMPLE 1
Garden Soil
'a'
SAMPLE 2
Garden Soil
'b'
SAMPLE 3
Roadside
Soil
SAMPLE 4
Paddy field
Soil
SAMPLE 5
Stream Bank
Soil.

Procedure

1. 5 different soil samples that are oven dried or air died and powdered.
2. All large particles like stone or plant parts need to be removed
3. 5 spoons, 5 bikers (100ml), 5 stirrer, 10 test tubes, test tube stand, 5 gradual pipes, 5 funnels,5 filter papers Ph paper or standard ph solution indicator, 50- or 100-ml graduated cylinder, distilled water, glass plate or large plate, weighing scale.
4. Weight 10 grams of the sample over the weighing scale and add 50ml of distilled water into the 5 bakers then mix them for 2 to 3 minutes and leave them for about 30 minutes.
5. Then carefully settle the filter papers in the funnel and settle the funnels in the test tubes separately label them.
6. Then depth the 5 strips of ph. papers in each of the test tubes and place the strips on a large plate and allow them to air dry and label them properly in order not to mix the samples.

THANK YOU FOR YOUR ATTENTION ?

- Any Questions ?????????