

Unit A: Principle of Soil Science

Lesson : Overview of Soil Science

KEY TERMS

Sand

Silt

Clay

Holes

Organic Matter

Horizons

Formation of soil

Color

Density

Texture

Objective 1: Understand the Definition of soil.

I. Soil is the driving force for all life on earth.

Soil consists of multiple parts:

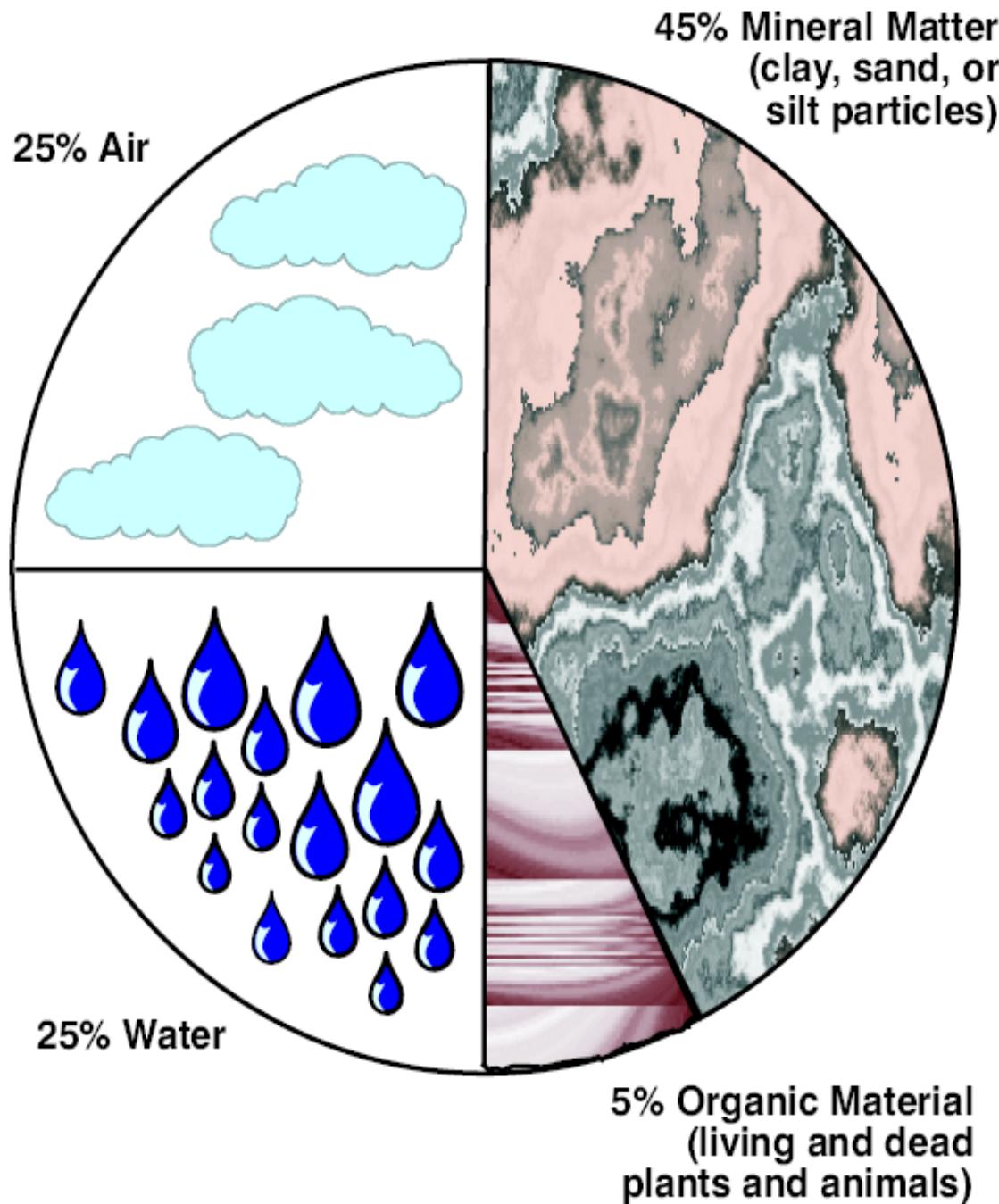
A. Mineral- approximately 45%

1. Sand-largest
2. Silt-medium
3. Clay-smallest
4. Rocks and Gravel

B. Organic Matter- decaying matter from living things- approximately 5%

C. Air Space- or holes in soil- about 25%

D. Water- about 25%



II. There are different percentages for different types of soil, but these percentages are good averages.

- A. Darker soils usually have a higher percentage of organic matter.
- B. Desert soils have a lower percentage of water.

Objective 2: Identify focus areas when studying soil.

I. Horizons

A. Soils are studied in cutouts called soil profiles. These profiles can be split up into different layers, called horizons. The most common horizons are:

1. O- organic layer
2. A-topsoil
3. B-subsoil
4. C-parent material
5. R-bedrock

B. Horizons are defined using many different items when studying soil:

1. Color
2. Organic content
3. Texture
 - a. Sand content
 - b. Clay content
4. Structure
5. Thickness

II. Soil Formation

A. Soil is formed by the climate over thousands of years.

1. Wind
2. Precipitation
3. Plants

B. Soil is transformed by chemical processes as well.

1. Oxidation
2. Hydration

III. Color

- A. Soils come in all different colors ranging from black to green, blue, and yellow.
- B. Different colors of soil usually tell us a history of the soil.
 1. Gray colored soils have usually been wet.
 2. Black colored soils indicate high organic matter, lots of plant life.
 3. Red colored soils are old.
 4. Brown colored soils are young.

IV. Texture- Texture is how we identify different soils that feel similar. A triangle is used to identify the different textures with the percentages of sand, silt, and clay.

V. Density- soil density is defined using mechanical processes. The denser the soil is, the harder it is to grow crops in the soil.

VI. Holes-the space in soil between the mineral particles. This space is filled with air or water. Plant roots need both air and water to survive, so saturated soils will prevent plant growth due to lack of air to the roots.

Objective 3: Identify a soil profile

I. Looking at a soil profile, you can immediately identify different layers, or horizons in the soil. There is a pattern of soil horizons that occurs in almost every soil profile.

REVIEW/SUMMARY

1. What are the major focus areas used when studying soils?

2. What is the order of soil horizons from the top to the bottom in a soil profile?