



# *SOIL* Formation

Unit 3 - Ch 5.2

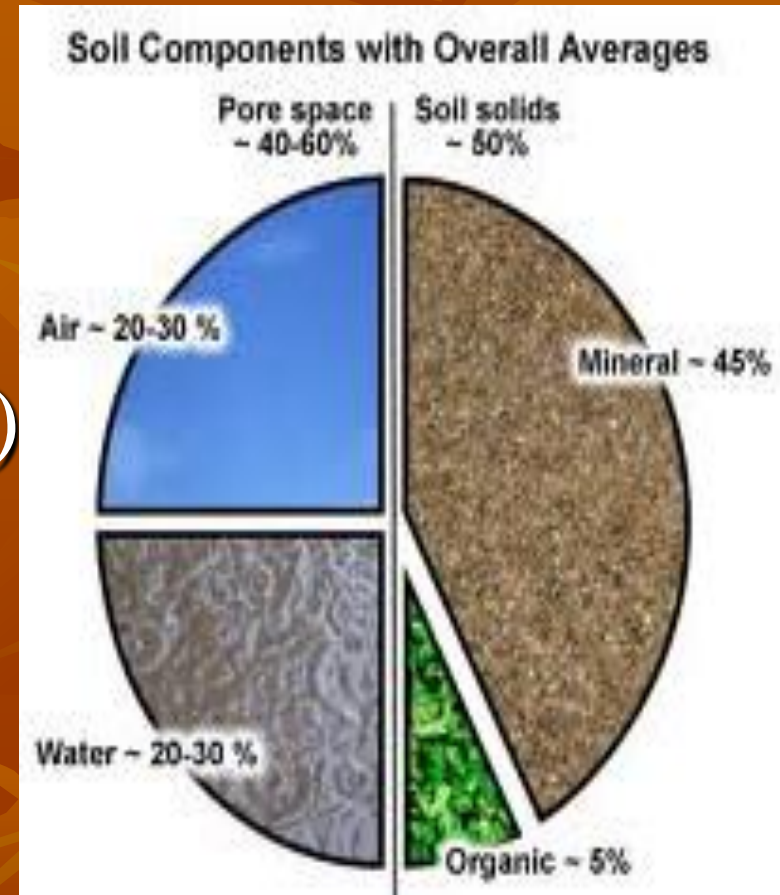
# Soil *Formation*

- DEF: Complex **mixture** of mineral *nutrients*, *eroded rock*, *water*, and *air*



# Soil Composition

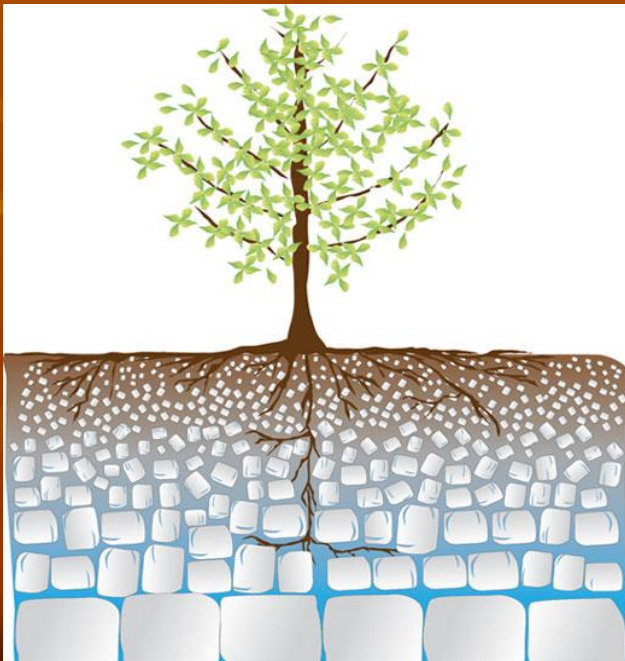
- 1) **Mineral nutrients**  
(Humus - Organic)
- 2) **Eroded Rock** –  
(Sediment - Weathering)
- 3) **Water** – Water Cycle
- 4) **Air** – Atmospheric  
gases





# Soil *Characteristics*

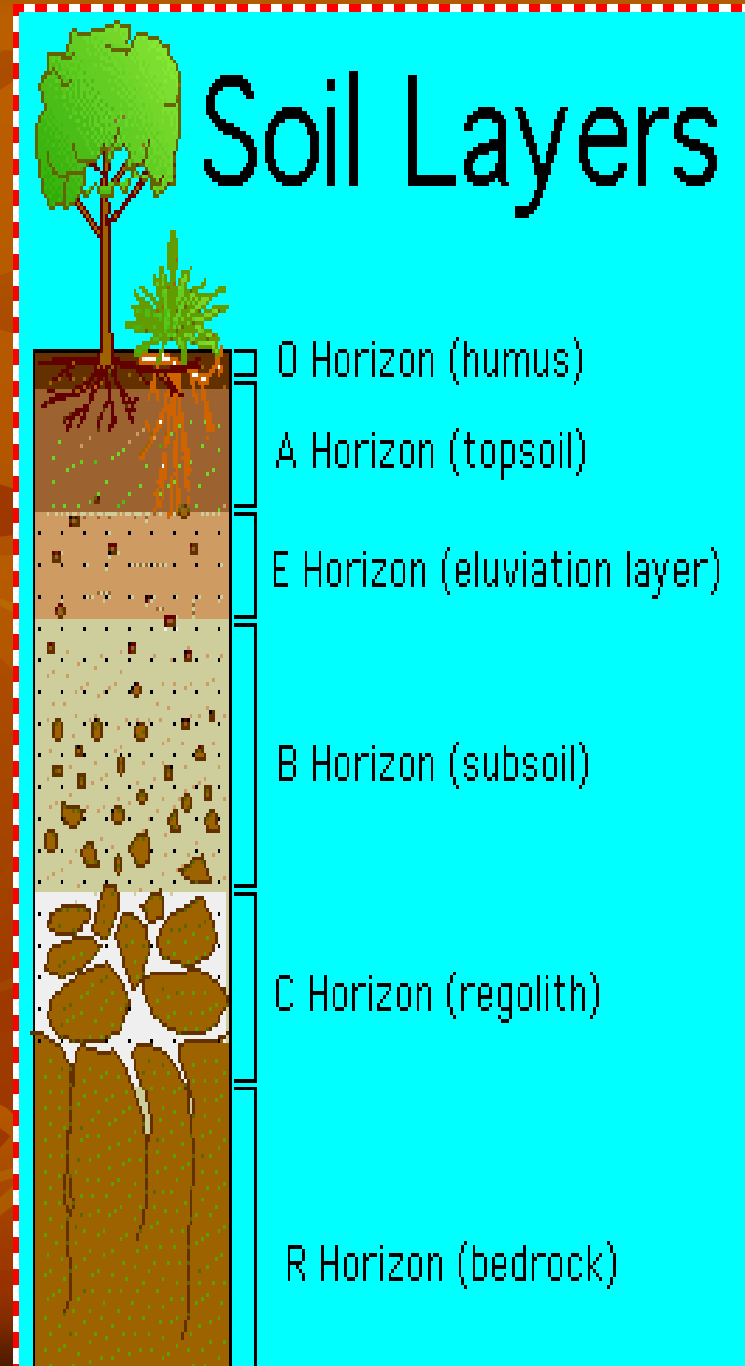
- Weathering produces REGOLITH
  - Layer of partially *weathered* (loose rock)  
*SOIL* material sitting above *bedrock*



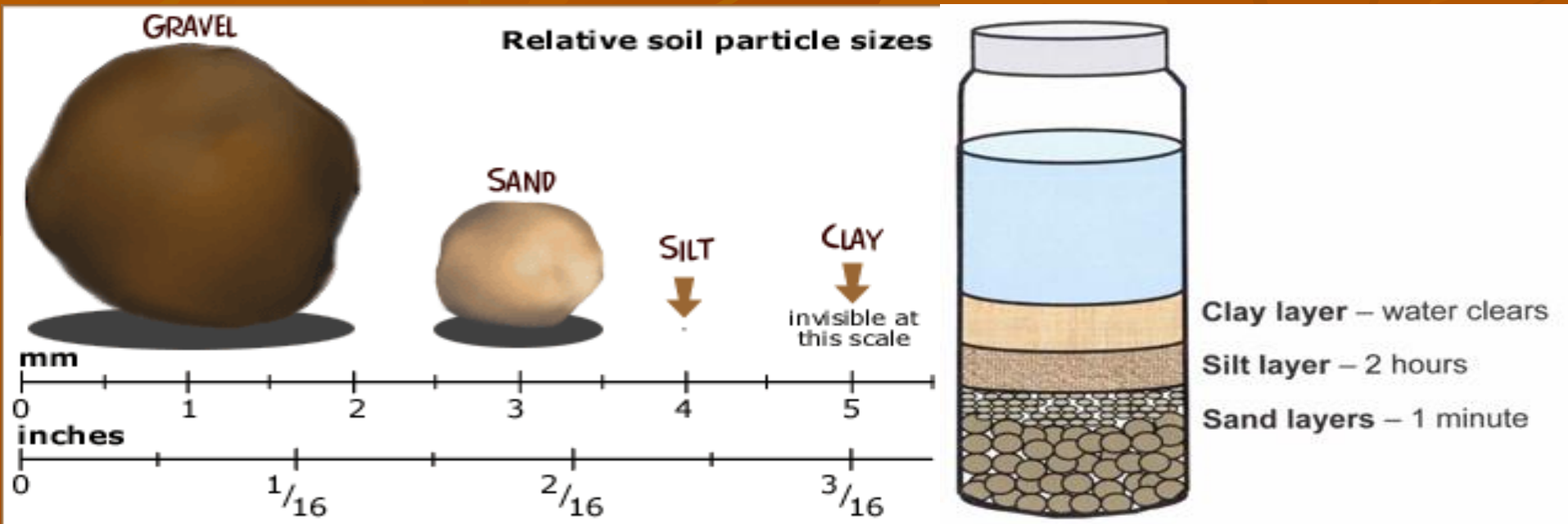
# SOIL PROFILE

## ■ **Vertical** sequence of layers (*horizons*)

- **O:** Humus (*organic nutrients*)
- **A:** Topsoil (*mineral/humus mix*)
- **E:** Eluviation (*minerals seep out*)
- **B:** Subsoil (*seeped minerals collect*)
- **C:** Regolith (*partially weathered bedrock*)
- **R:** Bedrock (*un-weathered bedrock*)



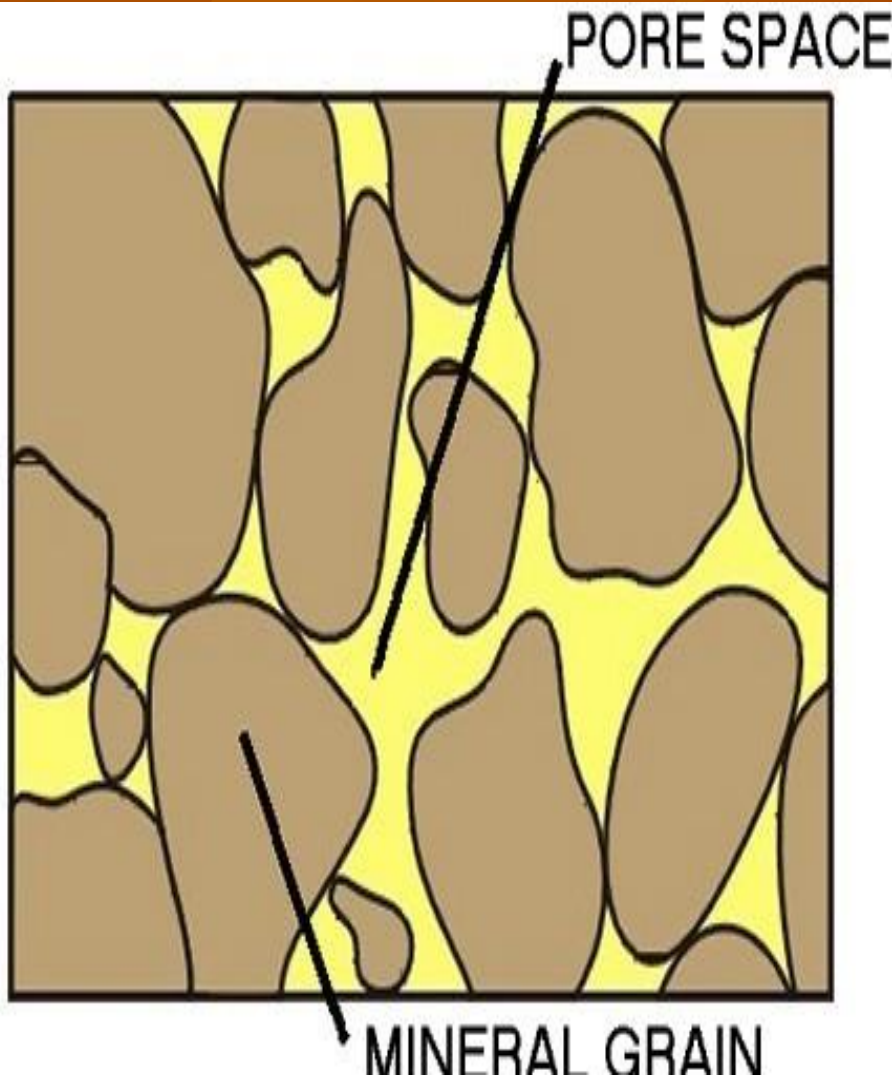
# Soil Texture



- DEF: Determined by soil's particle sizes
  - Determines soil's ability to support plant life



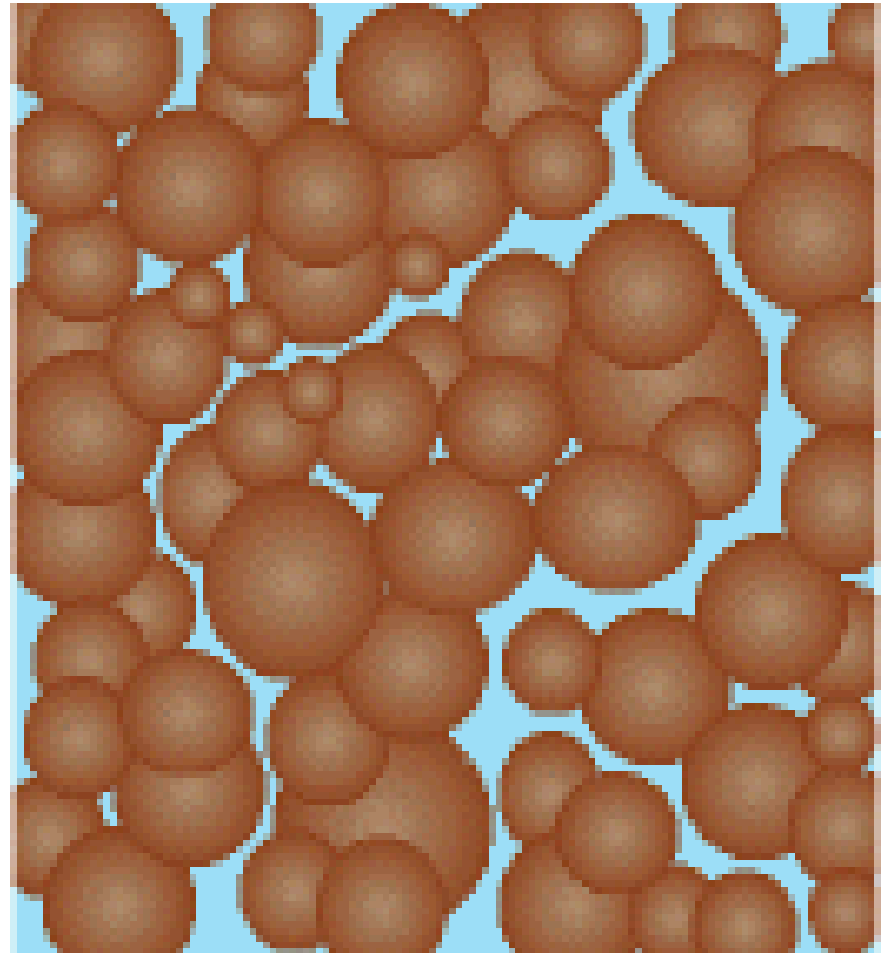
# Porosity



- DEF: Percentage of **air/space** between particles
- *Measures* amount of **water/nutrients** that can be held
- Directly influenced by **particle size**

# Permeability

- Ability to allow water to *pass through*
- Larger particles produce *less friction*
  - Therefore, *greater* permeability

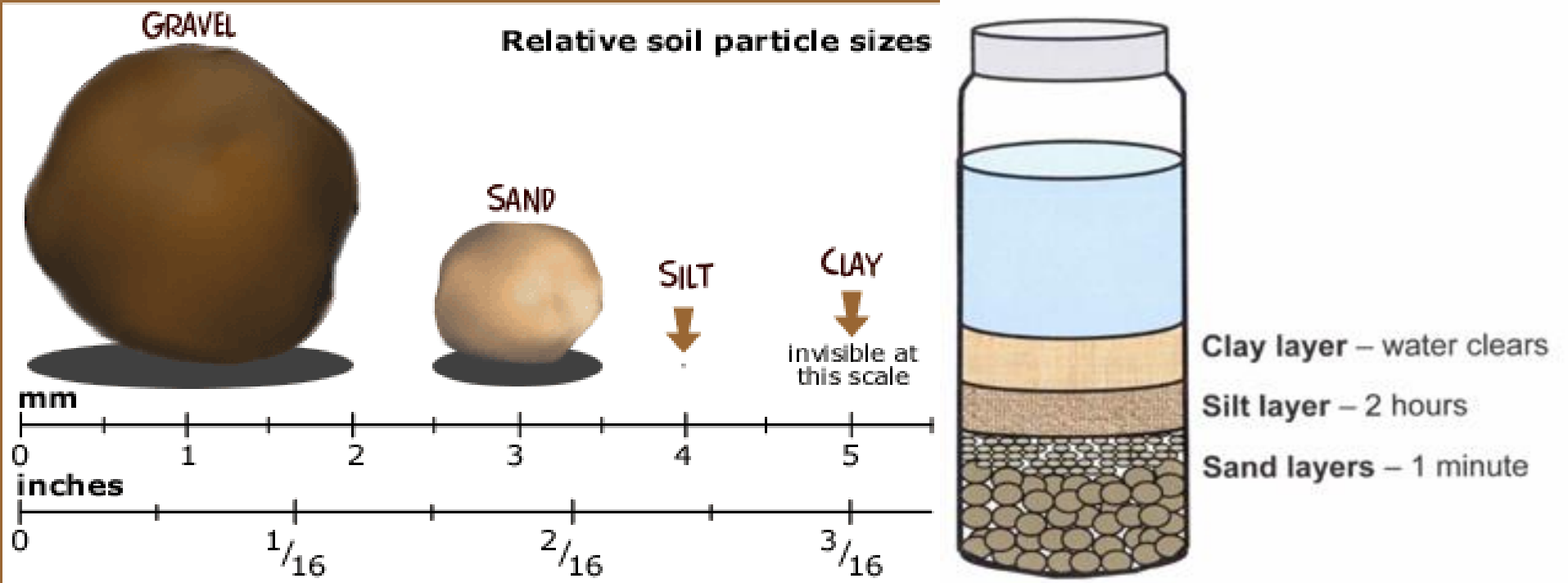




# Holding Capacity

- DEF: Ability of soil to STOP water/nutrients from seeping out
- *Inversely* influenced by *particle size*





- **Sand**: *Large & Poor nutrient-holding capacity*
- **Silt**: *Medium & Medium holding capacity*
- **Clay**: *Very small; Best water-holding capacity; Yet Poorest aeration (porosity)*
- **Loam**: *Mixture - Best in permeability & nutrient-holding capacity*

# Soil Textures

Type/Texture	Particle Size	Porosity/ Aeration (Air space)	Permeability (Water drainage)	Holding Capacity (Water/Nutrients)
Sand				
Silt				
Clay				

Loam — Mixture of sand, silt, and some clay  
\*Ideal for plants — enough porosity for roots to get air without losing all water & nutrients

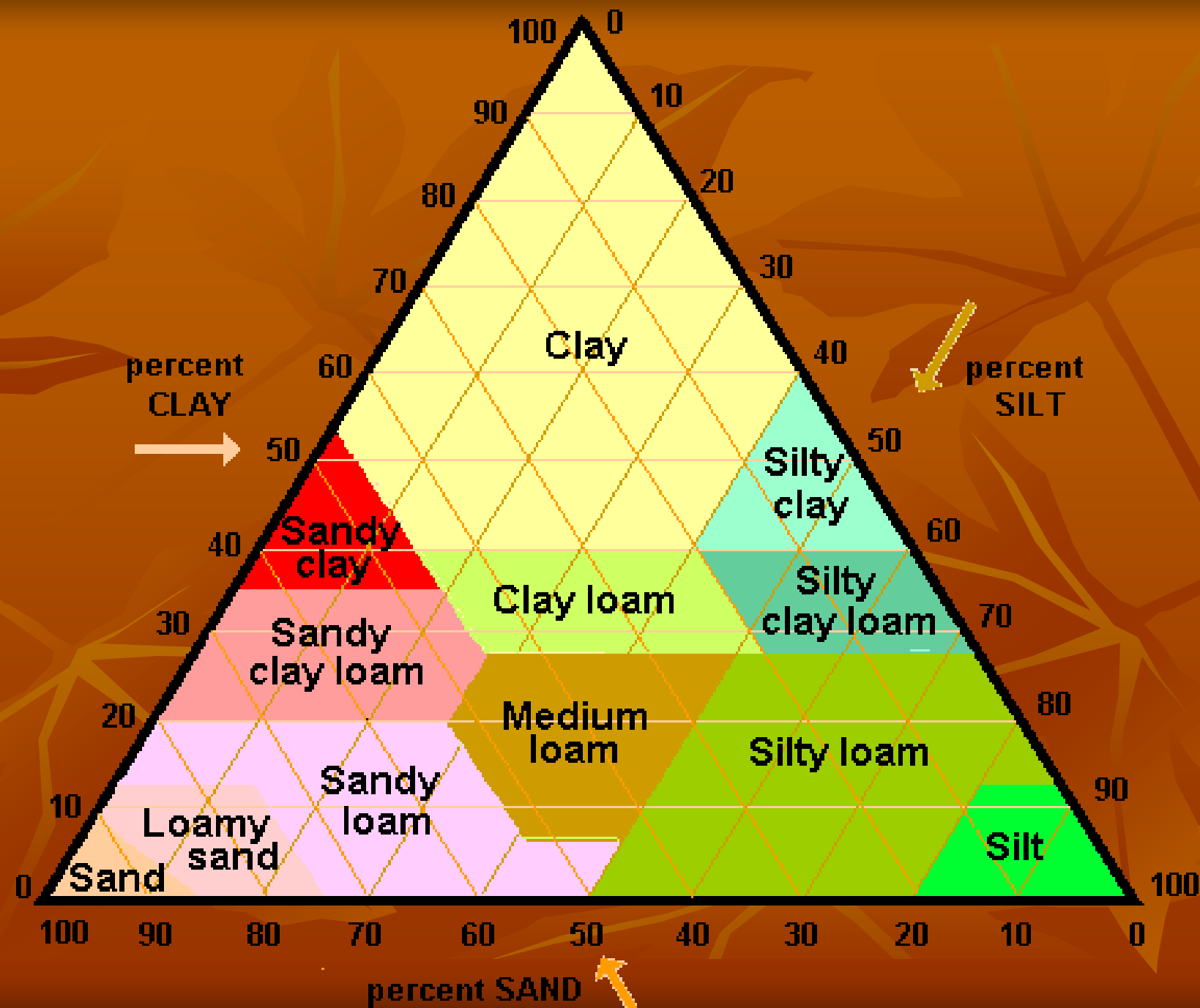
# Soil Erosion

## ■ Factors in Soil Formation AND Erosion:

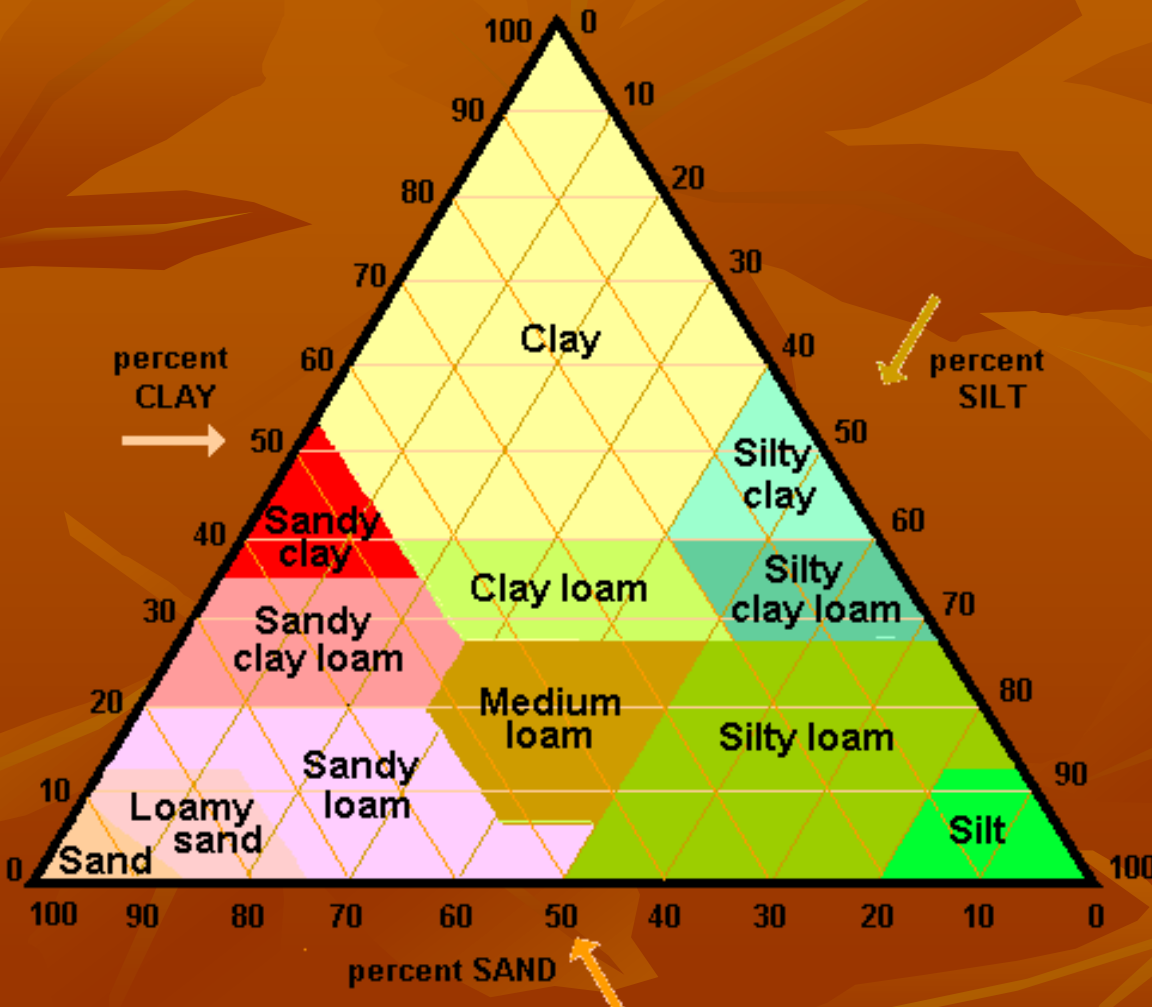
- Parent material
- Time
- Slope (*steepness*)
- Vegetation
- CLIMATE







# Soil Texture Investigation



•20% sand, 36% silt,  
44% clay = ?

•**CLAY**

•35% sand, 45% silt,  
20% clay = ?

•**MEDIUM LOAM**

•25% sand, \_\_\_?\_\_\_ silt,  
50% clay = ?

•**CLAY**