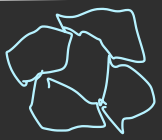
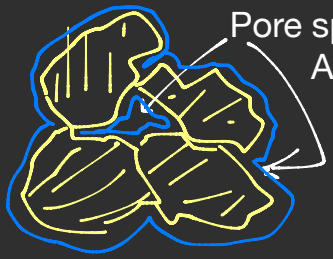
Low Moderate High Ratting associated with soil separates

Property/behavoir	Sand	Silt	Clay
Water-holding Capacity	L	M	H
Aeration	H	M	L
Drainage rate	H	M	L
Soil organic matter level	L	M	H
Decomposition of O matter	H	M	L
Warm-up in spring	H	M	L
Compactability	L	M	H
Susceptibility to wind erosion	M-H	H	L
Susceptibility to water erosion	L-M	H	L-H
Shrink-swell potential	L	L-M	M-H
Sealing of ponds, dams, landfills	L	L	M-H
Suitability for tillage after rain	H	M	L
Pollutant leaching potential	H	M	L
Ability to store plant nutrients	L	M	H
Resistance to pH Change	H	M	L



Sand



Pore spaces -
Air and water

Large grain sizes
Large air space

Larger air spaces;
but less total pore volume

Silt

Clay

Decrease in grain size
and pore size

Soil particle
Mineral , negative charge

Film of water
bonded to particle

Weathering is on going!

Micro-orgnaisms can grow on particle surfaces!

All particles sizes can exist in a mixture in soils simultanesouly

Loam = A mixture of about equal proportions of each particle size

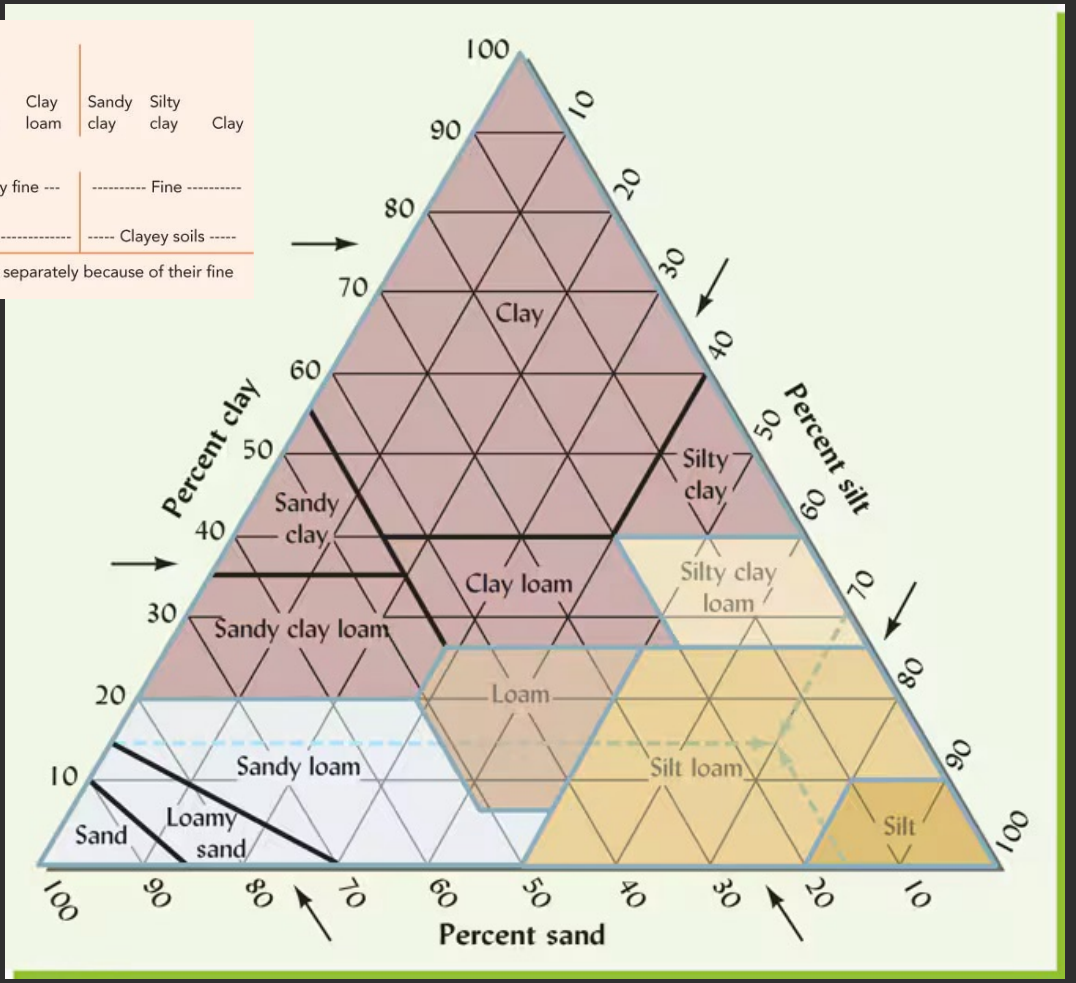
Basic soil textural class names

Sands	Loamy sands	Sandy loam	Fine sandy loam[a]	Very fine sandy loam[a]	Loam	Silt loam	Silt	Sandy clay loam	Silty clay loam	Clay loam	Sandy clay	Silty clay	Clay

General texture terms

----- Coarse -----		-- Moderately -- coarse	---------- Medium ----------		--- Moderately fine ---		---------- Fine ----------		
Sandy soils	---------- Loamy soils ----------							----- Clayey soils -----	

[a]Although not included as class names in Figure 4.13, these soils are usually treated separately because of their fine sand content.

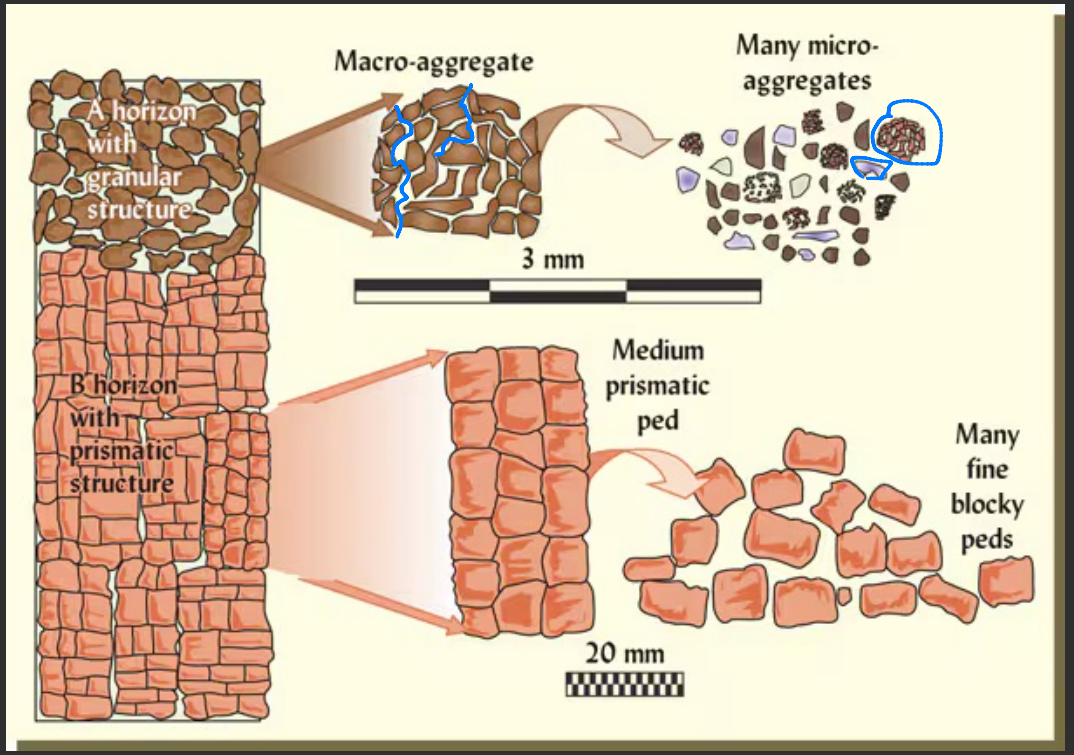


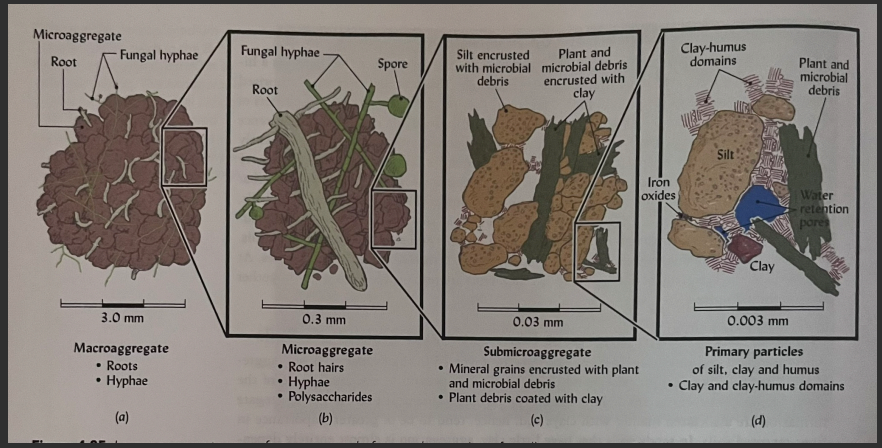
Soil structure -
The spatial arrangement of particles to form complex aggregates, pore, and channels

Peds or aggreagates = a mixture of multiple particles

-- THESE ARE NOT CLODS (wet mud)

Single-grained to massive (many many grained)


Macro-aggregate
Many micro-aggregates
A horizon with granular structure
3 mm
B horizon with prismatic structure
Medium prismatic ped
Many fine blocky peds
20 mm


Microaggregate
Root
Fungal hyphae
3.0 mm
Macroaggregate
• Roots
• Hyphae
(a)
Fungal hyphae
Spore
Root
0.3 mm
Microaggregate
• Root hairs
• Hyphae
• Polysaccharides
(b)
Silt encrusted with microbial debris
Plant and microbial debris encrusted with clay
0.03 mm
Submicroaggregate
• Mineral grains encrusted with plant and microbial debris
• Plant debris coated with clay
(c)
Clay-humus domains
Plant and microbial debris
Silt
Iron oxides
Water retention pores
Clay
0.003 mm
Primary particles
of silt, clay and humus
• Clay and clay-humus domains
(d)

Spheroidal

Characteristic of surface (A) horizons. Subject to wide and rapid changes.

Granular (porous)

Crumb (very porous)

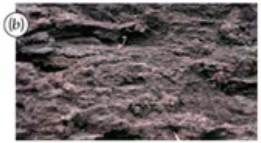
(a)

Plate-like

Common in E horizons, may occur in any part of the profile. Often inherited from parent material of soil, or caused by compaction.

Platy

(b)



Block-like

Common in B horizons, particularly in humid regions. May occur in A horizons.

Angular blocky

(c)

Subangular blocky

(d)

Prism-like

Usually found in B horizons. Most common in soils of arid and semi-arid regions.

Columnar (rounded tops)

(e)

Prismatic (flat, angular tops)

(f)