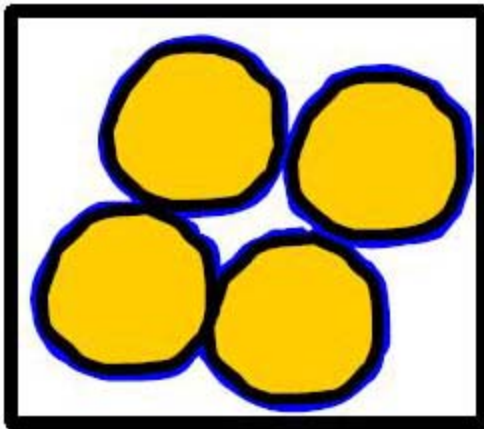
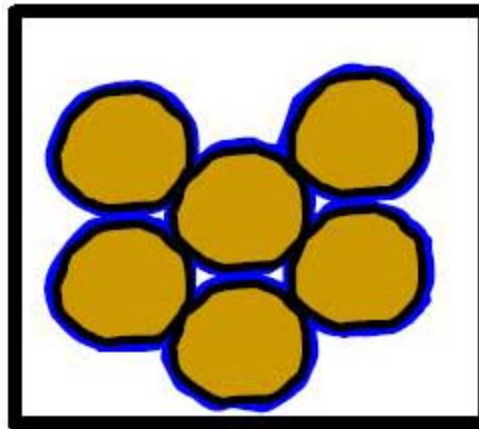


# Soil Particle Size Classification

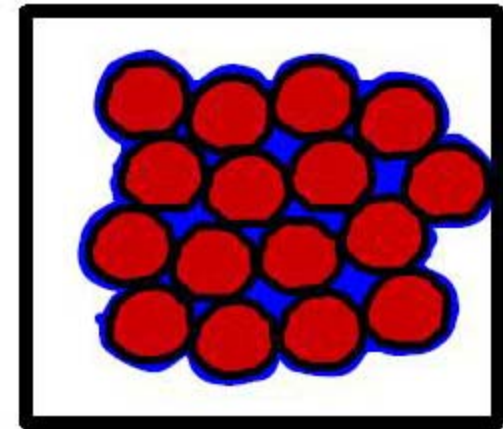
Sand



Silt

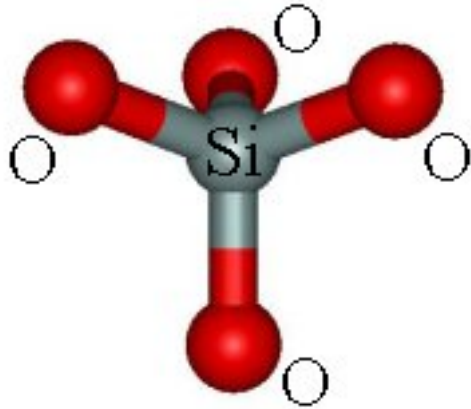


Clay

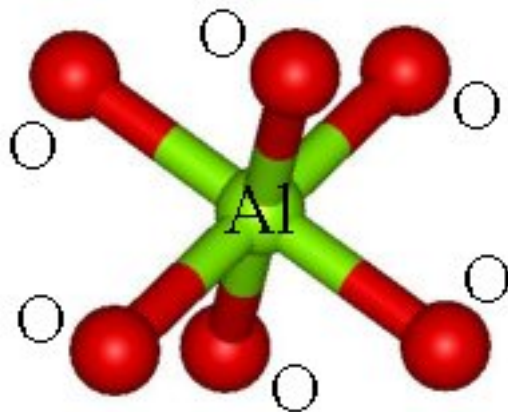


Type of Mineral Particle	Size Range
Sand	2.0 - 0.06 millimeters
Silt	0.06 - 0.002 millimeters
Clay	less than 0.002 millimeters

# Clay Mineral Structures

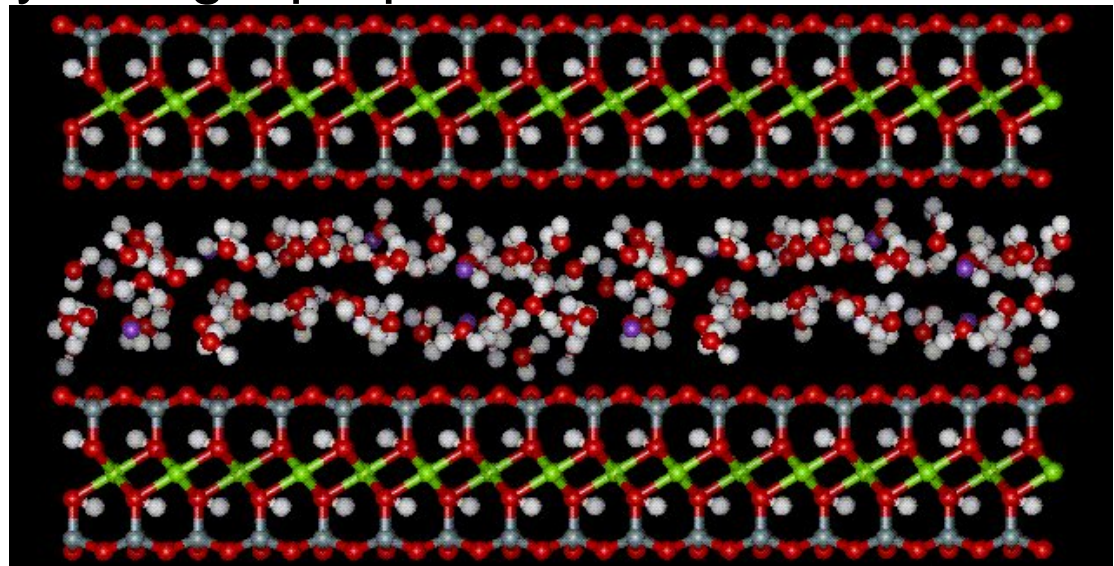


Silica:  $\text{SiO}_3$



Alumina:  $\text{Al}(\text{OH})_6$

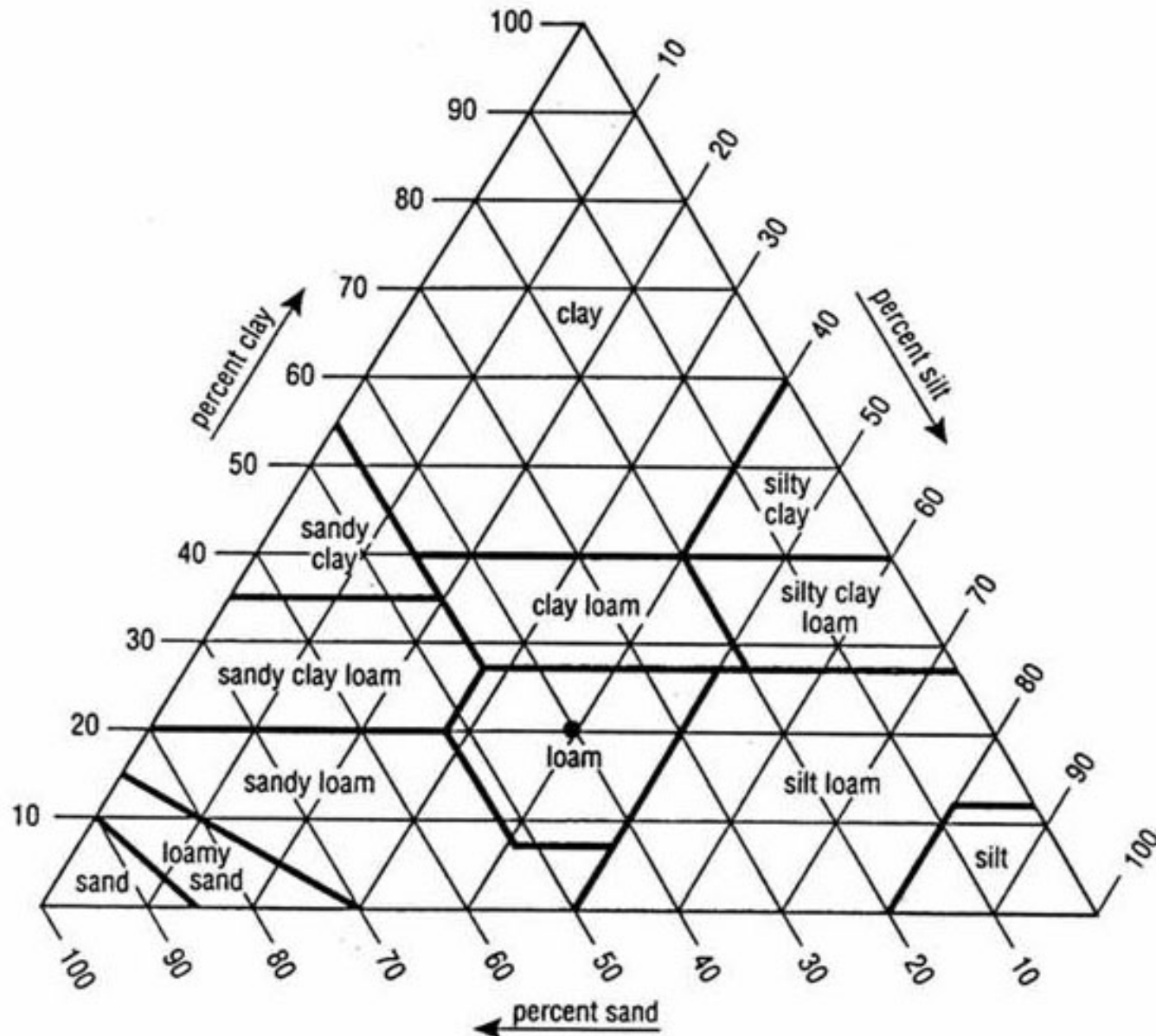
- Clays are **aluminosilicate** minerals.
  - They contain layers of silica bonded to layers of alumina.
- Clays are classified by the number and arrangement of these sheets.
- Water can be hydrogen bonded on the surface of or between sheets.
- Metal cations (Na, K, Ca, Fe, Mg) in the water will swap places with Al, giving individual clays unique colors and hydrologic properties.



# Soil Fractions

- The clay fraction
  - Consists of the most weathered particles.
  - Tends to consist of clay minerals.
  - Adsorbs and retains the most soil water.
    - Adsorb: bond to the surface of
  - Most important in determining hydrologic properties.
- The sand and silt fractions
  - Consist of less weathered, less reactive particles
  - Retain less water.
  - Contain large amounts of quartz ( $\text{SiO}_3$ ), a stable, almost inert compound.

# Soil Textural Triangle



# Determining Soil Type, pt. I

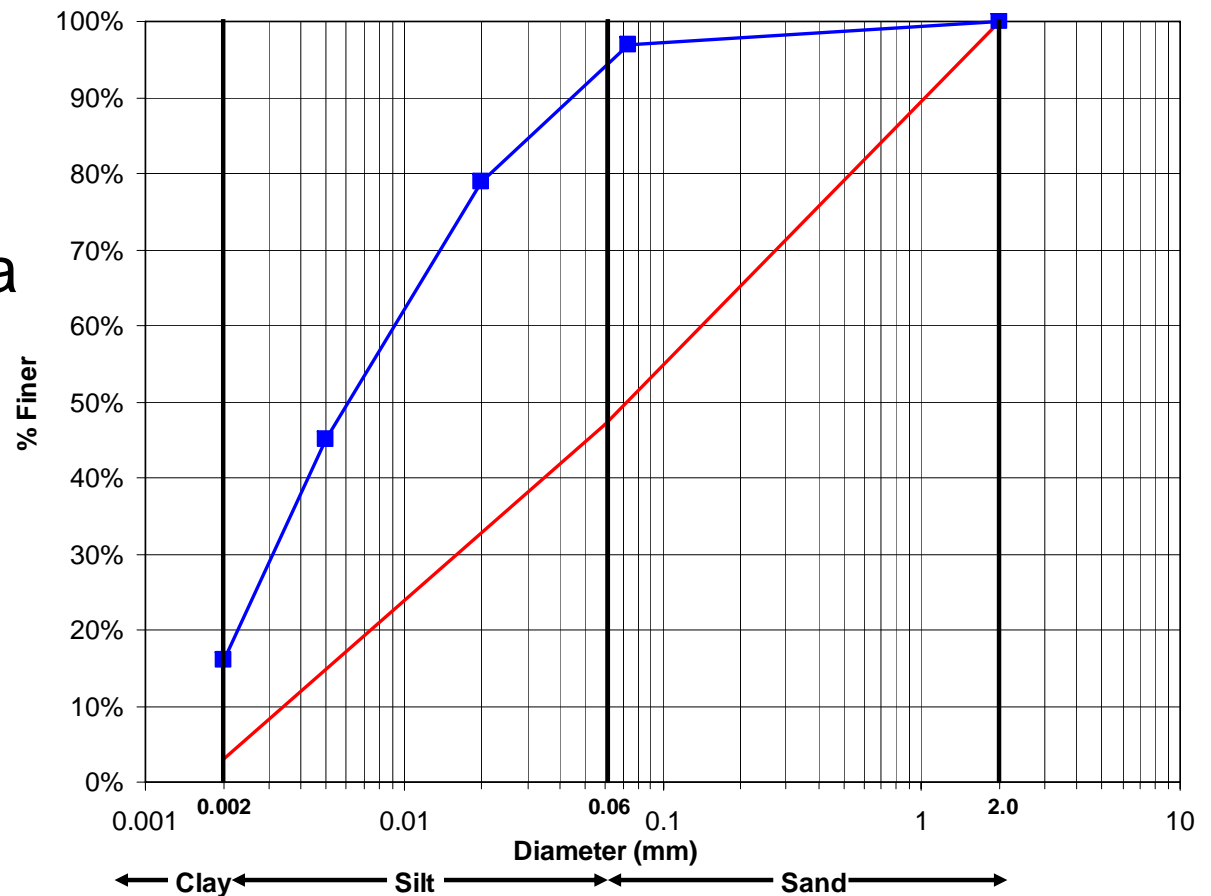
- Sieve analysis is the most common method.
- A soil sample is shaken through a set of sieves that have progressively smaller openings.
- After shaking, the mass of soil in each sieve is determined.



- The result is expressed as the % of the total mass of soil that passed through each sieve.

# Determining Soil Type, pt. II

- The results are plotted on a semi-log graph to create a **grain-size distribution curve**.
- 3% finer than 0.002 mm = 3% clay.
- 47% finer than 0.06 mm means 47% – 3% = 44% silt.
- 100% – 47% = 53% sand



Use textural triangle to get soil type name